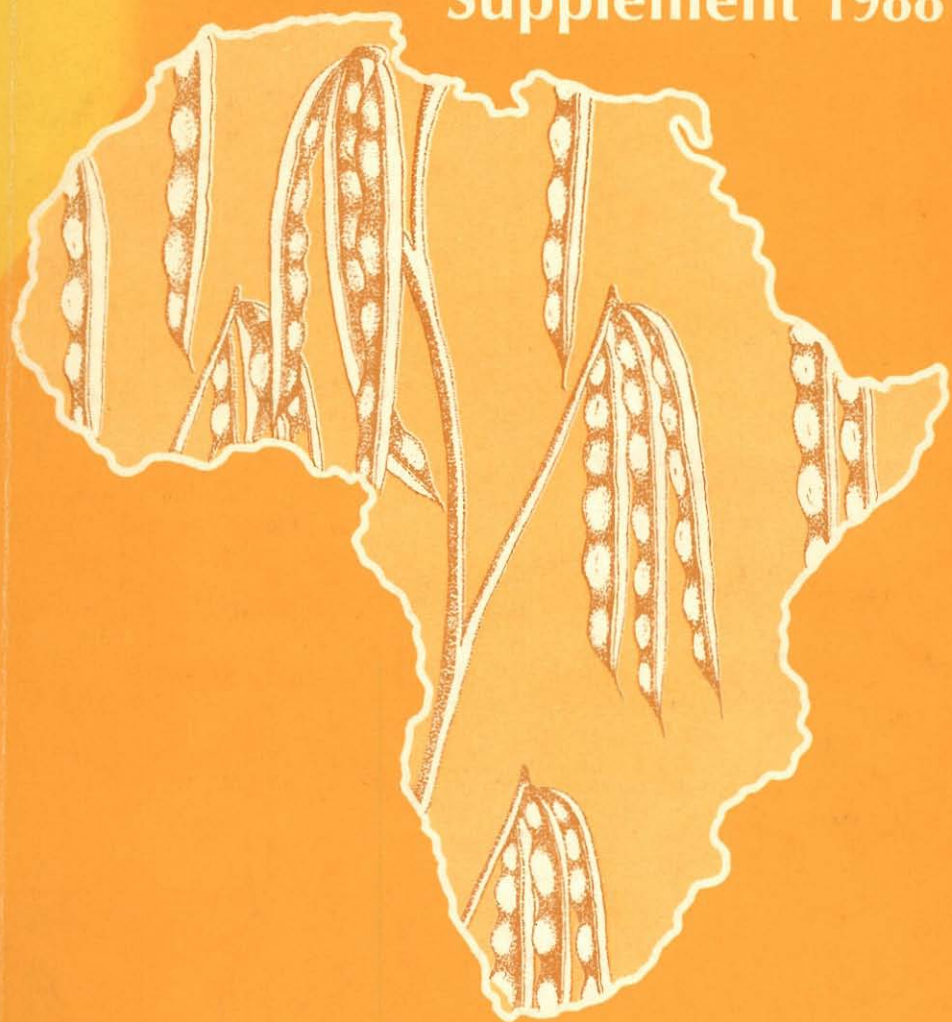


34814

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Supplement 1988



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Information and conclusions reported herein do not necessarily reflect the position of any of the aforementioned entities.

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INTRODUCTION

Through the "Bibliography on Bean Research in Africa" CIAT's Bean Information Center (BIC) aims to assist those researchers interested in Phaseolus bean production in Africa. It provides an annotated bibliography to scientific literature on beans in Africa. Supplement 1988 updates the "Bibliography" (1983) and the 1984 and 1986 supplements. The bibliography in its entirety is directed at national programs and the bean research network operating in Africa.

The present supplement contains 656 new entries. Citations are organized by country to highlight national bean program research and other research specific to each country. Within each country, citations are arranged alphabetically by author and, within each author's papers, in descending chronological order.

Most citations are provided with a descriptive abstract of their contents, and descriptors (see figure). The source of the abstract is indicated by the acronyms AS (author summary) and CIAT (database at the Centro Internacional de Agricultura Tropical).

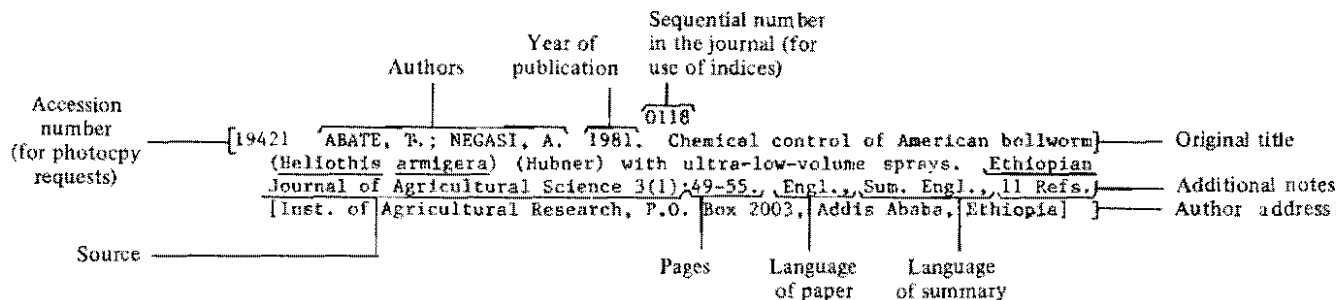
Separate author and subject indexes are provided and alphabetically ordered. In the author index, not only authors but also co-authors, are listed, together with their respective sequential numbers. The subject index lists major descriptors, again together with their respective sequential numbers. By combining these descriptors, more specific topics may be found. The sequential numbers below each author or subject are listed in numerical order.

Readers wishing to use BIC's documents may request copies from CIAT's Library Photocopying Service by quoting the citation's accession number.

Because the quest for literature is continuous, authors are invited to notify BIC of their writing activities specific to beans, not just in Africa, but in all parts of the world. Contributions of copies of their new research documents to CIAT's collection of African and world literature are actively sought. By including them in CIAT's abstracting services, in particular, BIC's "Abstracts on Field Beans," worldwide awareness of the documents' existence will be ensured and greater access to them will be possible through the CIAT Library's document copying and supply services.

Correspondence may be addressed to Bean Information Center, Information Unit, Training and Communication Support Program, Centro Internacional de Agricultura Tropical (CIAT), Apartado Aéreo 6713, Cali, Colombia.

COMPONENTS OF AN ABSTRACT



Phaseolus vulgaris. Injurious insects. Lepidoptera. Heliothis armigera.
 Insect control. Chemical control. Ethiopia.

Expt. consisting of ultralow vol. formulations of endosulfan (500 and 750 g a.i./ha), cypermethrin (150 g a.i./ha), fenitrothion (960 g a.i./ha), profenofos (750 g a.i./ha), and an untreated check were conducted for 2 consecutive yr against Heliothis armigera on haricot beans at the Awassa and Nazareth Expt. Stations of the Institute of Agricultural Research (IAR), Ethiopia. The treatments were replicated 5 times in a randomized complete block design on 20 x 20 m plots. Of the insecticides used, single application of cypermethrin gave a more consistent and significant control than the check in both seasons at both stations. A new product, cypermethrin/profenofos 166^R, substituted for fenitrothion at Nazareth in the 1980 season, gave promising results to warrant further testing. Endosulfan, a recommended insecticide against the American bollworm in the past, was not as satisfactory as cypermethrin in its control of H. armigera on haricot beans. [AS]

↓
 Abstractor
 and/or translator

GENERAL

1730

32510 AL-JIBOURI, H.A.; KASSAPU, S. 1987. FAO grain legume program in East and Central Africa. In Consultative Group Meeting for Eastern and Central African Regional Research on Grain Legumes (Groundnut, Chickpea, and Pigeonpea) Addis Ababa, Ethiopia, 1986. Research on grain legumes in Eastern and Central Africa; summary proceedings. Patancheru, India, International Crops Research Institute for the Semi-Arid Tropics, pp.89-93. En. [Plant Production and Protection Division, FAO Via delle Terme di Caracalla, 00100 Rome, Italy]

Phaseolus vulgaris. Statistical data. Yields. Production. Burundi. Ethiopia. Rwanda. Somalia. Sudan. Uganda. Ghana.

Data on harvested area (ha) and yields (kg/ha) are given for various grain legume species (including beans) grown in different eastern and central African countries such as Burundi, Ethiopia, Rwanda, Somalia, Sudan, and Uganda. (CIAT)

1731

28189 CALDERON C., W. 1985. BEANS IN AFRICA. IN CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. TRENDS IN CIAT COMMODITIES. CALI, COLOMBIA. INTERNAL DOCUMENT ECONOMICS 1.10. PP.74-78. EN.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; HUMAN NUTRITION; PROTEIN CONTENT; AFRICA; CIAT-1.

DATA ARE GIVEN ON WORLDWIDE BEAN PRODUCTION (MT) FOR THE PERIOD 1981-83, AS WELL AS THE MEAN PRODUCTION (MT), AREA CULTIVATED, AND MEAN YIELDS IN THE DIFFERENT SUB-SAHARAN COUNTRIES IN AFRICA. DATA ON GROWTH RATES IN BEAN PRODUCTION, AREA CULTIVATED, AND YIELDS ARE ALSO INCLUDED FOR SEVERAL AFRICAN COUNTRIES (ETHIOPIA, TANZANIA, UGANDA, BURUNDI, RWANDA, ANGOLA, MADAGASCAR, REPUBLIC OF SOUTH AFRICA, AND ZAMBIA) FOR THE PERIODS 1962-70 AND 1970-81. FINALLY, DATA ARE INCLUDED ON THE NUTRITIONAL ROLE OF BEANS IN SUB-SAHARAN AFRICA DURING THE PERIOD 1979-81 WITH RESPECT TO PERCENTAGE OF TOTAL PROTEIN FROM BEANS AND THE RANK OF BEANS AMONG PROTEIN SOURCES AND AMONG QUALITY PROTEINS. (CIAT)

1732

29755 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1987. BEAN GERMPLASM ACTIVITIES. GERMPLASM COLLECTION, MULTIPLICATION AND DISTRIBUTION. IN-----, BEAN PROGRAM. ANNUAL REPORT 1986. CALI, COLOMBIA. WORKING DOCUMENT NO.21. PP.21-31. EN.

PHASEOLUS VULGARIS; GERMPLASM; PROPAGATION; PLANT HABIT; SEED CHARACTERS; PHASEOLUS LUNATUS; PHASEOLUS COCCINEUS; PHASEOLUS ACUTIFOLIUS; PLANT INTRODUCTIONS; AMERICA; EUROPE; ASIA; AFRICA; CIAT-1.

DURING 1986 THE EMPHASIS ON THE ACQUISITION OF PHASEOLUS GERMPLASM CONTINUED TO BE DIRECTED TO LAND RACES AND WILD SPECIES. IN ADDITION TO INTENSIVE EXPEDITIONARY WORK IN LATIN AMERICA, SEVERAL INTERESTING MATERIALS FROM EUROPE, ASIA, AND AFRICA WERE RECEIVED. OF THE LAST BATCH OF 6000 NEW ACCESSIONS APPROVED BY THE INSTITUTO COLOMBIANO AGROPECUARIO FOR MULTIPLICATION IN CIAT GREENHOUSES AND ISOLATED FIELDS, ABOUT 1100 MATERIALS WERE MULTIPLIED FROM 23 COUNTRIES (MAINLY FROM USA, PERU, AND RWANDA). CHARACTERIZATION OF GERMPLASM BY PLANT HABIT AND SEED SIZE, USING THE DESCRIPTORS PROPOSED BY CIAT, CONTINUED TO DETECT SIMILAR GROUPS OF GERMPLASM. A DUPLICATE OF THE BASE COLLECTION FOR PRESERVATION IN LONG-TERM STORAGE (2000 ACCESSIONS) WAS SENT TO THE CENTRO NACIONAL DE RECURSOS

GENETICOS, BRAZIL. FOUR COLLECTION TRIPS TO GUATEMALA, ARGENTINA, PERU, AND MEXICO WERE CARRIED OUT BY THE GENETIC RESOURCES UNIT, OF WHICH THE RESULTS AND OUTSTANDING CONCLUSIONS ARE PRESENTED. FUTURE PLANS INCLUDE THE COLLECTION OF GERMPLASM IN COSTA RICA AND THE AFOREMENTIONED COUNTRIES AND RESEARCH ON SEED MULTIPLICATION AND MORPHOAGRONOMIC EVALUATION, ESPECIALLY FOR YIELD AND ADAPTATION. (CIAT)

1733

29753 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1987. BEAN PROGRAM. ANNUAL REPORT 1986. CALI, COLOMBIA. WORKING DOCUMENT NO.21. 318P. EN., IL.

PHASEOLUS VULGARIS; SNAP BEANS; GERMPLASM; DATABASE; PROPAGATION; PLANT BREEDING; HYBRIDIZING; RESISTANCE; MYCOSES; VIROSES; BACTERIOSES; INJURIOUS INSECTS; ADAPTATION; YIELDS; PHOTOPERIOD; TEMPERATURE; DROUGHT; NITROGEN FIXATION; NUTRITIVE VALUE; TRANSFER OF TECHNOLOGY; CENTRAL AMERICA; CARIBBEAN; BRAZIL; PERU; MEXICO; ARGENTINA; ASIA; AFRICA; NETHERLANDS; CIAT-1.

THE ACTIVITIES CARRIED OUT BY THE CIAT BEAN PROGRAM IN 1986 ARE REPORTED. BEAN GERMPLASM ACTIVITIES COVERED COLLECTION, MULTIPLICATION AND DISTRIBUTION, DATA MANAGEMENT, GENETIC VARIABILITY FROM BIOTECHNOLOGICAL TECHNIQUES, AND VARIABILITY FROM INTERSPECIFIC HYBRIDIZATION. INDIVIDUAL CHARACTER IMPROVEMENT STUDIES WERE CONDUCTED ON RESISTANCE TO FUNGAL, BACTERIAL, AND VIRAL DISEASES AND INVERTEBRATE PESTS, YIELD POTENTIAL, PHOTOPERIOD AND TEMP. ADAPTATION, DROUGHT AND ACID SOILS TOLERANCE, N FIXATION, NUTRITIONAL QUALITY, AND SNAP BEANS. GENETIC IMPROVEMENT ALSO AIMED AT EVALUATION IN UNIFORM NURSERIES (BEAN EVALUATION NURSERY, VEF; PRELIMINARY TRIALS, EP; AND IBYAN). AGRONOMIC PRACTICES WERE EVALUATED IN ON-FARM TRIALS. REGIONAL ACTIVITIES WERE CARRIED OUT IN CENTRAL AMERICA, THE CARIBBEAN, BRAZIL, PERU, MEXICAN HIGHLANDS, ARGENTINA, WEST ASIA, ANDEAN ZONE, AFRICA (GREAT LAKES REGION, EAST AND SOUTHERN AFRICA), AND THE NETHERLANDS, IN THE LATTER WITH THE INSTITUTE FOR HORTICULTURAL PLANT BREEDING. (CIAT)

1734

29759 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1987. GENETIC IMPROVEMENT AND RELATED ACTIVITIES. IMPROVEMENT OF INDIVIDUAL CHARACTERS, RESISTANCE TO FUNGAL AND BACTERIAL DISEASES. IN-----, BEAN PROGRAM. ANNUAL REPORT 1986. CALI, COLOMBIA. WORKING DOCUMENT NO.21. PP.55-81. EN., IL.

PHASEOLUS VULGARIS; GERMPLASM; RESISTANCE; UROMYCES PHASEOLI; ISARIOPSIS GRISEOLA; COLLETOTRICHUM LINDEMUTHIANUM; XANTHOMONAS CAMPESTRIS PV. PHASEOLI; CUBA; MEXICO; COLOMBIA; KENYA; ZAIRE; TANZANIA; BURUNDI; CIAT-1.

MAIN ACTIVITIES CONDUCTED DURING 1986 REGARDING THE IMPROVEMENT OF INDIVIDUAL CHARACTERS IN BEAN COMPRISED THE EVALUATION OF SEVERAL ADVANCED AND SEGREGATING BEAN NURSERIES FOR THEIR REACTIONS UNDER FIELD CONDITIONS TO RUST, ANGULAR LEAF SPOT, ANTHRACNOSE, COMMON BACTERIAL BLIGHT, AND HALO BLIGHT AS WELL AS THE DEVELOPMENT OF METHODOLOGIES TO BETTER DETERMINE DISEASE RESISTANCE MECHANISMS. RESULTS OF THESE EVALUATIONS ARE INCLUDED. (CIAT)

1735

29777 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1987. GENETIC IMPROVEMENT AND RELATED ACTIVITIES. REGIONAL ACTIVITIES. AFRICA. EAST AFRICA. IN-----, BEAN PROGRAM. ANNUAL REPORT 1986. CALI, COLOMBIA. WORKING DOCUMENT NO.21. PP.278-282. EN.

PHASEOLUS VULGARIS; VARIETAL MIXTURES; PLANT BREEDING; TRANSFER OF TECHNOLOGY; PLANT INTRODUCTIONS; GERMPLASM; ETHIOPIA; KENYA; SOMALIA; UGANDA; CIAT-1.

DETAILED INFORMATION IS PRESENTED ON THE ACTIVITIES OF THE EASTERN AFRICA REGIONAL BEAN PROGRAM. THIS REGIONAL PROJECT COVERS ETHIOPIA, KENYA, SOMALIA, AND UGANDA. CIAT'S REGIONAL ACTIVITIES AIM PRIMARILY AT STRENGTHENING NATIONAL CAPABILITIES TO CONDUCT RESEARCH RELEVANT TO SMALL FARMERS' NEEDS. SPECIAL ATTENTION IS BEING GIVEN TO TRAINING, BOTH AT CIAT AND IN AFRICA. EACH COUNTRY'S VAR. DEVELOPMENT PROGRAM IS BEING STRENGTHENED BY ACCESS TO A WIDER RANGE OF GERMPLASM. (CIAT)

1736

29776 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1987. GENETIC IMPROVEMENT AND RELATED ACTIVITIES. REGIONAL ACTIVITIES. AFRICA. GREAT LAKES REGION. IN----- . BEAN PROGRAM. ANNUAL REPORT 1986. CALI, COLOMBIA. WORKING DOCUMENT NO.21. PP.235-277. EN., IL.

PHASEOLUS VULGARIS; GERMPLASM; CULTIVARS; RESISTANCE; PLANT INTRODUCTIONS; ISARIOPSIS GRISEOLA; COLLETOTRICHUM LINDEMUTHIANUM; ASCOCHYTA; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; XANTHOMONAS CAMPESTRIS PV. PHASEOLI; UROMYCES PHASEOLI; BEAN COMMON MOSAIC VIRUS; OPHIOMYIA PHASEOLI; COOKING; TIMING; SEED HARDENING; WATER ABSORPTION; VARIETAL MIXTURES; YIELDS; TRANSFER OF TECHNOLOGY; TECHNOLOGY EVALUATION; SEED PRODUCTION; RWANDA; ZAIRE; BURUNDI; CIAT-1.

THE GREAT LAKES REGIONAL BEAN PROGRAM WORKS WITH THE AGRICULTURAL RESEARCH INSTITUTIONS OF BURUNDI, RWANDA, AND ZAIRE. ADVANCED BREEDING LINES WERE INTRODUCED AS POTENTIAL NEW VAR. FOR THE REGION AND/OR AS SOURCES OF RESISTANCE TO ANGULAR LEAF SPOT, ANTHRACNOSE, ASCOCHYTA LEAF SPOT, HALO AND COMMON BLIGHT, RUST, BCMV, AND THE BEAN FLY. TOGETHER WITH LOCALLY COLLECTED GERMPLASM, THE INTRODUCED GERMPLASM FORMS AN EXCELLENT BASIS FOR THE VAR. DEVELOPMENT PROGRAMS. ADVANCED LINES FROM ALL 3 NATIONAL PROGRAMS IN THE REGION WERE EVALUATED FOR COOKING TIME, WATER ABSORPTION, AND HARD SEED CHARACTER. A COLLABORATIVE PROJECT BETWEEN THE U. OF MÜNCHEN AND CIAT INVESTIGATED THE SIGNIFICANCE OF VAR. MIXTURES IN TERMS OF YIELD GAINS TO OBTAIN INFORMATION TO DEVELOP A STRATEGY FOR IMPROVING VAR. MIXTURES. THE GENOTYPES WHICH GAINED MOST FROM BEING PLANTED IN MIXTURES WERE BAT 1297 AND PVMX 1531. ON-FARM VAR. TRIALS WERE CARRIED OUT IN RWANDA AND BURUNDI. DIAGNOSTIC SURVEYS AND EXPLORATORY TRIALS WERE ALSO CONDUCTED IN SEVERAL REGIONS OF ALL 3 COUNTRIES IN THE GREAT LAKES REGION TO ESTABLISH ON-STATION AND ON-FARM RESEARCH PRIORITIES. CULTURAL METHODS (SEED SELECTION AND REMOVAL OF DISEASED LEAVES AND SEEDLINGS) IN COMBINATION SHOW PROMISE AS AN EFFECTIVE WAY TO CONTROL DISEASES IN VAR. MIXTURES. THE PROGRAM IN 1986 INITIATED THE FOLLOWING TECHNOLOGY DEVELOPMENT AND TESTING TRIALS: (A) CHEMICAL SEED TREATMENTS FOR AREAS WITH ROOT ROT, BEAN FLY, AND SOIL ACIDITY PROBLEMS; (B) A DETAILED STUDY ON THE ACCEPTABILITY OF CLIMBING BEANS IN THE CENTRAL PLATEAU REGION; (C) ON-STATION TRIALS TESTING THE INTEGRATION OF SOIL IMPROVEMENT COMPONENTS SUCH AS LEGUME-TREES AND GREEN MANURES CROPS IN BEAN PRODUCTION SYSTEMS; AND (D) TECHNIQUES TO IMPROVE FARMERS' SELF-SEED PRODUCTION. (CIAT)

1737

29778 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1987. GENETIC IMPROVEMENT AND RELATED ACTIVITIES. REGIONAL ACTIVITIES. AFRICA. SOUTHERN AFRICA. IN----- . BEAN PROGRAM. ANNUAL REPORT 1986. CALI, COLOMBIA. WORKING DOCUMENT NO.21. PP.283-284. EN.

PHASEOLUS VULGARIS; PLANT BREEDING; CULTIVARS; YIELDS; ADAPTATION; RESISTANCE; OPHIOMYIA PHASEOLI; TRANSFER OF TECHNOLOGY; TANZANIA; MALAWI; ZAMBIA; ZIMBABWE; MOZAMBIQUE; ANGOLA; BOTSWANA; LESOTHO; SWAZILAND; CIAT-1.

THE SOUTHERN AFRICA DEVELOPMENT COORDINATION CONFERENCE (SADCC) REGION COVERS TANZANIA, MALAWI, ZAMBIA, ZIMBABWE, MOZAMBIQUE, ANGOLA, BOTSWANA, LESOTHO, AND SWAZILAND, AND IS THE LARGEST OF THE 3 REGIONS HOSTING A CIAT BEAN PROGRAM IN AFRICA. BEAN PRODUCTION FROM THE SADCC REGION AMOUNTS TO ABOUT 564 THOUSAND T OF DRY SEED, WHICH IS APPROX. A QUARTER OF THE TOTAL PRODUCTION OF AFRICA. THE STRENGTH OF NATIONAL PROGRAMS DIFFERS SUBSTANTIALLY ACROSS THE 9 COUNTRIES. THE TANZANIA PROGRAM IS THE LARGEST. IN MOST OTHER COUNTRIES IN SOUTHERN AFRICA, NATIONAL SCIENTISTS ARE PART OF GRAIN LEGUME RESEARCH TEAMS NOT DEVOTED SOLELY TO BEANS. CIAT'S REGIONAL ACTIVITIES HAVE INCLUDED THE CONDUCT OF THE 1ST STEERING COMMITTEE MEETING, THE CONVENING OF A BEAN FLY WORKSHOP IN ARUSHA, TANZANIA, AND THE ATTENDANCE OF A BOARD MEETING OF SOUTHERN AFRICAN CENTER FOR COOPERATION IN AGRICULTURAL RESEARCH IN LUSAKA, ZAMBIA. (CIAT)

1738

29754 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1987. TRAINING. IN----- . BEAN PROGRAM. ANNUAL REPORT 1986. CALI, COLOMBIA. WORKING DOCUMENT NO.21. PP.11-19. EN.

PHASEOLUS VULGARIS; TRANSFER OF TECHNOLOGY; EL SALVADOR; COSTA RICA; NICARAGUA; PERU; HONDURAS; EUROPE; ASIA; AFRICA; COLOMBIA; CIAT-1.

TRAINING OF SCIENTISTS AND EXTENSIONISTS AT CIAT HEADQUARTERS IN THE DEVELOPMENT, TESTING, AND PROMOTION OF NEW BREEDING LINES AND AGRONOMIC PRACTICES CONTINUED TO RECEIVE HIGH PRIORITY IN THE BEAN PROGRAM. A TOTAL OF 180 SCIENTISTS FROM EL SALVADOR, COSTA RICA, NICARAGUA, PERU, HONDURAS, AND COLOMBIA WERE TRAINED THIS YEAR IN ON-FARM RESEARCH. SEVENTY-SIX SCIENTISTS FROM THE AMERICAS, EUROPE, ASIA, AND AFRICA RECEIVED TRAINING IN VARIOUS DISCIPLINES. DATA ARE INCLUDED ON TRAINING PROVIDED AT CIAT IN SPECIFIC DISCIPLINES AND THE NO. OF MAN-MO. OF TRAINING PROVIDED BY CIAT, BY COUNTRY; A LIST IS INCLUDED WITH NAME OF TRAINEE, COUNTRY, INSTITUTION, DISCIPLINE, SUPERVISOR, AND SCIENTIST-MO. AT THE BEAN PROGRAM. (CIAT)

1739

28684 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1986. BEAN PRODUCTION SYSTEMS IN AFRICA; AUDIOTUTORIAL UNIT. SCIENTIFIC CONTENT ALLEN, D.J.; PRODUCTION ARREGGOCES, O. CALI, COLOMBIA. 65 COLOR SLIDES 5 X 5 CM.; 1 CASSETTE 65 MIN.; SCRIPT 12P.; STUDY GUIDE 16P. EN., IL. ALSO IN FRENCH.

PHASEOLUS VULGARIS; CULTIVATION SYSTEMS; PLANT BREEDING; AFRICA; CIAT-1.

THE PRINCIPAL BEAN PRODUCTION SYSTEMS IN AFRICA ARE DESCRIBED. POTENTIAL IMPROVEMENT STRATEGIES ARE PROPOSED. THE MAIN AGRONOMIC CONSTRAINTS TO BEAN PRODUCTION ARE ANALYZED AND STRATEGIES ARE GIVEN FOR IMPROVING PRODUCTION. (CIAT)

1740

26990 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1986. BEAN PROGRAM. ANNUAL REPORT 1985. CALI, COLOMBIA. WORKING DOCUMENT NO.14. 331P. EN., IL. ALSO IN SPANISH.

PHASEOLUS VULGARIS; GERMPLASM; DATABASE; PROPAGATION; PLANT BREEDING; DISEASES AND PATHOGENS; INJUNIOUS INSECTS; YIELDS; ADAPTATION; RESISTANCE; DROUGHT; NITROGEN FIXATION; HYBRIDIZING; NUTRITIVE VALUE; TRANSFER OF TECHNOLOGY; LATIN AMERICA; SOUTH AMERICA; AFRICA; CARIBBEAN; CIAT-1.

THE ACTIVITIES CARRIED OUT BY THE CIAT BEAN PROGRAM IN 1985 ARE REPORTED. BEAN GERMPLASM ACTIVITIES COVERED COLLECTION, MULTIPLICATION, AND DISTRIBUTION, BIOTECHNOLOGY RESEARCH, AND DATA MANAGEMENT. CHARACTER IMPROVEMENT STUDIES WERE CARRIED OUT ON RESISTANCE TO DISEASES AND PESTS, YIELD POTENTIAL, ADAPTATION, DROUGHT TOLERANCE, N FIXATION, INTERSPECIFIC

HYBRIDIZATION, AND NUTRITIONAL QUALITY, BREEDING ALSO AIMED AT CHARACTER DEVELOPMENT FOR SPECIFIC REGIONS AND EVALUATION IN UNIFORM NURSERIES. AGRONOMIC PRACTICES WERE EVALUATED AND IMPROVED. SCIENTIFIC TRAINING AND NETWORK ACTIVITIES WERE CONDUCTED IN CENTRAL AMERICA, BRAZIL, PERU, AND AFRICA. (CIAT)

1741

27012 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1986. SCIENTIFIC TRAINING AND NETWORK ACTIVITIES. AFRICA. IN -----, BEAN PROGRAM. ANNUAL REPORT 1985. CALI, COLOMBIA. WORKING DOCUMENT NO.14. PP.282-318. EN. ALSO IN SPANISH.

PHASEOLUS VULGARIS; PLANT BREEDING; DEVELOPMENT; TRANSFER OF TECHNOLOGY; PLANT INTRODUCTIONS; PEST CONTROL; GERMPLASM; COOKING; TIMING; PROTEIN CONTENT; AFRICA; CIAT-1

DETAILED INFORMATION ON THE ACTIVITIES OF THE CIAT BREEDING PROGRAM AND AFRICAN REGIONAL AND NATIONAL PROGRAMS IS PRESENTED, WITH SPECIAL EMPHASIS ON THE GREAT LAKES REGIONAL PROJECT IN CENTRAL AFRICA. THE MAIN ACTIVITIES CARRIED OUT IN 1985 IN THE AREAS OF TRAINING, VAR. DEVELOPMENT AND INTRODUCTION, CULTURAL AND CHEMICAL CONTROL OF DISEASES AND PESTS, NUTRITIONAL STUDIES (COOKING TIME AND PROTEIN CONTENT), ON-FARM RESEARCH, BEAN CONSUMPTION PREFERENCE SURVEYS, AND ON-FARM VAR. TRIALS ARE SUMMARIZED AND MAJOR RESULTS ARE GIVEN. FUTURE PLANS FOR 1986 ARE INCLUDED. (CIAT)

1742

27008 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1986. SCIENTIFIC TRAINING AND NETWORK ACTIVITIES. TRAINING. IN -----, BEAN PROGRAM. ANNUAL REPORT 1985. CALI, COLOMBIA. WORKING DOCUMENT NO.14. PP.231-242. EN., IL. ALSO IN SPANISH.

PHASEOLUS VULGARIS; TRANSFER OF TECHNOLOGY; TECHNOLOGICAL PACKAGE; LATIN AMERICA; CARIBBEAN; BURUNDI; RWANDA; UGANDA; CIAT-1.

THE METHODOLOGY AND ACHIEVEMENTS OF TRAINING AT CIAT ARE DESCRIBED. TABLES INDICATING THE TRAINING BY DISCIPLINE AND CATEGORY, AND THE PARTICIPANTS TRAINED IN 1985 ARE INCLUDED. (CIAT)

1743

25699 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1985. VIVERO INTERNACIONAL DE ROYA DEL FRIJOL; RESULTADOS 1983-1984. (INTERNATIONAL BEAN RUST NURSERY; RESULTS FOR 1983-84). CALI, COLOMBIA, DOCUMENTO DE TRABAJO NO.9. 45P. ES., EN., IL.

PHASEOLUS VULGARIS; CULTIVARS; UROMYCES PHASEOLI; RESISTANCE; LATIN AMERICA; USA; AFRICA.

THE RESULTS OF THE 1983-84 INTERNATIONAL BEAN RUST NURSERY (IBRN), DISTRIBUTED BY CIAT TO 30 COLLABORATORS IN 24 SITES OF LATIN AMERICA, USA, AND AFRICA, ARE PRESENTED. HOWEVER, RESULTS OF ONLY 12 SITES ARE REPORTED; 100 BEAN CV. WERE INCLUDED OF WHICH 41 VAR. WERE USED AS MONITOR CONTROLS. THE OBJECTIVES WERE TO (1) IDENTIFY BEAN CV. AND BREEDING LINES RESISTANT TO A WIDE SPECTRUM OF UROMYCES PHASEOLI PATHOGENIC RACES, (2) DETECT NEW AND MORE VIRULENT RACE COMPLEXES, (3) IDENTIFY RUST DIFFERENTIAL VAR., (4) OBTAIN INFORMATION ON RUST RACE GEOGRAPHICAL DISTRIBUTION PATTERNS, AND (5) DETERMINE THE STABILITY OF DIFFERENT TYPES OF RUST RESISTANCE IN TIME AND SPACE. THE GERMPLASM WAS EVALUATED FOR RUST RESISTANCE FROM PREFLOWERING TO MID-FLOWERING AND FROM MID-FLOWERING TO POD FORMATION (20-40 AND 40-60 DAYS AFTER PLANTING, RESP.). NO MATERIAL WAS FOUND TO BE IMMUNE AND 66 PERCENT WERE SUSCEPTIBLE IN 1 OR MORE SITES. FIFTEEN MATERIALS THAT HAVE EXHIBITED RESISTANCE TO RUST PATHOGENS SINCE 1975 ARE LISTED. COMPARISONS ARE MADE TO

ILLUSTRATE THE APPLICABILITY OF THE IBRN DATA TO STUDY THE PATHOGENIC VARIABILITY INHERENT IN THE RUST FUNGUS. (CIAT)

1744

29994 CORREA V., F.J. 1987. Pathogenic variation, production of toxic metabolites, and isoenzyme analysis in *Phaeoisariopsis griseola* (Sacc.) Ferr. Ph.D. Thesis. East Lansing, Michigan State University. 164p. En., Sum. En., 96 Ref., Il.

PHASEOLUS VULGARIS; ISARIOPSIS GRISEOLA; ISOLATION; PATHOGENICITY; CULTIVARS; RESISTANCE; ENZYMES; ANALYSIS; LATIN AMERICA; AFRICA.

Seventeen Latin American *Isariopsis griseola* isolates were studied for virulence characteristics on a group of 21 bean cv. Large differences in virulence were found among isolates for disease severity, lesion size and no., sporulation capacity, and no. of days required to cause a given level of disease. No cv. was resistant to all isolates of the pathogen; however, regression analyses indicated that several cv. such as A 339 and BAT 1647 show presence of several components of nonspecific resistance. Forty-two isolates of the pathogen obtained from Latin America and Africa were separated into 14 pathogenicity groups on the basis of their reactions on 8 differential bean cv. Studies were conducted on production of toxic metabolites in vitro by 2 *I. griseola* isolates representing the most pathogenic (Colombia 1) and the least pathogenic (Michigan 5) groups. Results indicate that isolate Colombia 1 produces several toxic compounds which differ in host-specificity on the bean cv. Montcalm and BAT 1647. Isolate Michigan 5 produced toxic metabolites with a degree of specificity towards the susceptible cv. Montcalm. A 10-fold difference in the concn. of toxin required to induce the same symptoms on the resistant cv. BAT 1647, with respect to susceptible Montcalm, was found. Further studies are needed to elucidate the role of these toxic compounds in the angular leaf spot disease. Isoenzyme variation among 55 *I. griseola* isolates from Latin America, Africa, and USA was studied. Two isoenzyme patterns were found for each of the 4 enzymes (esterase, catalase, leucine aminopeptidase, and adenylate kinase). All African isolates exhibited pattern 1 for each enzyme while Latin American isolates exhibited both patterns 1 and 2. Pattern 1 of each enzyme was associated with large-seeded bean types, suggesting coevolution with this bean type in the Andean zone of South America. Pattern 2 was associated with small-seeded bean types suggesting coevolution with this bean type in Central and North America. (AS)

1745

28867 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1985. BEANS, DRY. FAO PRODUCTION YEARBOOK 39:136-137. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1979-81 AND FOR EACH YEAR OF THE PERIOD 1983-85. (CIAT)

1746

28. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1985. BEANS, GREEN. FAO PRODUCTION YEARBOOK 39:177. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1979-81 AND FOR EACH YEAR OF THE PERIOD 1983-85. (CIAT)

1747

28865 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1984. BEANS, DRY. FAO PRODUCTION YEARBOOK 38:136-137. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1974-76 AND FOR EACH YEAR OF THE PERIOD 1982-84. (CIAT)

1748

28866 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1984. BEANS, GREEN. FAO PRODUCTION YEARBOOK 38:175. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1974-76 AND FOR EACH YEAR OF THE PERIOD 1982-84. (CIAT)

1749

28863 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1983. BEANS, DRY. FAO PRODUCTION YEARBOOK 37:134-135. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1974-76 AND FOR EACH YEAR OF THE PERIOD 1981-83. (CIAT)

1750

28864 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1983. BEANS, GREEN. FAO PRODUCTION YEARBOOK 37:173. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1974-76 AND FOR EACH YEAR OF THE PERIOD 1981-83. (CIAT)

1751

28861 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1982. BEANS, DRY. FAO PRODUCTION YEARBOOK 36:132-133. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1974-76 AND FOR EACH YEAR OF THE PERIOD 1980-82. (CIAT)

1752

28862 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1982. BEANS, GREEN. FAO PRODUCTION YEARBOOK 36:170. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA;
ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT)
OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD
1974-76 AND FOR EACH YEAR OF THE PERIOD 1980-82. (CIAT)

1753

28859 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1981. BEANS,
DRY. FAO PRODUCTION YEARBOOK 35:120-121. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA;
ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT)
OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD
1969-71 AND FOR EACH YEAR OF THE PERIOD 1979-81. (CIAT)

1754

28860 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1981. BEANS,
GREEN. FAO PRODUCTION YEARBOOK 35:158. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA;
ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT)
OF FRESH BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD
1969-71 AND FOR EACH YEAR OF THE PERIOD 1979-81. (CIAT)

1755

28857 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1980. BEANS,
DRY. FAO PRODUCTION YEARBOOK 34:121-122. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA;
ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT)
OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD
1969-71 AND FOR EACH YEAR OF THE PERIOD 1978-80. (CIAT)

1756

28858 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1980. BEANS,
GREEN. FAO PRODUCTION YEARBOOK 34:159. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA;
ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT)
OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD
1969-71 AND FOR EACH YEAR OF THE PERIOD 1978-80. (CIAT)

1757

28855 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS . 1979. BEANS,
DRY. FAO PRODUCTION YEARBOOK 33:120-121. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA;
AS EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT)
OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD
1969-71 AND FOR EACH YEAR OF THE PERIOD 1977-79. (CIAT)

1758

28856 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1979. BEANS, GREEN. FAO PRODUCTION YEARBOOK 33:158. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1969-71 AND FOR EACH YEAR OF THE PERIOD 1977-79. (CIAT)

1759

28853 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1978. BEANS, DRY. FAO PRODUCTION YEARBOOK 32:120-121. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1969-71 AND FOR EACH YEAR OF THE PERIOD 1976-78. (CIAT)

1760

28854 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1978. BEANS, GREEN. FAO PRODUCTION YEARBOOK 32:159. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1969-71 AND FOR EACH YEAR OF THE PERIOD 1976-78. (CIAT)

1761

28851 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1977. BEANS, DRY. FAO PRODUCTION YEARBOOK 31:118-119. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1969-71 AND FOR EACH YEAR OF THE PERIOD 1975-77. (CIAT)

1762

28852 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1977. BEANS, GREEN. FAO PRODUCTION YEARBOOK 31:156. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1969-71 AND FOR EACH YEAR OF THE PERIOD 1975-77. (CIAT)

1763

28849 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1976. BEANS, DRY. FAO PRODUCTION YEARBOOK 30:117-118. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-65 AND FOR EACH YEAR OF THE PERIOD 1974-76. (CIAT)

1764

28850 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1976. BEANS, GREEN. FAO PRODUCTION YEARBOOK 30:154. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-65 AND FOR EACH YEAR OF THE PERIOD 1974-76. (CIAT)

1765

28847 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1975. BEANS, DRY. FAO PRODUCTION YEARBOOK 29:91-92. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-65 AND FOR EACH YEAR OF THE PERIOD 1973-75. (CIAT)

1766

28848 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1975. BEANS, GREEN. FAO PRODUCTION YEARBOOK 29:164. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR EACH YEAR OF THE PERIOD 1964-75 FOR THE WORLD, AFRICA (ALGERIA, EGYPT, MAURITIUS, MOROCCO, REUNION, SOUTH AFRICA, AND TUNISIA), NORTH AMERICA (BERMUDA, CANADA, GUADELOUPE, MARTINIQUE, MEXICO, AND USA), AND SOUTH AMERICA (ARGENTINA, CHILE, ECUADOR, PERU, AND URUGUAY). (CIAT)

1767

28845 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1974. BEANS, DRY. FAO PRODUCTION YEARBOOK 28:74-75. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-65 AND FOR EACH YEAR OF THE PERIOD 1972-74. (CIAT)

1768

28846 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1974. BEANS, GREEN. FAO PRODUCTION YEARBOOK 28:148. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-75 AND FOR EACH YEAR OF THE PERIOD 1972-74. (CIAT)

1769

28843 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1973. BEANS, DRY. FAO PRODUCTION YEARBOOK 27:101-105. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS FOR EACH YEAR OF THE PERIOD 1962-73. (CIAT)

1770

28870 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1973. BEANS, GREEN. FAO PRODUCTION YEARBOOK 27:162. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-65 AND FOR EACH YEAR OF THE PERIOD 1971-73. (CIAT)

1771

28841 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1972. BEANS, DRY. FAO PRODUCTION YEARBOOK 26:101-102. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-65 AND FOR EACH YEAR OF THE PERIOD 1970-72. (CIAT)

1772

28869 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1972. BEANS, GREEN. FAO PRODUCTION YEARBOOK 26:142. EN., FR., ES.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF FRESH BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIOD 1961-65 AND FOR EACH YEAR OF THE PERIOD 1970-72. (CIAT)

1773

28840 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1971. DRY BEANS. FAO PRODUCTION YEARBOOK 25:154-159. EN., FR.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIODS 1948-52 AND 1961-65 AND FOR EACH YEAR OF THE PERIOD 1967-71. (CIAT)

1774

28839 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1971. GREEN BEANS. FAO PRODUCTION YEARBOOK 25:140-143. EN., FR.

PHASEOLUS VULGARIS; SNAP BEANS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA (HA), PRODUCTION (MT), AND YIELD (KG/HA) OF SNAP BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIODS 1948-52 AND 1961-65 AND FOR EACH YEAR OF THE PERIOD 1966-70. (CIAT)

1775

28838 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1970. DRY BEANS. FAO PRODUCTION YEARBOOK 24:153-158. EN., FR.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS FOR THE PERIOD 1948-52 AND 1961-65 AND FOR EACH YEAR OF THE PERIOD 1966-70. (CIAT)

1776

28837 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1970. GREEN BEANS. FAO PRODUCTION YEARBOOK 24:139-142. EN., FR.

PHASEOLUS VULGARIS; SNAP BEANS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), PRODUCTION (MT), AND YIELD (KG/HA) OF SNAP BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIODS 1948-52 AND 1961-65 AND FOR EACH YEAR OF THE PERIOD 1965-69. (CIAT)

1777

28836 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1969. DRY BEANS. FAO PRODUCTION YEARBOOK 23:154-159. EN., FR.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIODS 1948-52 AND 1952-56 AND FOR EACH YEAR OF THE PERIOD 1964-68. (CIAT)

1778

28835 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1969. GREEN BEANS. FAO PRODUCTION YEARBOOK 23:140-143. EN., FR.

PHASEOLUS VULGARIS; SNAP BEANS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), PRODUCTION (MT), AND YIELD (KG/HA) OF SNAP BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIODS 1948-52 AND 1952-56 AND FOR EACH YEAR OF THE PERIOD 1964-68. (CIAT)

1779

28834 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1968. DRY BEANS. FAO PRODUCTION YEARBOOK 22:152-157. EN., FR.

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA HARVESTED (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF DRY BEANS FOR THE DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIODS 1948-52 AND 1952-56 AND FOR EACH YEAR OF THE PERIOD 1964-67. (CIAT)

1780

28833 FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS. 1968. GREEN BEANS. FAO PRODUCTION YEARBOOK 22:138-141. EN., FR.

PHASEOLUS VULGARIS; SNAP BEANS; PRODUCTION; YIELDS; STATISTICAL DATA; AFRICA; AMERICA; ASIA; EUROPE; OCEANIA.

DATA ARE INCLUDED ON AREA (HA), YIELD (KG/HA), AND PRODUCTION (MT) OF SNAP BEANS FOR DIFFERENT COUNTRIES AND CONTINENTS DURING THE PERIODS 1948-52 AND 1952-56 AND FOR EACH YEAR OF THE PERIOD 1963-67. (CIAT)

1781

31774 INSTITUT DE RECHERCHE AGRONOMIQUE ET ZOOTECHNIQUE. 1986. Le haricot. (Beans). In Institut de Recherche Agronomique et Zootechnique. Synthèse du point de la recherche agronomique et zootechnique dans les pays de la Communauté Economique des Pays des Grands Lacs (C.E.P.G.L.) Burundi-Rwanda-Zaire. Gitega, Burundi, pp.61-66. Fr.

Phaseolus vulgaris. Dwarf beans. Climbing beans. Zea mays. Intercropping. Flant breeding. Cultivars. Spacing. Developmental research. Burundi. Rwanda. Zaire.

The economic importance of beans as a staple food in Burundi, Rwanda, and Zaire is highlighted. Research objectives for this crop in Burundi aim at obtaining highyielding var., with high protein content and disease-resistance. In Rwanda, they also focus on obtaining highyielding and disease-resistant var. adapted to different ecological conditions. Research on climbing beans focuses on obtaining var. suitable for intercropping with maize. In Zaire, the major research objective is the selection of tasty, disease-, and lodging-resistant early bean var. Trials carried out in Burundi in 1979-80 resulted in the selection of Karama var. 1/2 and Diacol Calima (the latter from CIAT), 2 bush bean var. proposed for release in areas lower than 1250 and between 1200 and 2000 m alt., resp. For areas above 2000 m alt., var. 0688 Colorado is recommended. Information in table form is included for bush, semi-climbing, and climbing bean var. proposed for release in Rwanda. The spacing recommended for dwarf and semi-climbing beans is 30 x 40 and 40 x 20 cm for climbing beans. Bean var. proposed for release in Zaire are also mentioned; the planting distance recommended for the maize-bean association is 160 x 60 cm. The major constraints (including diseases and poor var. adaptation) for bean production in Burundi, Rwanda, and Zaire are enumerated. (CIAT)

1782

31064 INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES. 1984. Haricot. (Beans). In Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières. Rapport Annuel 1984.

Phaseolus vulgaris. Cultivars. Dwarf beans. Climbing beans. *Colletotrichum lindemuthianum*. Temperature. Yields. *Rhizobium phaseoli*. Strains. CIAT-2. Inoculation. Fertilizers. N. K. Intercropping. Zea mays. *Coffea arabica*. *Hoplocheilus marginalis*. Rwanda. Madagascar. Cameroon. New Caledonia. Reunion. France.

The major results of research on beans conducted in Rwanda, Madagascar, Cameroon, New Caledonia, Reunion, and France are reported. In Rwanda, the 75 bean ecotypes identified were classified into 3 groups according to their plant habit: dwarf, semi-climbing, and climbing beans. Among the 7 var. tested for performance under high temp. conditions, Bataaf and Tostade (dwarf), Inyumba (semi-climbing), and Cajainaroca and Gisenyi 6 (climbing) outstood, in spite of the extremely low yield (less than 1000 kg/ha) due to a severe anthracnose attack. The hypothesis that a lack of

rhizobia survival is achieved at the end of an irrigated rice crop was verified. Inoculation with rhizobium and organic manure application increased both no. of nodules/plant and yields, as shown in a table. In Western Cameroon, the fertilization of beans at a rate of 20 and 40 kg N and K/ha, resp. was found suitable. Regarding intercropping with maize, the climbing bean var. Porrillo 693 resulted in a 400 kg/ha yield decrease of the cereal compared with the dwarf bean var. BAT 95 which does not wrap around the maize plant. In New Caledonia, climbing bean var. yielded more than dwarf bean var.; Kidney Bean and Red Kidney Bean var. were not suitable for processing in a local canning industry. Bean cultivation as a rotational crop with yams or intercropped with young coffee plants is recommended. In Reunion, higher populations of *Hoplochelus marginalis* caused the death of bean plants. In Montpellier, France, expt. on the survival of *Rhizobium phaseoli* (CIAT 899) within an inoculum exposed to high temp. (45 degrees Celsius) indicated that care should be taken when handling inoculum since a marked decrease of living bacteria was observed after 2 h. (CIAT)

1783

29938 JANSSEN, W. 1988. SNAP BEANS IN THE DEVELOPING WORLD . IN-----; LOPEZ S., J.; GONZALEZ V., F. SNAP BEANS: PRESENT STATUS IN THE DEVELOPING WORLD AND BIBLIOGRAPHY OF RESEARCH (1919-1987). CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. PP.1-26. EN., 27 REF. (CIAT, APARTADO AEREO 6713, CALI, COLOMBIA)

PHASEOLUS VULGARIS; SNAP BEANS; YIELDS; PRODUCTION; CONSUMPTION; INCOME; CHEMICAL CONTROL; INJURIOUS INSECTS; DISEASES AND PATHOGENS; PROCESSING; MARKETING; PRICES; LATIN AMERICA; AFRICA; ASIA.

THE PRESENT STATUS OF SNAP BEANS IN THE DEVELOPING WORLD IS REVIEWED. SOCIOECONOMIC ASPECTS ARE MAINLY DISCUSSED. PRODUCTION, MARKETING, AND CONSUMPTION FEATURES ARE DESCRIBED AND THE FUTURE POTENTIAL FOR THE CROP IS OUTLINED. CONSTRAINTS TO PRODUCTION INCREASES ARE DISCUSSED AND THE OPPORTUNITIES FOR RESEARCH AND DEVELOPMENT OF THE CROP ARE DEFINED. (CIAT)

1784

29937 JANSSEN, W.; LOPEZ S., J.; GONZALEZ V., F. 1988. SNAP BEANS: PRESENT STATUS IN THE DEVELOPING WORLD AND BIBLIOGRAPHY OF RESEARCH (1919-1987). CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 411P. EN., 922 REF.

PHASEOLUS VULGARIS; SNAP BEANS; ECONOMICS; YIELDS; PRODUCTION; CONSUMPTION; INCOME; CHEMICAL CONTROL; INJURIOUS INSECTS; DISEASES AND PATHOGENS; PROCESSING; MARKETING; PRICES; LATIN AMERICA; AFRICA; ASIA.

THE PRESENT STATUS OF SNAP BEANS IN THE DEVELOPING WORLD IS REVIEWED IN THE LEADING PAPER ACCOMPANYING THIS PUBLICATION. SOCIOECONOMIC ASPECTS ARE MAINLY DISCUSSED. PRODUCTION, MARKETING, AND CONSUMPTION FEATURES ARE DESCRIBED AND THE FUTURE POTENTIAL FOR THE CROP IS OUTLINED. CONSTRAINTS TO PRODUCTION INCREASES ARE DISCUSSED AND THE OPPORTUNITIES FOR RESEARCH AND DEVELOPMENT OF THE CROP ARE DEFINED. THE BIBLIOGRAPHY CONTAINS 922 REFERENCES TO RESEARCH ON SNAP BEANS. MOST OF THE DOCUMENTS (761) ARE AVAILABLE AT CIAT. REFERENCES ARE ORGANIZED BY DISCIPLINES AND ARE COMPLEMENTED WITH AUTHOR AND SUBJECT INDEXES. THE INSTITUTIONS IDENTIFIED BY THE BEAN INFORMATION CENTER AS CARRYING OUT RESEARCH ON SNAP BEANS ARE LISTED IN THE ENCLOSED PRELIMINARY DIRECTORY, WHICH ALSO INCLUDES THE NAMES OF THE SNAP BEAN RESEARCHERS RECORDED IN THE CIAT DATABASE AND THE PARTICIPANTS IN THE WORKSHOP ON SNAP BEAN BREEDING HELD AT CIAT IN 1987. (CIAT)

1785

28300 KIRKEY, R.A. 1986. THE ROLE, ORGANIZATION AND MANAGEMENT OF CIAT'S ACTIVITIES IN SUPPORT OF NATIONAL BEAN IMPROVEMENT PROGRAMS IN EASTERN AFRICA. DEBRE ZEIT, ETHIOPIA, CROPPING SYSTEMS AGRONOMIST, CIAT REGIONAL PROGRAM ON BEANS IN EASTERN AFRICA. 10P. EN., 7 REF. PAPER PRESENTED AT CONSULTATIVE GROUP MEETING FOR EASTERN AND CENTRAL AFRICA REGIONAL RESEARCH ON GRAIN LEGUMES. ADDIS ABABA, ETHIOPIA, 1986. (CIAT REGIONAL PROGRAM ON BEANS IN EASTERN AFRICA, P.O. BOX 67, DEBRE ZEIT, ETHIOPIA)

PHASEOLUS VULGARIS; DEVELOPMENTAL RESEARCH; PLANT BREEDING; AGRICULTURAL PROJECTS; TRANSFER OF TECHNOLOGY; AFRICA; CIAT-1.

GENERAL INFORMATION IS GIVEN ON AFRICAN BEAN PRODUCTION AND RESEARCH OPPORTUNITIES. THE OBJECTIVES AND ORGANIZATION OF THE CIAT BEAN PROGRAM IN AFRICA ARE MENTIONED, INCLUDING THE PROBABLE PATTERN OF STAFFING AND LOCATION OF CIAT REGIONAL BEAN PROGRAMS IN THE GREAT LAKES REGION, EASTERN AFRICA, AND SOUTHERN AFRICA. THE PHILOSOPHY AND MANAGEMENT OF THE REGIONAL PROGRAM OPERATIONS ARE DESCRIBED AND METHODS USED FOR THE INTEGRATION OF INDEPENDENTLY FUNDED REGIONAL PROGRAMS ARE ENUMERATED AND BRIEFLY EXPLAINED. THE CURRENT COLLABORATIVE RESEARCH SUBPROJECTS ARE MENTIONED AS WELL AS THE BEAN INFORMATION SERVICES CIAT PROVIDES IN THE REGION. (CIAT)

1786

31679 KYOMO, M.L.; KESWANI, C.L. 1987. Structure and distribution of land and corresponding yields of field food crops in Eastern and Southern Africa. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.54-69. En., Sum. En., 15 Ref.

Phaseolus vulgaris. Farm size. Statistical data. Land use. Production. Yields. Inoculation. Malawi. Angola. Botswana. Mozambique. Zimbabwe.

The different types of farm holdings in Eastern and Southern Africa are described. Emphasis is given to 9 countries of the Southern African Development Coordination Conference: Angola, Botswana, Lesotho, Malawi, Mozambique, Swaziland, Tanzania, Zambia, and Zimbabwe. Data on bean production in 1981 are presented for Angola and Botswana. Area planted to beans in Malawi was estimated in 850,000 ha. Statistics are given on area planted, yields, and production in Mozambique for 1981-82 and 1982-83. Large commercial farms (more than 100 ha) and private state farms each produced 50 percent of the beans in Tanzania. The use of legume inoculum should be encouraged taking advantage of the Inoculation Factory located at Grasslands Research Station (Marondera, Zimbabwe). (CIAT)

1787

28206 MCGILL JUNIOR, J.A. 1977. WHITE BEAN PRODUCTION IN AFRICA IS ON THE SKIDS. MICHIGAN DRY BEAN DIGEST 1(2):6-7. EN., IL.

PHASEOLUS VULGARIS; ECONOMICS; PRODUCTION; STATISTICAL DATA; AFRICA.

THE DRAMATIC SITUATION OF WHITE BEAN PRODUCTION IN SEVERAL AFRICAN COUNTRIES (KENYA, ETHIOPIA, TANZANIA, AND SOUTH AFRICA) IS BRIEFLY ANALYZED FOR THE PERIOD 1976-77. (CIAT)

1788

29946 PACHICO, D. 1986. Structure and trends in world common bean production. Michigan Dry Bean Digest 11(1):7-8,15. En., 7 Ref.

Phaseolus vulgaris. Production. Yields. Trade. Consumption. South America. North America. Central America. Caribbean. Europe. Asia. Africa.

The structure and trends in world common bean production are globally analyzed based on data for the 1962-64-1982-84 period. Bean production, production and area growth rates, yields, trade, and consumption figures are given and analyzed for 12 subregions (Brazil, Mexico, Eastern Africa, North America, Eastern Europe, African Great Lakes, Southern Cone, Central America/Caribbean, West Asia, Western Europe, Southern Africa, and Andean). (CIAT)

1789

28083 PACHICO, D.; CALDERON C., W. 1984. Bean consumption and production in Sub-Saharan Africa. A preliminary review. Cali, Colombia, Centro Internacional de Agricultura Tropical. Trends in CIAT Commodities. Internal Document. Economics 1.9. pp.64-100. En.

Phaseolus vulgaris. Production. Consumption, Marketing. Rwanda. Malawi. Tanzania. Kenya.

Bean production trends during 1962-81 in Africa and the structure of bean production in some major African producers are briefly analyzed; consumer preferences and marketing issues are also reviewed. Sub-Saharan Africa is second only to Latin America among the world's leading producing regions of *Phaseolus vulgaris*. Eastern Africa is the leading Sub-Saharan region in terms of land devoted to dry bean production, followed by the Great Lakes Region and Southern Africa. In both Africa and Latin America, beans are typically produced in small farms, much of the time in mixed cropping systems. In Africa, beans are produced as a subsistence crop and input use is almost always negligible. Available information on bean cropping systems in Rwanda, Malawi, Tanzania, and Kenya is briefly summarized. Typically, African consumers appear to readily accept mixtures of bean grain types of varying colors, shapes, and sizes. In most countries, it appears that large beans are preferred, especially red, than red mottled, pinkish or purple grain types, although yellows and whites are also accepted in some regions. Beans are also consumed as a fresh vegetable in the form of young green leaves. (CIAT)

1790

27732 STOCKINGER, E.J.; WAINES, J.G. 1986. INTERSPECIFIC HYBRIDIZATION BETWEEN KENYAN COMMON BEANS AND TEPARY BEANS. BEAN IMPROVEMENT COOPERATIVE. ANNUAL REPORT 29:93-94. EN. (DEPT. OF BOTANY & PLANT SCIENCES, UNIV. OF CALIFORNIA, RIVERSIDE, CA 92521, USA)

PHASEOLUS VULGARIS; HYBRIDIZING; PHASEOLUS ACUTIFOLIUS; RESISTANCE; DROUGHT; CULTIVARS; BACKCROSSING; AFRICA.

AN INTERSPECIFIC BEAN BREEDING PROGRAM BETWEEN PHASEOLUS VULGARIS AND P. ACUTIFOLIUS WAS LAUNCHED TO DEVELOP COMMON BEANS RESISTANT TO DROUGHT CONDITIONS IN EAST AFRICA. PRELIMINARY RESULTS INDICATE THAT THREE KENYAN COMMON BEAN LINES (NB86, NB585, AND PB13) READILY CROSS WITH THE 4 TEPARY BEAN LINES USED. ALSO, 1 IN 150 BACKCROSS POLLINATIONS RESULTED IN A VIABLE BC1F1 PLANT. DESIRABLE COMMON BEAN LINES SUCH AS ROSE COCO, WHICH WILL NOT PRODUCE VIABLE F1 PLANTS, CAN BE USED AS THE RECURRENT PARENT IN A BACKCROSSING SCHEME. SEED SIZE AND SEED COAT COLOR OF THE ORIGINAL COMMON BEAN PARENT WERE FOUND TO BE QUICKLY RESTORED. LIKEWISE, A VERY HIGH LEVEL OF FERTILITY WAS OBSERVED IN THE BC1F1 GENERATION WHEN THE BACKCROSS COMMON BEAN PARENT WAS A SPECIFIC WILD MEXICAN COMMON BEAN. (CIAT)

1791

28982 TAYLOR, J.D.; TEVERSON, D.M. 1986. HALO-BLIGHT OF PHASEOLUS BEAN. IN NATIONAL VEGETABLE RESEARCH STATION. ANNUAL REPORT 1985. WELLESBOURNE, ENGLAND. PP.67-68. EN.

PHASEOLUS VULGARIS; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; RACES;
RESISTANCE; GERMPLASM; AFRICA; LATIN AMERICA; CIAT-2.

CONTINUING THE COLLABORATIVE PROJECT BETWEEN CIAT AND NATIONAL VEGETABLE RESEARCH STATION (WELLESBOURNE, ENGLAND); APPROX. 300 ISOLATES OF PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA FROM INFECTED BEANS, COLLECTED FROM AFRICA AND LATIN AMERICA, WERE ASSIGNED TO RACE 1, 2, 3, AND 4. PRELIMINARY TESTS FOR RESISTANCE WERE MADE ON A COLLECTION OF 454 PHASEOLUS VULGARIS ACCESSIONS FROM THE CIAT GERMPLASM COLLECTION. RACE-SPECIFIC REACTIONS WERE MOST COMMON, WITH 54 ACCESSIONS RESISTANT TO RACE 3, 23 RESISTANT TO RACE 1, AND 5 RESISTANT TO RACES 1 AND 3; NO SPECIFIC RESISTANCE HAS YET BEEN FOUND TO RACE 2. (CIAT)

1792

26914 TAYLOR, J.D.; TEVERSON, D.M. 1985. HALO-BLIGHT OF PHASEOLUS BEAN. IN NATIONAL VEGETABLE RESEARCH STATION, ANNUAL REPORT 1984. WELLESBOURNE, SCOTLAND. P.87. EN.

AFRICA; CULTIVARS; ISOLATION; LATIN AMERICA; PHASEOLUS VULGARIS; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; RESISTANCE; CIAT-2.

A COLLABORATIVE PROJECT, CIAT-NATIONAL VEGETABLE RESEARCH STATION, IS IN PROGRESS TO STUDY THE OCCURRENCE AND DISTRIBUTION OF PATHOGENIC VARIANTS OF THE CAUSAL ORGANISM PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA IN LATIN AMERICA AND AFRICA, AND TO EVALUATE RESISTANCE SOURCES IN BEANS APPROPRIATE FOR THESE AREAS. SOME AFRICAN ISOLATES APPEAR TO BELONG TO A PREVIOUSLY UNDESCRIBED RACE, NOW DESIGNATED RACE 3. THE RESISTANCE OF PI 150414, WHICH HAS BEEN WIDELY USED IN BREEDING PROGRAMS IN EUROPE AND N. AMERICA, SEEMS TO BE NONSPECIFIC. (PLANT BREEDING ABSTRACTS)

1793

28995 TECHNICAL MEETING OF BEAN RESEARCH COORDINATORS IN EASTERN AFRICA, ADIS ABABA, 1985. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:39-41. 1985. EN.

PHASEOLUS VULGARIS; AGRICULTURAL PROJECTS; ETHIOPIA; UGANDA; SOMALIA; TANZANIA.

THE MAIN OBJECTIVES OF THE MEETING OF BEAN RESEARCH COORDINATORS IN EASTERN AFRICA, HELD AT ADIS ABABA, ETHIOPIA, IN DEC. 1985, ARE GIVEN. PULSE SITUATION IS BRIEFLY DESCRIBED, AND PARTICULARLY THE BEAN SITUATION IN ETHIOPIA, UGANDA, SOMALIA, AND TANZANIA; RESEARCH PRIORITIES OF THE BEAN PROGRAMS OF THESE COUNTRIES ARE INCLUDED. (CIAT)

1794

23624 VOYSEST, G.; GARCIA, J.; CRESPO, J.; MARTINEZ, N.; SANTACRUZ, D. 1982. VIVERO INTERNACIONAL DE RENDIMIENTO Y ADAPTACION DE FRIJOL (PHASEOLUS VULGARIS). IBYAN 1982: FRIJOL ARBUSTIVO. (INTERNATIONAL BEAN YIELD AND ADAPTATION NURSERY, IBYAN 1982; BUSH BEANS). CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 377P. ES., IL. (CIAT, APARTADO AEREO 6713, CALI, COLOMBIA)

PHASEOLUS VULGARIS; CULTIVARS; PLANT INTRODUCTIONS; GERMPLASM; ADAPTATION; YIELDS; FLOWERING; SEED COLOR; LATIN AMERICA; CARIBBEAN; AFRICA; ASIA.

THE RESULTS OF THE IBYAN DISTRIBUTED IN 1982 ARE REPORTED. THESE TOTALLED 223 EXPT. IN 4 COUNTRIES IN LATIN AMERICA AND THE CARIBBEAN, NORTH AMERICA, AFRICA, AND ASIA; HOWEVER, DATA WERE RECEIVED ONLY FROM 108 EXPT. IN 22 COUNTRIES. DETAILED INFORMATION IS GIVEN ON THE BEAN GERMPLASM DISTRIBUTED, EXPTL. DESIGN RECOMMENDED, AND DATA COLLECTED (YIELD, PLANTS HARVESTED, DAYS TO FLOWERING, DAYS TO PHYSIOLOGICAL MATURITY, AND REACTION TO DISEASES).

DETAILED RESULTS ARE PRESENTED GROUPED BY COLOR TYPES AS FOLLOWS: SMALL BLACK BEANS, SMALL RED BEANS, INTERMEDIATE AND LARGE RED MOTTLED BEANS, SMALL WHITE BEANS, SMALL AND INTERMEDIATE CREAM AND CREAM STRIPPED BEANS, MULATINHO (SMALL CREAM BEANS) TYPE BEANS, AND CARIOCA (SMALL AND INTERMEDIATE CREAM STRIPPED BEANS) TYPE BEANS. (CIAT)

1795

27042 WARREN, A. 1985. BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 42P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PRODUCTION; CULTIVATION SYSTEMS; CULTIVATION; FERTILIZERS; TANZANIA; MALAWI; ZAMBIA; ZIMBABWE.

AN EXPEDITION WAS ORGANIZED IN 1984 TO OBTAIN INFORMATION ON BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA, AND ZIMBABWE. THIS INFORMATION REPRESENTS VALUABLE RESEARCH LITERATURE NOT AVAILABLE THROUGH CONVENTIONAL SOURCES. PERSONAL INTERVIEWS WERE CONDUCTED WITH SCIENTISTS TO EXPLORE DIFFERENT ASPECTS OF BEAN CULTIVATION SUCH AS ENTOMOLOGY, SOILS, STATISTICAL DATA, BREEDING, NUTRITION, CROPPING SYSTEMS, PESTS AND DISEASES ATTACKING BEANS, PRODUCTION DATA, MARKETING, AND BEAN NUTRITION. (CIAT)

ANGOLA

1796

31459 AMARAL, J.M.P. DO 1966. Breve apontamento sobre a producao e a exportacao do feijao. (Brief notes on bean production and exports). Gazeta Agricola de Angola 11(5):1058-1059. Pt., II.

Phaseolus vulgaris. Trade. Women. Statistical data. Intercropping. Zea mays. Fertilizers. Angola.

The efforts aiming at promoting and improving bean production in Angola since 1958 are highlighted and the situation of bean exports is briefly described. Attempts have failed to promote various bean types that can be competitive in international markets, mainly in the Planalto Central region, since it is well known that climate and soil requirements for improved var. are more demanding. The women's role in bean cultivation in this region is also highlighted; additional reasons to justify not adopting the improved material are mentioned. Statistics are presented on the amount of seed (kg) distributed among the growers in Huambo and Bie from 1959 to 1966. Data are also given on the amount of improved seed (kg) bought by the multipliers and its value for 1961-65. It is indicated that most beans are intercropped with maize and that the fertilization of the latter is also suitable for beans. The total amount (t) exported for the 1959-65 period is indicated. (CIAT)

1797

31455 CONSTANTINO, A.T. 1958. O feijao de Angola. Panorama actual da sua cultura, comércio e armazenamento. (Beans in Angola. Current status of its cultivation, trade, and storage). Lisboa, Portugal, Junta de Investigacoes do Ultramar. Estudos, Ensaios e Documentos no.49. 150p. Pt., Sum. Fr., En., 14 Ref., II.

Phaseolus vulgaris. Trade. Cultivation. Storage. Production. Diseases and pathogens. Acanthoscelides obtectus. Zabrotes subfasciatus. Pest control. Seeds. Angola.

The present status of the agricultural production, trade, and storage of beans in Angola is reviewed. Current trade conditions and future perspectives are described and analyzed and a general description of the agricultural techniques and their relationships with the soil and climate of the main producing districts is included. Pests and diseases of frequent occurrence as well as trading qualities of the most common are also described. Other aspects studied are the trading and transportation scheme and the storage conditions from the field to the docks (storing locations and prevailing temp.-humidity conditions). *Acanthoscelides obtectus* and *Zabrotes subfasciatus* are emphasized as stored bean pests; control measures are also mentioned. Regarding bean seed selection, the most common screening operations are described as well as legislation on quality standards of the exported product. The most important measures to overcome the present trade crisis of this grain legume are summarized. They involve introduction of cv. with export quality, high-quality production, and low cost of production to allow for international competition. (AS)

1798

31097 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.68:22. 1974. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1972 and 1973. (CIAT)

1799

31096 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.65:20. 1974. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1972 and 1973. (CIAT)

1800

31093 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.61:22. 1973. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1971 and 1972. (CIAT)

1801

31095 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.57:41. 1972. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1970 and 1971. (CIAT)

1802

31087 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Setembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.53:20. 1971. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Data on total amount and value of beans (among other products) exported by Angola during 1969 and 1970 are given. Exports were 14,304 and 10,838 t. resp. (CIAT)

1803

31094 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.54:24. 1971. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1969 and 1970. (CIAT)

1804

31092 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.49:24. 1970. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1968 and 1969. (CIAT)

1805

31091 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.45:28. 1969. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1967 and 1968. (CIAT)

1806

31090 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.41:36. 1968. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1966 and 1967. (CIAT)

1807

31089 EXPORTACAO DOS principais produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports: beans). Boletim Trimestral (Angola) no.37:20. 1967. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1965 and 1966. (CIAT)

1808

31088 EXPORTACAO DE produtos originários da agricultura (Janeiro-Dezembro): feijao. (Main agricultural exports; beans). Boletim Trimestral (Angola) no.33:23. 1966. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (t) and value of the main agricultural products (including beans) exported by Angola during 1964 and 1965. (CIAT)

1809

31156 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Epocas de sementeiras e de colheitas; zonas e áreas das principais producoes agrícolas; feijao. (Planting and harvesting times; main agricultural producing areas; beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.118. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1810

31157 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Exportacao agrícola, segundo os países de consumo 1963 a 1972: feijao. (1963-1972 agricultural exports per consuming country; beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.208-209. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. Macao. Federal Republic of Germany. Belgium. Luxemburgo. France. Spain. South Africa. Netherlands. Angola. Zaire.

1811

31098 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1972. Melhoramento de feijao (ano agrícola de 1971-1972). (Bean improvement (1971-1972)). In Instituto de Investigacao Agronómica de Angola. Relatório de 1972. Angola, pp.86-88. Pt.

Phaseolus vulgaris. Yields. Seed color. Selection. Angola.

In comparative trials with multicolored beans established at the Centros de Estudos da Chianga and Cunene (Angola) only black-colored beans yielded over 500 kg/ha. A table is included with information on different bean types and their colors identified in the Angolese districts. (CIAT)

1812

30356 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Precos médios de retalho de produtos alimentares, de produtos para aquecimento, de iluminação e de higiene, na cidade de Luanda. (Main retail prices of food, heating, lights, and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.244. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1813

30355 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Precos médicos de retalho nas principais cidades e vilas. (Main retail prices in the main cities and villages). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.247-248. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1814

30357 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Produtos transaccionados nos mercados rurais. (Products exchanged in the rural markets the main cities and villages). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.242. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1970 and 1972. (CIAT)

1815

30358 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Produtos transaccionados nos mercados rurais, por distritos. (Products exchanged in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.239-240. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1970 and 1972. Information is organized per district. (CIAT)

1816

31158 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1972. Produtos transaccionados nos mercados rurais, por distritos 1970 a 1972: feijao. (1970-1972 products traded in rural markets per district: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1972. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.241. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Angola.

1817

31149 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Epocas de sementeiras e de colheitas; zonas e áreas das principais producoes agricolas: feijao. (Planting and harvesting times; main agricultural producing areas: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.118. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1818

31150 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Exportacao agricola, segundo os países de consumo 1962 a 1971: feijao. (1962-1971 agricultural exports per consuming country: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.204-205. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. France. Spain. United Kingdom. South Africa. Netherlands. Angola.

1819

31175 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1971. Melhoramento de feijao (Ano agricola de 1970/71). (Plant breeding in beans (1970/71)). In Instituto de Investigacao Agronomica de Angola. Relatório de 1971. Angola. pp.85-86. Pt.

Phaseolus vulgaris. Selection. Cultivars. Yields. Zimbabwe. Angola.

Statistics are presented on mean seed production (kg/ha), variation coefficient (percentage), and no. of bean cv. selected and kept under observation, as a result of selection trials conducted at the Centro de Estudos de Chianga (Angola) in 1970-71, with bean cv. IGP 38, IGP 39, IGP 40, IGP 41, IGP 42, and IGP 43. Only 1 bean cv. (introduced from Zimbabwe), from the 12 multiplied at the Centro, was selected. (CIAT)

1820

30346 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Precos médios de retalho de produtos alimentares, de produtos para aquecimento, de iluminacao e de higiene, na cidade de Luanda. (Mean retail prices of food products, heating, lights, and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.251. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1821

30345 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Precos médios de retalho nas principais cidades e vilas: produtos alimentares. (Mean retail prices in the main cities and villages: food products). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.254-255. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1822

30348 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.249. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1969 and 1971. (CIAT)

1823

30343 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per district). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direccao Provincial dos Servicos de Economia e Estatística Geral. pp.247-248. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1969 and 1971. Information is organized per district. (CIAT)

1824

30344 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1971. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per districts). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1971. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.245-246. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1969 and 1971. Information is organized per district. (CIAT)

1825

30326 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Epocas de sementeiras e de colheitas; zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.117. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1826

31107 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Exportacao agricola, segundo os países de consumo 1961 a 1970: feijao. (1961-1970 agricultural exports per consuming country: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Angola, Direcção Provincial dos Serviços de Estatística. pp.202-203. Pt., Dat.num.

Phaseolus vulgaris. Trade. Statistical data. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. Macao. Federal Republic of Germany. Belgium. Luxembourg. Congo. Zaire. USA. France. Spain. United Kingdom. South Africa. Netherlands. Angola.

1827

31454 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1970. Melhoramento de feijao (año agrícola de 1969/70). (Bean improvement (1969/70)). In Instituto de Investigacao Agronómica de Angola. Relatório de 1970. Angola, pp.87-88. Pt.

Phaseolus vulgaris. Cultivars. Yields. Selection. Zimbabwe. Angola.

Among the bean var. tested in 3 comparative trials at the Centro de Estudos da Chianga, Angola, var. Jamapa gave the highest yields. Av. yields of 540 and 610 kg/ha were obtained in the trials with black-colored and multicolored beans, resp. Micro-cuttings from 12 different local bean types and 5 from Zimbabwe were planted for observation. (CIAT)

1828

31109 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Precos médios de retalho de produtos alimentares, de produtos para aquecimento de iluminacao e de higiene, na cidade de Luanda: feijao. (Mean retail prices in Luanda:

beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Angola, Direcção Provincial dos Serviços de Estatística. p.249. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1829

30331 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Preços médios de retalho nas principais cidades e vilas do Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.252-253. Pt., Dat.num.

Phaseolus vulgaris. Prices. Consumption. Marketing. Angola.

1830

30329 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.247. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1968 and 1970. (CIAT)

1831

30327 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per district). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.245. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1968 and 1970. Information is organized per district. (CIAT)

1832

30328 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per district). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.243. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1968 and 1970. Information is organized per district. (CIAT)

1833

31108 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1970. Produtos transaccionados nos mercados rurais, por distritos: feijao. (Products traded in rural markets per district: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1970. Angola, Direcção Provincial dos Serviços de Estatística. pp.244,246. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (kg) and value of various products (including beans) traded in different Angolese districts from 1968 to 1970. (CIAT)

1834

30391 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Epocas de sementeiras e de colheitas; zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1969. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.126. Pt., Fr., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1835

31453 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1969. Melhoramento de feijao (ano agricola 1968/69). (Bean improvement (1968/69)). In Instituto de Investigacao Agronomica de Angola. Relatório de 1969. Angola, pp.64-65. Pt.

Phaseolus vulgaris. Selection. Cultivars. Angola.

Var. and screening trials were established during 2 cropping seasons with 55 and 12 selected bean var., resp., at the Centros de Estudos da Chianga, Cellunga, Luso, Alto Capaca, Gargassol, Cela, and Humpata (Angola). Av. yields were low maybe because of poor crop management and lack of treatment of cuttings. (CIAT)

1836

30387 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Preços médios de retalho de produtos alimentares de produtos para aquecimento de iluminação e de higiene na cidade de Luanda. (Mean retail prices of food products, heating, lights, and sanitation products in the city of Luanda). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1969. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.257. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1837

30388 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Produtos transaccionados nos mercados rurais. (Products exchanged in the rural markets). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1969. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.255. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Consumption. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola during 1967-69. (CIAT)

1838

30389 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Produtos transaccionados nos mercados rurais, por distritos. (Products exchanged in the rural markets, per district). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1969. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.251-253. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1967 and 1969. Information is organized per district. (CIAT)

1839

31155 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1969. Produtos transaccionados nos mercados rurais, por distritos 1967 a 1969: feijao. (Products traded in rural markets per district from 1967 to 1969: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1969. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.254. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

1840

30354 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Epocas de sementeiras, de colheitas; zonas e áreas das principais produções agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.126. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1841

31147 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Exportação agrícola, segundo os países de consumo 1959 a 1968: feijao. (1959-1968 agricultural exports per consuming country: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.206-207. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. Macao. Federal Republic of Germany. Belgium. Luxembourg. USA. France. Zaire. United Kingdom. South Africa. Netherlands. Angola.

1842

31452 INSTITUTO DE INVESTIGACAO AGRONOMICIA DE ANGOLA. 1968. Melhoramento do feijoeiro. (Bean improvement). In Instituto de Investigação Agronómica de Angola. Relatório de 1968. Angola, pp.87-88. Pt.

Phaseolus vulgaris. Selection. Cultivars. Yields. Planting. Timing. Insecticides. Angola.

Trials were conducted at the Centro de Estudos da Chianga, Angola, to compare the effect of 3 planting times and endrin sprayings every 15 days on the yield of various bean types. No significant differences were observed with insecticide application. Data are included on the mean grain yields (kg/ha) of the different beans tested. (CIAT)

1843

30351 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.253. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1844

30350 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Preços médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.256,258. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1845

30352 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Produtos transaccionados nos mercados rurais. (Products traded in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.251. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1966 and 1968. (CIAT)

1846

30353 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Produtos transaccionados nos mercados rurais, por distritos. (Products traded in the rural markets, per district). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.247-249. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1966 and 1968. Information is organized per district. (CIAT)

1847

31148 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1968. Produtos transaccionados nos mercados rurais, per distritos: feijao. (Products traded in rural markets per district: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1968. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.250. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics are presented on the amount (kg) and value of various products (including beans) traded in the district of Huila, Angola during 1966-1968. (CIAT)

1848

31451 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1967. Eleicao de variedades de feijoeiro anao. (Selection of annual bean varieties). In Instituto de Investigacao Agronomica de Angola. Relatório de 1967. Angola, pp.58-59. Pt.

Phaseolus vulgaris. Cultivars. Selection. Angola. *Ophiomyia phaseoli*. Resistance.

Selection trials conducted at the Centros de Estudos da Ceilunga and Gangassoi (Angola) are briefly reported. Susceptibility to *Melanagromyza*

phaseoli was evident in almost all materials. Var. eliminated presented climbing growth habit and/or low yields. (CIAT)

1849

30371 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Epocas de sementeiras, de colheitas, zonas e áreas das principais producoes agricolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatistica Geral. p.135. Pt., Fr., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1850

30370 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Exportacao agricola, segundo os países de consumo. (Agricultural exports, according to consumer countries). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatistica Geral. pp.220-221. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (beans included) exported by Angola to different countries between 1958 and 1967. (CIAT)

1851

30368 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatistica Geral. p.265. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1852

30367 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Precos médios de retalho nas principais cidades e vilas da Provincia. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatistica Geral. pp.268,270. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1853

30369 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1967. Produtos transaccionados nos mercados rurais. (Products exchanged in the rural markets). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1967. Luanda, Direccao Provincial dos Servicos de Economia e Estatistica Geral. p.263. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1965 and 1967. (CIAT)

1854

31450 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1966. Eleicao de cultivares de feijoeiro anao. (Selection of annual bean cultivars). In Instituto de Investigacao Agronomica de Angola. Relatório de 1966. Angola. p.59. Pt.

Phaseolus vulgaris. Germplasm. Selection. Angola.

Comparative trials were established at the Centros de Estudos in Chianga, Cela, Cellunga, and Gangassol (Angola); the different bean types selected at each are mentioned. Studies on grain type and planting time will be carried out with the 100 var. forming the bean collection. The progeny of the 50 var. was observed to select those serving as starting point for var. purifying. (CIAT)

1855

30364 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Epocas de sementeiras, de colheitas, zonas e áreas das principais producoes agricolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1966. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.135. Pt., Fr., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1856

30363 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Exportacao agricola, segundo os países de consumo. (Agricultural exports according to consumer countries). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1966. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.218-219. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. Federal Republic of Germany. Belgium. Luxembourg. Congo. Zaire. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (beans included) exported by Angola to different countries from 1957 to 1966. (CIAT)

1857

30361 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1966. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.263. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1858

30360 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Precos médios de retalho nas principais cidades e vilas da Provincia. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1966. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.266. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1859

30362 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1966. Produtos transaccionados nos mercados rurais. (Products exchanged in the rural markets). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1966. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.261. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

Statistics are given on the total amount and value of the different products (including beans) traded in the rural markets of Angola between 1964 and 1966. (CIAT)

1860

30383 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Epocas de sementeiras, de colheitas, zonas e áreas das principais producoes agricolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1965. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.105. Pt., Fr, Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1861

30382 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Exportacao agricola, segundo os países de consumo. (Agricultural exports according to consumer countries). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1965. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.176-177. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. India. Federal Republic of Germany. Belgium. Luxembourg. Congo. Zaire. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (beans included) exported by Angola to different countries between 1956 and 1965. (CIAT)

1862

31449 INSTITUTO DE INVESTIGACAO AGRONOMICA DE ANGOLA. 1965. Melhoramento do feijoeiro anão. (Improvement of annual bean varieties). In Instituto de Investigacao Agronómica de Angola, Relatório de 1965. Angola, pp.80-82. Pt.

Phaseolus vulgaris. Selection. Yields. Cultivars. Seed color. Latin America. Angola.

The major results of comparative trials with multicolored beans conducted at the Centros de Estudos da Chianga, Ceilings, Gangassol, and Cela (Angola) are summarized. Bean cv. from Latin America (most of them black-colored) gave better yields than the rest of multicolored beans; however, lower yields recorded at 2 exptl. sites were due to deficient cultural practices. (CIAT)

1863

30379 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Precos médias de retalho nas principais cidades e vilas da Provincia. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1965. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.224,226. Pt., Fr., Dat.num .

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1864

30381 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1965. Produtos transaccionados nos mercados rurais. (Products traded in rural markets). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1965. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.219. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Angola.

1865

30176 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Epocas de sementeiras, e de colheitas, zonas e áreas das principais produções agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1964. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.105. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1866

30175 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Exportação agrícola, segundo os países de consumo. (Agricultural exports according to consumer countries). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1964. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.172-173. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. India. Federal Republic of Germany. Belgium. Luxembourg. Congo. Zaire. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (including beans) exported by Angola to different countries between 1955 and 1964. (CIAT)

1867

30173 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Preços médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1964. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.216. Pt., Dat.num.

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1868

30177 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Preços médios de retalho nas principais cidades e vilas da Província. (Mean retail prices in the main cities and villages of the Province). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1964. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.219,221. Pt., Dat.num.

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1869

30174 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1964. Produtos transaccionados nos mercados rurais. (Products traded in rural markets). In Instituto Nacional de Estatistica. Angola. Anuário Estatístico 1964.

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1870

30386 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1963. Epocas de sementeiras, e de colheitas, zonas e áreas das principais produções agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1963. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.92. Pt., Fr., Dat.num.

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1871

30385 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1963. Exportação agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1963. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.174-175. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guineas. Sao Tome and Principe. Mozambique. India. Federal Republic of Germany. Belgium. Luxembourg. Congo. Zaire. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (beans included) exported by Angola to different countries between 1954 and 1963. (CIAT)

1872

30384 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1963. Preços médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1963. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.213. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1873

31133 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1963. Preços médios de retalho nas principais cidades e vilas da Província: feijão. (Mean retail prices in the most important cities and villages: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1963. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.216-217. Pt., Dat.num.

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1874

31140 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1962. Preços médios de retalho nas sedes dos distritos: feijão. (Mean retail prices in district capitals: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1962. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.222-223. Pt., Dat.num.

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1875

31139 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1962. Quantidades e

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1876

30377 INSTITUTO NACIONAL DE ESTATÍSTICA. ANGOLA. 1962. Quantidades e valores das principais mercadorias exportadas: 1949 a 1958. (Amounts and values of the main commodities exported: 1949-58). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1962. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.117. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

1877

30172 INSTITUTO NACIONAL DE ESTATÍSTICA. ANGOLA. 1961. Exportação agrícola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1961. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.174-175. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. India. Federal Republic of Germany. Belgium. Luxembourg. Congo. Zaire. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (including beans) exported by Angola to different countries between 1952 and 1961. (CIAT)

1878

31145 INSTITUTO NACIONAL DE ESTATÍSTICA. ANGOLA. 1961. Exportação agrícola 1951 a 1960: feijao. (1951-1960 agricultural exports: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1960. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.152-153. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. India. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. Congo. United Kingdom. South Africa. Netherlands. Angola.

1879

30170 INSTITUTO NACIONAL DE ESTATÍSTICA. ANGOLA. 1961. Preços médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1961. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.238. Pt., Dat.num.

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1880

31111 INSTITUTO NACIONAL DE ESTATÍSTICA. ANGOLA. 1961. Preços médios de retalho nas sedes dos distritos: feijao. (Mean retail prices in district capitals: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1961. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.240-241. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1881

31146 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1961. Preços médios de retalho nas sedes dos distritos; feijão. (Mean retail prices in district capitals; beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1960. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.234-235. Pt., Dat.num.

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1882

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1883

31154 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Cotações dos géneros de Angola, na praça de Lisboa, em 31 de Dezembro 1943 a 1959; feijão. (1943-1959 quotations of Angolese commodities in the Lisbon market; beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1959. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.243. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1884

31151 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Exportação agrícola 1950 a 1959; feijão. (1950-1959 agricultural exports; beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1959. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.156-157. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Sao Tome and Principe. Mozambique. India. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. Congo. United Kingdom. South Africa. Netherlands. Angola. France.

1885

31152 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Preços médios de retalho na cidade de Luanda 1955 a 1959; feijão. (1955-1959 mean retail prices in Luanda; beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1959. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.235. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1886

31153 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Preços médios de retalho nas sedes dos distritos 1955 a 1959; feijão. (Mean retail prices in district capitals from 1955 to 1959; beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1959. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.236-241. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1887

30168 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1960. Quantidades e valores das principais mercadorias exportadas: 1951 a 1960. (Amounts and values of the main commodities exported: 1951-60). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1960. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.181. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

1888

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Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

1889

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Phaseolus vulgaris. Statistical data. Prices. Angola.

1890

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Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1891

30373 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Exportação agrícola. (Agricultural exports). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1958. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.180-181. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. India. Federal Republic of Germany. Belgium. Luxembourg. Congo. Zaire. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (beans included) exported by Angola to different countries between 1953 and 1962. (CIAT)

1892

31141 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Exportação agrícola 1949 a 1958: feijão. (1949-1958 agricultural exports: beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1958. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.148-149. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Sao Tome and Principe. Mozambique. India. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. France. Congo. United Kingdom. South Africa. Netherlands. Angola.

1893

30372 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Precos médios de retalho de produtos alimentares e de higiene na cidade de Luanda. (Mean retail prices of food and sanitation products in the city of Luanda). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1958. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.219. Pt., Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Angola.

1894

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Phaseolus vulgaris. Statistical data. Prices. Angola.

1895

31143 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1959. Precos médios de retalho nas sedes dos distritos 1954 a 1958; feijao. (1954-1958 mean retail prices in district capitals: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1958. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.194-199. Pt., Dat.num.

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1896

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Phaseolus vulgaris. Statistical data. Prices. Angola.

1897

31129 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1958. Cotacoes dos géneros de Angola, na praça de Lisboa, em 31 de Dezembro 1940 a 1956; feijao. (1940-1956 quotations of Angolese commodities in the Lisbon market: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1956. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.232. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1898

31120 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1958. Cotacoes médias dos principais géneros de Angola, na Metrópole e no estrangeiro, durante os anos de 1949 a 1957; feijao. (1949-1957 mean quotations of the main Angolese commodities in the capital and abroad: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1957. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.209. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1899

31130 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1958. Cotacoes médias dos principais géneros de Angola, na Metrópole e no estrangeiro, durante os anos de 1948 a 1956: feijao. (1948-1956 mean quotations of the main Angolese commodities in the capital and abroad: beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1956. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.233. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1900

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Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands, Sao Tome and Principe, Mozambique, India, Macao, Federal Republic of Germany, Belgium, Luxembourg, Zaire, USA, France, Congo, United Kingdom, South Africa, Netherlands, Angola.

1901

31126 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1958. Exportacao agrícola 1947 a 1956. (1947-1956 agricultural exports; beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1956. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.170-171. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands, Guinea, Sao Tome and Principe, Mozambique, India, Macao, Federal Republic of Germany, Belgium, Luxembourg, Zaire, USA, France, Congo, United Kingdom, South Africa, Netherlands, Angola.

1902

31117 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1958. Precos médios de retalho na cidade de Luanda 1953 a 1957: feijao. (Mean retail prices in Luanda from 1953 to 1957: beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1957. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.200. Pt., Dat.num.

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1903

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Phaseolus vulgaris. Statistical data. Prices. Angola.

1904

31118 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1958. Precos médios de retalho nas sedes dos distritos 1953 a 1957: feijao. (Mean retail prices in district capitals from 1953 to 1957: beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1957. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.202-207. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1905

31128 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1958. Precos médios de retalho nas sedes dos distritos 1952 a 1956: feijao. (1952-1956 mean retail prices in district capitals: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1956. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.226-231. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1906

31124 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Cotacoes dos generos de Angola, na praça de Lisboa, em 31 de Dezembro 1939 a 1955: feijao. (1939-1955 quotations of Angolese commodities in the Lisbon market: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.228. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1907

31125 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Cotacoes médias dos principais generos de Angola, na Metrópole e no estrangeiro, durante os anos de 1947 a 1955: feijao. (1947-1955 mean quotations of the main Angolese commodities in the capital and abroad: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.229. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1908

30319 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1957. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.87. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1909

31121 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Exportacao agrícola 1946 a 1955: feijao. (1946-1955 agricultural exports: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.166-167. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. India. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. France. Congo. United Kingdom. South Africa. Netherlands. Angola.

1910

31122 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Precos médios de retalho na cidade de Luanda 1951 a 1955: feijao. (Mean retail prices in Luanda from 1951 to 1955: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.220. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1911

31123 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Preços médios de retalho nas sedes dos distritos 1951 a 1955: feijão. (1951-1955 mean retail prices in district capitals: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.222-227. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1912

30317 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1957. Quantidades e valores das principais mercadorias exportadas: 1948 a 1957. (Amounts and values of the main commodities exported: 1948-57). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1957. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.173. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

1913

31115 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1956. Cotações dos géneros de Angola, na praça de Lisboa, em 31 de Dezembro 1930 a 1954: feijão. (1930-1954 quotations of Angolese commodities in the Lisbon market: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1954. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.381-382. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1914

30334 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1956. Epocas de sementeiras, e de colheitas, zonas e áreas das principais produções agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1956. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.105. Pt., Dat.num.

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1915

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Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinéa. São Tomé and Príncipe. Mozambique. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. France. Congo. United Kingdom. South Africa. Netherlands. Angola.

1916

31113 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1956. Preços médios de retalho na cidade de Luanda 1950 a 1954: feijão. (Mean retail prices in Luanda from 1950 to 1954: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1954. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.373. Pt., Dat.num.

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1917

31114 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1956. Precos médios de retalho nas sedes dos distritos 1950 a 1954: feijao. (Mean retail prices in district capitals from 1950 to 1954; beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1954. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.374-380. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1918

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Phaseolus vulgaris. Statistical data. Prices. Trade. Angola.

1919

31137 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Cotacoes dos géneros de Angola, na praça de Lisboa, em 31 de Dezembro 1930 a 1953: feijao. (1930-1953 quotations of Angolese commodities in the Lisbon market: beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1952-1953. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.480-481. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1920

31138 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Cotacoes médias, dos principais géneros de Angola, na Metrópole e no estrangeiro, durante os anos de 1947 a 1953: feijao. (1947-1953 mean quotations of the main Angolese commodities in the capital and abroad: beans). In Instituto Nacional de Estatística, Angola. Anuário Estatístico 1952-1953. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.479. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1921

30316 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.100. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1922

31134 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Exportacao agrícola 1944 a 1953: feijao. (1944-1953 agricultural exports; beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1952-1953. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.422-423. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guínea. Sao Tome and Principe. Mozambique. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. USA. France. Congo. United Kingdom. South Africa. Netherlands. Angola.

1923

31136 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Precos médios de retalho na cidade de Luanda 1949 a 1953: feijao. (Mean retail prices in Luanda from 1949 to 1953: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1952-1953. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.470. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1924

31135 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Precos médios de retalho nas sedes dos distritos 1949 a 1953: feijao. (Mean retail prices in district capitals from 1949 to 1953: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1952-1953. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.472-478. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1925

30314 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Quantidades e valores das principais mercadorias exportadas: 1946 a 1955. (Amounts and values of the main commodities exported: 1946-55). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1955. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.195. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

1926

30340 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1955. Quantidades e valores das principais mercadorias exportadas: 1944 a 1953. (Amounts and values of the main commodities exported: 1944-53). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1952-1953. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.453. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

1927

30322 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1954. Epocas de sementeiras, e de colheitas, zonas e áreas das principais produções agrícolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1954. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.220. Pt., Dat.num.

Phaseolus vulgaris. Planting. Harvesting. Timing. Angola.

1928

30320 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1954. Quantidades e valores das principais mercadorias exportadas: 1945 a 1954. (Amounts and values of the main commodities exported: 1945-54). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1954. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.355. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

1929

31132 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1952. Precos médios de retalho na cidade de Luanda 1947 a 1951: feijao. (1947-1951 mean retail prices in Luanda: beans). In Instituto Nacional de Estatística. Angola.

Anuário Estatístico 1950-1951. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.397. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Angola.

1930

31131 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1952. Precos médios de retalho nas sedes dos distritos 1947 a 1951: feijao. (1947-1951 mean retail prices in district capitals: beans). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1950-1951. Angola, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.390-396. Pt., Dat.num.

Phaseolus vulgaris. Prices. Statistical data. Angola.

1931

30336 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1951. Epocas de sementeiras, e de colheitas, zonas e áreas das principais producoes agricolas. (Planting and harvesting times, zones and areas of main agricultural production). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1950-1951. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.380. Pt., Dat.num.

Phaseolus vulgaris. Planting. Timing. Harvesting. Angola.

1932

30335 INSTITUTO NACIONAL DE ESTATISTICA. ANGOLA. 1951. Exportação agricola. (Agricultural exports). In Instituto Nacional de Estatística. Angola. Anuário Estatístico 1950-1951. Luanda, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.440-441. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Cape Verde Islands. Guinea. Sao Tome and Principe. Mozambique. Macao. Federal Republic of Germany. Belgium. Luxembourg. Zaire. Congo. USA. France. Central African Republic. United Kingdom. South Africa. Netherlands. Angola.

Statistics are given on the total amount and value of different commodities (beans included) exported by Angola to different countries from 1942 to 1951. (CIAT)

1933

31460 MIRRADO, J.H.M. 1969. Cultura do feijao. (Bean cultivation). Gazeta do Agricultor 21(237):130-132. Pt.

Phaseolus vulgaris. Economics. Cultivars. Plant introductions. Crop rotation. Timing. Zea mays. Manihot esculenta. Solanum tuberosum. Soil requirements. Land preparation. Fertilizers. Spacing. Weeding. Irrigation. Harvesting. Storage. Angola.

General information is given on bean origin and introduction in Angola; its importance as an export is highlighted. The major constraints for the placement of this grain legume in world markets are indicated. General information is also presented on aspects such as main cultivated bean var. (including their outstanding agronomic characters), seed selection, and cropping schedule for rotational cultivation systems (with either maize, cassava, potatoes, wheat, or groundnut). Other aspects included are soil requirements, land preparation, fertilization, planting dates, procedure for sowing, planting density and distances, and cultivation practices (weeding, earthing up, irrigation, harvesting, threshing, and storage). (CIAT)

1934

32271 PEREIRA, A.R. 1957. L'économie de l'Angola et du Mozambique. (The economics of Angola and Mozambique). *Marchés Tropicaux* no.587:426-436. Fr., Il.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola.

Statistics on the evolution of exports (t) of various Angolese products (including beans) from 1931 to 1955 are presented. Beans are mainly grown by native farmers, both for self-consumption and export. Data are also given on the value of bean exports from 1946 to 1955. (CIAT)

1935

30434 SERAFIM, F.J.D.; SERAFIM, M.C. 1982. Annotated list of plant diseases in Angola. *Garcia de Orta, Série Estacao Agronomica* 9(1-2):321-332. En., Sum. En., Pt., 7 Ref.

Phaseolus vulgaris. *Colletotrichum lindemuthianum*. *Uromyces phaseoli*. *Fusarium solani phaseoli*. *Sclerotium rolfsii*. *Isariopsis griseola*. *Ascochyta phaseolorum*. *Nezara viridula*. Angola.

Results of a disease survey carried out by the Instituto de Investigacao Agronomica de Angola (Huambo, Angola) from 1962 to 1975 are summarized in an annotated list of main crop diseases caused by fungi and bacteria. Anthracnose (*Colletotrichum lindemuthianum*), rust (*Uromyces appendiculatus*), wilt (*Fusarium solani phaseoli*), stem rot (*Sclerotium rolfsii*), angular leaf spot (*Isariopsis griseola*), leaf spots (*Ascochyta phaseolorum*, *Cercospora cruenta*, and *Alternaria tenuissima*), and stigmatomycosis (*Nematospora* sp.) were the major bean diseases. Estimates of their importance are given as well as the areas in which they were recorded. *Nezara viridula*, a bean pest, was also reported. (CIAT)

1936

31175 SERAFIM, F.J.D.; SERAFIM, M.C. 1968. Feijoeiro: *Phaseolus vulgaris* L. (Beans). In Serafim, F.J.D.; Serafim, M.C. *Lista das doencas de culturas de Angola*. Angola, Instituto de Investigacao Agronomica de Angola. Serie Técnica no.2. p.7. Pt.

Phaseolus vulgaris. *Sclerotium rolfsii*. *Fusarium solani phaseoli*. *Uromyces phaseoli*. *Colletotrichum lindemuthianum*. *Isariopsis griseola*. *Ascochyta phaseolorum*. *Nezara viridula*. Symptomatology. *Cercospora cruenta*. *Alternaria tenuissima*. Angola.

The major diseases and pests of bean crops in Angola are listed and symptoms are briefly described. The diseases reported are *Sclerotium rolfsii*, *Fusarium solani phaseoli*, *Uromyces phaseoli*, *Colletotrichum lindemuthianum*, *Isariopsis griseola*, *Ascochyta phaseolorum*, *Cercospora cruenta*, and *Alternaria tenuissima*. The pests reported include *Nezara viridula* and *Heterodera* sp. Information on the sites where diseases and pests have been detected is also included. (CIAT)

BENIN

1937

31622 ADAM, K.S.; BOKO, M. 1983. Les activités rurales: agriculture. (Rural activities: agriculture). In Adam, K.S.; Boko, M. *Le Bénin*. Paris, France, EDICEF. pp.46-50. Fr., Il.

Phaseolus vulgaris. Production. Intercropping. Zea mays. Maps. Benin.

The main characteristics of agriculture in Benin are briefly described. Beans, highlighted as the major legume crop, are commonly grown in association with maize. A map showing the bean growing regions is included. In 1977-78, the total area planted to this crop was 113,298 ha and its production was 32,900 t. (CIAT)

1938

31329 INSTITUT NATIONAL DE LA STATISTIQUE ET DE L'ANALYSE ECONOMIQUE. BENIN, 1983. Les prix en République Populaire du Bénin en 1982. (Prices in People's Republic of Benin in 1982). Cotonou, Bénin, Ministère du Plan et de la Statistique. 96p. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Benin.

Statistics are presented on annual and monthly av. prices for the consumer for various food products (including beans) in the different provinces (Atacora, Atlantic, Borgou, Mono, Oueme, and Zou) of Benin, during 1982. (CIAT)

1939

31631 L'AGRICULTURE: objectif no.1: produire pour parvenir a l'autosuffisance. (Agriculture: objective no.1: to produce in order to reach self-sufficiency). Europe Outremer 54(566):20-23. 1977. Fr., Il.

Phaseolus vulgaris. Statistical data. Food security. Production. Benin.

The general characteristics of agriculture in Benin are described; government objectives and policies to increase agricultural production since 1975 are explained. Beans are the main vegetable crop; they play an important role in food shortage periods. Data are provided on bean production (t) for 1972-73, 1973-74, and 1974-75. (CIAT)

BURKINA FASO

1940

28830 INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVIERES. 1983. CULTURES MARAICHERES: LE HARICOT VERT (HORTICULTURAL CROPS: FIELD BEANS). IN----- RAPPOR ANNUEL 1983. FRANCIA. PP.174,186. FR.

PHASEOLUS VULGARIS; SNAP BEANS; CULTIVARS; YIELDS; RHIZOCTONIA SOLANI; SCLEROTIUM ROLFII; RHIZOBIUM; INOCULATION; N; DEVELOPMENTAL RESEARCH; BURKINA FASO; MARTINIQUE; REUNION.

RESULTS ARE GIVEN OF RESEARCH ON SNAP BEANS AND DRY BEANS CARRIED OUT BY THE INSTITUT DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVIERES DURING 1983. OF THE 4 SNAP BEAN VAR. (ARIAN, BELNA, MORGANE, AND 76 C1) STUDIED DURING THE DRY SEASON IN UPPER VOLTA, THE FORMER 2 PERFORMED BETTER, YIELDING UP TO 9 T/HA 25 DAYS AFTER PLANTING. THERE WAS NO SIGNIFICANT DIFFERENCE BETWEEN THE 6 DRY BEAN VAR. STUDIED AT THE END OF THE RAINY SEASON IN MARTINIQUE; MEAN YIELDS WERE 1.5 T/HA DUE TO RHIZOCTONIA SOLANI AND SCLEROTIUM ROLFII ATTACKS. IN REUNION THERE WERE NO SIGNIFICANT DIFFERENCES BETWEEN BEAN VAR. POMPADOUR 109, PETIT ROUGE, AND NOIR; MEAN YIELDS RANGED FROM 700 TO 1100 KG/HA DUE TO DROUGHT. FINALLY, IN A SEED INOCULATION STUDY OF BEAN VAR. MARLAT WITH RHIZOBIUM STRAINS (AMONG THEM CIAT 107), IT WAS FOUND THAT HIGHER N DOSES DECREASE ATMOSPHERIC N FIXATION BUT INCREASE GRAIN PRODUCTION. (CIAT)

BURUNDI

1941

28986 AUTRIQUE, A.; NTAHIMPERA, L. 1986. BIOLOGICAL CONTROL OF THE BLACK BEAN APHID IN BURUNDI. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:9-10. EN. (ISABU, DEPT. DEFENSE DES VEGETAUX, B.P. 795, BUJUMBURA, BURUNDI)

PHASEOLUS VULGARIS; APHIS FABAE; BIOLOGICAL CONTROL; PREDATORS AND PARASITES; BURUNDI.

TO IMPROVE THE NATURAL REGULATION OF BLACK BEAN APHID (APHIS FABAE) POPULATIONS, A PEST OF ECONOMIC IMPORTANCE IN BURUNDI, 4 SPECIES OF APHIDIIDAE WERE INTRODUCED FROM CZECHOSLOVAKIA (LYSIPHLEBUS FABARUM, L. CARDUI, EPHEDRUS NACHERI, AND LIPOLEXIS GRACILIS) SINCE JAN. 1986. THESE PARASITIDS WERE MULTIPLIED ON A. FABAE GROWN IN CAGES ON BROAD BEAN PLANTLETS. THE 1ST 3 SPECIES ARE REGULARLY RELEASED AT 10- TO 15-DAY INTERVALS, SINCE FEB. OF THE SAME YEAR, IN 1 LOCATION IN KISOZI (2100 M) WHERE APHID SOURCES HAVE BEEN MAINTAINED. SINCE THEN, MORE THAN 30,000 PARASITIDS HAVE BEEN RELEASED, CONSISTING MAINLY OF L. FABARUM, AND MORE WILL BE RELEASED AT THE BEGINNING AND DURING THE DRY SEASON. IN THE SAME WAY, THE ESTABLISHMENT OF THESE PARASITIDS AND THEIR IMPACT ON APHID POPULATION WILL BE FOLLOWED ON SPONTANEOUS AND CULTIVATED PLANTS. (CIAT)

1942

33230 AUTRIQUE, A.; GAHUNGU, E.; NTAHIMPERA, L. 1986. Programme de recherches sur la mouche du haricot. In Institut des Sciences Agronomiques du Burundi. Rapport Annuel 1986- Bujumbura, v.3, pp.174-176. Fr.

Phaseolus vulgaris. Ophiomyia phaseoli. Insecticides. Resistance. Cultivars. Agricultural projects. CIAT-2, Burundi.

Generalities of the bean production improvement program (developed by CIAT) in the Central African Great Lakes region are presented. Research focuses on the bean fly (Ophiomyia phaseoli), one of the major pests in Eastern Africa. Results of a trial conducted at the Gisozi exptl. station, Burundi, showed that the dry coating of bean seeds after planting with lindane (wettable powder) at 25 percent concn. (3 g/kg seed) effectively controlled C. phaseoli attacks. In a var. trial conducted at the same exptl. station, 24.6 percent of the plantlets were parasited by the bean fly 6 wk. after planting; therefore, assessing var. sensitivity was rather difficult. Bean var. Karama and Urubonobono seemed to be more resistant to the pest (12.5 percent of the plantlets were parasited) compared with BAT 1426 (46.2 percent of the plantlets parasited). As marked differences in bean infestation were observed within the same site, trials will be conducted involving different planting dates and altitudes in order to identify factors accounting for such variations, evaluate fly incidence, and establish the appropriate time for evaluation trials. Regarding the chemical control of the bean fly, wet coating of seeds with insecticide will be tested to avoid product waste during planting. (CIAT)

1943

28992 AUTRIQUE, A. 1986. PROSPECTS FOR THE CONTROL OF BEAN FLY (OPHIOMYIA PHASEOLI TRYON) IN BURUNDI. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:18-19. EN. (ISABU, B.P. 795, BUJUMBURA, BURUNDI)

PHASEOLUS VULGARIS; OPHIOMYIA PHASEOLI; INSECT CONTROL; CHEMICAL CONTROL; INTEGRATED CONTROL; BURUNDI; CIAT-2.

GENERAL OBJECTIVES OF THE MAIN INVESTIGATIONS TO BE DEVELOPED BY THE RESEARCH PROGRAM ON THE CONTROL OF THE BEANFLY IN BURUNDI ARE GIVEN. THIS PROGRAM WAS INITIATED IN LATE 1985. (CIAT)

1944

27467 BAERT, T.; NZIMENYA, I.; BANYIREKA, C.; MANAGURE, E. 1985. LEGUMINEUSES: HARICOT (PHASEOLUS VULGARIS). (LEGUMES: COMMON BEAN). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT DES RECHERCHES AGRONOMIQUES 1985. BUJUMBURA, BURUNDI. PP.32-36. FR., IL.

PHASEOLUS VULGARIS; PLANT INTRODUCTIONS; CULTIVARS; ADAPTATION; YIELDS; TECHNOLOGY EVALUATION; BURUNDI; CIAT-2.

ACTIVITIES CARRIED OUT BY THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI (ISABU) ON COMMON BEAN ARE REPORTED. ASPECTS RELATED TO THE INTRODUCTION OF NEW MATERIALS AND TO VAR. ASSESSMENT ARE DISCUSSED. BASED ON THE REGIONAL TRIALS CARRIED OUT, URUBONONO WAS OUTSTANDING AS WELL AS OTHERVAR. FROM FWANDA, COMPARABLE WITH ISABU ONES. THE PROCEDURE FOLLOWED IN VAR. TRIALS IS DESCRIBED, AND A TABLE WITH THE YIELDS AND BEHAVIOR OF THE 10 BEST VAR. EVALUATED IS GIVEN. (CIAT)

1945

27358 BAERT, T.; NZIMENYA, I.; BANYIREKA, C. 1984. GROUPE DES LEGUMINEUSES: HARICOT. (LEGUME GROUP: COMMON BEAN). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1984 (SEPTEMBRE 1983-AOUT 1984). BUJUMBURA. V.1, PP.87-124. FR., IL.

PHASEOLUS VULGARIS; GERMLASM; PLANT INTRODUCTIONS; ADAPTATION; TECHNOLOGICAL PACKAGE; SELECTION; CULTIVARS; BURUNDI; CIAT-2.

THE OBJECTIVES, METHODOLOGY, AND RESULTS ARE GIVEN ON THE DIFFERENT RESEARCH WORKS ON BEANS CARRIED OUT BY THE INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI IN COLLABORATION WITH CIAT, DURING THE PERIOD SEPT. 1983-AUG. 1984. INTRODUCTIONS OF NEW MATERIALS, VAR. TRIALS, PHYTOTECNIC TRIALS, GERMLASM COLLECTION, AND MULTIPLICATION OF VAR. WERE PERFORMED. THE INTRODUCTIONS OF NEW MATERIALS ORIGINATED FROM FIELD INSPECTIONS, INTERNATIONAL TRIALS, REGIONAL TRIALS, CIAT VAR. INTRODUCTIONS FOR SELECTION, AND INTENSIFICATION OF PEDIGREE SELECTION. (CIAT)

1946

28872 GERARD, T.R. 1986. DETERMINATION DES BESOINS EN EAU DES PLANTES. DES DOSES D'IRRIGATION ET DES FREQUENCES D'ARROSAGE (AM 8301). (DETERMINATION OF PLANT WATER REQUIREMENTS AND IRRIGATION RATES AND FREQUENCIES). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1986. (SEPTEMBRE 1985-AOUT 1986). BUJUMBURA. V.3, PP.AM52-AM61. FR., IL.

PHASEOLUS VULGARIS; WATER REQUIREMENTS; IRRIGATION; YIELDS; BURUNDI.

IN TRIALS CARRIED OUT IN BURUNDI OVER A 3-YR PERIOD (1983-85) TO DETERMINE THE WATER REQUIREMENTS OF BEAN CROPS AND ADEQUATE IRRIGATION RATES AND FREQUENCIES, IT WAS OBSERVED THAT THIS CROP RESPONDED FAVORABLY TO IRRIGATION WHEN RATES WERE INCREASED FROM 75 OR 50 TO 100 PERCENT OF THE OPTIMUM RATE. INCREASES IN PRODUCTION (6-23 PERCENT) WERE OBSERVED AND IT WAS FOUND THAT MOIST SOIL (LITTLE DRAINAGE) FAVORS BEAN GERMINATION. (CIAT)

1947

28873 GOOTHALS, M. 1986. LES VIROSES DES LEGUMINEUSES (DV 8703). (VIRAL DISEASES IN LEGUMES (DV 8703)). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1986. (SEPTEMBRE 1985-AOUT 1986). BUJUMBURA. V.3.P.93. FR.

PHASEOLUS VULGARIS; BEAN COMMON MOSAIC VIRUS; INOCULATION; CULTIVARS;
SYMPTOMATOLOGY; RESEARCH; BURUNDI; COLOMBIA; CIAT-2.

THE MAIN SYMPTOMS OF BCMV ARE LISTED, INDICATING THAT IN THE MUMANIRA EXPTL. STATION, BURUNDI, HIGHER DEGREES OF INFESTATION WERE OBSERVED ON CLIMBING BEANS GROWN IN ASSOCIATION WITH MAIZE. BASED ON THE SHIPMENT MADE BY CIAT-COLOMBIA OF SEEDS OF BEAN VAR. THAT ALLOW THE DIFFERENTIATION OF BCMV STRAINS, AN ISOLATE OF BCMV FROM GISOZI WAS USED FOR INOCULATION. LOCAL NECROTIC-LIKE LESIONS WERE OBSERVED ON PRIMARY LEAF VENATIONS IN BEAN VAR. WIDUSA, JUBILA, AND TOPECROP (CV. WITH DOMINANT ALLELE GENES OF THE NECROSIS GENE), AND TYPICAL BCMV SYMPTOMS IN BEAN VAR. DUBBLE WITTE AND SANILAC (CV. WITH RECESSIVE ALLELE GENES OF THE NECROSIS GENE). (CIAT)

1948

28871 LANDA, C. 1986. ESSAI DE RENTABILISATION IMMEDIATE DES AMENDEMENTS CALCO-MAGNESIENS PAR APPLICATION LOCALISEE SUR CULTURES VIVRIERES. AM 8602. (TRIAL ON IMMEDIATE INCOME OF CALCIUM-MAGNESIUM AMENDMENTS BY SPOT APPLICATION ON HORTICULTURAL CROPS. AM 8602). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1986. (SEPTEMBRE 1985-AOÛT 1986). Bujumbura. V.3, PP.20-30. FR., IL.

PHASEOLUS VULGARIS; ZEA MAYS; INTERCROPPING; SOIL AMENDMENTS; INCOME; PH;
CA; MG; K; MICRONUTRIENTS; BURUNDI.

THE ECONOMIC AND AGRONOMIC ADVANTAGES OF THE SPOT APPLICATION OF CA-MG AMENDMENTS IN BEAN/MAIZE ASSOCIATED CROPPING SYSTEMS WERE STUDIED AS COMPARED WITH BROADCASTING. THE TRIALS WERE PERFORMED IN NYABIHANGA (NYABIBUGA, BURUNDI), IN ACID SOIL (PH 4.3) WITH A HIGH PERCENTAGE OF EXCHANGEABLE AL. RESULTS SHOWED A SEVERE EFFECT OF SPOT APPLICATIONS WHICH RAPIDLY INCREASED THE SOIL PH. CONSEQUENTLY, THERE WAS A LACK OF EQUILIBRIUM IN THE CA:MG RATIO AND MINOR ELEMENTS SUCH AS FE AND MN WERE IMMOBILIZED. SOIL PH INCREASED AT A SLOWER RATE WITH BROADCASTING. IT WAS CONCLUDED THAT BROADCASTING WAS MORE EFFICIENT SINCE IT ASSURES A BETTER DISTRIBUTION OF THE AMENDMENT ON THE TOPSOIL, WITHOUT CAUSING SUCH RAPID INCREASES IN PH WHICH ARE HARMFUL TO A BALANCED MINERAL NUTRITION. THE ECONOMIC OPTIMUM IS REACHED WITH A CA-MG AMENDMENT DOSE BETWEEN 800-1000 KG/HA, ALTHOUGH VERY GOOD RESULTS WERE OBTAINED WITH LOWER DOSES. (CIAT)

1949

28985 MUNIMBAZI, C.; FERREAU, D. 1986. SCREENING FOR RESISTANCE TO COMMON AND HALO BACTERIAL BLIGHTS. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:5-6. EN.

PHASEOLUS VULGARIS; XANTHOMONAS CAMPESTRIS PV. PHASEOLI; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; SELECTION; RESISTANCE; AGRICULTURAL PROJECTS;
BURUNDI; CIAT-2.

IN MARCH 1986 IN BURUNDI THE INTERNATIONAL BEAN HALO BLIGHT NURSERY AND THE INTERNATIONAL BEAN COMMON BLIGHT TRIALS WERE INSTALLED IN GISOZI (2100 M) AND IN BUJUMBARA (830 M), RESP.; BOTH ARE CIAT TRIALS. MECHANICAL ARTIFICIAL INOCULATION WAS PERFORMED FOR EACH VAR. TO BE TESTED AND INOCULUM PRESSURE WAS MAINTAINED WITH REGULAR SPRAYS OF CONCENTRATED BACTERIAL SUSPENSION AT AN ULTRALOW VOL. UNIFORM INFECTION OF SUSCEPTIBLE CHECKS WAS ACHIEVED FOR HALO BLIGHT, WHEREAS INFECTION BY COMMON BLIGHT BACTERIA DID NOT REACH SATISFACTORY LEVELS. THE OBSERVATIONS ARE NOT YET COMPLETED, BUT SOURCES OF RESISTANCE TO PV. PHASEOLICOLA STRAINS OF BURUNDI APPEAR TO BE QUITE NUMEROUS. (CIAT)

1950

28984 PERREAUX, D. 1986. ECOLOGY AND IMPORTANCE OF BEAN DISEASES IN BURUNDI. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:4-5. EN. (ISABU, PLANT PROTECTION DEPT., BURUNDI)

PHASEOLUS VULGARIS; EPIDEMIOLOGY; RAMULARIA PHASEOLI; ISARIOPSIS GRISEOLA; ASCOCHYTA PHASEOLORUM; COLLETOTRICHUM LINDEMUTHIANUM; BURUNDI.

THE INCIDENCE AND SEVERITY OF BEAN DISEASES WERE DETERMINED IN VARIOUS LOCATIONS OF BURUNDI: MOSO (1250 M), MURONGWE (1450 M), GITEGA (1600 M), AND NGOZI (2100 M). THE FLOURY LEAF SPOT (MYCOVELLOSIELLA PHASEOLI) IS THE MOST COMMON DISEASE IN MOSO AND ANGULAR LEAF SPOT (PHASEOISARIOPSIS GRISEOLA) IN MURONGWE; ASCOCHYTA LEAF SPOT (ASCOCHYTA PHASEOLORUM) AND ANTHRACNOSE WERE FOUND AT HIGHER ALT. (GISOZI). BASED ON PRELIMINARY RESULTS, FURTHER WORK ON SCREENING FOR RESISTANT VAR. IS PLANNED. (CIAT)

1951

28875 PERREAUX, D.; BAGAMBAKE, D.; GAHUNGU, E.; MIKOKORO, C.; NKUBAYE, E.; WAKANA, E. 1986. EPIDEMIOLOGIE DES MALADIES DU HARICOT EN MILIEU RURAL ET PERTES DE RENDEMENT (DV8603). (EPIDEMIOLOGY OF BEAN DISEASES IN THE FIELD AND YIELD LOSSES). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT ANNUEL 1986. (SEPTEMBRE 1985-AOUT 1986). BUJUMBURA. V.3.PP.128-146. FR., IL.

PHASEOLUS VULGARIS; XANTHOMONAS CAMPESTRIS PV. PHASEOLI; RHIZOCTONIA SOLANI; RAMULARIA PHASEOLI; ISARIOPSIS GRISEOLA; VIROSES; ASCOCHYTA PHASEOLORUM; EPIDEMIOLOGY; BURUNDI.

IN 1986 TRIALS WERE CARRIED OUT IN 6 LOCALITIES OF BURUNDI WITH DIFFERENT ECOLOGICAL CONDITIONS (BUJUMBURA, MOSO, MURONGWE, GITEGA, NGOZI, AND GISOZI) TO DETERMINE THE RELATIVE IMPORTANCE OF BEAN DISEASES PER REGION IN ORDER TO ESTABLISH RESEARCH PRIORITIES IN BREEDING FOR RESISTANCE AND TO DETERMINE THE SITES WHERE RESEARCH SHOULD BE CARRIED OUT. AT EACH SITE THE EVOLUTION OF THE DISEASES WAS MONITORED IN 2 PLOTS OF 30 SQUARE METERS EACH. BOTH WERE FUMIGATED WITH DIMETHOATE (15 CUBIC CENTIMETERS/10 LITERS WATER) TO LIMIT ENTOMOLOGICAL PROBLEMS AS MUCH AS POSSIBLE. EACH PLOT ALSO RECEIVED BIWEEKLY SPRAYS WITH A MIXTURE OF MANEB 50 PERCENT AND METHYL THIOPHANATE 25 PERCENT (40 G/10 LITERS WATER) TO PROTECT THE CROPS AGAINST FUNGAL DISEASES. THE MOST PREVALENT DISEASES IN BUJUMBURA WERE COMMON BACTERIAL BLIGHT (XANTHOMONAS CAMPESTRIS PV. PHASEOLI) AND WEB BLIGHT (TRANATEPHORUS CUCUMERIS); IN MOSO, FLOURY LEAF SPOT (RAMULARIA PHASEOLI); IN MURONGWE, ANGULAR LEAF SPOT (PHASEOISARIOPSIS GRISEOLA) AND VIRAL DISEASES; IN GITEGA, ANGULAR LEAF SPOT AND IN GISOZI, ASCOCHYTA LEAF AND POD SPOT (ASCOCHYTA PHASEOLORUM). TABLES ARE INCLUDED ON THE EVOLUTION OF DISEASE SEVERITY ON DISEASED LEAVES AND GLOBAL SEVERITY IN THE FIELD, IN RELATION TO THE GROWTH STAGE OF THE CROP; THE RELATIVE IMPORTANCE OF DISEASES THROUGHOUT THE REGION AND FOR EACH DISEASE IS SUMMARIZED IN TABLE FORM, WITH THE DISTRIBUTION INDICATED PER REGION. YIELD DATA/PLOT (TREATED AND UNTREATED), FOR BOTH SEMESTERS, INDICATE LOSSES OF APPROX. 30 PERCENT. (CIAT)

1952

27465 PERREAUX, D.; BAGAMBAKE, E.; GAHUNGU, E.; NKUBAYE, E.; WAKANA, E.; KIRIMONO, S. 1985. EPIDEMIOLOGIE DES MALADIES DU HARICOT EN MILIEU RURAL. (EPIDEMIOLOGY OF BEAN DISEASES IN THE FIELD). IN INSTITUT DES SCIENCES AGRONOMIQUES DU BURUNDI. RAPPORT DES RECHERCHES AGRONOMIQUES 1985. BUJUMBURA, BURUNDI. PP.121-123. FR., IL.

PHASEOLUS VULGARIS; EPIDEMIOLOGY; ISARIOPSIS GRISEOLA; UROMYCES PHASEOLI; COLLETOTRICHUM LINDEMUTHIANUM; ASCOCHYTA PHASEOLORUM; XANTHOMONAS CAMPESTRIS PV. PHASEOLI; RAMULARIA PHASEOLI; BURUNDI.

THE FIELD INCIDENCE OF BEAN DISEASES AND THEIR VARIATION IN TERMS OF AGROECOLOGICAL CONDITIONS WERE DETERMINED. OBSERVATIONS WERE MADE IN BURUNDI AT 6 LOCATIONS WITH ALT. VARYING BETWEEN 1250-2100 M. DISEASE INCIDENCE WAS EVALUATED OVER 50 RANDOMLY SELECTED PLANTS, AND THE DISEASE SEVERITY WAS ASSESSED BY COMPARING EACH LEAF OF THE DISEASED PLANTS WITH REFERENCE DIAGRAMS FROM CIAT ILLUSTRATING RATIOS OF 1, 5, 25, AND 50 PERCENT OF DESTROYED LEAF AREA. THE MAIN DISEASES WERE PRESENT AT ALL THE LOCATIONS. IN KISOZI (2100 M), ANGULAR LEAF SPOT, RUST, ANTHRACNOSE, AND ASCOCHYTA WERE PRESENT IN ALMOST THE SAME RATIO; COMMON BACTERIAL BLIGHT WAS RARE. VIRUSES WERE IMPORTANT ONLY IN MURONGWE (1450 M), AND FLOURY LEAF SPOT (MYCOVELLOSIELLA PHASEOLI) WAS THE MORE PREVALENT DISEASE THERE AND IN GITEGA (1600 M). ANTHRACNOSE WAS THE DISEASE THAT APPEARED 1ST (SEED TRANSMISSION). AN AV. OF 1-5 PERCENT OF DESTROYED LEAF AREA WAS OBSERVED AT THE DIFFERENT LOCATIONS. (CIAT)

1953

31014 WOUTERS, J.F.R.; WAKANA, M.; OPDECAMP, L. 1986. Sensibilite du haricot Phaseolus vulgaris a la concentration en aluminium des sols de la region des Grands Lacs (Sensitivity of bean to soil aluminum concentrations in the Great Lakes region). Tropicultura 4(1):20-26. Fr., Sum. Fr., En., 6 Ref., Il. (Dept. de Fertilisation et Phytotechnie, Faculte des Sciences Agronomiques, Universite du Burundi, B.P. 2940 Bujumbura, Burundi)

PHASEOLUS VULGARIS; AL; NUTRIENT SOLUTION; BIOMASS PRODUCTION; NODULATION; RHIZOBIUM; TOXICITY; GROWTH; BURUNDI; ZAIRE; RWANDA.

The response of bean cv. Diacol Calima, a widely grown cv. in Burundi, to soil Al concn. was studied in pot trials using (1) superficial soil samples of humiferous high alt. kaolisols with m index of Kamprath between 4-92; (2) culture medium consisting of an inert substrate complemented with a nutritive solution to which a series of soluble Al concn. (0-12 meq Al(3+)/liter) were added. With treatment 1, biomass production after 25 days of growth decreased as of an m value of 33. The no. of Rhizobium nodules also decreased drastically with Al toxicity, becoming negligible at an m value of 33. With treatment 2, increasing Al concn. affected growth adversely, although root growth inhibition was less pronounced than with treatment 1. (AS)

CAMEROON

1954

31346 CAMEROON. MINISTERE DE L'AGRICULTURE. 1986. L'agriculture Camerounaise en Chiffres 1986. (Numerical data on Cameroon's agriculture 1986). Cameroun, Direction des Etudes et Projets, Division de la Statistique, 30p. Fr., Dat.num., Il.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Cameroon.

Statistics are given on the commercialization of the main agricultural products (beans included) of Cameroon in 1984. Data correspond to the no. of bean-growing farms, the percentage of the production sold, and av. prices. (CIAT)

1955

31609 CAMEROON. MINISTERE DE L'ECONOMIE ET DU PLAN. 1986. Ve plan quinquenal de développement économique, social et culturel 1981-1986. (1981-1986 fifth quinquennial plan for economic, social, and cultural development). Cameroun, pp.7-8,23-34,37,53-58,61-69,77-79,81,89-90,96-97,293-296,385-387. Fr.

Phaseolus vulgaris. Statistical data. Production. Developmental research. Agricultural projects. Cameroon.

Statistics are presented on the production and availability of various food crops (beans and peas included as a whole) in Cameroon in 1980. Estimates for 1985 are also given as well as the evolution of production deficits and surplus. Within the framework of the 1981-86 5th quinquennial plan for the economic, social, and cultural development, the deficit in bean and pea production is expected to reach 5000 t. Beans along with peas appear to be among the main crops that will be promoted by the plan. Efforts are mainly focused on research and seed production and on extension work towards yield improvement. (CIAT)

1956

31356 CAMEROUN. MINISTERE DU PLAN ET DE L'AMENAGEMENT DU TERRITOIRE. 1983. Résultats de 1982. (1982 results). In Cameroon. Ministère du Plan et de l'Amenagement du Territoire. Annuaire Statistique du Cameroun 1983. Cameroun, Direction de la Statistique et de la Comptabilité Nationale. pp.17,23-29,183-184,245-246,252,257. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Cameroon.

Consumer retail prices of various commodities (including beans) in Yaounde, Cameroon, are given for 1972-80. Retail prices for Bamenda are included for 1977-80. General information is also provided on the physical characteristics of the country, and data on av. temp. (degrees Celsius) and rainfall (mm) in several localities are included for 1970-80. (CIAT)

1957

31403 CAMEROUN. MINISTRY OF AGRICULTURE. NATIONAL DIRECTORATE OF CENSUS. 1986. Summary of selected traditional crop/livestock estimates with coefficients of variation: beans. In Cameroon. Ministry of Agriculture. National Directorate of Census. 1984 agricultural census in Cameroon. Final draft. Cameroon, v.1,p.9. En., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Cameroon.

Statistics are presented on the no. and percentage of farms planted to beans, the total area planted (ha) and the total production of beans in Cameroon in 1984. (CIAT)

1958

32026 4EME PLAN quinquennial 1976-1977/1980-1981 de la République Unie du Cameroun. 2. L'agriculture. (Fourth quinquennial plan 1976-77/1980-81 of the United Republic of Cameroon. 2. Agriculture). Bulletin de l'Afrique Noire no.883:17223-17226. 1976. Fr.

Phaseolus vulgaris. Statistical data. Production. Cameroon.

Statistics on bean production (t) in Cameroon in 1967-68 and 1974-75 are provided as well as estimates for 1975-76 and 1980-81. (CIAT)

1959

30499 NATIONAL DIRECTORATE OF CENSUS. CAMEROUN. 1986. 1984 agricultural census in Cameroon. 1. Traditional sector. Cameroon, Ministry of Agriculture. v.1,285p. En., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Prices. Consumption. Yields. Cameroon.

The results of the 1984 agricultural census in the traditional sector of Cameroon are summarized. Statistics on beans are presented for area (ha) planted (no. of farms planted, total area planted and area planted/farm by province and by farm size), production (no. of farms harvested, estimated total production (t), av. production/harvested farm (kg), and av. yield (kg/ha) by province), and sales (no. of farms with sales, estimated quantity (t) sold and av. quantity (kg) sold/selling farm by province). Additional statistical information is included on production/sales (no. of farms harvested and no. of farms with sales, quantity (t) harvested and sold, av. quantity (kg) sold/harvested farm by province and by quantity of beans harvested). Data are also included for production/farms (rank of departments by total bean production (t) with total bean farms for a total of 10 departments). Data on sales covers value of sales (estimated total value of sales, av. value of sales/selling farm, and av. prices by province). (CIAT)

1960

26048 SALEZ, P. 1985. LE POINT DES RECHERCHES SUR LES SYSTEMES DE CULTURE ASSOCIEE MAIS-LEGUMINEUSE DANS L'OUEST CAMEROUN. (RESEARCH OF MAIZE-LEGUME ASSOCIATED CROPPING SYSTEMS IN WESTERN CAMEROON), DSCHANG, CAMEROON, INSTITUT DE LA RECHERCHE AGRONOMIQUE. 9P. PAPER PRESENTED AT COLLOQUE SUR LES LEGUMINEUSES ALIMENTAIRES, NIAMEY, 1985. FR., SUM. FR., 9 REF. (INSTITUT DE LA RECHERCHE AGRONOMIQUE, B.P. 44, DSCHANG, CAMEROON)

CAMEROON; FERTILIZERS; INTERCROPPING; NODULATION; PHASEOLUS VULGARIS; PLANTING; SPACING; ZEA MAYS.

THE MAIN RESULTS OF RESEARCH CARRIED OUT SINCE 1972 IN WESTERN CAMEROON ARE PRESENTED REGARDING THE MAIZE-SOYBEAN AND MAIZE-BEAN ASSOCIATED CROPPING SYSTEMS. THE POSSIBILITIES OF IMPROVING THESE SYSTEMS THROUGH VAR. SELECTION, PLANTING DISTANCES, AND PLANT DENSITIES FOR THE 2 SPECIES AS WELL AS THROUGH FERTILIZATION ARE BEING STUDIED. COMPARISONS WERE MADE BETWEEN THE ASSOCIATED CROPS AND THE MONOCROPS REGARDING DISEASES, LEGUME NODULATION, AND TIME OF THE TRIALS. (AS (EXTRACT)-CIAT)

CENTRAL AFRICAN REPUBLIC

1961

31621 DECOUDRAS, P-M. 1984. Agriculture. (Agriculture). Atlas de la République Centrafricaine. Paris, France, Editions Jeune Afrique. pp.35-41. Fr., 11.

Phaseolus vulgaris. Maps. Intercropping. Manihot esculenta. Central African Republic.

The general characteristics of agriculture in Central African Republic are described. The role of the rural community in traditional agricultural activities is detailed; common cultivation techniques are described. Although beans are not the major food crop, they are an important staple often grown in association with cassava, mainly in the northern area. A map showing the distribution of the main crops and the associated cropping systems involving beans is included. (CIAT)

1962

31347 MINH, B.O. 1977. Projet enquete budget et consommation des ménages en empire Centrafricain: rapport final. (Domestic budget and consumption project in Central African Republic: final report). Bangui, Central African Republic, Bureau de la Coopération Technique des Nations Unies. pp.1,5-6,26-28,115-119,126,129,132,135,138,141,144,147,159,167,170. Fr., Dat.num.

Phaseolus vulgaris. Snap beans. Statistical data. Production. Prices. Consumption. Central African Republic.

Data are given on snap bean global annual consumption (t), av. monthly consumption/capita (g), and composition and caloric supply of daily allowances/capita for the different regions in Central African Republic. Av. prices/kg are also given for 1975-76. (CIAT)

1963

31345 PROJET DE DEVELOPPEMENT RURAL DE L'OMBELLA-MPOKO. CENTRAL AFRICAN REPUBLIC. 1984. Etude sociologique. (Sociological study). Central African Republic, Fonds International pour le Développement Agricole. pp.1,4-7,35,39-40,45,48-55,77-79,109-110,147-156. Fr., Sum. Fr., Il.

Phaseolus vulgaris. Socioeconomic aspects. Production. Statistical data. Agricultural projects. Central African Republic.

Current socioeconomic trends were determined for the active area of the Umbella-Mpoko rural development project in Central African Republic. Aspects studied were the family and social organization of food crop production, the role of food crop activities in the production system, the constraints and potential influences on the peasant's reality, and the potential impact of the former in the implementation of the project. Statistics are given on the total area planted to various food crops (beans included), av. plot area, distribution of area planted (in percentage) per province, as related to the country as a whole, and area planted per farm. (CIAT)

1964

27726 TRUTMANN, P.; KAYTARE, J. 1986. CONTROL OF DISEASES OF PHASEOLUS VULGARIS L. IN CENTRAL AFRICA USING CULTURAL METHODS. BEAN IMPROVEMENT COOPERATIVE. ANNUAL REPORT 29:127. EN.

PHASEOLUS VULGARIS; DISEASES AND PATHOGENS; DISEASE CONTROL; CULTURAL CONTROL; CENTRAL AFRICAN REPUBLIC; CIAT-1.

THE EFFECT OF SEED SELECTION METHODS AND REMOVAL OF DISEASED SEEDLINGS AND LEAVES ON BEAN DISEASE DEVELOPMENT AND YIELD WAS STUDIED. THE BEST RESULTS WERE OBTAINED WITH THE REMOVAL OF DISEASED LEAVES, AND THE COMBINED USE OF DISEASED SEEDLING REMOVAL PLUS REMOVAL OF DISEASED LEAVES SIGNIFICANTLY ($P = 0.05$) INCREASED YIELDS BY 67 AND 43 PERCENT, RESP. (CIAT)

CONGO

1965

32002 L'AGRICULTURE n'occupe que 0,6 pourcent de l'étendue du territoire national. (Agriculture covers only 0.6 percent of the national territory). Marchés Tropicaux et Méditerranéens no.1912:1779-1783,1785. 1982. Fr., Il.

Phaseolus vulgaris. Production. Statistical data. Congo.

The Congolese agricultural situation until 1981 is presented and analyzed. Statistics on the evolution of several food crops (beans included) for the 1969-78 period and estimates on area planted (ha) and production (t) for 1980 and 1986 are given. The development of bean production was faster than expected (186 t in 1981 whereas the amount expected was 87 t), which proves the farmers' interest in this legume crop. (CIAT)

1966

30863 BABASSANA, H. 1983. Coûts de production et système des prix dans l'agriculture paysanne. (Production costs and price system in small farm agriculture). Brazzaville, Congo, Ministère de l'Agriculture et de l'Élevage. pp.42,50-53,64,66,68-69,164,174-175,179,181-185,190-199. Fr.

Phaseolus vulgaris. Statistical data. Costs. Prices. Consumption. Congo.

A comparative table between production costs and purchase prices for mechanized and non-mechanized beans in Congo for 1982-83 is presented. For the same period, statistics on bean purchase prices to producer and sale prices to consumer are also given as well as net costs of commercialized beans. Data are given on the evolution of purchase prices to producer and sale prices to consumer for 1978-83. Conclusions from an analysis of production costs and prices for several agricultural products are presented and discussed as well as some recommendations concerning production and price policies. (CIAT)

1967

31619 CODOU, A.; LA COGNATA, G. 1977. Agriculture. (Agriculture). In Atlas de la République Populaire du Congo. Paris, France, Editions Jeune Afrique. pp.30-39. Fr.

Phaseolus vulgaris. Maps. Production. Intercropping. Zea mays. Relay crops. Congo.

General characteristics of agriculture in the People's Republic of the Congo are described as well as the major characteristics of the regions in which the country is divided (Enkou, Moussanda, and Boutazab). Beans play an important role in Enkou, where they are grown in the forest and in association or as a relay crop with maize. A map showing the bean growing areas in Enkou is included. (CIAT)

1968

31408 CONGO. MINISTERE DE L'AGRICULTURE ET DE L'ELEVAGE. 1983. Le haricot. (Beans). In Congo. Ministère de l'Agriculture et de l'Élevage. Agriculture Congolaise 1982 faits et chiffres. Brazzaville, Congo, Secrétariat Général à l'Agriculture et à l'Élevage. pp.396-403. Fr.

Phaseolus vulgaris. Composition. Monocropping. Women. Cultivation. *Maruca testulalis*. *Uromyces phaseoli*. *Ophiomyia phaseoli*. *Colletotrichum lindemuthianum*. *Acanthoscelides obtectus*. Production. Marketing. Prices. Consumption. Trade. Zaire. France. Italy. Spain. USA. Chile. Turkey. Cameroon. Rwanda. Argentina. Morocco. Congo.

The importance of beans as a staple food in Congo is highlighted; data on their composition are included. The major producing regions are indicated. This legume is planted in monocropping both in the forest and the savanna. Women's role in crop cultivation and harvesting is highlighted. Time devoted to land preparation, planting, crop cultivation, harvesting, and post-harvest management is indicated. *Maruca testulalis*, *Melanogromyza phaseoli*, *Uromyces phaseoli*, and *Colletotrichum lindemuthianum* are mentioned as the main constraints to bean production; *Acanthoscelides obtectus* is the major pest of stored beans. A scheme of the bean cropping schedule is included and statistics on area planted (ha), production (t), and labor in 1980 are given for the Niari, Bouenza, and Plateaux regions. Data are also given for the evolution of commercialized production between 1969 and 1981 along with data on prices to producer for 1971-82. The evolution of retail prices in Brazzaville for 1970-81 shows a marked increase in the last 4 years. Estimates on bean imports (t) for 1972-78 are given as well as the amounts imported from different countries in

1978-80. Production perspectives for the 1982-86 quinquennial plan are indicated for different Congolese regions. (CIAT)

1969

24613 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1951. Legumineuses: Phaseolus vulgaris .(Legumes: Phaseolus vulgaris). In Institut National pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1951. Zaire, Station de Nioka. pp.15-18,31-35. Fr.

PHASEOLUS VULGARIS; DEVELOPMENTAL RESEARCH; CULTIVARS; DWARF BEANS; ZEA MAYS; INTERCROPPING; FERTILIZERS; YIELDS; PLANTING; CONGO; ZAIRE.

The objectives, methodology, and main results and conclusions of comparative trials among bush bean var. are given, as well as the results and conclusions of organic and mineral fertilization trials of various crops (beans among them); results of trials on beans intercropped with cassava carried out during 1948-50 are also included. From the comparative trials among bush bean var. carried out at Nioka and Pimbo, the cv. Cuarentino H6, Linhagen H35, and Caracotas H7 were outstanding. In beans/cassava intercropping trials, a marked decrease was noted in the tuber yields compared with cassava in monoculture; on the other hand, its association with beans is particularly interesting as it improves the protein content of cassava. Beans-maize-cassava appears to perform the best and it is recommended to plant maize before or simultaneously with beans. Furthermore, in the association beans-Eleusine sp.-cassava, it is recommended to plant the 2 latter species a month after beans are planted. (CIAT)

EGYPT

1970

26069 ABD EL-SAMEI, M.H.; LASZTITY, R. 1984. COMPARATIVE STUDY ON THE AMINO ACIDS COMPOSITION IN THREE LOCAL PHASEOLUS VULGARIS SEEDS VARIETIES. ZEITSCHRIFT FUER LEBENSMITTEL-UNTERSUCHUNG UND- FORSCHUNG 178(1):24-26. EN., SUM. DE., EN., 22 REF. (AGRICULTURAL CHEMISTRY DEPT., FACULTY OF AGRICULTURE, EL-MINIA UNIV., EL-MINIA, EGYPT)

PHASEOLUS VULGARIS; CULTIVARS; SEED; AMINO ACIDS; COMPOSITION; EGYPT.

THE OVERALL AMINO ACID COMPOSITIONS OF 3 PHASEOLUS VULGARIS SEED VAR. (CONTENDER, SWISSBLAN, AND GIZA) WERE SIMILAR. ALL HAD A RELATIVE DEFICIENCY IN S-CONTAINING AMINO ACIDS. MOREOVER, THERE WAS A NEGATIVE CORRELATION BETWEEN S-AMINO ACID CONTENT AND THE PERCENTAGE OF SEED PROTEINS. THE LYSINE CONTENT OF THE PHASEOLUS SEEDS WAS RELATIVELY HIGH; THE AMOUNT RANGED FROM 8.05 TO 8.63 G/16 G N. TRIPTOPHAN WAS SLIGHTLY HIGHER FOR VAR. GIZA THAN FOR THE OTHERS. THE HIGHEST LEVELS OF FREE AMINO ACIDS WERE RECORDED FOR VAR. CONTENDER AND SWISSBLAN. CYSTINE, PHENYLALANINE, AND TYROSINE WERE ABSENT FROM THE EXTRACTS OF THE 3 VAR. (AS)

1971

28961 BARAKAT, A.; STEVENS, W.A. 1986. EFFECTS OF GYPSOPHILA PANICULATA EXTRACTS ON THE INFECTIVITY OF PLANT VIRUSES. MICROBIOS LETTERS 31(123-124):137-142. EN., SUM. EN., 19 REF. (DEPT. OF BOTANY, FACULTY OF SCIENCE, AIN HELWAN UNIV., CAIRO, EGYPT)

PHASEOLUS VULGARIS; SNAP BEANS; VIROSES; RESISTANCE; DISEASE CONTROL; EGYPT.

AQUEOUS EXTRACTS OF GYPSOPHILA PANICULATA WHEN SPRAYED ONTO THE UPPER LEAF SURFACES OF PHASEOLUS VULGARIS, COMPHRENA GLOBOSA, AND NICOTIANA

TABACUM (LOCAL LESION HOSTS TO TOBACCO NECROSIS VIRUS, POTATO VIRUS X, AND TMV, RESP.), REDUCED LOCAL LESION NO. INHIBITION WAS MOST EFFECTIVE WHEN THE SPRAY WAS MADE 1 DAY BEFORE INOCULATION WITH THE VIRUS, BUT WAS STILL EFFECTIVE AFTER 6 DAYS. THE INHIBITION OF LOCAL LESION PRODUCTION BY POTATO VIRUS X DECREASED MORE RAPIDLY THAN INHIBITION OF TOBACCO NECROSIS VIRUS OR TMV. APPLICATION OF *G. PANICULATA* EXTRACTS TO LOWER LEAF SURFACES BROUGHT ABOUT INHIBITION OF VIRUS APPLIED TO THE UPPER SURFACES AND SOME FORM OF INDUCED RESISTANCE WAS INDICATED. RESISTANCE ALSO OCCURRED IN YOUNG LEAVES OF FRENCH BEAN WHEN *G. PANICULATA* INHIBITOR WAS APPLIED TO THE PRIMARY LEAF OPPOSITE TO THAT RECEIVING THE VIRUS. (AS)

1972

30637 BARAKAT, A.; STEVENS, W.A. 1986. OCCURRENCE AND SOME PROPERTIES OF TOBACCO NECROSIS VIRUS INHIBITORS EXTRACTED FROM SEVEN SPECIES OF PLANTS FROM THE CENTROSPERMAE. MICROBIOLOGICAL LETTERS 33(129):7-13. EN., SUM. EN., 25 REF. (DEPT. OF BOTANY, FACULTY OF SCIENCE, UNIV. OF AIN SHAMS, CAIRO, EGYPT)

Phaseolus vulgaris; SNAP BEANS; TOBACCO NECROSIS VIRUS; INHIBITORS; EGYPT.

EXTRACTS FROM 5 SPECIES OF PLANTS BELONGING TO THE ORDER CENTROSPERMAE SHOWED POTENT INHIBITION TO LOCAL LESION PRODUCTION IN FRENCH BEAN PLANTS BY TOBACCO NECROSIS VIRUS. THE EFFECT OF DILUTION, HEATING, DIALYSIS, AND AMMONIUM SULPHATE FRACTIONATION ON THE INHIBITORY EXTRACTS WAS INVESTIGATED. ACCORDING TO THESE PROPERTIES, 2 GROUPS OF INHIBITORS WERE IDENTIFIED. THE 1ST GROUP CONTAINED INHIBITORS OF HIGH MOL. WT. AND WERE PROBABLY PROTEINS EXTRACTED FROM *DIANTHUS GIGANTEUS*, *SAPONARIA OFFICINALIS*, AND *RIVINA HUMILIS*. THE 2ND GROUP CONSISTED OF LOW MOL. WT. INHIBITORS EXTRACTED FROM *AMARANTHUS FLAVUS* AND *SCLERANTHUS ANNUUS*. EXTRACTS FROM *GOMPHRENA GLOBOSA* AND *ARENARIA MONTANA* SHOWED LITTLE VIRUS INHIBITION. (AS)

1973

33229 EL-AFRY, M.M.; ABUSHOBA, L.M. 1983. Studies on the photoperiodic reactions. 2. In some vegetable crops. Journal of Agricultural Research 9(4):966-973. EN., SUM. EN., 16 Ref. [Dept. of Agricultural Botany, Faculty of Agriculture, Kafr El-Sheikh Tanta Univ., Egypt]

Phaseolus vulgaris. Photoperiod. Light. Temperature. Growth. Flowering. Egypt.

Greenhouse expt. were conducted to study the effect of different photoperiods (8, 16, and 24 h) on bean plant growth, dry wt., and flowering. The height (cm) of plants exposed to 16 or 24 h light (135.0 and 106.7 resp.) was about 3-fold that of plants kept under 8 h photoperiod (36.7). The no. of internodes in plants with 16 or 24 h light exposure (13.3 and 10.3, resp.) was almost twice that of plants grown under 8 h light (6.3). Dry wt. (g) of leaves (2.69 and 1.98) and stems (1.58 and 1.70) in plants with 16- and 24- h light exposure, resp. increased significantly in comparison with that of plants grown under 8-h light (0.99 and 0.72 for leaves and stems, resp.). Day length had no effect on bean flowering which occurred at about the same time under all conditions (3 and 4 wk. until 1st flower bud and open flower, resp.). However, low temp. seemed to slightly delay flowering (20, 21, and 23 days for 8, 16, and 24 h photoperiod) since long day and continuous light conditions using fluorescent lamps are usually characterized by heat immitance. (CIAT)

1974

29612 EL-HAMMADY, M.; HABIB, S.A.; ABO-EL-ATTA, O.K.; AWAD, M. 1983. INTERACTION BETWEEN BCMV AND BYMV IN RELATION TO ANATOMICAL STRUCTURE OF BEAN LEAVES (*PHASEOLUS VULGARIS* L.). ANNALS OF AGRICULTURAL SCIENCES

28(3):1123-1141. EN., SUM. EN., AR., 25 REF., IL. (FACULTY OF AGRICULTURE, AIN SHAMS UNIV., CAIRO, EGYPT)

PHASEOLUS VULGARIS; BEAN COMMON MOSAIC VIRUS; BEAN YELLOW MOSAIC VIRUS; LEAVES; CYTOLOGY; EGYPT.

SINGLE INFECTION WITH BCMV AND BYMV REDUCED THICKNESS, NO., AND SIZE OF CERTAIN TISSUES AND CELLS IN BEAN LEAVES. PALISADE CELLS WERE ABNORMAL IN THEIR SHAPE AND ARRANGEMENT, INTERCELLULAR SPACES DIFFERED COMPARED WITH HEALTHY LEAVES, CHLOROPLASTS WERE MARKEDLY AFFECTED, DEVELOPMENT AND DIFFERENTIATION OF MESOPHYLL TISSUE INTO PALISADE AND SPONGY CELLS WAS REDUCED, AND CRYSTALS FOUND NORMALLY IN PHLOEM CELLS WERE REPLACED BY SOME OTHER STORAGE COMPOUNDS. DOUBLE INFECTION WITH BOTH VIRUSES REVEALED THE EXISTENCE OF AN ANTAGONISTIC EFFECT BETWEEN THE 2 VIRUSES ON ANATOMICAL CHARACTERS OF BEAN LEAVES. (AS)

1975

27227 EL-SAEID, H.M.; EL-BELTAGY, A.S.; ABOU-HUSSEIN, M.R.; KHALIL, S.; EL-BELTAGY, M.S. 1983. CHANGES IN THE ENDOGENOUS LEVELS OF AUXINS, GIBBERELLINS AND INHIBITORS OF BEAN PLANTS DURING THEIR GROWTH AND DEVELOPMENT AS AFFECTED BY DIFFERENT WATER REQUIREMENT. EGYPTIAN JOURNAL OF HORTICULTURE 10(1):83-92. EN., SUM. EN., AR., 26 REF., IL. (HORTICULTURE DEPT., FACULTY OF AGRICULTURE, AIN SHAMS UNIV., SHUBRA EL-KHIMA, EGYPT)

PHASEOLUS VULGARIS; SOIL MOISTURE; AUXINS; GIBBERELLINS; INHIBITORS; DEVELOPMENTAL STAGES; COMPOSITION; EGYPT.

PLANTS OF BEAN VAR. GIZA 3 GROWN AT 90 PERCENT FIELD CAPACITY HAD HIGHER LEVELS OF ACIDIC AUXINS AND ACIDIC AND BASIC GIBBERELLINS, AND LOW LEVELS OF INHIBITORS, COMPARED WITH THOSE GROWN AT 54 PERCENT FIELD CAPACITY, FROM THE INITIAL SAMPLING (16 DAYS AFTER SOWING AND JUST BEFORE TREATMENTS WERE APPLIED) TO THE 2ND ONE (62 DAYS AFTER SOWING AND ABOUT 16 DAYS BEFORE MAX. FLOWERING). NEUTRAL AUXINS, HOWEVER, WERE HIGHER IN PLANTS GROWN AT 54 PERCENT FIELD CAPACITY DURING THIS SAME PERIOD. AT THE 3RD SAMPLING (82 DAYS AFTER SOWING AND ABOUT 16 DAYS BEFORE PEAK POD PRODUCTION), PLANTS GROWN AT 54 PERCENT FIELD CAPACITY CONTAINED HIGHER LEVELS OF ACIDIC AUXINS AND ACIDIC AND BASIC GIBBERELLINS, AND INHIBITORS APPEARED IN THE BASIC FRACTION BIOASSAYED BY LETTUCE SEED TEST COMPARED WITH THOSE GROWN AT 90 PERCENT FIELD CAPACITY. MOREOVER, AT THAT STAGE PLANTS CONTAINED LOW LEVELS OF NEUTRAL AUXINS AND INHIBITORS APPEARED IN THE ACIDIC FRACTION BIOASSAYED BY BOTH WHEAT COLEOPTILE STRAIGHT GROWTH TEST AND LETTUCE SEED TEST. (AS)

1976

27078 EL-SAEID, H.M.; ABOU-HUSSEIN, M.R.; EL-BELTAGY, A.S.; KHALIL, S.; EL-BELTAGY, M.S.; MAKSOUD, M.A. 1983. EFFECT OF WATER IMBALANCE ON GROWTH AND DEVELOPMENT OF BEAN PLANTS (PHASEOLUS VULGARIS L.). EGYPTIAN JOURNAL OF HORTICULTURE 10(1):63-82. EN., SUM. EN., AR., 30 REF., IL. (HORTICULTURE DEPT., FACULTY OF AGRICULTURE, AIN SHAMS UNIV., SHUBRA EL-KHIMA, EGYPT)

PHASEOLUS VULGARIS; SOIL MOISTURE; GROWTH; FLOWERING; PODDING; FOLIAGE; ABSCISSION; YIELDS; YIELD COMPONENTS; EGYPT.

POT EXPT. WERE CONDUCTED DURING THE SUMMER SEASON OF 1978 AND 1979 AT THE NATIONAL RESEARCH CENTER (DOKKI GIZA, EGYPT) TO INVESTIGATE THE EFFECT OF DIFFERENT PERCENTAGES OF FIELD CAPACITY (9, 27, 54, AND 90) ON THE GROWTH, FLOWERING, AND FRUITING OF PLANTS OF BEAN CV. GIZA 3. AT 9 OR 27 PERCENT FIELD CAPACITY, PLANTS DIED BEFORE FLOWERING. IN GENERAL, AS FIELD CAPACITY WAS INCREASED, PLANT HEIGHT, NO. OF LEAVES PRODUCED, AND NET NO. OF LEAVES (NO. OF LEAVES PRODUCED MINUS NO. OF LEAVES ABSCISSED) WERE INCREASED. LEAF ABSCISSION INCREASED, IN GENERAL, AS FIELD CAPACITY PERCENTAGE WAS DECREASED. AT 54 PERCENT FIELD CAPACITY, FLOWER PRODUCTION WAS ENHANCED

RELATIVE TO THAT OF 90 PERCENT; HOWEVER, FLOWER ABSCISSION WAS STIMULATED. THUS, THE NET NO. OF FLOWERS WAS NOT SIGNIFICANTLY DIFFERENT AT BOTH PERCENTAGES OF FIELD CAPACITY DURING THE LAST STAGE OF THE GROWTH PERIOD. AT 90 PERCENT FIELD CAPACITY, POD PRODUCTION INCREASED AND POD ABSCISSION DECREASED; YIELD AND YIELD COMPONENTS ALSO INCREASED. (AS)

1977

26913 FIRGANY, A.H.; HUSSEIN, M.M. 1984. GROWTH AND CHEMICAL COMPOSITION OF VICIA FABA AND PHASEOLUS VULGARIS SEEDLINGS AS AFFECTED BY DIFFERENT CONCENTRATIONS OF MANGANESE IN WATER CULTURE. ANNALS OF AGRICULTURAL SCIENCE 29(1):19-28. EN., SUM. EN., 14 REF. (NATIONAL RESEARCH CENTRE, DOKKI, CAIRO, EGYPT)

COMPOSITION; EGYPT; GROWTH; MN; PHASEOLUS VULGARIS; SEEDLING.

POT-GROWN PLANTS OF PHASEOLUS VULGARIS AND VICIA FABA WERE IRRIGATED WITH NUTRIENT SOLUTION CONTAINING 0, 0.01, 0.02, 0.05, 1.00, 5.00, OR 10.00 PPM MN. SHOOT AND ROOT FRESH WT. OF P. VULGARIS INCREASED WITH 0.01 PPM MN AND DECREASED WITH FURTHER INCREASE IN MN CONC. TOTAL SHOOT + ROOT DRY WT. WAS HIGHEST AT 0.01 PPM MN FOR V. FABA (7.6 G) AND AT 0.05 PPM MN FOR P. VULGARIS (3.8 G). LEAF MN CONC. INCREASED WITH INCREASING MN SUPPLY TO P. VULGARIS, WHILE V. FABA WAS LITTLE AFFECTED. (HORTICULTURAL ABSTRACTS)

1978

29658 GABAL, M.R.; ABDELLAH, I.M.; ABED, I.A.; EL-ASSIOUTY, F.M. 1985. Effect of Cu, Mn and Zn foliar application on common bean growth, flowering and seed yield. Acta Horticulturae no.158:307-319. En., Sum. En., 23 Ref. [Faculty of Agriculture, Zagazig Univ., Moshtohor, Egypt]

Phaseolus vulgaris. Fertilizers. Foliage. Cu, Mn, Zn. Growth. Flowering. Podding. Yields. Egypt.

Field trials were carried out in clay loam soil with pH 7.5 at the Faculty of Agriculture exptl. farm in Moshtohor, Egypt. The soil contained 3.30, 0.10, and 0.25 ppm of Cu, Mn, and Zn, resp. Seeds of bean cv. Giza-3 were sown on April 8 and March 7 of both the 1981 and 1982 summer seasons, resp. Plants were supplied 3 times with Cu, Mn, or Zn sulphates as foliar spray at the 2nd, 4th, and the 6th true leaf stage. Ten treatments were included: 10, 20, 40 ppm Cu; 25, 50, 100 ppm Mn; 25, 50, 100 ppm Zn; and the control treatment which was sprayed with distilled water only. Results showed that Cu, Mn, or Zn foliar application had no promising effect on vegetative growth in terms of plant height, internode length, no. of leaves, fresh and dry wt./plant at full blooming stage. All treatments enhanced flowering date 3-7 days compared with the control. Spraying plants with 40, 25 or 25-50 ppm Cu, Mn, and Zn, resp., considerably increased the no. of flowers/plant, whereas fruit setting percentage was significantly increased by using 10-20 ppm Cu or 25 ppm Zn compared with other treatments. Micronutrient application led to a slight increase in the no. of seeds/pod. The treatments that produced higher no. of pods/plant showed the least no. of seeds/pod. Application of 100 ppm Mn increased 100-seed wt over that of the control; however, other treatments decreased it. Application of 20, 100, and 50-100 ppm Cu, Mn, and Zn, resp., significantly increased total dry seed yield, which reached a max. of 31-38 percent over the control by using 100 ppm Mn as foliar spray. This increase could be mainly referred to an increase in seed index and not to the no. of pods/plant. NPK uptake and total carbohydrate accumulation in dry seeds showed similar response as did the total dry seed yield. (AS)

1979

30642 HUSSEIN, H.A.; HUSSEIN, E.H.A.; YOUSSEF, S.S.; EWEDA, M.A. 1984. GENOTYPIC DIFFERENCES IN BANDING PATTERNS OF PHASEOLUS PROTEINS. BULLETIN OF

FACULTY OF AGRICULTURE, CAIRO UNIVERSITY 35(3):1521-1532. EN., SUM. EN., AR., 13 REF., IL. (DEPT. OF GENETICS, FACULTY OF AGRICULTURE, CAIRO UNIV., GIZA, EGYPT)

PHASEOLUS VULGARIS; CULTIVARS; PROTEINS; ANALYSIS; EGYPT.

WATER-SOLUBLE PROTEINS OF 10 PHASEOLUS VULGARIS CV. WERE CHARACTERIZED ACCORDING TO THEIR ELECTROPHORETIC PATTERNS. RESULTS INDICATED THAT THE CV. GIZA-3, GIZA-4, AND SWISS BLANC COULD BE CLASSIFIED AS 1 GROUP AND CV. PREVATO, RAMESCO, AND LARGO IN A 2ND GROUP. THE OTHER 4 CV. (DAUPLINE, JOLANCO, NECORES, AND PROCESSOR) DID NOT SHOW CLEAR GENETICAL RELATIONSHIPS AT THE PROTEIN BANDING LEVEL. IT WAS CONCLUDED, HOWEVER, THAT EACH OF THE 10 GENOTYPES REPRESENTS A DIFFERENT GENETICAL IDENTITY. DENSITOGRAMS AS WELL AS SDS + THE REDUCING AGENT 2ME CONFIRMED THE RESULTS BASED ON SDS ALONE. (AS)

1980

27219 IBRAHIM, I.K.A.; REZK, M.A.; KHALIL, H.A.A. 1983. RESISTANCE OF SOME PLANT CULTIVARS TO ROOT-KNOT NEMATODES, MELOIDOGYNE SPP. NEMATOLOGIA MEDITERRANEA 11(2):189-192. EN., 2 REF. (DEPT. OF PLANT PATHOLOGY, COLLEGE OF AGRICULTURE, ALEXANDRIA UNIV., ALEXANDRIA, EGYPT)

PHASEOLUS VULGARIS; MELOIDOGYNE ARENARIA; MELOIDOGYNE INCOGNITA; MELOIDOGYNE JAVANICA; RESISTANCE; EGYPT.

A SERIES OF GLASSHOUSE TESTS WERE UNDERTAKEN TO EVALUATE THE RESISTANCE OF SOME LEGUMINOSAE, GRAMINAE, UMBELLIFERAE AND TOMATO CV. TO MELOIDOGYNE ARENARIA (RACE 1), M. INCOGNITA (RACES 2, 3, AND 4), AND M. JAVANICA. AMONG THE LEGUMINOSAE, THE COMMON BEAN CV. MENGATOT WAS RESISTANT TO M. ARENARIA, M. INCOGNITA RACE 3, AND M. JAVANICA; COWPEA CV. AZMERLI WAS RESISTANT TO M. INCOGNITA RACE 3 AND GARDEN PEA CV. PERFECTION WAS RESISTANT TO M. INCOGNITA RACE 2. (CIAT)

1981

27237 LOFTY, A.A.; EL-HADY, O.A. 1984. EFFECT OF BENTONITE ON SOME CHARACTERISTICS, YIELD AND WATER USE EFFICIENCY OF KIDNEY BEAN IN SANDY SOIL UNDER TRICKLE IRRIGATION. EGYPTIAN JOURNAL OF SOIL SCIENCE 24(3):225-235. EN., SUM. EN., AR., 15 REF., IL. (SOILS & WATER USE LABORATORY, NATIONAL RESEARCH CENTER, CAIRO, EGYPT)

PHASEOLUS VULGARIS; IRRIGATION; SOIL FERTILITY; SOIL ANALYSIS; GROWTH; EGYPT.

A FIELD EXPT. WAS CONDUCTED AT THE IRRIGATION EXPTL. STATION IN INSHAS, EGYPT, ON KIDNEY BEAN PLANTS, GROWN IN SANDY SOIL MIXED WITH EGYPTIAN BENTONITE AT THE RATES OF 2.5, 5.0, 7.5, AND 10.0 PERCENT, TO DETERMINE THE EFFECT OF THIS SOIL ON GERMINATION, GROWTH, WATER USE EFFICIENCY, MACRO- AND MICRONUTRIENT UPTAKE, AND YIELD UNDER A TRICKLE IRRIGATION SYSTEM. THE ADDITION OF BENTONITE DECREASED THE DRY WT. OF SEEDLINGS DUE TO DELAYED GERMINATION, BUT IT INCREASED THE DRY WT. OF PLANTS AT BOTH VEGETATIVE AND FLOWERING STAGES, AS WELL AS THE WATER USE EFFICIENCY, AND N, P, K, FE, ZN, AND MN CONTENTS AND UPTAKE BY PLANTS AT DIFFERENT GROWTH STAGES. CONSEQUENTLY, YIELD ALSO INCREASED. BENTONITE (AS NATURAL DEPOSIT IN EGYPT) CAN BE USED FOR CONDITIONING SANDY SOIL, ESPECIALLY UNDER A SUITABLE AND ECONOMICAL IRRIGATION SYSTEM. (AS)

1982

26070 MAHMOUD, S.A.Z.; THABET, F.M.; RAMADAN, E.M.; KHATER, T. 1984. MICROBIAL AND BIOCHEMICAL CHANGES IN SOIL AND RHIZOSPHERE OF TOMATO AND COMMON BEAN PLANTS. ZENTRALBLATT FUER MIKROBIOLOGIE 139(4):219-225. EN., SUM. EN., DE., 15 REF., IL. (DEPT. OF AGRICULTURAL MICROBIOLOGY, FACULTY OF AGRICULTURE, AIN SHAMS UNIV., SHOUBRA EL-KHAIMA, EGYPT)

BACTERIOLOGY; EGYPT; MICROBIOLOGY; PHASEOLUS VULGARIS; RHIZOSPHERE; ROOTS; SOILS.

TOTAL MICROBIAL FLORA, AS WELL AS SOME OF THE IMPORTANT MICROBIAL GROUPS, WERE DETERMINED IN SOIL AND RHIZOSPHERE OF BOTH COMMON BEAN AND TOMATO PLANTS AT DIFFERENT STAGES OF GROWTH. THE ACCUMULATION OF SOME IMPORTANT BIOLOGICAL SUBSTANCES IN ROOT ZONE WAS ALSO INTERPRETED. THE TOTAL MICROBIAL FLORA IN GENERAL DECREASED SLIGHTLY DURING THE GROWTH SEASON IN BOTH SOIL AND RHIZOSPHERE REGION. THE RHIZOSPHERE/SOIL RATIOS WERE POSITIVE AND RANGED FROM 5 TO 20 DEPENDING ON PLANT SPECIES AND AGE. THERE WAS A DISTINCT RELATION BETWEEN THE STAGES OF PLANT DEVELOPMENT AND THE DENSITIES OF TOTAL MICROBIAL FLORA, ACTINOMYCETES, N FIXING CLOSTRIDIA, SPOREFORMERS, AEROBIC AND ANAEROBIC CELLULOSE DECOMPOSERS. DENSITIES OF AEROBIC N FIXERS (AZOTOBACTER) AND FUNGI SEEMED TO BE CONSTANT IN THEIR LOW COUNT IN THE RHIZOSPHERE REGIONS DURING THE GROWTH SEASON. (AS)

1983

28072 1984. MICHIGAN, UNITED STATES, AND WORLD DRY BEAN STATISTICS. MICHIGAN DRY BEAN DIGEST 9(1):24-26. EN., IL.

PHASEOLUS VULGARIS; TRADE; STATISTICAL DATA; PRODUCTION; EGYPT; JAPAN; USA; CANADA.

AN OUTLOOK ON THE PERSPECTIVES OF DRY BEAN (WHITE, COLORED, AND BLACK) MARKET FOR 1984 IS GIVEN AND ANALYZED AS WELL AS THE EGYPTIAN PULSE SITUATION IN 1983 (IMPORTS, PRODUCTION, TRADE POLICY AND FINANCING, AND PER CAPITA CONSUMPTION). DATA ON JAPAN BEAN IMPORTS (1979-84) ARE GIVEN. THE BEAN SITUATION IN ONTARIO, CANADA, IS ALSO ANALYZED. FINALLY, ESTIMATES FOR DRY BEAN ACREAGE AND PRODUCTION IN THE MAIN PRODUCING STATES OF THE USA ARE INCLUDED. (CIAT)

1984

29743 MOHAMED, H.A.; ABDEL-AL, H.R.; FADL, F.A.; SHATTA, H.M.; NAGI, I.M. 1983. REACTION OF BEAN CULTIVARS TO RUST AND ITS RELATION TO STOMATAL SIZE. EGYPTIAN JOURNAL OF PHYTOPATHOLOGY 15(1-2):1-6. EN., SUM. EN., AR., 10 REF.

PHASEOLUS VULGARIS; UROMYCES PHASEOLI; CULTIVARS; TEMPERATURE; RELATIVE HUMIDITY; RESISTANCE; STOMATA; EGYPT.

FACTORS AFFECTING UREDOSPORE GERMINATION OF UROMYCES PHASEOLI TYPICA ARE REPORTED. THE REACTION OF 6 BEAN CV. (TAYLOR'S HORTICULTURE, ASTRO, PROVIDER, VADENAL, GIZA-3 AND GIZA-4) TO RUST AND ITS RELATION WITH STOMATA SIZE WERE ALSO STUDIED. OPTIMAL TEMP. FOR UREDOSPORE GERMINATION WAS NEAR 25 DEGREES CELSIUS. THE LOWEST PERCENTAGE OF GERMINATION WAS OBTAINED AT 10 DEGREES CELSIUS AND UREDOSPORES FAILED TO GERMINATE AT 40 DEGREES CELSIUS. HIGHEST PERCENTAGE OF GERMINATION WAS OBTAINED AT 95-100 PERCENT RH. GERMINATION GRADUALLY DECREASED BY DECREASING THE RH WITH NO GERMINATION AT 14 PERCENT RH. CV. DIFFERED IN THEIR REACTION TO RUST: VADENAL AND ASTRO SHOWED LOW PERCENTAGE OF INFECTION, FOLLOWED BY GIZA-3, PROVIDER, AND GIZA-4; TAYLOR'S HORTICULTURE WAS THE MOST SUSCEPTIBLE. THE NO. OF STOMATA WAS NOT CORRELATED WITH RUST INFECTION; HOWEVER, DIFFERENCES WERE SIGNIFICANT BETWEEN CV. WITH RESPECT TO THE LENGTH AND AREA OF THE STOMATA, BUT NOT THE WIDTH. TAYLOR'S HORTICULTURE HAD THE LONGEST STOMATA AND ALSO THE HIGHEST PERCENTAGE OF INFECTION. (AS)

1985

28978 OMAR, H.A.; MEHIAR, F.F.; ZAYED, E.A.; DEIF, A.A. 1985. Biological studies on some seed-borne viruses and their effect on vegetative growth and yield component of the host plants. Acta Phytopathologica Academiae Scientiarum Hungaricae 20(1-2):59-78. EN., SUM. EN., 39 Ref., IL.

(Agricultural Botany Dept., Faculty of Agriculture, Tanta Univ.,
Kafr-El-Sheikh, Egypt)

PHASEOLUS VULGARIS; BEAN COMMON MOSAIC VIRUS; HOST RANGE; DISEASE
TRANSMISSION; SYMPTOMATOLOGY; YIELD COMPONENTS; ELECTRON MICROSCOPY; EGYPT.

BCMV was isolated from naturally infected bean plants and identified on the basis of the host range, modes of transmission, stability, and electron microscopy. Symptoms induced by this virus on host plants were recorded. BCMV was easily transmitted by sap using an abrasive. BCMV was found to be transmitted through bean seeds by 54.7 percent and transmitted by means of *Myzus persicae*. Electron microscopic examination of bean leaf extracts infected with BCMV isolates showed the presence of filamentous flexuous particles. Infection with BCMV caused a significant reduction in plant height, leaf area and no. of leaves/bean plant. DM content of bean leaves decreased significantly as a result of infection with the virus. No. of pods/plant and no. of seeds/pod significantly decreased as a result of infection. A significant reduction in seed wt./plant (yield) of bean plants was recorded as a result of infection with BCMV. Seed index and seed DM produced by infected bean plants were significantly reduced in comparison with healthy ones. Similar studies were conducted on soybean mosaic virus and lettuce mosaic virus. (AS)

1986

26905 RIZK, A.M.; HAMMOUDA, F.M.; ISMAIL, S.I.; AZZAM, S.A.; WOOD, G. 1984. STUDIES ON GREEN BEANS (PHASEOLUS VULGARIS L.). 1. PHYTOALEXINS OF THE PODS. QUALITAS PLANTARUM PLANT FOODS FOR HUMAN NUTRITION 34(3):203-209. EN., SUM. EN., 17 REF., IL. (PHARMACEUTICAL SCIENCE LABORATORY, NATIONAL RESEARCH CENTRE, DOKKI, CAIRO, EGYPT)

EGYPT; FUSARIUM SOLANI PHASEOLI; PENICILLIUM PATULUM; PHASEOLUS VULGARIS;
PHYTOALEXINS; PHYTOPHTHORA MEGASPERMA.

THE PHYTOALEXINS PRODUCED AFTER THE INOCULATION OF GREEN BEAN PODS WITH THE SPORE SUSPENSION OF 3 FUNGI (FUSARIUM SOLANI, PENICILLIUM PATULUM, AND PHYTOPHTHORA MEGASPERMA) WERE STUDIED. FIVE PHYTOALEXINS WERE ISOLATED AND IDENTIFIED AS PHASEOLLIN, COUMESTROL, KIEVITONE, PHASEOLLIDIN, AND 6-ALPHA-HYDROXYPHASEOLLIN. THEIR IDENTITY WAS PROVED ACCORDING TO TLC, UV, LIGHT, AND MASS SPECTROMETRY BY COMPARISON WITH AUTHENTICS. THE PRELIMINARY SCREENING OF THEIR ANTIFUNGAL ACTIVITY WAS CARRIED OUT. (AS)

1987

28661 YOUSSEF, S.A.M.; EL-SHEREF, E.M.; SHALABY, T.M.; EL-KEREDY, M.S. 1978. RESPONSE OF BEAN PLANTS TO FOLIAR APPLICATIONS OF CCC (2-CHLORO-ETHYL-TRIMETHYL AMMONIUM CHLORIDE). JOURNAL OF THE NATIONAL AGRICULTURAL SOCIETY OF CEYLON 15:57-62. EN., SUM. EN., 12 REF.

PHASEOLUS VULGARIS; CULTIVARS; PLANT GROWTH SUBSTANCES; GROWTH; LEAF AREA;
YIELD COMPONENTS; YIELDS; EGYPT.

TWO FIELD EXPT. WERE CONDUCTED AT KAFR EL-SHEIKH EXPTL. FARM OF TANTA U. (EGYPT) DURING 1974 AND 1975 TO STUDY THE EFFECT OF 2-CHLORO-ETHYL-TRIMETHYL AMMONIUM CHLORIDE CCC AT 0, 125, 250, 500, 1000, AND 2000 PPM ON THE GROWTH AND PRODUCTIVITY OF 4 BEAN CV. (GIZA 1, FAMILY 209, REBAYA 40, AND HYBRID 6I/356/66). LEAF AREA, LAI, DRY WT./PLANT, AND PLANT HEIGHT WERE LOW DURING THE EARLY STAGES OF GROWTH AND INCREASED AS DEVELOPMENT PROCEEDED. ALL CCC TREATMENTS SIGNIFICANTLY AFFECTED LEAF AREA, DRY WT./PLANT, AND PLANT HEIGHT, BUT LAI WAS ONLY SLIGHTLY AFFECTED. THE REDUCTION IN PLANT HEIGHT WAS DUE TO THE REDUCTION IN LENGTH AND NO. OF THE MAIN STEM INTERNODES. THE LENGTH OF PRIMARY AND SECONDARY BRANCHES/PLANT WERE REDUCED BUT THEIR NO. WERE NOT SIGNIFICANTLY ALTERED BY CCC. NONE OF THE CCC TREATMENTS AFFECTED

THE NO. OF PODS/PLANT, NO. OF SEEDS/POD, AND SEED YIELD/PLANT COMPARED WITH THE CONTROL. BASED ON SEED YIELD/PLANT, THE 4 CV. RANKED, IN DESCENDING ORDER, GIZA 1--1STREBAYA 40 AND HYBRID 61/356/66--INTERMEDIATE, AND FAMILY 209 LAST. (AS)

1988

31461 ZAGHLOUL, E.M.A. 1981. Effects of salinity and nitrogen fertilizer on symbiotic nitrogen fixation in beans (*Phaseolus vulgaris* and *Vicia faba*). (Summary). Alexandria Journal of Agricultural Research 29(2):1003. En.

Phaseolus vulgaris. Fertilizers. N. Nitrogen fixation. Nodulation. Salinity. Inoculation. Egypt.

Pot expt. were conducted at Sakha Agriculture Research Station (Egypt) to study the effects of inoculation, salinity (0-15 mmhos/cm) and N fertilization (95.2 kg N/ha) on nodulation and N fixation (acetylene reduction technique) by *Phaseolus vulgaris* and *Vicia faba*. Without inoculation, *P. vulgaris* did not form any root-nodules while roots of *V. faba* were well nodulated. Inoculation of *P. vulgaris* caused the formation of root-nodules, stimulated N fixation and increased the dry wt. and N content of plants. Inoculation of *V. faba* also increased nodulation and enhanced N fixation. Saline conditions depressed nodulation and N fixation. *P. vulgaris* was less tolerant to salinity than *V. faba*. At a salinity level of 7.5 mmhos/cm, the no. of nodules/plant was reduced to almost nothing in *P. vulgaris* but was high in *V. faba*. At 10 mmhos/cm growth of *P. vulgaris* was reduced in 75 percent while in *V. faba*, it was only 40 percent. N fertilization tended to depress nodulation and N fixation; this effect was stronger in the presence of salts. (AS)

ETHIOPIA

1989

26235 ABIYO, F. 1987. Effect of vegetative cover, tillage and planting system on run-off, soil erosion and other soil physical properties. Agricultural Mechanization in Asia, Africa and Latin America 18(2):23-28. En., Sum. En., 38 Ref., Il. (Inst. of Agric. Research, Addis Ababa, Ethiopia)

PHASEOLUS VULGARIS; COVER CROPS; TILLAGE; PLANTING; SOIL CONSERVATION; SOIL MOISTURE; DRAINAGE; ETHIOPIA.

The effects of vegetative cover, tillage, and planting systems on run-off, soil erosion and moisture conservation, bulk density, OM content, and moisture infiltration rates were assessed in an expt. conducted on a sandy soil with a uniform 10-11 percent slope in Melkassa, a semiarid region in Ethiopia, during 1981-82. Treatments were natural grass cover, bare fallow, and haricot bean (*Phaseolus vulgaris*) broadcasted or ridge planted across the slope. The quantity of run-off from each test plot was collected by a cylindrical tank with 5 slot divisors attached to it. Among all treatments, the grass cover was most effective in controlling soil erosion when about 85 percent of the plots had been covered with the grass. Ridge planting of beans helped conserve soil water on steep slope; broadcasting is not recommended on this slope, regardless of soil type. (AS)

1990

33209 AMARE ABEBE. 1987. Effect of inoculation and N-fertilizer on seed yield of *Phaseolus vulgaris* in Ethiopia. Nazareth, Ethiopia, Nazareth Research Center. 7p. En., Sum. En. Paper presented to the Regional Workshop

on Bean Research in Eastern Africa, Kampala, 1987. [Nazreth Research Center, P.O.Box 103, Nazreth, Ethiopia]

Phaseolus vulgaris. *Rhizobium phaseoli*. Nodulation. Fertilizers. N. P. Inoculation. Strains. Urea. Yields. Ethiopia.

A mixture of 3 strains of *Rhizobium phaseoli* (Tal 182, 1383, and 1376) and N fertilizer (urea) at the rate of 100 kg/ha were used to study the response of *Phaseolus vulgaris* to different N sources. A control was used for comparison; the treatments were tested with and without 100 kg P/ha. The trial was conducted at the Melkassa Research Center (Nazret, Ethiopia), for 2 consecutive years (1981 and 1982) using a randomized complete block design with 4 replications. N-fertilizer application significantly ($P = 0.05$) depressed *P. vulgaris* nodulation in both years. Differences in yield among treatments were significant ($P = 0.05$) during the 1st year but not in the 2nd year. The highest mean yield (2467 kg/ha) was recorded for the treatment of 100 kg N/ha with 100 kg P/ha. P application had a significant ($P = 0.05$) effect on both nodulation and mean yield. *P. vulgaris* respond more to N fertilizer and less to inoculation. (AS)

1991

33221 GIORGIS, K. 1987. A review of haricot bean agronomy research in the semi-arid regions of Ethiopia. Kampala, Uganda, 10p. En., 7 Ref. Paper presented to the Regional Workshop on *Phaseolus* Bean Research in Eastern Africa, Kampala, 1987.

Phaseolus vulgaris. Land preparation. Planting. Spacing. Timing. Fertilizers. P. N. Intercropping. Zea mays. Harvesting. Developmental research. Drought. Ethiopia.

Results of expt. with beans conducted in the semiarid regions of Ethiopia since 1972 are reviewed. Aspects studied were seed bed preparation and sowing methods, planting dates, plant population, fertilization, intercropping, and harvesting. Good yields are obtained from traditional methods in which, ploughing with a "maresha" plough (with a crumpling rather than a turning action that works shallowly about 10-15 cm) is done 2-3 times, then the seed is broadcasted and covered with a subsequent ploughing. Row sowing reduced weeding time. Late June to early July were determined as the optimum planting dates. Regarding plant population, a seed rate of 60-70 kg/ha and an interrow spacing of 40-60 cm seemed to be optimum. Seed yields increased when 40-70 and 20-30 kg P and N/ha, resp. were applied. A higher LER was obtained when bean was intercropped with both maize and sorghum. Harvesting by pulling the plants and stooking them in the field for final drying can be started when 50 percent of the pods have yellowed or delayed until about 10 days after all seeds have hardened. Future research will focus on developing soil management practices for soil moisture conservation to enhance bean production under dry land farming conditions, assisting breeders in screening drought tolerant resistant cv., studying the necessary conditions for satisfactory seedling establishment, developing agronomic practices and packages following the release of new cv., and establishing on-farm research trials after detailed information from research centers has been obtained. (CIAT)

1992

33212 MARIAM, E.G. 1987. Effect of weed competition on the yield of haricot bean (*Phaseolus vulgaris*) under Melkassa condition. Kampala, Uganda, 11p. En., Sum. En., 6 Ref. Paper presented to the Regional Workshop on *Phaseolus* Bean Research in Eastern Africa, Kampala, 1987.

Phaseolus vulgaris. Weeding. Timing. Yields. Emergence. Ethiopia.

At the Melkassa Research Center (Nazret, Ethiopia), the critical period of weed competition in beans was determined and yield losses due to weeds were estimated in heavy and light soils. Expt. were conducted for 3 years (1980-82) using 6 handweeding treatments and an unweeded one (check). The early growing stage of the crop (10-15 days after emergence) was the critical period of weed competition. Higher yields (1141.7 and 895.1 kg/ha for heavy and light soils, resp.) were obtained when the crop was weeded during early and mid seasons (10-15 and 30-35 days after emergence, resp.). Weed infestation was greater on light than on heavy soil as shown by data on the estimated yield losses in unweeded treatments (37 and 64 percent for heavy and light soils, resp.). (CIAT)

1993

33223 TILAHUN, M. 1987. Farm survey results and on-farm trials in haricot bean: Nazreth area, Ethiopia. Nazreth, Ethiopia, Nazreth Research Center. 9p. En., 4 Ref. Paper presented to the Regional Workshop on Phaseolus Bean Research in Eastern Africa, Kampala, Uganda, 1987. [IAR, Nazreth Research Center, P.O. Box 103, Nazreth, Ethiopia]

Phaseolus vulgaris. On-farm research. Survey. Socioeconomic aspects. Planting. Timing. Land preparation. Weeding. Fertilizers. *P. Xanthomonas campestris* pv. *phaseoli*. Yields. Cultivars. Agricultural projects. Ethiopia.

A survey was conducted in Nazret, central Ethiopia, in 1985-86, to describe the farmer's environmental and socioeconomic aspects and his farming system, and to identify the major production constraints. A special emphasis is given to beans; some of the cultural practices (seed bed preparation and planting, fertilization, weeding, disease and pest control, harvesting, storage, and uses) used by small farmers are described. The role of beans as staple food and income source is highlighted; av. area planted by each grower is mentioned as well as planting time, seed rate, and the percentage of farmers that use weeding and commercial P fertilizers. *Xanthomonas campestris* pv. *phaseoli* and *Callosobruchus* spp. were the major field disease and pest of stored beans, resp.; no control measures are taken. The av. grain yield was 600 kg/ha. The results of a package testing program conducted in 1986-83 and the outcome of an on-farm var. verification trial undertaken in 1986 are also included. Results from the package testing program indicated that farmers can increase their yields from 275 to 690 kg/ha. In the on-farm verification trial, bean var. W-108 and W-117 performed well; however, since the farmers' beans performed equal or better than the new var., no final recommendations are given. Further studies are suggested to determine appropriate seed rates. (CIAT)

GABON

1994

32024 TABLEAU ECONOMIQUE du Gabon a fin 1975. (Gabon economics at the end of 1975). Bulletin de l'Afrique Noire no.877:17108. 1976. Fr.

Phaseolus vulgaris. Production. Statistical data. Gabon.

Data on production of the major food crops (including beans) planted in Gabon in 1975 are given. The total area cultivated to different crops was about 145,000 ha. The total bean production was 48 t. In general, the Gabonese agricultural production did not show visible progress in spite of the recent government policies directed towards preventing rural emigration. (CIAT)

IVORY COAST

1995

32018 DAGATIGUY, F. 1962. Emmagasinage des produits alimentaires en milieu rural Africain de Cote d'Ivoire. (African rural storage of food products in Ivory Coast). Nogent sur Marne, France, Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres. 9p. Fr., 5 Ref.

Phaseolus vulgaris. Storage. Stored grain pests. *Acanthoscelides obtectus*. Injurious insects. Ivory Coast.

Storage methods for different food crops (including beans) in rural areas of Ivory Coast are briefly described. Beans are generally stored as dry pods, large baskets usually made of woven palm leaves. Bean pods and/or grains are stored in jute bags only when immediate sale is planned. Pods are sometimes stored in bulk in wooden granaries or cabins from where they are taken and dehusked when needed. *Sitophilus oryzae*, *Tribolium castaneum*, *Araecerus fasciculatus*, *Acanthoscelides obtectus*, *Corcyra cephalonica*, and *Plodia interpunctella* are reported as the major pests of stored beans in this country. (CIAT)

1996

32072 INSTITUT FRANCAIS DE RECHERCHE SCIENTIFIQUE POUR LE DEVELOPPEMENT EN COOPERATION. 1986. Parasites et ravageurs des productions alimentaires. Unité de recherche 505. (Parasites and pests of food crops. Research Unit 505). In Institut Francais de Recherche Scientifique pour le Développement en Coopération. Département E: indépendance alimentaire. Abidjan, Cote d'Ivoire, pp.28-32. Fr.. 12 Ref.

Phaseolus vulgaris. Noxious animals. Stored grain pests. Congo. Ivory Coast.

Research on bean pests in Congo and Ivory Coast and on pests of stored beans in the 1st country are mentioned. (CIAT)

1997

29600 KNIPSCHER, H.C. 1980. Ivory Coast urban retail prices for foodcrops 1976-1980. Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.12. 8p. En., Il.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Ivory Coast.

Data on monthly urban retail prices for food crops (beans included) in Ivory Coast are provided for 1976, 1977, 1979, and 1980. Graphs showing price trends are included for 1976, 1977, and 1979. Data for 1978 are not included. (CIAT)

KENYA

1998

26235 ACHWANYA, C.S. 1984. EFFECTS OF OZONE, SULFUR DIOXIDE AND ALPHA AND DELTA RACES OF COLLETOTRICHUM LINDEMUTHIANUM (SACC. & MAGN.) BRI. AND CAV. ON BEAN (PHASEOLUS VULGARIS L.). PH.D. THESIS. BLACKSBURG, VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY. 166P. EN., SUM. EN., 227 REF., IL.

AIR POLLUTION; BIOMASS PRODUCTION; CHLOROPHYLL; COLLETOTRICHUM
LINDEMUTHIANUM; CULTIVARS; KENYA; OZONE; PHASEOLUS VULGARIS; PLANT INJURIES;
SO2; USA

A NO. OF BEAN CV. WERE EVALUATED FOR THEIR RESPONSE TO THE AIR POLLUTANTS O3 AND SO2, SINGLY AND IN COMBINATION, AS WELL AS FOR THEIR REACTION TO THE ALPHA AND DELTA RACES OF COLLETOTRICHUM LINDEMUTHIANUM. VARIATION IN RESPONSE TO BOTH THE POLLUTANTS AND THE FUNGUS WAS NOTED AMONG THE CV. ANTHRACNOSE CAUSED A REDUCTION IN THE BIOMASS OF SOME CV. OF THE ORDER OF 50 PERCENT. A NEGATIVE CORRELATION OF ($R = -0.72$, P LESS THAN 0.0001) WAS FOUND BETWEEN THE DISEASE SEVERITY AND THE TOTAL PLANT BIOMASS. GREATER THAN ADDITIVE EFFECTS OF O3 + SO2 MIXTURES WERE DEMONSTRATED. CHLOROPHYLL CONTENT AND BIOMASS WERE FOUND TO BE RELIABLE VARIABLES FOR ASSESSING TREATMENT EFFECTS. THE POLLUTANTS APPEARED TO STIMULATE THE DISEASE DEVELOPMENT. GREATER POLLUTANT INJURY WAS ALSO NOTED IN THE PRESENCE OF THE ANTHRACNOSE DISEASE. THE RESULTS INDICATED THAT THERE WAS AN INTERACTION BETWEEN THE FUNGAL DISEASE AND THE AIR POLLUTANTS. IMPLICATIONS FOR EVALUATING BEAN CV. FOR RESISTANCE TO *C. LINDEMUTHIANUM* UNDER POLLUTED ATMOSPHERE ARE SUGGESTED. (DISSERTATIONABSTRACTS INTERNATIONAL)

1999

33213 BURUCHARA, R.A.; TYAGI, A.P. 1987. Adaptation and resistance in bean to angular leaf spot and rust in Kenya. Nairobi, Kenya, Department of Crop Science, 11p. En., 10 Ref., Il. [Dept. of Crop Science, P.O.Box 30197, Nairobi, Kenya]

Phaseolus vulgaris. Plant introductions. Yields. Cultivars. Adaptation. *Uromyces phaseoli*. *Isariopsis griseola*. Resistance. Genetics. Kenya.

Preliminary results are reported on the yield performance of bean accessions and their reaction to *Uromyces phaseoli* and *Isariopsis griseola*. Field expt. were carried out during the long rainy season of 1985 and the short rainy season of 1986, at the University of Nairobi, Kenya. The accessions tested came from CIAT and Puerto Rico; the local lines used as controls were Red haricot, Mwezi Moja, GLP2, and Small Rose Coco. Highly significant differences were observed among yields of the cv. tested during both seasons. During the long rains (1985) yields ranged between 304 and 4348 kg/ha (av. 2572 kg/ha) and during the short rains (1986) they ranged between 264 and 2970 kg/ha (av. 1519 kg/ha). During the long rains, the bean lines showed more variation and spread from the mean than during the short rains, indicating that the former environmental conditions enabled cv. to express their yield potential which was otherwise masked in the latter conditions. Regarding disease reaction, out of the 43 CIAT entries evaluated for resistance to *I. griseola*, 28 resulted resistant, 11 showed intermediate resistance, and 4 were susceptible. Among the 5 lines from Puerto Rico, 3 were resistant and 2 were susceptible. Among the local lines, Red haricot was resistant, GLP2 and Small Rose Coco showed intermediate resistance, and Mwezi Moja was susceptible. As great genetic variation was observed in yields and disease reactions among the different accessions tested, further studies are recommended to determine their suitability and potential in different agroecological conditions. (CIAT)

2000

26931 COULSON, C.L. 1985. RADIANT ENERGY CONVERSION IN THREE CULTIVARS OF *PHASEOLUS VULGARIS*. AGRICULTURAL AND FOREST METEOROLOGY 35(1):21-29. EN., SUM. EN., 25 REF., IL. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, UNIV. OF NAIROBI, KENYA)

PHASEOLUS VULGARIS; CULTIVARS; CLIMATIC REQUIREMENTS; LIGHT; DRY MATTER ; KENYA.

DM ACCUMULATION, LEAF AREA DEVELOPMENT AND RADIANT ENERGY INTERCEPTION WERE MONITORED OVER THE GROWTH PERIOD OF 3 PHASEOLUS VULGARIS CV. THE RADIANT ENERGY CONVERSION TO TOTAL DM AVERAGED 1.6 PERCENT IN ALL VAR. (TAKING THE PHOTOSYNTHETICALLY ACTIVE RADIATION AS 0.63 OF TOTAL AND THE REFLECTION COEFFICIENT AS 0.21). BASED ON ECONOMIC YIELD, THE CONVERSION EFFICIENCY IS LESS THAN 1.6 PERCENT, THOUGH THE SMALL-SEEDED ROSE COCO HAD A SLIGHTLY HIGHER CONVERSION EFFICIENCY THAN MWEZI MOJA AND CANADIAN WONDER. EFFICIENCY INCREASED IN ALL 3 CV. AND THEN DECREASED AS THE CROPS MATURED AND SENESCED. VARIATIONS OF CALCULATED EFFICIENCY REPORTED MAY BE DUE TO SEVERAL FACTORS, WHICH INCLUDE THE VALUES ACCEPTED FOR THE PHOTOSYNTHETICALLY ACTIVE RADIATION; TOTAL RADIATION RATIO, REFLECTANCE, AND CALORIFIC VALUES. (AS)

2001

22910 COULSON, C.L. 1983. Final report. Growth parameters of beans varieties under varying water regimes. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.105-120. En., Il.

Phaseolus vulgaris. Cultivars. Growth. Irrigation. Drought. Leaf area. Dry matter. Yields. Yield components. Production. Kenya.

Preliminary results of expt. conducted in 1983 at Kabete (Nairobi, Kenya) to examine the growth of 2 bean var. (Mwezi Moja and Small Rose Coco) under varying water regimes are analyzed and discussed. Graphs are included showing exptl. design, irrigation gradients, economic yields (t/ha), total DM (g/plant), DM production (g/plant), leaf area, relationship between DM accumulation and accumulated leaf area, no. of pods/plant, no. of seeds/plant, relationship between seeds/pod and pods/plant, root:shoot ratios, mean root dry wt. (g/plant), relationship between accumulated DM and accumulated energy, and conversion efficiency. Based on the data analysis, some observations and considerations for future research are made. (CIAT)

2002

22909 COULSON, C.L. 1983. Interim report on progress for growth parameters of bean varieties under varying water regimes. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.99-104. En.

Phaseolus vulgaris. Cultivars. Resistance. Drought. Leaf area. Yields. Yield components. Kenya.

Expt. were conducted at the Kabete field station, Kenya, to study the adaptation of bean var. Mwezi Moja and Small Rose Coco to reduced soil moisture and to determine the factors influencing economic yield. The irrigation gradient varied from a min. of 246.6 mm to a max. of 592.5 mm during the growing period. Although no conclusions can be drawn, a positive correlation was observed between economic yield and water supply and no max. response was noted though a max. is suspected between 600 and 700 mm. Small Rose Coco outyielded Mwezi Moja at all water application levels as shown by its economic yield of 2.4 t/ha at 592.5 mm and of 0.32 t/ha at 246.6 mm compared with 2.1 and 0.22 t/ha given by Mwezi Moja at both application levels, resp. The low LAI in both var. may be a constraint to productivity. LA development and total DM were reduced to almost a half (from 592.5 to 334 mm) in both var. pods/plant, seeds/pod, and mean seed wt. are positively correlated with water supply. Further studies are recommended. (CIAT)

2003

22906 GATHURU, E.M.; MUKUNYA, D.M. 1983. Disease survey. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.65-73. En.

Phaseolus vulgaris. Monocropping. Intercropping. *Zea mays*. *Isariopsis griseola*. *Ascochyta phaseolorum*. *Colletotrichum lindemuthianum*. *Uromyces phaseoli*. *Alternaria tenuis*. *Elsinoe phaseoli*. Bean common mosaic virus. *Pseudomonas syringae* pv. *phaseoli*. *Xanthomonas campestris* pv. *phaseolicola*. Kenya.

A total of 37 small scale farms of the Machakos and Kitui districts, Kenya, were surveyed in 1982 to determine the occurrence and incidence of diseases in beans (monocropped and intercropped with maize, pigeon peas, green grams, and cowpeas). *Isariopsis griseola*, *Ascochyta phaseolorum*, *Colletotrichum lindemuthianum*, *Uromyces phaseoli*, *Alternaria tenuis*, *Elsinoe phaseoli*, BCMV, bean yellow spot virus, *Pseudomonas syringae* pv. *phaseoli*, and *Xanthomonas campestris* pv. *phaseolicola* were the diseases prevailing in bean crops. A high incidence and a wide distribution of all diseases were observed in both districts. Their occurrence suggested their economic importance in bean production in these dry areas. Thus, their effect on bean yields and their incorporation in breeding programs for disease resistance should be given priority. (CIAT)

2004

30437 GRAHAM, J.F. 1959. Notes on Kenya agriculture. 7. Insect pests and control measures. East African Agricultural Journal 25(1):2-9. En.

Phaseolus vulgaris. *Ophiomyia phaseoli*. *Acanthoscelides obtectus*. Injurious mites. Insect control. Insecticides. Mite control. Acaricides. Kenya.

Brief indications are given on how insect specimens should be sent to Kenya for identification. General precautions to be taken when using toxic substances in agriculture are mentioned; indications are given on the mixture and dilution of insecticides. Some of the most important pests of different crops (including beans) are listed. *Bruchus* spp. (a pest of stored beans), *Melanagromyza phaseoli* (which attacks leaves and stems), and *Tetranychidae* spp. (a foliage pest) are reported as the major bean pests in the country. They were detected in all areas; damage caused is sometimes severe. Control measures include bean dusting with Gamma-BHC at 0.04 percent (0.25 kg/100 kg beans) to prevent *Bruchus* spp. attack; seed dressing of aldrin at 40 percent (0.5 kg/50 kg seed) to prevent damage caused by *M. phaseoli*; and the use of an acaricide on advice of entomologist to control *Tetranychidae* spp., resp. (CIAT)

2005

22908 ITULYA, F.; COULSON, C.; WEBSTER, B. 1983. Progress report on identification of bean cultivars suitable for semi-arid areas in Kenya. (October rains, 1982 and March rains, 1983). In Webster, B.D. Improvement of drought and tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.95-98. En.

Phaseolus vulgaris. Planting. Timing. Yields. Biomass production. Cultivars. Kenya.

The influence of different planting times (before the rains, 1, and 3 wt. after the rains) on yields and biomass production was determined for bean cv. Mwezi Moja, Small Rosecoco, GLP2, Canadian Wonder, Red Haricot, and Large Rosecoco. Significant yield reductions were observed when beans were

planted 1 to 3 weeks after the rains. It is suggested that all bean cv. grown in conditions similar to those of this expt. be planted before the onset of rains to avoid yield reductions. (CIAT)

2006

28653 KHAEMBA, B.M.; OGENGA-LATIGO, M.W. 1985. EFFECTS OF THE INTERACTION OF TWO LEVELS OF THE BLACK BEAN APHID, APHIS FABAE SCOPOLI (HOMOPTERA: APHIDIDAE), AND FOUR STAGES OF PLANT GROWTH AND DEVELOPMENT ON THE PERFORMANCE OF THE COMMON BEAN, PHASEOLUS VULGARIS L., UNDER GREENHOUSE CONDITIONS IN KENYA. INSECT SCIENCE AND ITS APPLICATION 6(6):645-648. EN., SUM. EN., FR., 20 REF. (DEPT. OF ZOOLOGY, UNIV. OF NAIROBI, P.O. BOX 30197, NAIROBI, KENYA)

PHASEOLUS VULGARIS; APHIS FABAE; PLANT INJURIES; SEEDLING; ANTHESIS; PODDING; YIELD COMPONENTS; KENYA.

DAMAGE CAUSED BY THE BLACK BEAN APHID, APHIS FABAE, ON THE COMMON BEAN, WAS SEVEREST WHEN THE APHIDS WERE TRANSFERRED ONTO BEAN PLANTS DURING THE PREFLOWERING STAGE. THERE WERE SIGNIFICANT REDUCTIONS IN THE AV. LENGTH OF THE CENTRAL SHOOT, PRODUCTION OF FLOWERS, PODS, AND SEEDS/PLANT. SEED WT./PLANT WAS ALSO SIGNIFICANTLY REDUCED WHEN APHID INFESTATION OCCURRED DURING THE PREFLOWERING STAGE. SMALLER, BUT SIGNIFICANT REDUCTIONS TO THE LENGTH OF THE CENTRAL SHOOT, NO. OF PODS, AND WT. OF SEEDS PRODUCED/PLANT CAUSED BY A. FABAE WERE ALSO RECORDED WHEN THE APHIDS WERE TRANSFERRED ONTO PLANTS AT ANTHESIS. WHEN APHID INFESTATION OCCURRED DURING THE GRAIN FILLING STAGE THE DAMAGE CAUSED WAS MINIMAL AND INSIGNIFICANT. THE RESULTS OBTAINED INDICATED THAT THE PREFLOWERING STAGE WAS THE VULNERABLE STAGE OF BEAN DEVELOPMENT DURING WHICH APHID ATTACK IS MOST HARMFUL AND, IF UNCHECKED, COULD LEAD TO DRASTIC YIELD LOSSES. (AS)

2007

27220 KHAEMBA, B.M.; LATIGO, M.W.O. 1981. EFFECTS OF INFESTATION AND TRANSMISSION OF THE COMMON BEAN MOSAIC VIRUS (CBMV) BY THE BLACK BEAN APHID A. FABAE ON THE COMMON BEAN P. VULGARIS. EAST AFRICAN AGRICULTURAL AND FORESTRY JOURNAL 47(1):1-4. EN., SUM. EN., 19 REF.

PHASEOLUS VULGARIS; BEAN COMMON MOSAIC VIRUS; APHIS FABAE; DISEASE TRANSMISSION; VECTORS; KENYA.

DAMAGE CAUSED TO VEGETATIVE GROWTH AND YIELD OF BEAN BY APHIS FABAE COMBINED WITH BCMV WAS GENERALLY SIGNIFICANT (P EQUAL TO OR LESS THAN 0.05) WHEN APHID INFESTATION OCCURRED DURING THE EARLY AND LATE VEGETATIVE STAGES OF PLANT DEVELOPMENT, AND TO A LESSER EXTENT DURING ANTHESIS. DAMAGE WAS AGGRAVATED BY HIGHER (6 APHIDS/PLANT) RATHER THAN LOWER INITIAL A. FABAE INFESTATIONS (3 APHIDS/PLANT) AND WHEN THE APHIDS TRANSMITTED BCMV. REGRESSION ANALYSES OF BEAN RESPONSES TO INSECT INFESTATIONS SHOWED THAT SIGNIFICANTLY (P EQUAL TO OR LESS THAN 0.01) LARGER PROPORTIONS WERE LINEAR RATHER THAN QUADRATIC OR CUBIC. (AS (EXTRACT))

2008

25755 KENYA. MINISTRY OF AGRICULTURE. . 1974. BEAN RESEARCH PROJECT. THIKA, NATIONAL HORTICULTURAL RESEARCH STATION. INTERIM REPORT. LONG-RAINS 1974. 66P. EN.

ADAPTATION; AGRICULTURAL PROJECTS; CANNED BEANS; CULTIVARS; FERTILIZERS; HERBICIDES; KENYA; N; PHASEOLUS VULGARIS; RHIZOBIUM; SEED COLOR; SNAP BEANS; TECHNOLOGICAL PACKAGE; YIELDS.

THE RESULTS OF BEAN RESEARCH ACTIVITIES IN KENYA DURING THE 1974 RAINY SEASON ARE REPORTED. IN YIELD TRIALS WITH 26 VAR., 2 BLACK VAR., 90-91 AND 76-79, OUYIELDED ALL OTHER MATERIALS WITH AV. OF 3549 AND 3360 KG/HA,

RESP., OVER 4 SITES. IN WHITE-SEEDED BEAN VAR. TRIALS, LINE R.M. 1-6, Y47 WAS OUTSTANDING AND SHOWED RESISTANCE TO UROMYCES PHASEOLI. IN A N/RHIZOBIUM TRIAL WITH BEAN VAR. MEXICAN 142, NO INTERACTION BETWEEN THE FACTORS WAS OBSERVED. HERBICIDE TRIALS SHOWED THAT HAND WEEDING WAS THE BEST; HOWEVER, THE MIXTURE ALACHLOR + LINURON CAN BE RECOMMENDED. NO SIGNIFICANT YIELD RESPONSES WERE FOUND DUE TO TRACE ELEMENT APPLICATIONS. PACKAGES OF GOOD AND BAD CULTURAL PRACTICES WERE COMPARED; GOOD CULTURAL PRACTICES (EARLY PLANTING, WEED CONTROL, GOOD SEED QUALITY, AND FERTILIZATION) HAD A SIGNIFICANT EFFECT ON YIELD; HOWEVER, NO SIGNIFICANT DIFFERENCES WERE OBSERVED WITH THE USE OF FERTILIZATION AND GOOD SEED QUALITY. YIELD TRIALS WITH 10 FRENCH BEAN VAR. SHOWED THAT VAR. PREMIER WAS THE HIGHEST YIELDER (10,625 KG PODS/HA) AND SHOWED THE HIGHEST PERCENTAGE OF MARKETABLE PODS (57.8 PERCENT = 6133 KG/HA). LAB. WORK WITH WHITE-SEEDED BEANS FOR CANNING IS SUMMARIZED. (CIAT)

2009

29663 MBATIA, O.L.E. 1985. FINANCIAL ANALYSIS OF PRODUCTION OF FRENCH BEANS IN KENYA (PHASEOLUS VULGARIS) . ACTA HORTICULTURAE NO.158:449-456. EN., SUM. EN. (DEPT. OF AGRICULTURAL ECONOMICS, UNIV. OF NAIROBI, KENYA)

PHASEOLUS VULGARIS; SNAP BEANS; COSTS; TRADE; INCOME; LABOR; KENYA.

PRODUCTION COSTS OF FRENCH BEANS WERE ANALYZED, AND THE FINANCIAL GAIN FOR KENYAN SMALL FARMERS WAS ASSESSED. FRENCH BEANS ARE GROWN MAINLY FOR EXPORT, FROM NOV. TO APRIL. THE COSTS OF THE INPUTS SUCH AS FERTILIZERS, SEED, LABOR FOR LAND PREPARATION AND HARVESTING WERE ESTIMATED. SOME OF THE SMALL FARMERS HAD DIRECT ACCESS TO THE EXPORT MARKETS BUT THE MAJORITY OF THEM HAD TO SELL TO THE EXPORTERS. A GOOD MAJORITY OF THE FARMERS ESTIMATED A PROFIT OF ABOUT 25 PERCENT BUT CONSIDERED EMPLOYMENT IT PROVIDES FOR THEM AND THE RURAL PEOPLE A VERY IMPORTANT BENEFIT. (AS (EXTRACT))

2010

28990 MBUGUA, G.W. 1986. EFFECTS OF PLANT DENSITY AND PHOSPHATE LEVELS ON GROWTH, YIELD AND YIELD COMPONENTS OF FIELD BEANS PHASEOLUS VULGARIS L. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:15-16. EN. (NATIONAL HORTICULTURAL RESEARCH STATION, THIKA, KENYA)

PHASEOLUS VULGARIS; SPACING; PLANTING; FERTILIZERS; P; LEAF AREA; GROWTH; NODULATION; YIELD COMPONENTS; YIELDS; KENYA.

THE EFFECT OF POPULATION DENSITY AND PHOSPHATE FERTILIZER ON BEANS WAS STUDIED IN 2 EXPT. CONDUCTED IN KABETE, KENYA, DURING 1979 AND 1980. FOUR PLANT DENSITIES (160,000, 250,000, 444,444, AND 1,000,000 PLANTS/HA) AND 4 RATES OF TRIPLE SUPERPHOSPHATE (0, 50, 100, AND 150 KG/HA) WERE USED. PHOSPHATE FERTILIZER INCREASED LAI, PLANT GROWTH RATE, RATE OF PLANT SENESCENCE, AND NO. AND WT. OF NODULES. IN 1980 POD NO./PLANT, SEEDS/POD, AND 100-SEED WT. WERE ALSO HIGHER IN THE FERTILIZED THAN IN THE CONTROL PLANTS. THERE WAS A 13 AND 9 PERCENT INCREASE IN SEED YIELD OVER THE CONTROL IN 1979 AND 1980, RESP., WITH 150 KG P/HA. YIELD DIFFERENCES RESULTING FROM THE DIFFERENT RATES WERE NOT SIGNIFICANT; CONSEQUENTLY, THE APPLICATION OF 50 KG P/HA APPEARED TO BE THE BEST. WITH INCREASED PLANT POPULATION, THE GROWTH RATE, DM YIELD, RATE OF SENESCENCE, AND NO. OF PODS/HA INCREASED; HOWEVER, NO YIELD BENEFIT WAS OBTAINED BY INCREASING PLANT POPULATION BEYOND 160,000 PLANTS/HA. POPULATION DENSITY X FERTILIZER INTERACTIONS WERE LARGELY INSIGNIFICANT. (CIAT)

2011

27239 M'RIBU, E. 1985. THE EFFECTS OF DIFFERENTIAL WATERING AT VARIOUS DEVELOPMENT STAGES ON THE PRODUCTION OF FRENCH BEANS (PHASEOLUS VULGARIS L.). ACTA HORTICULTURAE NO.153:145-149. EN., SUM. EN., 10 REF. (DEPT. OF CROP SCIENCE, EGERTON COLLEGE, NJORO, KENYA)

PHASEOLUS VULGARIS; SNAP BEANS; IRRIGATION; TIMING; YIELDS; YIELD COMPONENTS; KENYA.

PLANTS OF FRENCH BEAN CV. MOREL WERE GROWN IN POLYETHYLENE BAGS IN THE GREENHOUSE. FROM THE 2-LEAF STAGE THE PLANTS WERE WATERED AT INTERVALS OF 2-6 DAYS IN VARIOUS COMBINATIONS DURING THE VEGETATIVE, FLOWERING, AND POD DEVELOPMENT STAGES. SHORT WATERING INTERVALS DURING THE VEGETATIVE STAGE INCREASED THE TOTAL AND MARKETABLE YIELD BUT HAD NO EFFECT ON POD LENGTH. WATERING AT SHORT INTERVALS DURING POD DEVELOPMENT INCREASED TOTAL AND MARKETABLE YIELDS AND POD LENGTH. THE WATERING INTERVAL DURING THE MAIN FLOWERING STAGE HAD NO EFFECT ON YIELD OR QUALITY. (AS)

2012

28994 MUGAI, S.G.S.; PERE, W.M. 1986. BEANFLY: RESISTANCE SCREENING OF PHASEOLUS GERMLASM AND BEANFLY SPECIES IDENTIFICATION IN KENYA. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:35-37. EN. (GRAIN LEGUME PROJECT, NATIONAL HORTICULTURAL RESEARCH STATION, THIKA, KENYA)

PHASEOLUS VULGARIS; OPHIOMYIA PHASEOLI; CULTIVARS; RESISTANCE; INSECT CONTROL; OPHIOMYIA SPENCERELLA; KENYA; CIAT-2.

THE OCCURRENCE AND DISTRIBUTION OF SPECIES OF THE BEAN FLY IN KENYA WERE DETERMINED AND PHASEOLUS CV. AND LINES WERE SCREENED FOR RESISTANCE IN THIKA. OPHIOMYIA SPENCERELLA WAS FOUND IN ALL THE SAMPLED PLANTS WHILE O. PHASEOLI OCCURRED IN ONLY 25 PERCENT OF THE SAMPLED PLANTS, ASSOCIATED WITH THE FORMER SPECIES. O. CENTROSEMATIS WAS NOT OBSERVED. THE PERFORMANCE OF SEVERAL BEAN LINES FROM CIAT'S BEAN PROGRAM WAS SIMILAR TO THAT OF THE LOCAL CHECK REGARDING BEAN FLY TOLERANCE, ALTHOUGH COMPLETE RESISTANCE WAS NOT OBSERVED IN ANY OF THE ACCESSIONS. (CIAT)

2013

22903 MUKUNYA, D.M.; GATHURU, E.M.; WAINES, G. 1983. Germplasm testing. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.33-48. En., Dat.num. [Dept. of Crop Science, Univ. of Nairobi, Kabete, Kenya]

Phaseolus vulgaris. Germplasm. Adaptation. Yields. Selection. Colletotrichum lindemuthianum, Uromyces phaseoli, Pseudomonas syringae pv. phaseolicola, Isariopsis griseola. Resistance. Ophiomyia phaseoli, Kenya.

The best 40 bean accessions of Kenya were assessed in 4 sites (Katumani, Murinduko, Karai, and Kabete), during the short rainy season (Oct. 1982-Jan. 1983). Exptl. plots were inoculated with Rhizobium. Av. yields recorded at Kabete and Katumani were much higher than those obtained at Murinduko and Karai, as shown in the tables. The highest mean yield recorded at Kabete, Katumani, Murinduko, and Karai were 951.2, 1184.0, 565.8, and 825.4 kg/ha, resp., corresponding to bean cv. NB 149, NB 776, NB 154, and NB 728. The best 9 var. will be retested at all locations during the long rainy season of 1983. Colletotrichum lindemuthianum, Uromyces phaseoli, Pseudomonas syringae pv. phaseolicola, and Isariopsis griseola were the major diseases recorded at all sites. A severe attack of Ophiomyia phaseoli was observed at Murinduko. (CIAT)

2014

31824 MUTHOKA, D.K. 1987. Case studies of on-farm demonstration/trials of improved production technology of maize and bean intercropping. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.272-276. En., Sum. En.

Phaseolus vulgaris. Intercropping. Maize. On-farm research. Technology. Yields. Kenya.

Maize and beans are the leading staple foods and cash crops of 2.3 million small-scale farmers in Kenya; thus, their importance to the country's economy cannot be over emphasized. Maize and bean intercropping gives stable yields and max. returns for a min. effort; increases income, and improves the nutritional diet of the farm family. Intercropping of maize and beans gives higher yields because nutrients, water, and solar energy are more efficiently used. Improved maize and bean production technology is being demonstrated to small-scale farmers, and is being widely adopted. (AS)

2015

22907 MUTITU, E.W.; MUKUNYA, D.M.; GATHURU, E. 1983. *Fusarium solani* f.sp. *phaseoli* in Kenya. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing. Bean-Cowpea Collaborative Research Support Program. pp.74-94. En.

Phaseolus vulgaris. *Fusarium solani* f. sp. *phaseoli*. Symptomatology. Inoculation. Soils. Manures. Kenya.

Detailed information is presented on various aspects of *Fusarium solani* f. sp. *phaseoli* such as morphological characteristics, distribution, penetration and host-parasite relationships, and symptomatology. The methodology and results of expt. on isolation of *F. solani* f. sp. *phaseoli* from diseased bean plants and on the soil preservation of this pathogen are described in detail. Other expt. were conducted on the effect of inoculum levels of *F. solani* f. sp. *phaseoli* on beans growing on balanced "Muguga pot mix" soil; the effect of different soils on *Fusarium* root rot disease on beans; the effect of manure (cowdung) as organic amendment for the 3 soils on *Fusarium* root rot disease; and the effect of manure (cowdung) on *Fusarium* root rot on beans growing in naturally-infested soil. The methodology and results of these expt. are also described, further studies are suggested since the inoculation method used was not effective. (CIAT)

2016

22905 MWANGI, S.F.M.; MUKUNYA, D.M.; GATHURU, E.M. 1983. Variation in *Colletotrichum lindemuthianum* the cause of bean anthracnose and its implications in bean improvement in Kenya. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of Research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.56-64. En.

Phaseolus vulgaris. *Colletotrichum lindemuthianum*. Races. Isolation. Culture media. Cultivars. Resistance. Kenya.

Research was conducted on the variation of the races of *Colletotrichum lindemuthianum* in Kenya through conventional race studies with different pathogen isolates and different var. differentials. *C. lindemuthianum* culture was obtained from diseased samples from Katumani; the best sporulation media were nutrient agar and pure agar. The reaction of bean differentials (Emerson 847, Michelite, Cornell 49-242, Canadian Wonder, Dark Red Kidney, Perry Marrow, Kaboon, Processor, and Rico 23) to the Katumani pathogen isolate was tested. The inoculation method used is described in detail. Emerson 847, Cornell 49-242, Kaboon, and Rico 23 were resistant. Preliminary results indicated that this isolate could fall in the delta alpha, or beta groups. (CIAT)

2017

29739 NADAR, H.M. 1984. Intercropping and intercrop component interaction on under varying rainfall conditions in eastern Kenya. 1. Maize/bean intercrop. East African Agricultural and Forestry Journal 44(Special Issue):166-175. En., Sum. En., 13 Ref., Il. (USAID/Kenya Agricultural Research Inst., Muga)

PHASEOLUS VULGARIS; INTERCROPPING; ZEA MAYS; SPACING; RAINFALL; PLANTING; KENYA.

To improve the intercrop production, a study was started in the short rains season of 1978/79 in the Machakos area, Katumani, Kenya, to evaluate the performance of both maize and beans in sole crop and intercrop systems with different populations, spatial arrangements, and fertility levels as influenced by the varying rainfall conditions prevalent in the study area. The rate of intracrop competition was much higher than that of intercrop. Increasing the population by intercropping resulted in competition levels 10 percent lower than that caused by higher maize populations. Intercropping in the same row was superior to intercropping in alternate rows. This might be due to better spatial arrangements or to the closeness of the maize and bean plant roots in the same row arrangement, resulting in the maize plants benefitting from the N fixed by the bean plants. This beneficial effect was found to be positively correlated with the proximity to each other of the roots of the 2 intercrop components. LERs of intercrop expt. under adequate rainfall conditions were always more than unity. On the other hand, under drought conditions LER values were lower than unity, probably because of the competition between the intercrop components for the available moisture. Because of the maize/bean price relationship, the intercrop would be more economical than sole crop maize under drought conditions, while sole crop beans would be more economical than either sole crop maize or a maize/bean intercrop. It was also found that within a certain range of population levels, bean plants do not significantly respond to changes in population and can counteract the change by an opposite change in the no. of pods/plant. These results clearly indicate that under unpredictable rainfall conditions, such as prevail in the Machakos area, maize and bean intercropping would not be the best practice. (AS)

2018

28881 NJORGE, J.M.; MWAHA, E. 1986. RESULTS OF FIELD EXPERIMENTS, RUIRU. 3. EFFECTS OF N, P AND K FERTILIZERS ON COFFEA ARABICA L YIELDS, QUALITY AND THEIR RESIDUAL EFFECTS ON DRY BEAN (PHASEOLUS VULGARIS L.) YIELDS IN KENYA. KENYA COFFEE 51(592):29-34. EN., SUM. EN., 21 REF., IL. (COFFEE RESEARCH STATION, P.O. BOX 4, RUIRU, KENYA)

PHASEOLUS VULGARIS; INTERCROPPING; COFFEA ARABICA; FERTILIZERS; N; P; K; YIELDS; KENYA.

APPLICATION OF N, P, AND POTASH FERTILIZERS WERE TESTED ON ARABICA COFFEE YIELD AND QUALITY IN RUIRU, KENYA. THEIR INTERACTION AND RESIDUAL EFFECTS ON DRY BEAN YIELD WERE ALSO ASSESSED. A HIGHLY SIGNIFICANT RESPONSE TO THE RESIDUAL P FERTILIZER ON DRY BEAN YIELDS WAS RECORDED. THE IMPLICATIONS OF THE RESULTS ARE DISCUSSED. (AS)

2019

27232 OCHETIM, S.; BOGERE, C.; KATONGOLE, J.B.D. 1980. NUTRIENT CONTENT AND FEEDING VALUE OF COMMON BEAN TYPES GROWN AND CONSUMED IN KENYA. EAST AFRICAN AGRICULTURAL AND FORESTRY JOURNAL 45(4):284-289. EN., SUM. EN., 26 REF.

PHASEOLUS VULGARIS; CULTIVARS; NUTRITIVE VALUE; DIETARY VALUE; PROTEIN CONTENT; FIBER CONTENT; AMINO ACIDS; KENYA.

NUTRIENT CONTENT AND FEEDING VALUE OF 4 BEAN VAR. GROWN AND CONSUMED IN KENYA (ROSE COCO, MWEZI MOJA, CANADIAN WONDER, AND MEXICAN 142) WERE DETERMINED. THE PROTEIN CONTENT OF THE 4 VAR. WAS 20 PERCENT; THAT OF MWEZI MOJA WAS SLIGHTLY GREATER THAN IN THE REST. MEXICAN 142 HAD THE MOST FIBER, 9.08 PERCENT, AND CANADIAN WONDER THE LEAST, 6.76 PERCENT. GE VALUE WAS 4.33-4.47 KCAL/G. BEANS WERE HIGH IN P, MG, AND CA BUT LOW IN FE. FIRST LIMITING AMINO ACIDS WERE MET. AND CYSTINE, WITH VALINE NEXT. ESSENTIAL AMINO ACID INDEX WAS FROM 88.7 IN CANADIAN WONDER TO 94.4 IN MEXICAN 142. CHEMICAL SCORES FOR CANADIAN WONDER, MWEZI MOJA, MEXICAN 142, AND ROSE COCO WERE 87.1, 84.8, 81.7, AND 77.9, RESP. RATS GIVEN AUTOCLAVED BEANS LOST WT. BUT WHEN MET. WAS PRESENT THEY GAINED WT. BUT NOT AS MUCH AS DID CONTROLS GIVEN CASEIN. (NUTRITION ABSTRACTS AND REVIEWS)

2020

29164 OGENGA-LATIGO, M.V.; KHAMBA, B.M. 1985. SOME ASPECTS OF THE BIOLOGY OF THE BLACK BEAN APHID APHIS FABAE SCOPOLI REARED ON THE COMMON BEAN PHASEOLUS VULGARIS L. INSECT SCIENCE AND ITS APPLICATION 6(5):591-593. EN., SUM. EN., FR., 11 REF., IL. (INTERNATIONAL CENTRE OF INSECT PHYSIOLOGY & ECOLOGY, P.O. BOX 30772, NAIROBI, KENYA)

PHASEOLUS VULGARIS; APHIS FABAE; INSECT BIOLOGY; LABORATORY EXPERIMENTS; KENYA.

INVESTIGATIONS WERE CONDUCTED IN THE GREENHOUSE TO EVALUATE THE BIOLOGICAL PERFORMANCE OF APHIS FABAE WHEN BRED ON 2 COMMON BEAN VAR. MEAN DEVELOPMENTAL PERIOD OF THE APHID WAS 7.8 DAYS AT 26.5 DEGREES CELSIUS (RANGE 15.0-32.5 DEGREES CELSIUS) ON BEAN VAR. MWEZI MOJA (GLP.10) AND RED HARCOT (GLP.3). THE REPRODUCTIVE LIFE OF THE APHID AVERAGED 15.3 DAYS (RANGE 11-17 DAYS) DURING WHICH EACH MOTHER APHID PRODUCED ON AV. 55.2 AND 56.2 NYMPHS ON THE 2 BEAN VAR., RESP. NYMPHS (66.2 PERCENT) WERE BORN DURING THE DAYTIME (0600-1800 H), WHEREAS ONLY 33.8 PERCENT OF THE NYMPHS WERE PRODUCED DURING THE NIGHT (1800-0600 H). THERE WERE 2 PEAKS OF DIURNAL NYMPHAL PRODUCTION, AND MORE NYMPHS WERE BORN DURING THE MORNING PEAK (0600-0800 H) THAN DURING THE MID-AFTERNOON PEAK (1400-1600 H). A VERY HIGH RATE OF A. FABAE POPULATION INCREASE WAS OBSERVED. (AS)

2021

28988 OMUNYIN, M.E.; GATHURU, E.M.; MUKUNYA, D.M. 1986. EFFECT OF BEAN COMMON MOSAIC VIRUS ON GROWTH AND YIELD OF BEANS. (ABSTRACT). PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:11-12. EN. (NATIONAL HORTICULTURAL RESEARCH STATION, THIKA, KENYA)

PHASEOLUS VULGARIS; BEAN COMMON MOSAIC VIRUS; GROWTH; YIELDS; CULTIVARS; KENYA.

THE EFFECT OF BCMV ON STEM HEIGHT, POD PRODUCTION, WT. OF DM, AND YIELD OF BEANS WAS EXAMINED IN LOCALLY GROWN VAR. BEAN VAR. GLP-2 (ROSE COCO (1828 KG/HA)), GLP-24 (CANADIAN WONDER (1662 KG/HA)), AND GLP-1004 (MWEZI MOJA (1437 KG/HA)) WERE INOCULATED WITH 3 BCMV STRAINS: WCH2 (KN4), 510 (KN3), ANDN (KN1). FORTY DAYS AFTER INOCULATION, THE STEM HEIGHTS OF BCMV-INFECTED AND NONINFECTED PLANTS WERE MEASURED. INFECTED PLANTS RESULTED IN SIGNIFICANTLY SHORTER STEMS, FEWER PODS, AND LOWER DM WT. THAN THE CONTROLS. YIELDS OF ROSECOCO, CANADIAN WONDER, AND MWEZI MOJA WERE REDUCED BY 55, 64, AND 67 PERCENT DUE TO VIRUS INFECTION. THE VAR. REACTED DIFFERENTLY TO THE VIRUS STRAINS, WHICH WERE SIGNIFICANTLY DIFFERENT ON THE VAR. CANADIAN WONDER ONLY. (FULL TEXT)

2022

19742 RHEENEN, H.A.VAN; MUJIGAI, S.G.S. 1983. Control of bean common mosaic by deployment of the dominant I gene. Thika, Kenya, National Horticultural Research Station. Grain Legume Project. En.

BEAN COMMON MOSAIC VIRUS; DISEASE CONTROL; GENES; RESISTANCE; YIELDS;
THELAVIOPSIS BASICOLA; KENYA; VIROSES; GENETICS; MYCOSES; DISEASES AND
PATHOGENS; AFRICA.

The deployment of the dominant I gene for the control of bean common mosaic predisposes a bean crop to the danger of death by black root if one or more recessive genes to prevent the hypersensitive plant reaction are lacking. However, during 3 years in Kenya black root occur exceptionally to a percentage of more than 10, and in such cases the yields from crops having the dominant I gene exceeded significantly those from mosaic susceptible crops. The use of dominant resistance factor in Kenya is therefore recommended, but continued caution and monitoring of the disease situation are required. Broadening the resistance basis by adding recessive genes to control black root is advisable. (AS)

2023

30436 SAVILE, A.H.; WRIGHT, W.A. 1958-1959. Notes on Kenya agriculture. 3. Oil seeds, pulses, legumes, and root crops. East African Agricultural Journal 24(1):1-9. En.

Phaseolus vulgaris. Climatic requirements. Soil requirements. Spacing. Yields. Snap beans. Kenya.

General recommendations on climate and soil requirements, cultivation, and harvesting of various crops (including common and French beans) in Kenya are given. These legumes are mainly used as staple pulses throughout African areas and for employed labor. For a spacing of 0.6 x 0.3 m the seed rate is 28 kg/ha; yields range from 336 to 1120 kg/ha and the time to maturity is 3 mo. (CIAT)

2024

28825 SCHLUTER, M. 1984. PULSES AND HORTICULTURAL CROPS. IN -----
CONSTRAINTS ON KENYA'S FOOD AND BEVERAGE EXPORTS. WASHINGTON, D.C.,
INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE. RESEARCH REPORT NO.44.
PP.78-90. EN., 34 REF.

PHASEOLUS VULGARIS; TRADE; PRICES; MARKETING; AGRICULTURAL PROJECTS; KENYA.

BACKGROUND INFORMATION IS GIVEN ON PULSES IN KENYA, WITH EMPHASIS ON DRY EDIBLE BEANS. DATA ON IMPORTS/EXPORTS, OFFICIAL PRICES, CULTIVATED AREA, MARKETING, RESEARCH PROJECTS, AND YIELDS ARE INCLUDED. CONSTRAINTS TO INCREASED PULSE EXPORTS AND TO THE DIFFUSION OF YIELD-INCREASING TECHNOLOGICAL INNOVATIONS FOR BEANS ARE MENTIONED AND ANALYZED. (CIAT)

2025

29128 SINGH, J.P.; MUSYIMI, A.B.K. 1980. CHEMICAL CONTROL OF BEAN RUST IN KENYA. EAST AFRICAN AGRICULTURAL AND FORESTRY JOURNAL 45(3):207-209. EN., SUM. EN., 9 REF.

PHASEOLUS VULGARIS; UROMYCES PHASEOLI; DISEASE CONTROL; FUNGICIDES; KENYA.

BEAN RUST WAS MOST EFFECTIVELY CONTROLLED AND A CORRESPONDING INCREASE IN YIELD OBTAINED FROM 4 FOLIAR SPRAYS OF EITHER BITERTANOL AT THE RATE OF 1.75 LITERS/HA OR TRIADIMEFON AT THE RATE OF 500 G/HA. (AS (EXTRACT))

2026

27800 SSALI, H.; KEYA, S.O. 1986. THE EFFECTS OF PHOSPHORUS AND NITROGEN FERTILIZER LEVEL ON NODULATION, GROWTH AND DINITROGEN FIXATION OF THREE BEAN CULTIVARS. TROPICAL AGRICULTURE (TRINIDAD) 63(2):105-109. EN., SUM. EN., 10 REF., IL. (DEPT. OF SOIL SCIENCE, UNIV. OF NAIROBI, P.O. BOX 30197, NAIROBI, KENYA)

PHASEOLUS VULGARIS; FERTILIZERS; N; P; NODULATION; DRY MATTER; NITROGEN FIXATION; MINERAL CONTENT; YIELDS; CULTIVARS; KENYA.

P AND N FERTILIZER LEVEL EFFECTS ON NODULATION, DM YIELD, DINITROGEN FIXATION (AS MEASURED BY THE (15)N TECHNIQUE), N AND P TISSUE CONTENT, AND SEED YIELD OF 3 COMMON DRY BEAN CV. WERE INVESTIGATED IN A FIELD EXPT. IN KABETE, KENYA. THE 2 LEVELS OF P WERE 0 AND 150 KG/HA AND THE 2 N FERTILIZER LEVELS WERE 10 AND 100 KG/HA. APPLICATION OF P INCREASED NODULATION, DM MATTER YIELD, P UPTAKE, TISSUE N YIELD, DINITROGEN FIXATION, AND SEED YIELD OF THE 3 BEAN CV. AT BOTH N LEVELS. A HIGH DOSE OF N SEVERELY REDUCED NODULATION ONLY WHERE P WAS NOT APPLIED BUT SEVERELY REDUCED DINITROGEN FIXATION AT BOTH P LEVELS. WHERE P WAS APPLIED CV. FIXED COMPARABLE QUANTITIES OF DINITROGEN. AT THE LOW LEVEL OF N WHERE NO P WAS APPLIED, HOWEVER, 1 CV. (ROSE COCO) NODULATED WELL EARLY IN THE GROWTH STAGES AND FIXED SUBSTANTIAL DINITROGEN. (AS)

2027

27236 SSALI, H.; KEYA, S.O. 1980. NITROGEN LEVEL AND CULTIVAR EFFECTS ON NODULATION, DINITROGEN FIXATION AND YIELD OF GRAIN LEGUMES: 2. COMMON BEAN CULTIVARS. EAST AFRICAN AGRICULTURAL AND FORESTRY JOURNAL 45(4):277-283. EN., SUM. EN., 7 REF., IL.

PHASEOLUS VULGARIS; CULTIVARS; FERTILIZERS; N; NODULATION; GROWTH; NITROGEN FIXATION; DRY MATTER; YIELDS; MINERAL CONTENT; KENYA.

THE EFFECTS OF A LOW AND A HIGH N FERTILIZER DOSE (20 AND 100 KG/HA, RESP.) ON NODULATION, GROWTH, AND DINITROGEN FIXATION OF 3 COMMON BEAN CV. (ROSE COCO, CANADIAN WONDER, AND MWEZI MOJA) AS MEASURED BY THE (15)N TECHNIQUE WERE INVESTIGATED IN A FIELD STUDY IN KABETE, KENYA. A LOW N FERTILIZER DOSE DID NOT SIGNIFICANTLY AFFECT NODULATION, DM, AND SEED YIELD OF THE 3 CV, WHEREAS A HIGH DOSE SIGNIFICANTLY REDUCED NODULATION BUT HAD NO SIGNIFICANT EFFECT ON DM AND SEED YIELD OF THE 3 CV. AT A LOW N DOSE, BEANS FIXED BETWEEN 27.7-35.2 KG N/HA BUT FIXATION WAS REDUCED BY 15-47 PERCENT AT THE HIGHER N DOSE. AT BOTH N LEVELS, THE BULK OF BEAN PLANT TISSUE N WAS DERIVED FROM NONFERTILIZER SOIL N. THERE WERE NO SIGNIFICANT INTERACTIONS BETWEEN BEAN CV. AND N LEVEL FOR ALL PARAMETERS. (AS)

2028

22902 WAINES, J.C. 1983. USAID-Bean/Cowpea CRSP MSU/Davis title XII. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.26-32. En., 10 Ref. [Dept. of Botany & Plant Sciences, Univ. of California, Riverside, CA, USA]

Phaseolus vulgaris. Crossbreeding. Backcrossing. Hybridizing. Phaseolus acutifolius. Drought. Resistance. Temperature. CIAT-2. Kenya.

Mature F1 hybrids and backcross plants were obtained from crossing 3 Kenyan common bean lines (NB 86, NB 26, and NB 510) with 6 Phaseolus acutifolius lines from CIAT (G40016, G40035, and G40036) and Riverside, USA (L179, L242-26, and PI321638). Crossings were made to improve the drought-, heat-, and disease tolerance of Kenyan common beans; however, difficulty was experienced in obtaining mature hybrid and backcross plants. Crossings were also made with PI321638 and Kenyan Machacos 2 to improving the consumer acceptability of P. acutifolius beans in semiarid African areas. Research work on selection for drought tolerance in common beans is indicated as well as the research plans on plant breeding for 1983-84. (CIAT)

2029

28227 WEBSTER, B.D.; WAINES, J.G. 1985. TEPARY BEANS: A RESOURCE FOR IMPROVEMENT OF COMMON BEANS. RESEARCH HIGHLIGHTS 2(3):1-4. EN., 8 REF., IL. (DEPT. OF AGRONOMY AND RANGE SCIENCE, UNIV. OF CALIFORNIA, DAVIS, CA 95616, USA)

PHASEOLUS VULGARIS; PHASEOLUS ACUTIFOLIUS; HYBRIDIZING; USA; KENYA.

THE MAIN CHARACTERISTICS OF TEPARY BEANS (PHASEOLUS ACUTIFOLIUS) THAT SHOULD BE TAKEN INTO ACCOUNT IN BREEDING PROGRAMS FOR COMMON BEANS (P. VULGARIS) ARE DISCUSSED. THE TRIALS CARRIED OUT BY THE U. OF CALIFORNIA (USA) AND THE U. OF NAIROBI (KENYA) ON THE TRANSFER OF THE BEST CHARACTERISTICS OF TEPARY BEAN TO COMMON BEAN ARE SUMMARIZED. (CIAT)

2030

22901 WEBSTER, B.D.; CORY, C.L.; SARATH, G.; GREAVES, M.O. 1983. Screening of Phaseolus vulgaris and Phaseolus acutifolius for drought tolerance. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research Support Program. pp.2-25. EN., Sum. EN., 24 Ref., IL. [Dept. of Agronomy & Range Science, Univ. of California, Davis, CA 95616, USA]

Phaseolus vulgaris. Phaseolus acutifolius. Cultivars. Crossbreeding. Resistance. Drought. Irrigation. Leaf area. Soil moisture. Flowering. Yields. USA. Kenya.

To identify parameters for efficient genotype screening for drought resistance, 13 cv. of Phaseolus vulgaris and 3 of P. acutifolius were planted in the spring of 1983 in 2 separate trials at the Agronomy Exptl. Fields of the University of California (Davis, USA). Concurrent studies were carried out under drought conditions at the University of Nairobi (Kabete, Kenya). Simultaneously, a trial with a line source sprinkler involving 4 water regimes and another with normal and min. furrow irrigation were undertaken simultaneously. Leaf water potential, leaf area, and soil water content were measured at periodic intervals after seed germination. At the onset of flowering, 4 inflorescences were selected at random and tagged on each of 3 plants/center row for all entries. Tagged inflorescences were monitored until harvest. Tags contained information on total no. of flowers produced, date of anthesis, and total no. of pods set. Difference were observed among cv. in leaf area, leaf water potential, and yield. The high leaf production recorded among certain cv. at the onset of the growing season, under conditions of high water availability, could be an indication of drought tolerance. This can be an important agronomic trait that might have contributed to the early establishment of the plant canopy. Continued leaf production seems essential for yield enhancement under conditions of low water availability. P. acutifolius accessions outyielded P. vulgaris cv. under the exptl. conditions. Based on these expt., the transference of drought adaptability from P. acutifolius to cultivated P. vulgaris genotypes seems a valid and worthwhile pursuit. Data on flowering and water use efficiency are currently being analyzed. It is expected that these analyses provide valuable insight on both the usefulness of the parameters studied and the effects of drought on yield components. (AS)

2031

22904 WEBSTER, B.D. 1983. Susceptibility of bean introductions to bean diseases in experimental plots at Karai, Kabete and Katumani in December, 1982 crop season. In Webster, B.D. Improvement of drought and heat tolerance of disease resistant beans in semi-arid regions of Kenya. Report of research, 1982-1983. East Lansing, Bean-Cowpea Collaborative Research

Support Program. pp.49-55. En. [Dept. of Agronomy & Range Science, Univ. of California, Davis, CA 95616, USA]

Phaseolus vulgaris. Plant introductions. Cultivars. Resistance. *Uromyces phaseoli*. *Elsinoe phaseoli*. *Ascochyta phaseolorum*. *Pseudomonas syringae* pv. *phaseolicola*. *Isariopsis griseola*. Bean common mosaic virus. Bean yellow spot virus. Selection. Strains. Kenya.

A total of 52 bean introductions were assessed in the field during the 1982 short rains for susceptibility to *Uromyces phaseoli*, *Elsinoe phaseoli*, *Ascochyta phaseolorum*, *Pseudomonas syringae* pv. *phaseolicola*, *Isariopsis griseola*, BCMV, and bean yellow spot virus. As shown in a table, since only BN 123, 86, 174, 117, 637, and 896 showed tolerance to most diseases, they will be tested both in the field and in the greenhouse to confirm the field disease-tolerance level. Out of 80 bean introductions screened for resistance to various BMV strains, only 2 (NE 68 and 69) gave no response to most strains. This indicates the presence of vital resistance to some of the most severe strains of the virus collected in Kenya and the possibility of transferring this resistance to agronomically useful beans through breeding. (CIAT)

2032

26038 WEBSTER, B.D.; WAINES, J.C.; FOSTER, K.W.; HALL, A.E.; MUKUNYA, D.M.; GATHURU, E.M.; ITULYA, F.; COULSON, C. 1982. IMPROVEMENT OF DROUGHT AND HEAT TOLERANCE OF DISEASE RESISTANT BEANS IN THE SEMI ARID REGIONS OF KENYA. (MEJORAMIENTO DE LA TOLERANCIA DEL FRIJOL, RESISTENTE A ENFERMEDADES, A LA SEQUIA Y AL CALOR EN LAS REGIONES SEMIARIDAS DE KENIA). IN BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM. U.S.A. 1982 ANNUAL REPORT, EAST LANSING, MICHIGAN STATE UNIVERSITY. PP.64-69. EN.

ABSCISSION; CROSSBREEDING; DROUGHT; GERMPLASM; GROWTH; INTERCROPPING; IRRIGATION; KENYA; *PHASEOLUS ACUTIFOLIUS*; *PHASEOLUS VULGARIS*; PLANT BREEDING; ZEA MAYS; CIAT-2.

THE OBJECTIVES, ACHIEVEMENTS IN 1982, AND PLANS FOR 1983 OF THE PROJECT TO IMPROVE DROUGHT AND HEAT TOLERANCE OF DISEASE-RESISTANT BEANS IN THE SEMIARID REGIONS OF KENYA ARE PRESENTED. ON-GOING RESEARCH WORK IS SUMMARIZED FOR ACTIVITIES CONDUCTED AT THE U. OF CALIFORNIA IN DAVIS AND RIVERSIDE (USA) AND AT THE U. OF NAIROBI IN KABETE (KENYA). (CIAT)

LYBIA

2033

23999 RUBEAI, M.A.F.; GODWARD, M.E.B. 1982. Effects of acute gamma irradiation of dormant seeds on the growth and yield of 4 varieties of French beans (*Phaseolus vulgaris* L.). *Genética Iberica* 34(1-2):83-100. En., Sum. En., 25 Ref., Il. (Dept. of Botany, Faculty of Science, Univ. of Garyounis, Benghazi, Libya)

Phaseolus vulgaris. Snap beans. Irradiation. Plant anatomy. Seed. Germination. Roots. Cultivars. Yields. Yield components. Lybia.

Dose response in the M₁ generation of 4 *Phaseolus vulgaris* var. (Cordon, Masterpiece, Swiss Blanc, and The Prince), after seed exposure to acute doses of gamma radiation, was assessed using morphological criteria. Lethal doses did not affect the onset of germination. LD50 values for survival were 8.5, 12.5, 12.5, and 9.0 kR for Cordon, Masterpiece, The Prince, and Swiss Blanc, resp. Decreases in the rate of root and shoot growth, fresh and dry wt., no. of leaves/plant, and a lengthening of time to flowering were

observed. The no. of pods/plant was the most sensitive indicator among yield components. Other alterations included the homogeneity of the populations and changes in the no. of leaflets, accompanied mostly by changes in leaf shape. (AS)

2034

32264 BRUYERE, R.; GRENILLET, B.; JANNAUD, G.; DELHAYE, R.E. 1962. Le P.C. 23. (P.C. 23). Lac Alaotra, République Malgache, Institut de Recherches Agronomiques Tropicales de Madagascar, Station Agronomique du Lac Alaotra. 70p. Fr., 11.

Phaseolus vulgaris. Yields. Intercropping. Zea mays. Planting. Timing. Harvesting. Madagascar.

The general characteristics of P.C. 23, a region in SW Alaotra Lake, Madagascar, are described in detail. Information is given on the major food crops (including beans) cultivated. The area planted to beans is small (15 ha). Beans are commonly planted in association with maize from Dec. to Jan. and harvested in Apr.-May. Yields range from 300 to 400 kg/ha. This legume crop does not play an important role; however, growers are advised to plant it as an out-of-season crop in areas near an irrigation channel. (CIAT)

MADAGASCAR

2035

25614 CHATEL, M. 1981. AMELIORATION VARIETALE DU POIS DU CAP (*PHASEOLUS LUNATUS* L.) A MADAGASCAR. (PHASEOLUS LUNATUS VARIETAL IMPROVEMENT IN MADAGASCAR). AGRONOMIE TROPICALE 36(3):294-298. FR., 10 REF., 11. (INST. DE RECHERCHES AGRONOMIQUES TROPICALES ET DES CULTURES VIVRIERES, B.P. 853, TANANARIVE, MADAGASCAR)

PHASEOLUS LUNATUS; CULTIVARS; SELECTION; PLANT BREEDING; GENOTYPES; YIELDS; MADAGASCAR.

RESULTS OF *PHASEOLUS LUNATUS* VAR. IMPROVEMENT IN MADAGASCAR ARE PRESENTED. HISTORICAL AND BOTANICAL DATA, CROP REGIONS, MONOCROPS AND ASSOCIATED CROPS, YIELD AND YIELD COMPONENT DATA, AND SCREENING, CARRIED OUT AT THE TULEAR STATION FROM 1970 TO 1976, ARE INCLUDED. THE MAIN SELECTION CRITERION HAS BEEN THE ABSENCE OF ANTOCYANIC SPOTS ON THE SEED DUE TO THE GRADUAL DISAPPEARANCE OF THE WHITE-SEED TYPE OF *P. LUNATUS*, THE REAPPEARANCE OF HYBRIDS WITH STAINED SEED, AND A MARKED DECREASE OF CULTIVATED AREA (19,100 TO 6790 HA), OF PRODUCTION (19,375 TO 8050 T), AND OF EXPORTS (16,476 TO 8008 T) BETWEEN 1975-76. SEVERAL PHENOTYPES AND THEIR CORRESPONDING GENOTYPES ARE DESCRIBED. THE PHENOTYPE IS WHITE ONLY WHEN THE GENE OF BASE COLORATION (C: CHROMOGENIC) IS FOUND IN RECESSIVE HOMOZYGOUS STATE. PEDIGREE SELECTION (CONTROLLED SELFING) WAS CARRIED OUT WITH 54 LINES FROM 5 LOCAL ECOTYPES (MOROMBE, ANKIKILOAKO, BETANIMENA, FIERERENANA, AND MANOMBO), 2 BEING SELECTED FOR THEIR DIVULGATION: BETANIMENA 117-15 (LINE 11) AND MANOMBO 55-1 (LINE 8). THE NEED TO TAKE MEASURES TO CONSERVE THE QUALITY OF THESE CV. IS EMPHASIZED. (CIAT)

MALAWI

2036

24866 ABANI, K.; BARNES-McCONNELL, P. 1983. Social science pilot study in northern Malawi--preliminary findings. East Lansing, Bean/Cowpea

Collaborative Research Support Program. Michigan State University. Technical Report no.2. 22p. En., 1 Ref. (Bean/Cowpea Collaborative Research Support Program, 200 Center for International Programs, Michigan State Univ., East Lansing, MI 48824-1035, USA)

PHASEOLUS VULGARIS; SOCIOECONOMIC ASPECTS; PRODUCTION; STORAGE; MALAWI.

The preliminary findings of a survey conducted in northern Malawi among 25 rural families in order to gain knowledge on the socioeconomic importance of beans are reported. All families grew beans at the time of the study. The large red kidney seed type was indicated as outstanding in yield and families preferred this type. Of the families, 88 percent intercrop beans, especially with maize, 48 percent use some fertilizer, and 80 percent produced 2 crops/yr. Bean production is usually a family affair although some hire laborers when needed. The contribution of family members to bean production by activity is given. The role of women in bean production is stressed. Economic aspects of bean production, storage, and preparation are discussed. The favorite beans for consumption were Nyauzembe for their flavor and fast cooking. There is economic advantage in separating seed types since the preferred var. usually bring a better price when sold separately. However, breeders cannot discount the potential importance of maintaining the complex genetic pool that now exists. (CIAT)

2037

25039 ADAMS, M.W.; BARNES-MCCONNELL, P.W.; MILLER, J.; EDJE, T. 1982. GENETIC, AGRONOMIC, AND SOCIO-CULTURAL ANALYSIS OF DIVERSITY AMONG BEAN LAND RACES IN MALAWI. IN BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM. U.S.A. 1982 ANNUAL REPORT. EAST LANSING, MICHIGAN STATE UNIVERSITY. PP.70-73. EN.

AGRICULTURAL PROJECTS; CROSSBREEDING; GERMPLASM; MALAWI; PHASEOLUS VULGARIS; SEED CHARACTERS.

THE OBJECTIVES AND ACHIEVEMENTS OF THE PROJECT TO ANALYZE THE GENETIC, AGRONOMIC, AND SOCIOCULTURAL DIVERSITY OF BEAN LAND RACES IN MALAWI ARE PRESENTED. A TOTAL OF 113 COLLECTIONS WERE MADE AND THEIR OVERALL CHARACTERISTICS ARE DESCRIBED. FIELD PLANTINGS AT MICHIGAN STATE U. (USA) OF 97 SEED TYPES FROM MALAWI SUPPORT THE HYPOTHESIS THAT SOME OF THE GENETIC DIVERSITY COULD BE DUE TO NATURAL OUTCROSSING. ACTIVITIES FOR 1983 ARE BRIEFLY OUTLINED. (CIAT)

2038

2910! AYOADE, J.A.; MAKHAMBERA, T.P.E. 1984. ALTERNATIVAS PARA LA SUSTITUCION DEL MAIZ EN DIETAS PARA CERDOS. 1. REEMPLAZO DEL MAIZ POR VAINAS DE FRIJOL EN DIETAS DE CERDOS EN CRECIMIENTO- ENGORDE EN LOS TROPICOS. (ALTERNATIVES FOR THE SUBSTITUTION OF MAIZE IN SWINE DIETS. 1. REPLACEMENT OF MAIZE BY BEAN PODS IN DIETS FOR GROWING-FINISHING PIGS IN THE TROPICS). PRODUCCION ANIMAL TROPICAL 9(3):212-214. ES., SUM. ES., 5 REF. (DEPTO. DE PRODUCCION GANADERA, UNIV. DE MALAWI, APARTADO POSTAL 219, LILONGWE, MALAWI)

PHASEOLUS VULGARIS; LABORATORY ANIMALS; DIETS; NUTRITIVE VALUE; ANIMAL NUTRITION; MALAWI.

FOUR GROUPS OF 4 MALE LARGE WHITE AND LANDRACE CROSSED PIGS, WITH AN INITIAL WT. OF 13 KG, RECEIVED A MAIZE-BASED DIET (50 PERCENT) WITH OR WITHOUT 5, 10, OR 15 PERCENT DRIED AND GROUND BEAN PODS SUBSTITUTING THE MAIZE. RESULTS INDICATED THAT THE RESP. VALUES OF MEAN DAILY WT. GAIN (KG/DAY) WERE 0.57, 0.48, 0.50, AND 0.44; FEED INTAKE (KG/KG WT. GAIN), 3.50, 3.98, 3.82, AND 3.62; CARCASS YIELD, 66.35, 67.86, 67.89, AND 68.07;

AND COLD-GRADED MEAT VALUE, 0.64, 0.66, 0.66, AND 0.66. THE INCLUSION OF BEAN PODS IN THE DIET HAD A SIGNIFICANT EFFECT (P LESS THAN 0.05) ON THE PARAMETERS MEASURED. (AS-CIAT)

2039

28263 CHITEDZE AGRICULTURAL RESEARCH STATION. ADAPTIVE RESEARCH PROGRAMME. MANAGEMENT UNIT. 1984. FARMING SYSTEM OVERVIEW EPA 22 IN THE LILONGWE NORTH EAST RURAL DEVELOPMENT PROJECT: RESULTS OF AN EXPLORATORY SURVEY 12-14. MARCH. 1984. LILONGWE, MALAWI. 13P. FN.

PHASEOLUS VULGARIS; AGRICULTURAL PROJECTS; CULTIVATION; MALAWI.

FARMER'S EXTERNAL CIRCUMSTANCES AND CONSTRAINTS THAT JUSTIFY THE LILONGWE RURAL DEVELOPMENT PROJECT (MALAWI) ARE DESCRIBED. THIS PROJECT AIMS TO INCREASE CROP AND LIVESTOCK PRODUCTION, AND CONSEQUENTLY FARM INCOME, THROUGH PROVISION OF IMPROVED EXTENSION COVERAGE, ROADS, MARKETING, AND CREDIT. SINCE THE PROJECT IS ONLY IN ITS 2ND YR OF FUNDING, IT IS TOO EARLY TO ASSESS IMPACT. FARMER'S INTERNAL CIRCUMSTANCES (LAND, LABOR, CASH, AND CAPITAL), OBJECTIVES, AND PRIORITIES AS WELL AS MAIN FARMING SYSTEMS (LOCAL MAIZE, HYBRID MAIZE, GROUNDNUTS, AND TOBACCO) ARE DESCRIBED. BEANS ARE PLANTED IN PURE STAND, FOR CONSUMPTION. IF INTERCROPPED WITH LOCAL MAIZE, THIS IS DONE AFTER THE 1ST WEEDING DURING THE SAME STATION. (CIAT)

2040

27479 EDJE, O.T. 1983. EFFECTS OF TASSEL REMOVAL AND DEFOLIATION OF MAIZE ON YIELD OF MAIZE AND BEAN GROWN ON MONOCULTURE AND IN ASSOCIATION. RESEARCH BULLETIN OF BUNDA COLLEGE OF AGRICULTURE 12:69-85. EN., SUM. EN., 10 REF.

PHASEOLUS VULGARIS; INTERCROPPING; ZEA MAYS; DEFOLIATION; YIELDS; MALAWI.

MAIZE VAR. MH12 AND BEAN VAR. 499/5 WERE GROWN EITHER IN MONOCULTURE OR IN ASSOCIATION AT BUNDA COLLEGE OF AGRICULTURE (MALAWI) DURING THE 1982-83 CROPPING SEASON. THE MAIZE IN MONOCULTURE OR IN ASSOCIATION WAS SUBJECTED TO DETASSELING AND DEFOLIATION TREATMENTS, THE TREATMENTS WERE (1) CONTROL, (2) DETASSEL ONLY, (3) DETASSEL AND REMOVAL OF 2 LEAVES, AND (4) DETASSEL AND REMOVAL OF 4 LEAVES. THE LEAF AREAS DEFOLIATED, AVERAGED OVER CROPPING SYSTEMS, FOR TREATMENTS 3 AND 4 WERE 6663 AND 22,400 SQUARE CENTIMETERS, RESP. THE TOTAL DM OF TREATMENTS 2, 3, AND 4 WAS CALCULATED AND FOUND TO BE SUFFICIENT TO FEED 1 LIVESTOCK UNIT WEIGHING 454 KG FOR 27.6, 36.1, AND 71.8 DAYS, RESP. DETASSELING INCREASED SEED YIELD OF MAIZE IN MONOCULTURE BY 13.7 PERCENT OVER CONTRL. TREATMENTS 3 AND 4 HAD NO SIGNIFICANT EFFECT ON MAIZE IN MONOCULTURE. THE RELATIVE PHOTOSYNTHETIC POTENTIALS OF TREATMENTS 3 AND 4 WERE 100.8 AND 86.8, RESP. (AS (EXTRACT))

2041

30736 MARTIN, G.B.; ADAMS, M.W. 1987. Landraces of *Phaseolus vulgaris* (Fabaceae) in northern Malawi. 1. Regional variation. Economic Botany 41(2):190-203. En., Sum. En., 21 Ref., 11. (U.S. Dept. of Energy Plant Research Laboratory, Michigan State Univ., East Lansing, MI 48824, USA)

PHASEOLUS VULGARIS; CULTIVARS; OUTCROSSING; AGRONOMIC CHARACTERS; PHENOLOGY; PLANT ANATOMY; MALAWI.

The extent and underlying patterns of variability in *Phaseolus vulgaris* when maintained as diverse landraces under traditional cropping systems in Malawi were investigated. The various seed types comprising these heterogeneous mixtures are known by an array of local names, reflecting farmer perceptions of seed color and pattern, eating quality, plant structure, origin, and other characteristics. A principal components analysis of morphological, phenological, and agronomic metrical traits for 375 lines randomly selected from 15 landraces revealed a clinal pattern, with the northern and southern

areas forming the extremes. Genetic distances, based on the 1st 6 principal components, indicated greater between-area variability than within-area variability. Bean landrace diversity in Malawi is likely the result of a complex interplay among forces that generate variability such as outcrossing and human and environmental selection. (AS)

2042

30740 MARTIN, G.B.; ADAMS, M.W. 1987. Landraces of *Phaseolus vulgaris* (Fabaceae) in Northern Malawi. 2. Generation and maintenance of variability. *Economic Botany* 41(2):204-215. En., Sum. En., 23 Ref., 11.

PHASEOLUS VULGARIS; CULTIVARS; VARIETAL MIXTURES; OUTCROSSING; MALAWI.

Observations are presented of several seed-handling practices that result in the initial mixing of diverse seed types, in an attempt to understand factors affecting diversity in the Malawian bean gene pool. Seed handling practices during harvest, storage, and marketing at the village, local market, and national levels were found to result in physical and usually nonselective mixing of many seed types. Expt. determined that outcrossing does occur at a low level among beans in Malawi and can result in the generation of many new seed phenotypes. A scenario was developed integrating seed-handling practices and outcrossing that lays a foundation for understanding the generation and maintenance of variability in these bean landraces. The process whereby landrace heterogeneity arises and the ways it is maintained, if understood, should assist plant breeders in the development of improved germplasm for subsistence farmers. (AS)

2043

29178 MUNTHALI, D.C.; WYATT, I.J. 1986. FACTORS AFFECTING THE BIOLOGICAL EFFICIENCY OF SMALL PESTICIDE DROPLETS AGAINST TETRANYCHUS URTICAE EGGS. *PESTICIDE SCIENCE* 17(2):155-164. EN., SUM. EN., 19 REF., 11.

PHASEOLUS VULGARIS; SNAP BEANS; TETRANYCHUS URTICAE; ACARICIDES; MALAWI.

THE INTERACTION BETWEEN DROPLET SIZE (18-146 MICRONS) AND PESTICIDE CONC. (0.5-40.0 G A.I./LITER) ON THE BIOLOGICAL EFFICIENCY OF SMALL, MONOSIZED SPRAY DROPLETS WAS ASSESSED BY DETERMINING THE EFFECTS ON MORTALITY OF TETRANYCHUS URTICAE EGGS USING OIL-BASED FORMULATIONS OF DICOFOL AS THE TOXICANT AND LEAF DISCS OF FRENCH BEAN CV. THE PRINCE AS THE TEST SURFACE. A POSITIVE CURVILINEAR RELATIONSHIP WAS FOUND BETWEEN THE SPACING OF DROPLETS THAT WAS REQUIRED TO PRODUCE 50 PERCENT KILL (LS50) AND THE ORIGINAL DIAMETER OF THE DROPLET, D, SUCH THAT $LS50 = 14.48D(B)$, WHERE B VARIED FROM 0.65 TO 1.44 AND BORE A U-SHAPED RELATIONSHIP TO CONC. THE OPTIMUM CONC. WAS THEREFORE APPROX. 10 G/LITER. THE THEORETICAL, PRACTICAL, AND ECONOMIC IMPLICATIONS OF THESE RESULTS ARE DISCUSSED. (AS)

2044

27050 WARREN, A. 1985. MALAWI: BEANS CROP EVALUATION. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PRODUCTION; YIELDS; MALAWI.

STATISTICAL DATA ARE PRESENTED OF BEAN PRODUCTION, AREA UNDER CULTIVATION, AND YIELDS FOR THE 1983-84 AND 1984-85 SEASONS FOR THE KARONGA, SALIMA, KASUNGU, AND LILONGWE REGIONS OF MALAWI. (CIAT)

2045

27051 WARREN, A. 1985. MALAWI: BEAN CROPPING SYSTEMS. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY

IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL.
4P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; INTERCROPPING; ZEA MAYS; RELAY CROPS; MALAWI.

THE MAJOR BEAN CROPPING SYSTEMS USING IN THE SOUTHERN HIGHLANDS, NORTHERN REGION, AND CENTRAL PLATEAU OF MALAWI ARE BRIEFLY DESCRIBED. SOME PROBLEMS ENCOUNTERED WHEN INTERCROPPING BEANS WITH MAIZE ARE MENTIONED. (CIAT)

2046

27049 WARREN, A. 1985. MALAWI: WOMEN FARMERS IN BEAN PRODUCTION (PROJECT OF CRSP, WITH BUNDA COLLEGE, IN THE NORTHERN REGION. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBAWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL, 2P EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; AGRICULTURAL PROJECTS; DEVELOPMENT; MALAWI.

A RESEARCH PROJECT TO STUDY THE ROLE OF WOMEN FARMERS IN BEAN PRODUCTION IN MALAWI IS DESCRIBED. BRIEF INFORMATION OF THE SURVEYS UNDERTAKEN, PROBLEMS ENCOUNTERED, AND FUTURE WORK IS INCLUDED. (CIAT)

MAURITIUS

2047

27411 BENIMADHU, S.P.; SOOMARY, S.; SOOBHANY, M.N. 1984. LEGUMINOUS CROPS: BEAN. IN MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. ANNUAL REPORT FOR THE YEAR 1981. PORT LOUIS, MAURITIUS. PP.138-140. EN.

PHASEOLUS VULGARIS; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; XANTHOMONAS CAMPESTRIS PV. PHASEOLI; CULTIVARS; SELECTION; RESISTANCE; MAURITIUS.

RESULTS OF A SURVEY ON BEAN DISEASES CARRIED OUT IN MAURITIUS ARE REPORTED. FIELD, LAB., AND GREENHOUSE EXPT. WERE PERFORMED TO DETERMINE THE DEGREE OF RESISTANCE OF VARIOUS CV. TO HALO BLIGHT AND COMMON BLIGHT, THE 2 MAJOR DISEASES DETECTED. CV. NOORINBEE SHOWED A HIGHER DEGREE OF RESISTANCE TO BOTH DISEASES; HOWEVER, IT SHOULD BE TESTED SEVERAL TIMES DURING DIFFERENTGROWTH PERIODS IN THE FIELD. (CIAT)

2048

31162 BENIMADHU, S.P.; SOOMARY, S. 1982. Bean. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1980. Port Louis, pp.139-141. En.

Phaseolus vulgaris. Pseudomonas syringae pv. phaseolicola. Etiology. Isolation. Pathogenicity. Races. Resistance. Cultivars. Symptomatology. Mauritius.

The importance of bean halo blight (*Pseudomonas phaseolicola*) in Mauritius is highlighted. Research on this bacterial disease included the identification, isolation, characterization, and race designation of the pathogen. Pathogenicity tests were conducted with susceptible var. Victory and Long Tom; the procedure is described in detail. Only 7 isolates, producing the typical halo blight symptoms (pale green, water-soaked lesions which develop into small halos with pinpoint brown spots in their centres), were kept and coded as PP1, PP2, PP4, PP7, PP9, PP10, and PP12. These isolates were characterized as belonging to *Pseudomonas* due to their

morphological and biochemical characteristics, which are also described in detail. Physiological races of *P. phaseolicola* were determined by means of the inoculation of local isolates on bean var. Red Mexican; the procedure is described in detail, indicating that all isolates were found to belong to race 1 (no susceptible reactions). Field trials were conducted to test the resistance of cv. Noorinbee to *P. phaseolicola*. No foliar symptoms were observed on this cv.; however, some plants showed halo blight lesions on their pods. Isolations from leaves of Noorinbee plants bearing infected pods resulted unsuccessful. How the pods got infected has not yet been determined. (CIAT)

2049

27462 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1984. BEAN (*PHASEOLUS VULGARIS*). IN -----, ANNUAL REPORT FOR THE YEAR 1981. PORT LOUIS, MAURITIUS. PP.69-71. EN.

PHASEOLUS VULGARIS; CULTIVARS; YIELDS; PLANTING; TIMING; YIELD COMPONENTS; MAURITIUS.

THE RESULTS OF RESEARCH CARRIED OUT ON BEANS DURING 1981 BY THE MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT OF MAURITIUS ARE SUMMARIZED. YIELDS OF BEAN VAR. COMPRISE, CANNELLINO, AND BORLOTTO WERE COMPARED WITH THAT OF VAR. LOCAL RED, COMPRISE GAVE THE HIGHEST YIELD (1.93 T/HA) AND HAD THE GREATEST NO. OF PODS/PLANT (7.4) AND SEEDS/POD (5 PLUS OR MINUS 1). IN A BEAN PLANTING DATE X VAR. TRIAL, MID-JUNE WAS FOUND TO BE THE BEST PLANTING TIME. NO SIGNIFICANT DIFFERENCES IN YIELD WERE FOUND AMONG THE VAR. TESTED. (CIAT)

2050

30416 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1984. Crop production; beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1981, Port Louis, p.268. En., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mauritius.

Data on area planted (in arpents; 1 arpent = 0.42 ha) to various food crops (including beans) are given for Mauritius, from the June 1981 crop census. (CIAT)

2051

31438 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1982. Bean. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1979. Port Louis, pp.48-51. En.

Phaseolus vulgaris. Cultivars. Adaptation. *Liriomyza*. *Maruca testulalis*. Insecticides. Yields. Yield components. Pods. *Uromyces phaseoli*. Resistance. Mauritius.

Three bean var. trials were established in Mauritius during 1979. Two expt. were conducted at the Plaisance exptl. station and 1 at the Reduit Central exptl. station. The 1st was conducted with var. Red Kidney, Slankette, Gordonco, and Local Red. The 2nd trial included var. Tenderpod Green Snap, Dwarf Horticultural Green Shell, Red Kidney, Bountiful Green Snap, Green Crop, White Morrowfat shell, Local Red, and Green Sleeves Green Snap. In the 3rd trial, the var. tested were Noorinbee, Pioneer, Contender, Red Kidney, Local Red, and Long Tom. In the 1st trial, attacks of *Liriomyza* and *Maruca testulalis* were effectively controlled by omethoate and dichlorvos, resp. A table is given with yields (t/ha) and av. no. of

Pods/plant for the var. tested. No significant differences were observed among yields (ranging from 3.14 to 7.71 t/ha). In the 2nd trial, all var. produced flat pods, except for Tenderpod Green Snap and Green Crop. A table is given with yields (t/ha) and av. pod length (cm) for the var. tested. No significant differences were observed among yields (ranging from 7.58 to 11.3 t/ha). In the 3rd trial, beans were harvested 45 days after planting. A table is included with yields (t/ha) av. no. of pods/plant, and av. plant height (cm) for the var. tested. Local Red gave the lowest yields (2.71 t/ha) compared with Noorinbee and Pioneer (9.75 and 9.60 t/ha, resp.). Symptoms of *Uromyces phaseoli* were observed on the susceptible var. Local Red and Red Kidney; var. Noorinbee was slightly less susceptible than the other var. tested. (CIAT)

2052

31448 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1981. International Bean Field and Adaptation Nursery (IBYAN) experiment. In Mauritius, Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1981. Port Louis, pp.88-89. En.

Phaseolus vulgaris. Cultivars. Adaptation. Yields. Yield components. Maturation. Timing. Podding. Harvesting. Mauritius. CIAT-2.

An expt. on non-black bush beans was conducted at the Barkly exptl. station (Mauritius) as part of the CIAT IBYAN project. Several exptl. lines (BAT 1296, BAT 1230, BAT 1297, Linea 22, and Linea 23), international checks (Linea 24), and local checks (Local Red and Canelloni) were evaluated for yield and adaptation. A table is given with data on various var. characteristics such as plant density/ha, mean pod no./plant, mean seed no./pod, and mean seed yields (kg/ha). The yield of the international check (Linea 24) did not differ significantly from most of the exptl. lines, except for BAT 1297 and 1296, which gave the highest seed yields (2271.88 and 2013.43 kg/ha, resp.). The local check gave significantly lower seed yields (P equal to or less than 0.01), lower pod no./plant, and lower seed no./pod. Another table includes information on the days to 50 percent flowering, maturity, and harvest of each group of var. tested. (CIAT)

2053

31160 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1980. Beans (Variety Long Tom). In Mauritius, Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1978. Port Louis, pp.90-91. En.

Phaseolus vulgaris. *Maruca testulalis*. Plant injuries. *Ophiomyia phaseoli*. Insecticides. Yields. Mauritius.

Two insecticides (pirimiphos-methyl and deltamethrin) were tested for their effectiveness in controlling bean pests. Trials were conducted at the Barkly exptl. station, Mauritius, in winter (June-Aug.) and summer (Dec.-Jan.) months. Methomyl was used as the standard insecticide. Plants were sprayed at the recommended dosages at weekly intervals from the 2 leaf stage, and twice a wk. during harvest. They were weekly examined for the presence of insects. An assessment was made by comparing green pod yields and the percentage of pods attacked by *Maruca testulalis*. In both trials, green pod yields were slightly higher in the plots sprayed with deltamethrin, which effectively controlled *M. testulalis*. *Ophiomyia phaseoli* was found in very few cases in both trials; *Nacoleia praeteritalis* was observed only in the summer trials. Damage caused by *M. testulalis* was less severe in winter than in summer. (CIAT)

2054

31159 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1980. Pole bean, Bush bean, Shell bean and pea. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1978. Port Louis, pp.48-49. En.

Phaseolus vulgaris. Climbing beans. Cultivars. Dwarf beans. Yields. Yield components. Timing. *Maruca testulalis*. Insecticides. Pod characters. Maturation. Mauritius.

An observational trial was conducted at the Plaisance exptl. station (Mauritius) with several climbing (Kentucky Wonder and Blue Lake-White Seeded), shell (Red Kidney), and bush (White Marrow Fat, Burpee's Tender Pod, Cordon, Gordonco, and Slankette) bean var. A table is included with data on seed yields (kg/ha), pod length (cm), no. of seed/pod, and crop cycle (days) for the best var. Both climbing bean var. were high yielding (6805 and 4820 kg/ha for Kentucky Wonder and Blue Lake-White Seeded, resp.), followed by Red Kidney (5450 kg/ha). These var. are recommended for further trials. All bean var. were attacked by *Maruca testulalis* which was effectively controlled by methomyl. (CIAT)

2055

31447 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1977. Bean. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1974. Port Louis, p.75. En.

Phaseolus vulgaris. Fungicides. Mauritius.

A fungicide trial was set up in Mauritius in 1974 by the plant pathology division. The plot had not yet been harvested at the time the research was reported. The trial on bean var. Victory, tobacco, potato, groundnut, ginger, and tomato, to assess the incidence of Bacherine wilt on these crops was continued by the plant pathology division on 1 arpent (1 arpent = 0.42 ha) of land. (AS)

2056

31446 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1977. Dwarf French bean (*Phaseolus vulgaris*). In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1974. Port Louis, p.18. En.

Phaseolus vulgaris. Snap beans. Dwarf beans. Cultivars. Adaptation. Yields. Harvesting. Timing. Pods. *Colletotrichum lindemuthianum*. *Isariopsis griseola*. *Uromyces phaseoli*. Mauritius.

Five new var. (Contender, Rocquencourt, Fin de Bagnols, Harvester and Coco Early White) of dwarf French beans imported from France were put under observational trial at the Central Exptl. Station in Mauritius, in April-May, 1974. The 1st 4 var. are suitable for use as fresh pods and the 1st 3 are stringless. The growth and yields of all var. were very satisfactory. Fresh pods yields were 17.5, 15.4, 13.5 and 12.5 t/ha for var. Contender, Rocquencourt, Fin de Bagnols and Harvester, resp. Var. Contender, Rocquencourt, and Fin de Bagnols were ready for harvest 50 days after planting; the harvesting period ranged between 15-25 days. Pods were picked every 5 days during the harvesting period. Var. Harvester was late maturing; it was ready for harvest after 60 days. Pods were picked 3 times at 5-day intervals. Var. Coco Early White was harvested for dry seeds, 90 days after planting. Slight incidence of *Colletotrichum lindemuthianum*, *Isariopsis griseola*, and *Uromyces phaseoli* was observed in all var. (Full text)

2057

31170 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1972. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1969. Port Louis, pp.74,85. En.

Phaseolus vulgaris. *Colletotrichum lindemuthianum*. *Isariopsis griseola*. *Rhizoctonia solani*. *Ophiomyia phaseoli*. *Maruca testulalis*. Plant injuries. Insecticides. Fungicides. Cultivars. Resistance. Mauritius.

Colletotrichum lindemuthianum and *Isariopsis griseola* caused substantial damage on bean var. Long Tom at Barkly exptl. station (Mauritius) while var. Victory underwent more nematode attacks. Var. Golden Padded was severely attacked by *I. griseola* at postmaturity stage in June, although the disease can be controlled with fungicides. Mosaic disease was reported on bean var. Long Tom in Reduit, Vacoas, and Plaisance. The importance of the disease is highlighted since the local bean var. is also affected. *Rhizoctonia solani* was reported in several localities; research on this disease will be conducted. No significant results were obtained from trials carried out with 5 insecticides (dichlorvos, phosphamidon, aldrin, chlorbromuron, and monocrotophos), whose effectiveness in controlling *Ophiomyia phaseoli* and *Maruca testulalis* was evaluated, since pest incidence was extremely low (less than 2 percent). (CIAT)

2058

31445 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1968. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1966. Port Louis, p.106. En.

Phaseolus vulgaris. *Corynebacterium flaccumfaciens*. *Whetzelinia sclerotiorum*. *Isariopsis griseola*. Cultivars. Resistance. Fungicides. Mauritius.

Corynebacterium flaccumfaciens in Mauritius was common on bean var. Local Red and Market which have shown increased susceptibility to the disease over the past few years. A fungicide trial was carried out at the Vacoas demonstration center to control *Sclerotinia sclerotiorum* with PCNB, and *Isariopsis griseola* with mancozeb and captafol. No results were obtained since both diseases were absent in all plots. (Full text)

2059

31443 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1968. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1966. Port Louis, p.81. En.

Phaseolus vulgaris. Fertilizers. N. P. K. Dung. Yields. Mauritius.

Bean var. Victory was used in a fertilizer trial to test 2 levels each of NPK and farmyard manure (FYM) at a spacing of 38 x 38 cm. The application rates were 0 and 44.8 kg N/ha and 89.6 kg each of P and K/ha, and 37.5 t/ha FYM. All treatments yielded more than the control (3575 kg/ha) except the K and K + FYM treatments, which yielded 3200 kg/ha each. Higher yields were obtained with the NP + FYM treatment (6500 kg/ha) followed by the N + FYM (5700 kg/ha). (CIAT)

2060

31444 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1968. Beans. In Mauritius. Ministry of Agriculture and Natural

Resources and the Environment. Annual Report for the year 1966. Port Louis, p.89. En.

Phaseolus vulgaris. Fertilizers. N. P. K. Statistical analysis. Mauritius.

In Mauritius, a 3 x 3 factorial fertilizer trial on bean var. Victory was planted in March with a single replication in 3 blocks of 9 plots each. N was applied at 0, 22.4, and 44.8 kg/ha, and P and K, at 0, 44.8, and 89.6 kg/ha each. Linear and quadratic responses, and interactions for each treatment are given in a table. The linear responses of P and K, the quadratic response of K, and the interaction PK were significant. (CIAT)

2061

31099 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1967. Bean. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1965. Port Louis, p.93. En.

Phaseolus vulgaris. *Corynebacterium flaccumfaciens*. *Isariopsis griseola*. *Rhizoctonia solani*. Cultivars. Resistance. Fungicides. Mauritius.

In Mauritius, *Corynebacterium flaccumfaciens* was severe during the summer months. Bean var. Local Red was more susceptible than var. Victory. At the Vacoas exptl. station a Local Red var. crop had 36 percent wilted plants and at the Plaisance exptl. station, another Local Red crop had 10 percent wilted plants. In a trial at the Arsenal exptl. station var. Victory, Local Red, and Marlet showed similar susceptibility to *Isariopsis griseola*. Both mancozeb and maneb controlled the disease satisfactorily. *Rhizoctonia solani* caused some damage from Sept. to Oct. at the Vacoas, Reduit, Arsenal, and Mapou exptl. stations. In a bean crop of var. Victory at the Vacoas exptl. station symptoms of *R. solani* were observed in 6 percent of the plants. A fungicide trial with PCNB to control *R. solani* was established at the Reduit exptl. station. (Full text)

2062

31100 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1965. Bean. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1964. Port Louis, p.65. En.

Phaseolus vulgaris. *Isariopsis griseola*. *Pseudomonas syringae* pv. *phaseolicola*. Symptomatology. Cultivars. Resistance. Disease control. Fungicides. *Rhizoctonia solani*. *Corynebacterium flaccumfaciens*. Mauritius.

Research was carried out to determine the relative status of bean diseases in Mauritius. Although the most common leaf disease was *Isariopsis griseola*, which occurred in crops planted in both winter and summer, there was a high incidence of *Pseudomonas syringae* pv. *phaseolicola* in beans planted from July to Oct., with both leaf and pod symptoms. In Sept., the latter disease was widespread at Reduit, Abercrombie, Arsenal, and at Plaisance exptl. stations, where 40 percent infection was recorded in a crop of var. Victory. *Pseudomonas syringae* pv. *phaseolicola* is seed-borne; it is not controlled by seed dressings. As a result, locally produced seed is generally infected. In a fungicidal trial at Plaisance exptl. station, mancozeb was found to control *Isariopsis griseola*. *Rhizoctonia solani* was found to affect bean crops at Vacoas, Arsenal, and Pamplemousses exptl. stations from May to Sept. The fungus produced lesions at the collar of young plants and caused growth stunting and poor stands. At Vacoas exptl. station, older plants were observed to break at the collar during windy weather, resulting in appreciable losses. In May, *Corynebacterium flaccumfaciens* occurred in crops at Mapou. (Full text)

2063

31442 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1965. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1963. Port Louis, p.60. En.

Phaseolus vulgaris. *Corynebacterium flaccumfaciens*. *Pseudomonas syringae* pv. *phaseolicola*. *Whetzelina sclerotiorum*. *Uromyces phaseoli*. Mauritius.

Corynebacterium flaccumfaciens occurred for the 1st time in several young bean crops in Beau Bassin and Black River, Mauritius. *Pseudomonas syringae* pv. *phaseolicola* and *Uromyces phaseoli* were severe throughout the season. A severe outbreak of *Sclerotinia sclerotiorum* in a seed production plot occurred during July and Aug. at the Barkly exptl. station. (Full text)

2064

31441 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1965. Variety of beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1963. Port Louis, p.48. En.

Phaseolus vulgaris. Cultivars. Yields. *Ophiomyia phaseoli*. Mauritius.

A randomized var. trial was carried out in Mauritius with 7 var. and 4 replications. Bean var. Long Tom, Fin de Bagnol, Golden Queen, Pioneer, Prolific Long-podded, Victory, and Oeil de Précoce yielded 3622.0, 1633.7, 1747.0, 1740.7, 1315.2, 1230.2, and 1004.5 kg/ha, resp. Less significant differences at 5 and 1 percent were plus or minus 1713.2 and 2346.7, resp. The crop suffered from *Ophiomyia phaseoli*. (Full text)

2065

31169 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1962. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1961. Port Louis, p.47. En.

Phaseolus vulgaris. *Pseudomonas syringae* pv. *phaseolicola*. *Macrophomina phaseoli*. Mauritius.

Severe wilt on beans occurred in Riviere des Anguilles, Mauritius, as a result of infection with *Pseudomonas syringae* pv. *phaseolicola*. In Vaccas, bean var. Victory, obtained from imported seed, was disease-free under conditions favoring *P. syringae* pv. *phaseolicola* attacks. *Macrophomina phaseoli* is reported as the causal agent of a foot rot on young bean plants in Richelieu and Arsenal. (Full text)

2066

31168 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1961. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1959. Port Louis, p.43. En.

Phaseolus vulgaris. *Phyllosticta phaseolina*. *Cercospora vanderysti*. BYMV. *Colletotrichum lindemuthianum*. Leaves. Cultivars. Resistance. *Pseudomonas syringae* pv. *phaseolicola*. Fungicides. Disease control. *Isariopsis griseola*. *Uromyces phaseoli*. *Sclerotium rolfsii*. Mauritius.

Phyllosticta phaseolina and *Cercospora vanderysti* caused appreciable damage on bean leaves in Mauritius. *Colletotrichum lindemuthianum* was not observed on the commercial var. Pioneer, Victory, and Local Red. BYMV and *Pseudomonas syringae* pv. *phaseolicola* were often found; control of the

latter in seed plots was attempted with Cu oxychloride sprays and roguing. *Isariopsis griseola* was controlled with zineb sprays, while *Uromyces phaseoli* did not respond to either fungicide. In seed box expt. PCNB was effective against *Sclerotium rolfsii*. (Full text)

2067

31167 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1961. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1960. Port Louis, p.48. En.

Phaseolus vulgaris. *Pseudomonas syringae* pv. *phaseolicola*. Fungicides. *Cercospora vanderysti*. *Uromyces phaseoli*. Mauritius.

Pseudomonas syringae pv. *phaseolicola* prevailed in Mauritius, even under drought conditions. At the Barkly exptl. station, a disease-free stock-seed-plot of bean var. Victory was raised by wide spacing, roguing and spraying with a fungicide. The remainder Cu of the terrace was planted in rows and showed the infection. *Cercospora vanderysti* caused extensive defoliation in Arsenal in June, *Uromyces phaseoli* was var. observed in July and prevailed the rest of the year. (Full text)

2068

31165 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1959. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1957. Port Louis, pp.33,35. En.

Phaseolus vulgaris. Dwarf beans. Yields. *Ophiomyia phaseoli*. Insecticides. Insect control. *Isariopsis griseola*. Fungicides. Disease control. Mauritius.

Dwarf beans are highlighted as a promising crop in Mauritius, with yields between 672-896 kg/ha dried beans. The effectivity of dieldrin in controlling *Ophiomyia phaseoli* is mentioned. Trials carried out at Barkly exptl. station showed that zineb at 2.5 g/liter is effective in controlling *Isariopsis griseola* when applied weekly during 5 weeks. (CIAT)

2069

31164 MAURITIUS. MINISTRY OF AGRICULTURE AND NATURAL RESOURCES AND THE ENVIRONMENT. 1958. Beans. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1956. Port Louis, p.51. En.

Phaseolus vulgaris. Dwarf beans. Mechanization. Fertilizers. *Ophiomyia phaseoli*. Insecticides. Yields. Mauritius.

A field at the Richelieu exptl. station (Mauritius) was devoted to a full scale trial on the mechanical cultivation of dwarf beans. The field was ploughed and harrowed; good tilth was obtained. Seed of bean var. Pioneer was planted with a peanut planter and fertilizer distributor. Four days after germination the whole field was sprayed with dieldrin at 30 percent (1 liter/376 liter water/ha). A good control of *Ophiomyia phaseoli* was achieved. Interrow cultivation and ridging were carried out satisfactorily with a tractor and appropriate implements. The rows which were not fertilized at planting time were given an equivalent dressing by hand 1 wk. later; however, plant development was poor throughout the growing period. It would thus appear essential to apply fertilizer (10-28-14 tobacco mixture) prior to planting. Yields of 1151.36 kg/ha dried beans were obtained after mechanical threshing. (Full text)

31163 PILLAY, M.; SOBUN, N. 1982. Fungal disease in beans (*Sclerotinia* mould). In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1980. Port Louis, p.142. En.

Phaseolus vulgaris. *Whetzelinia sclerotiorum*. Cultivars. Resistance. Symptomatology. Pods. Mauritius.

A severe outbreak of *Sclerotinia sclerotiorum* occurred at the Reduit central exptl. station of Mauritius in April/May. The disease was observed in bean var. Pioneer in a field expt. carried out by the Horticulture Division. It was then reported in a similar expt. at the Plaisance exptl. station, where var. Long Tom, Victory, Pioneer, and Noorinbee were indiscriminately affected. Subsequently, it reached epidemic proportions in a 0.2 ha field under var. Noorinbee devoted to seed production. The attack, which occurred at blossom-stage, rapidly disseminated throughout the field and the ground became covered by numerous sclerotia formed on pods and other decayed plant parts. The whole crop was uprooted and burnt. Since then, localized attacks have been observed in Quatre Bornes, Vacoas, and other sites at the Reduit central exptl. station. (Full text)

31161 VEERAPA, V. 1982. Bean. In Mauritius. Ministry of Agriculture and Natural Resources and the Environment. Annual Report for the year 1980. Port Louis, pp.64-66. En.

Phaseolus vulgaris. Planting. Timing. Cultivars. Yields. Yield components. Mauritius.

Trials were conducted at the Reduit and Plaisance exptl. stations (Mauritius), to determine the best planting dates for beans. Var. tested were Long Tom, Noorimbee, Red Kidney, Pioneer, Local Red, and Victory. A table is given with data on yields (t/ha), no. of pods/plant, and plant height (cm) for the var. tested at the Reduit exptl. station according to 3 planting dates (March 18, May 20, and July 29). Information is also included for the var. tested at the Plaisance exptl. station according to 2 planting dates (June 4 and Aug. 8). In the Reduit area, May 20 was the best planting date while June 4 was the best for dry areas like that of the Plaisance exptl. station. No significant differences were observed among yields in both expt. An analysis of the results indicated that the different planting dates did not have a significant effect on the bean yields. Further studies involving more planting dates should be conducted. (CIAT)

MOZAMBIQUE

2072

31457 CARVALHO, M.C. DE 1970. Cultura do feijoeiro. (Bean cultivation).
Gazeta do Agricultor 22(250):76-80. Pt.

Phaseolus vulgaris. Statistical data. Trade. Climatic requirements. Soil requirements. Agricultural lime. Soil analysis. Fertilizers. Spacing. Planting. Timing. Irrigation. Harvesting. *Ophiomyia phaseoli*. Nematodes. *Heliothis zea*. *Tetranychus desertorum*. *Tetranychus urticae*. *Colletotrichum lindemuthianum*. *Pseudomonas syringae* pv. *phaseolicola*. *Fusarium equiseati*. *Fusarium oxysporum*. *Fusarium solani phaseoli*. *Rhizoctonia solani*. Insecticides. Fungicides. Mozambique.

Figures corresponding to the amount of agricultural commodities imported by Mozambique in 1966-68 are provided; the situation of bean exports is also analyzed. In order to promote bean production in this country, general information is given on various aspects such as climatic and soil requirements, liming, soil analysis, fertilization, planting distances, spacing, planting time, irrigation, and harvesting. Plant injuries caused by the major pests (*Agromyza phaseoli*, nematodes, *Heliothis armigera*, and *Tetranychus* spp.) and diseases (*Colletotrichum lindemuthianum*, *Pseudomonas syringae* pv. *phaseolicola*, *Fusarium* spp., and *Rhizoctonia solani*) are described in detail. Control measures are also indicated. (CIAT)

2073

31458 FEIJAO FRADE atacado por insectos. (Bean pests). Gazeta do Agricultor 17(192):150. 1965. Pt.

Phaseolus vulgaris. *Maruca testulealis*. Pods. Insecticides. Timing. Fungicides. *Fusarium*. Leaves. Mozambique.

A pest reported attacking bean pods in Mozambique was identified as *Maruca testulealis*. Preventive control is recommended with DDT and carbaryl applied few days after podding, and repeating the treatment every 10 or 15 days. Cu-based fungicides (zineb and Zelate) applied every 10 days are recommended to control fungi of the genera *Trichotecium* and *Fusarium* attacking leaves. (CIAT)

2074

30167 INSTITUTO NACIONAL DE ESTADISTICA. MOCAMBICUE. 1972. Agricultura. 2. Areas ocupadas por principais cultura em terra arável. (Agriculture. 2. Areas planted to main crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuario Estístico 1972. Mocambique, Direcção Provincial dos Serviços de Estatística. p.237. Pt.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) to the main crops (including beans) in different districts of Mozambique in 1970. (CIAT)

2075

30165 INSTITUTO NACIONAL DE ESTADISTICA. MOCAMBICUE. 1972. Comércio de produtos agrícolas. 9. Agricultura tradicional. Produtos agrícolas e florestais, comprados aos agricultores. (Trade of agricultural products. 9. Traditional agriculture. Agricultural and forest products brought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuario Estístico 1972. Mocambique, Direcção Provincial dos Serviços de Estatística. p.359. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2076

31191 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1972. Precos médios de retalho de alguns produtos alimentares, de aquecimento, luz e higiene domésticas, em algumas cidades e sedes do concelho durante o mes de Dezembro: feijao. (Mean retail prices of several food and household products in some cities during December: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1972. Lourenco Marques, Direcção Provincial dos Servicos de Economia e Estatística Geral. p.407. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2077

30339 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Areas ocupadas por principais culturas em terra arável. (Areas devoted to the main crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Mocambique, Direcção Provincial dos Servicos de Estatística. p.269. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) to the main crops (including beans) in different districts of Mozambique in 1969. (CIAT)

2078

30337 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Comércio de produtos agrícolas. 11. Agricultura tradicional. Produtos agrícolas e florestais, comprados aos agricultores. (Trade of agricultural products. 11. Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Mocambique, Direcção Provincial dos Servicos de Estatística. p.453. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2079

31184 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Comércio especial. Exportacao das principais mercadorias: feijao. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Lourenco Marques, Direcção Provincial dos Servicos de Economia e Estatística Geral. p.468. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2080

31185 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Precos médios de retalho de alguns produtos alimentares, de aquecimento, luz e higiene domésticas, em algumas cidades e sedes do concelho durante o mes de Dezembro: feijao. (Mean retail prices of several food and household products in some cities during December: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Lourenco Marques, Direcção Provincial dos Servicos de Economia e Estatística Geral. p.501. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2081

30338 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1971. Producao das principais culturas em terra arável. (Production of the main crops in

arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1971. Mocambique, Direcção Provincial dos Serviços de Estatística. p.270. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total production (t) of the main crops (including beans) grown in different districts of Mozambique in 1969. (CIAT)

2082

30159 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1970. Areas ocupadas por principais culturas em terra arável. (Areas devoted to major crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Mocambique, Direcção Provincial dos Serviços de Estatística. p.265. Pt.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area (ha) planted to the main crops (including beans) in different districts of Mozambique in 1968. (CIAT)

2083

30160 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1970. Comércio de produtos agrícolas. 11. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Trade of agricultural products. 11. Traditional agriculture. Agricultural and forest products brought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Mocambique, Direcção Provincial dos Serviços de Estatística. p.469. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2084

31188 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1970. Comércio especial. Exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.484. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2085

30456 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1970. Importação para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Estatísticas do Comércio Externo 1970. Mocambique, Direcção Provincial dos Serviços de Estatística. v.1,p.8. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola. Netherlands. Malawi. Singapore. Mozambique.

2086

31189 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1970. Preços médios de retalho de alguns produtos alimentares, de aquecimento, luz e higiene domésticas, em algumas cidades e sedes de concelho da Província, durante o mês de Dezembro: feijão. (Mean retail prices of several food and household products in some cities during December: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.517. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2087

30161 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1970. Producao das principais culturas em terra arável. (Production of major crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1970. Mocambique, Direccao Provincial dos Servicos de Estatística. p.266. Pt.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total production (t) of the main crops (including beans) grown in different districts of Mozambique in 1968. (CIAT)

2088

30164 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1968. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.286-287. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

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30162 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Agricultura tradicional; produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture; agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1969. Mocambique, Direccao Provincial dos Servicos de Estatística. p.276. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2090

30163 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1968. Mocambique, Direccao Provincial dos Servicos de Estatística. p.290. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2091

31186 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Comércio especial. Exportacao das principais mercadorias: feijao. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1969. Lourenco Marques, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.357. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2092

30459 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Estatísticas do Comércio Externo 1969. Mocambique, Direccao Provincial dos Servicos de Estatística. v.1.p.8. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola. South Africa. USA. Singapore. Mozambique.

2093

31187 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Precos médios de retalho de alguns produtos alimentares, de aquecimento, luz e higiene doméstica em algumas cidades e sedes de concelho da provincia, durante o mes de Dezembro: feijao. (Mean retail prices of several food and household products in some cities during December: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1969. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.438. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

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30166 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1969. Producao das principais culturas em terra arável. (Production of major crops in arable land). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1972. Mocambique, Direcção Provincial dos Serviços de Estatística. p.236. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on the total production (t) of the main crops (including beans) grown in different districts of Mozambique during 1970. (CIAT)

2095

31190 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1968. Comércio especial. Exportacao das principais mercadorias: feijao. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1968. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.373. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

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31177 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1968. Precos médios de retalho de alguns produtos alimentares, de aquecimento, luz e higiene doméstica em várias cidades da provincia: feijao. (Mean retail prices of several food and household products, in various cities: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1968. Lourenço Marques, Direcção Provincial dos Serviços de Estatística. p.451. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

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30181 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1967. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.296-297. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

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30180 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1967. Mocambique, Direcção Provincial dos Serviços de Estatística. p.300. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

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31193 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Comércio especial. Exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1967. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.383. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

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30451 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Importação para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Estatísticas de Comércio Externo 1967. Mocambique, Direcção Provincial dos Serviços de Estatística. v.1,p.13. Pt.

Phaseolus vulgaris. Statistical data. Trade. Prices. Malawi. Zimbabwe. Hong Kong. Singapore. Angola. Mozambique.

2101

31194 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Preços médios de retalho de alguns produtos alimentares, de aquecimento, luz e higiene domésticas em várias cidades da Província: feijão. (Mean retail prices of several food and household products, in some cities: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1967. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.441. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

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31195 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1967. Preços médios de retalho de alguns produtos empregados na alimentação, aquecimento e higiene doméstica em Lourenço Marques: feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1967. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.443. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2103

30179 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Agricultura empresarial. Culturas, suas áreas e produção. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1966. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.282-283. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

2104

30178 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1966. Mocambique, Direcção Provincial dos Serviços de Estatística. p.286. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

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30455 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1966. Mocambique, Direcção Provincial dos Serviços de Estatística. v.1,p.12. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola. Netherlands. Zimbabwe. Singapore. Mozambique.

2106

30454 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Importacao para consumo. (Imports for consumption). In Instituto Nacional de Estatística. Mocambique. Estatísticas de Comercio Externo 1966. Mocambique, Direcção Provincial dos Serviços de Estatística. v.1,p.5. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Angola. Hong Kong. Singapore. Mozambique.

2107

31196 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Precos médios de retalho de alguns produtos alimentares, de aquecimento, luz e higiene domésticas em varias cidades da Provincia: feijao. (Mean retail prices of several food and household products in some cities: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1966. Lourenco Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.415. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2108

31197 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1966. Precos médios de retalho de alguns produtos empregados na alimentacao, aquecimento e higiene doméstica em Lourenco Marques: feijao. (Mean retail prices of several food and household products in Lourenco Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1966. Lourenco Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.417. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

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30184 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1965. Agricultura empresarial. Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1965. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.216-217. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

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30183 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1965. Agricultura tradicional. Produtos agricolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1965. Mocambique, Direcção Provincial dos Serviços de Estatística. p.220. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2111

30182 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1965. Comércio especial. Exportacao das principais mercadorias. (Special trade. Main commodity exports). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1965. Mocambique, Direcção Provincial dos Serviços de Estatística. p.315. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

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31192 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1965. Precos médios de retalho de alguns produtos empregados na alimentacao, aquecimento e higiene doméstica em Lourenço Marques: feijao. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1965. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.355. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mocambique.

2113

30197 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1964. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1964. Mocambique, Direcção Provincial dos Serviços de Estatística. p.240. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2114

31200 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1964. Comércio especial: exportacao das principais mercadorias: feijao. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1964. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.331. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2115

34101 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1964. Precos médios de retalho de alguns produtos empregados na alimentacao, aquecimento e higiene doméstica em Lourenço Marques: feijao. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1964. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.384. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2116

31198 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1963. Agricultura empresarial: culturas, suas áreas e producao: feijao. (Commercial agriculture: crops, area, and production: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1963. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. pp.220-221. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are presented on the total area planted (ha) and the total production (kg) of various crops (including beans), in different districts of Mozambique, during 1960-61. (CIAT)

2117

30186 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1963. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1963. Mocambique, Direcção Provincial dos Serviços de Estatística. p.224. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2118

30185 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1963. Comércio especial. Exportação das principais mercadorias. (Special trade. Main commodity exports). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1963. Mocambique, Direcção Provincial dos Serviços de Estatística. p.319. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2119

31199 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1963. Preços médios de retalho de alguns produtos empregados na alimentação, aquecimento e higiene doméstica em Lourenço Marques: feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1963. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.349. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2120

30311 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1962. Agricultura empresarial. Culturas, suas áreas e produção. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1962. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.382-383. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique in 1959-60. (CIAT)

2121

30310 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1962. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1962. Mocambique, Direcção Provincial dos Serviços de Estatística. p.386. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2122

31302 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1962. Comércio especial: exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística.

Mocambique. Anuário Estatístico 1962. Lourenço Marques, Direcção dos Serviços de Economia e Estatística Geral. p.471. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2123

31303 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1962. Preços médios a retalho de alguns produtos empregados na alimentação, aquecimento e higiene doméstica em Lourenço Marques: feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1962. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.496. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2124

30309 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1961. Agricultura empresarial. Culturas, suas áreas e produção. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1961. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.348-349. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique in 1958-59. (CIAT)

2125

30200 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1961. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1961. Mocambique, Direcção Provincial dos Serviços de Estatística. p.354. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2126

31304 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1961. Comércio especial: exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1961. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.446. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2127

31305 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1961. Preços médios a retalho de alguns produtos empregados na alimentação, aquecimento e higiene doméstica em Lourenço Marques: feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1961. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.478. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2128

30199 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1960. Agricultura empresarial, Culturas, suas áreas e producao. (Commercial agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1960. Mocambique, Direccao Provincial dos Servicos de Estatística. pp.316-317. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique in 1957-58. (CIAT)

2129

30198 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1960. Agricultura tradicional. Produtos agrícolas e florestais comprados aos agricultores. (Traditional agriculture. Agricultural and forest products bought from farmers). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1960. Mocambique, Direccao Provincial dos Servicos de Estatística. p.320. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2130

31306 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1960. Comércio especial: exportacao das principais mercadorias: feijao. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1960. Lourenco Marques, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.410. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2131

31437 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1960. Comércio especial: exportacao das principais mercadorias: feijao. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1958. Lourenco Marques, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.384. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2132

31439 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1960. Precos médios a retalho de alguns produtos empregados na alimentacao, aquecimento e higiene doméstica em Lourenco Marques: feijao. (Mean retail prices of several food and household products in Lourenco Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1958. Mocambique, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.428. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2133

31307 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1960. Precos médios a retalho de alguns produtos empregados na alimentacao, aquecimento e higiene doméstica em Lourenco Marques: feijao. (Mean retail prices of several food and household products in Lourenco Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1960. Lourenco Marques, Direccao Provincial dos Servicos de Economia e Estatística Geral. p.473. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2134

31183 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1960. Preços médios a retalho de alguns produtos empregados na alimentação, aquecimento e higiene domésticas em Lourenço Marques: feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1959. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.498. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2135

30307 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1959. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1959. Mocambique, Direcção Provincial dos Serviços de Estatística. p.366. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2136

30306 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1959. Agricultura Não indígena. Culturas, suas áreas e produção. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1959. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.362-363. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in the different districts of Mozambique for 1956-57. (CIAT)

2137

31433 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1959. Comércio especial: exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1957. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.374. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2138

31434 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1959. Preços médios a retalho de alguns produtos empregados na alimentação, aquecimento e higiene domésticas em Lourenço Marques: feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1957. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.417. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2139

30193 INSTITUTO NACIONAL DE ESTATÍSTICA. MOCAMBIQUE. 1958. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística, Mocambique. Anuário

Estatístico 1958. Mocambique, Direcção Provincial dos Serviços de Estatística. p.300. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2140

30194 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1958. Agricultura Nao indigena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1958. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.296-297. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique for 1955-56. (CIAT)

2141

31435 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1958. Comércio especial: exportacao das principais mercadorias: feijao. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1956. Lourenco Marques, Direcção dos Serviços de Economia e de Estatística Geral. p.364. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2142

31436 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1958. Precos médios de alguns produtos empregados na alimentacao, aquecimento e higiene domésticas em Lourenco Marques: feijao. (Mean retail prices of several food and household products in Lourenco Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1956. Lourenco Marques, Direcção Provincial dos Serviços de Economia e de Estatística Geral. p.408. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2143

30435 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1957. Agricultura indigena. Produtos agricolas e florestais comprados aos indigenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigenes). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1957. Mocambique, Direcção Provincial dos Serviços de Estatística. p.292. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2144

30187 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1957. Agricultura Nao indigena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1957. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.288-289. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique in 1954-55. (CIAT)

2145

34102 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1957. Comércio especial: exportação das principais mercadorias; feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1955. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.350. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2146

34103 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1957. Preços médios a retalho de alguns produtos empregados na alimentação, aquecimento e higiene domésticas em Lourenço Marques; feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1955. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.386. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2147

30190 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1956. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1956. Mocambique, Direcção Provincial dos Serviços de Estatística. p.280. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2148

30189 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1956. Agricultura Não indígena. Culturas, suas áreas e produção. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1956. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.276-277. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique in 1953-54. (CIAT)

2149

30324 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1955. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1955. Mocambique, Direcção Provincial dos Serviços de Estatística. p.270. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2150

30325 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1955. Agricultura Não indígena. Culturas, suas áreas e produção. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1955. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.266-267. Pt.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique in 1952-53. (CIAT)

2151

31179 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1955. Comércio especial. Exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1954. Lourenço Marques, Direcção Provincial dos Serviços de Estatística. p.324. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2152

31180 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1955. Preços médios a retalho de alguns produtos empregados na alimentação, aquecimento e higiene domésticas em Lourenço Marques: feijão. (Mean retail prices of several food and household products in Lourenço Marques: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1954. Lourenço Marques, Direcção Provincial dos Serviços de Estatística. p.359. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2153

30302 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1954. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1954. Mocambique, Direcção Provincial dos Serviços de Estatística. p.250. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2154

30301 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1954. Agricultura não indígena. Culturas, suas áreas e produção. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1954. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.246-247. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in different districts of Mozambique in 1951-52. (CIAT)

2155

31181 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1954. Comércio especial; exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1953. Lourenço Marques, Direcção Provincial dos Serviços de Estatística. p.318. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2156

31431 INSTITUTO NACIONAL DE ESTATISTICA. MOCAMBIQUE. 1954. Comércio especial; exportação das principais mercadorias: feijão. (Special trade. Main commodity exports: beans). In Instituto Nacional de Estatística. Mocambique. Anuário Estatístico 1952. Lourenço Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.302. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Mozambique.

2157

31182 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE. 1954. Preços médios a retalho de alguns produtos empregados na alimentacao, aquecimento e higiene doméstica em Lourenco Marques: feijao. (Mean retail prices of several food and household products in Lourenco Marques: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1953. Lourenco Marques, Direcção Provincial dos Serviços de Estatística. p.334. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2158

31432 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE. 1954. Preços médios a retalho de alguns produtos empregados na alimentacao, aquecimento e higiene doméstica em Lourenco Marques: feijao. (Mean retail prices of several food and household products in Lourenco Marques: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1952. Lourenco Marques, Direcção Provincial dos Serviços de Economia e Estatística Geral. p.318. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2159

30305 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE. 1953. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1953. Mocambique, Direcção Provincial dos Serviços de Estatística. p.246. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2160

30304 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE. 1953. Agricultura nao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1953. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.242-243. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in the different districts of Mozambique for 1950-51. (CIAT)

2161

30196 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE. 1952. Agricultura indígena. Produtos agrícolas e florestais comprados aos indígenas. (Aboriginal agriculture. Agricultural and forest products bought from aborigines). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1952. Mocambique, Direcção Provincial dos Serviços de Estatística. p.232. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2162

30195 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE. 1952. Agricultura nao indígena. Culturas, suas áreas e producao. (Nonaboriginal agriculture. Crops, their areas and production). In Instituto Nacional de Estatística.

Mocambique. Anuário Estatístico 1952. Mocambique, Direcção Provincial dos Serviços de Estatística, pp.228-229. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are given on total area planted (ha) and production (kg) of various crops (including beans) in the different districts of Mozambique for 1949-50. (CIAT)

2163

31178 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1952. Preços médios dos produtos alimentares de origem vegetal, em Lourenço Marques: feijão. (Mean retail prices of vegetables in Lourenço Marques: beans). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1950. Lourenço Marques, Direcção Provincial dos Serviços de Estatística. p.415. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Mozambique.

2164

30312 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1950. Comércio com os indígenas. Produtos agrícolas e florestais comprados aos indígenas pelo comércio da Colónia, e sua existência em armazém em 31 de Dezembro. (Trade with aborigines. Agricultural and forest products bought from aborigines as part of the Colony's trade, and their stock up to December 31). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1950. Mocambique, Direcção Provincial dos Serviços de Estatística. p.409. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Mozambique.

2165

30313 INSTITUTO NACIONAL DE ESTATISTICA, MOCAMBIQUE, 1950. Movimento de mercadorias em cabotagem. (Commodity movement in coastal trade). In Instituto Nacional de Estatística, Mocambique. Anuário Estatístico 1950. Mocambique, Direcção Provincial dos Serviços de Estatística. pp.379-380. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Marketing. Prices. Mozambique.

2166

31083 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE, 1973. Feijão europeu. (Cultivation of European beans). In Missao de Inquérito Agrícola de Mocambique. Estatísticas Agrícolas de Mocambique 1970. Mocambique, p.16. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are presented on the no. of farms growing European bean var., their area (ha) and production (t) in different districts of Mozambique. (CIAT)

2167

31084 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE, 1973. Feijão regional. (Cultivation of regional beans). In Missao de Inquérito Agrícola de Mocambique. Estatísticas Agrícolas de Mocambique 1970. Mocambique, p.17. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

Statistics are presented on the no. of farms growing regional bean var., their area (ha) and production (t) in different districts of Mozambique. (CIAT)

2168

31085 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1972. Feijao europeu. (Cultivation of European beans). In Missao de Inquerito Agricola de Mocambique. Estatisticas Agricolas de Mocambique 1969. Mocambique, p.2.1.2.3. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Intercropping. Monocropping. Mozambique.

Statistics on the cultivation of European bean var. in different districts of Mozambique are presented. Data are provided on the no. of farms growing monocropped beans and the total production (t). Data on area (ha) are given separately for monocropping and associated cropping systems, and total area. (CIAT)

2169

31086 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1972. Feijao regional. (Cultivation of regional beans). In Missao de Inquerito Agricola de Mocambique. Estatisticas Agricolas de Mocambique 1969. Mocambique, p.2.1.2.4. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Intercropping. Monocropping. Mozambique.

Statistics are presented on the cultivation of regional bean var. in different districts of Mozambique. Data are provided on the no. of farms growing beans in monoculture and total bean production (t). Data on area (ha) are given separately for total area and area devoted to monocropping and associated cropping. (CIAT)

2170

31081 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1970. Feijao europeu. (Cultivation of European beans). In Missao de Inquerito Agricola de Mocambique. Estatisticas Agricolas de Mocambique 1968. Lourenco Marques, Mocambique, p.2.1.2.1. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Intercropping. Monocropping. Mozambique.

Statistics on the cultivation of European bean var. in Mozambique are presented. Data are provided on the no. of bean-producing farms and their area (ha) for the different districts. Data on production (t) are divided into total production and production for different cultivation systems (monocropping, associated cropping, and broadcast sowing). (CIAT)

2171

31082 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1970. Feijao regional. (Cultivation of regional beans). In Missao de Inquerito Agricola de Mocambique. Estatisticas Agricolas de Mocambique 1968. Lourenco Marques, Mocambique, p.2.1.2.2. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Intercropping. Monocropping. Mozambique.

Statistics are presented on the cultivation of regional bean var. in different districts of Mozambique. Data on the no. and area (ha) of farms growing beans in monoculture are provided. Data on production (t) are

given separately for total production and production in different cultivation systems (monocropping, associated cropping, and broadcast sowing). (CIAT)

2172

30420 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Areas com culturas consociadas: estratos. (Areas under associated cropping; strata). In Missao de Inquerito Agricola de Mocambique, Recenseamento agricola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.3.3. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Intercropping. Manihot esculenta. Mozambique.

2173

30425 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Areas com culturas consociadas (ha); concelhos ou circunscricoes. (Areas under associated cropping (ha); towns or districts). In Missao de Inquerito Agricola de Mocambique, Recenseamento agricola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.2.2. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Intercropping. Manihot esculenta. Zea mays. Mozambique.

2174

30426 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Areas cultivadas (ha), expressas em percentagens, por estratos. (Cultivated areas (ha), expressed in percentages, by strata). In Missao de Inquerito Agricola de Mocambique, Recenseamento agricola de Mocambique. 9. Inhambane 1965. Mocambique, p.II. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Intercropping. Monocropping. Mozambique.

2175

31172 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Feijao europeu. (Cultivation of European beans). In Missao de Inquerito Agricola de Mocambique, Recenseamento Agricola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.1.5. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Intercropping. Monocropping. Farm size. Mozambique.

Statistics on the cultivation of European bean var. in Mozambique are presented. Data are provided on the no. of bean growers and the area planted (ha) in monoculture. Data on production (t) are given separately for monocropping, associated cropping systems, and total production. Farms are classified in terms of size (from less than 0.1 to less than 0.5 ha), and the no. of bean growers, the area (ha) and production (t) of monocropped beans are given for each farm size. (CIAT)

2176

31174 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Feijao regional. (Cultivation of regional beans). In Missao de Inquerito Agricola de Mocambique, Recenseamento Agricola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.1.6. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Monocropping. Intercropping. Farm size. Mozambique.

Statistics on the cultivation of regional bean var. in Mozambique are presented. Data are included on the no. of bean growers, and the area (ha)

planted in monoculture. Data on production (t) are given separately for monocropping, associated cropping, broadcast sowing and total production. Farms are classified according to size, and the no. of bean growers, area (ha), and production (t) of monocropped beans are given for each farm size. (CIAT)

2177

31173 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Leguminosas: número de exploracoes que as produzem, áreas e producoes respectivas, por classes de tamanho; por concelhos ou circunscricoes. (Legumes: farm number, area, and production by size, town or district). In Missao de Inquérito Agrícola de Mocambique. Recenseamento Agrícola de Mocambique. 9. Inhambane 1965. Mocambique, p.2.1.2. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

2178

30428 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Médias: áreas cultivadas (ha) e producoes (kg) por estratos. (Mean cultivated areas (ha) and production (kg) by strata). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, 2p. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Mozambique.

2179

30429 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de agricultores: áreas cultivadas e producoes (por cultura). (Number of farmers: cultivated areas and production (per crop)). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, 1p. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Monocropping. Intercropping. Farm size. Farmers. Mozambique.

2180

30430 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de agricultores por estrato; expresso em percentagens, por estrato. (Number of farmers per stratum; expressed in percentage per stratum). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, 1p. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Farmers. Mozambique.

2181

30423 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de parcelas com culturas consociadas, expresso em percentagens, por estrato. (Number of plots with associated crops, expressed in percentages, by stratum). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, pp.2.3.4-2.3.5. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Intercropping. Manihot esculenta. Zea mays. Mozambique.

2182

30422 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Número de parcelas com culturas consociadas, por estratos. (Number of plots with associated crops, by strata). In Missao de Inquérito Agrícola de Mocambique.

Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique.
p.2.3.2. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Intercropping. Manihot esculenta, Zea mays. Mozambique.

2183

30523 PREÇOS DOS produtos agrícolas verificados no marco nos vários mercados da província. (Prices of agricultural products verified within the framework of several provincial markets). Gazeta do Agricultor 18(202):92-93. 1966. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Consumption. Prices. Mozambique.

2184

30524 PREÇOS DOS produtos agrícolas verificados no mes de Abril nos vários mercados da província. (Prices of agricultural products verified in April in several provincial markets). Gazeta do Agricultor 18(203):122-123. 1966. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Consumption. Prices. Mozambique.

2185

30419 MISSAO DE INQUERITO AGRICOLA DE MOCAMBIQUE. 1966. Producoes (ton) por estratos, concelhos ou circunscriçoes. (Production (t) by strata and by towns or districts). In Missao de Inquérito Agrícola de Mocambique. Recenseamento agrícola de Mocambique. 9. Inhambane 1965. Mocambique, pp.1v, 2.2.3, 2.3.6. Pt., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Monocropping. Intercropping. Mozambique.

NIGERIA

2186

30001 KNIPSCHER, H.C. 1981. Rural retail prices (1979-1980) of major food crops in South West Nigeria. Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.2. 6p. En.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Nigeria.

Data on monthly rural retail prices for major food crops (including beans) in the areas of Oyo and Ibadan, in SW Nigeria, are given for 1979 and 1980. (CIAT)

2187

29597 KNIPSCHER, H.C. 1979. Prices (1973-1979) of major food crops in South West Nigeria (rice, maize, beans, gari, yam, and palm oil in Ibadan and Oyo rural regions). Ibadan, Nigeria, International Institute of Tropical Agriculture. Agricultural Economics Information Bulletin no.4. 26p. En., Il.

Phaseolus vulgaris. Statistical data. Prices. Consumption. Nigeria.

Data on rural retail prices for major food crops (including beans) in the areas of Oyo and Ibadan, in SW Nigeria, are given for 1973-79. Graphs

illustrate monthly and quarterly trends; tables present the annual information. (CIAT)

2188

26511 SODIPO, O.A.; ARINZE, H.U. 1985. SAPONIN CONTENT OF SOME NIGERIAN FOODS. JOURNAL OF THE SCIENCE OF FOOD AND AGRICULTURE 36(5):407-408. EN., SUM. EN., 6 REF. (DEPT. OF BIOCHEMISTRY, COLLEGE OF MEDICAL SCIENCES, UNIV. OF MAIDUGURI, P.M.B. 1069, MAIDUGURI, NIGERIA)

DIETARY VALUE; NIGERIA; NUTRITIVE VALUE; PHASEOLUS VULGARIS.

SAPONINS WERE EXTRACTED AND PURIFIED FROM MILLET, BEANS, SORGHUM VULGARE, AND GROUNDNUT. BEANS WERE FOUND TO CONTAIN A CONSIDERABLE AMOUNT OF SAPONIN (245.0 MG/KG), WHILE MILLET, S. VULGARE, AND GROUNDNUT CONTAINED 194.7, 72.7, AND 48.8 MG/KG DRY WT. BASIS, RESP. (AS)

REUNION

2189

29921 BEUNARD, P.; MICHELLON, R. 1986. EFFET DE L'INOCULATION DU HARICOT PAR DEUX SOUCHES DE RHIZOBIUM PHASEOLI (EFFECT OF INOCULATING BEANS WITH TWO STRAINS OF RHIZOBIUM PHASEOLI). AGRONOMIE TROPICALE 41(2):128-131. FR., SUM. FR., EN., ES., 13 REF. (IRAT-CIRAD, BP 5035, 34032 MONTPELLIER CEDEX, FRANCE)

PHASEOLUS VULGARIS; CULTIVARS; RHIZOBIUM PHASEOLI; STRAINS; INOCULATION; NITROGEN FIXATION; FRANCE; REUNION; COLOMBIA; HAITI.

GREENHOUSE AND FIELD TRIALS WERE CONDUCTED IN FRANCE AND REUNION, RESP., TO STUDY THE RESPONSE OF 2 BEAN VAR. (MARLAT AND TRIOMPHE DE FANCY) TO INOCULATION WITH 2 RHIZOBIUM PHASEOLI STRAINS (HFE AND CIAT 407 FROM HAITI AND COLOMBIA, RESP.). THE HETEROGENEITY OF BOTH GREENHOUSE AND FIELD RESULTS DID NOT ALLOW ANY CONCLUSION TO BE REACHED; HOWEVER, IT APPEARS THAT VAR. BREEDING AND THE CHOICE OF EFFICIENT R. PHASEOLI STRAINS HELP AVOID THE MASSIVE USE OF FERTILIZERS. EXPT. SHOULD BE CARRIED OUT WITH VAR. HAVING HIGH N FIXATION. (CIAT)

RWANDA

2190

33224 BALTENSWEILER, M. 1987. Programme régional du CIAT l'amélioration du haricot dans la région des Grands Lacs en Afrique Centrale Rwanda/Zaire/Burundi. Rapport de stage 21.3.1987-8.4.1987. (CIAT regional program for bean breeding in the Great Lakes region in Central Africa. Rwanda/Zaire/Burundi. Study report). Cali, Colombia. Centro Internacional de Agricultura Tropical. 50p. Fr., 14 Ref., 11.

Phaseolus vulgaris. Agricultural projects. Statistical data. Production. Rwanda. Zaire. CIAT-2.

The geographical area involved in the CIAT Great Lakes bean project is described in detail, giving particular emphasis to Rwanda and the North and South Kivu subregions of Zaire. General information is also included on population, climate, and soils. Statistics on bean production, area planted, and no. of farmers growing this crop are presented for 1981-84 for each subregion. The differences between the data for both North and South Kivu are analyzed and discussed. (CIAT)

2191

24646 CAMERMAN, A.; HAKIZIMANA, A. 1975. LA SYMBIOSE RHIZOBIUM-LEGUMINEUSES AU RWANDA. (RHIZOBIUM-LEGUME SYMBIOSIS IN RWANDA). RUBONA, INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. NOTE TECHNIQUE NO.6. 48P. FR., 28 REF.

FERTILIZERS; INOCULATION; N; NODULATION; PHASEOLUS VULGARIS; RHIZOBIUM; RWANDA; SYMBIOSIS.

THE IMPORTANCE OF INOCULATION FOR THE TRADITIONAL RWANDAN FARMER AND THE RESEARCH SITUATION AND MEANS AT THE INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA ARE DISCUSSED AS WELL AS RESULTS OBTAINED WITH INOCULATION IN THE COUNTRY BEFORE 1968. IN ORIENTATION TRIALS CARRIED OUT BETWEEN 1968-70 WITH BEANS, SOYBEANS, PEANUTS, AND PEAS, A CLEAR DIFFERENCE WAS OBSERVED BETWEEN THE EFFECTS OF BEAN INOCULATION IN KARAMA AND IN RUBONA, INITIALLY ATTRIBUTED TO THE SOURCES OF RHIZOBIUM ALREADY EXISTING IN RUBONA (COLLUVIAL SOILS OF LAKE KILIMBI) WHICH COMPETED WITH THE EVALUATED SOURCES 9.6 AND 9.35.1. BETWEEN 1970-72 THE SYMBIOTIC VALUE OF DIVERSE INOCULUM SOURCES WAS INVESTIGATED, AND INOCULATION WAS COMPARED WITH THE APPLICATION OF N FERTILIZER. BETWEEN 1972-74 THE INFLUENCE OF K ON INOCULATION WAS INVESTIGATED. OVERALL, THE USE OF A SOLID INOCULUM WAS PREFERRED SINCE IT IS EASIER TO MANUFACTURE, HAS A LOWER COST, AND CAN BE PRESERVED FOR A LONGER PERIOD OF TIME (3-5 MO.). RESULTS WITH BEANS WERE DISCOURAGING; A DEGENERATION PROCESS OF THE INOCULUM SOURCES DUE TO THE DIFFICULTY IN MAINTAINING THESE SOURCES IN A GEL MEDIA WAS ASSUMED. IN CONTROLLED RURAL ENVIRONMENTS (GATOVU HILL), SOURCE 9.6 PRODUCED A YIELD OF 1042 KG/HA; SOURCE 9.35.1, 1139 KG/HA, AND THE UNINOCULATED CONTROL, 981 KG/HA. FURTHERMORE, THE INOCULATION OF FALLOW GROUND AND PASTURES IS DISCUSSED AND RESEARCH RECOMMENDATIONS ARE PRESENTED. (CIAT)

2192

30453 CAMERMAN, A. 1972. Situation de la recherche sur les plantes vivrieres au Rwanda. (Situation of research of food crops in Rwanda). Rubona, Institut des Sciences Agronomiques du Rwanda. Note Technique no.16. 11p. Fr., Sum. Fr., En., Il.

Phaseolus vulgaris. Crossbreeding. Phaseolus coccineus. Resistance. Colletotrichum lindemuthianum. Viroses. Uromyces phaseoli. Drought. Cultivars. Yields. Rwanda.

The ecological conditions prevailing in Rwanda are summarized; the relationship between the demographic increase and the decrease of cultivated areas is mentioned. Research with emphasis on selection is being carried out at the Institut des Sciences Agronomiques du Rwanda on different crops (including beans). At the Rubona exptl. station, crossings have been made (Phaseolus vulgaris SG 44 x P. coccineus formosus and P. vulgaris Ibundu x P. aborigineus) to obtain highyielding var., resistant to the major diseases (anthracnose, viroses, and rust). At the Karama exptl. station, P. vulgaris cuarentino and P. aborigineus were crossed to obtain drought-resistant var. At the Rubona exptl. station, var. Wulma yielded 1470 and 660 kg/ha in the 1st and 2nd seasons, resp. At the Karama exptl. station, var. Bayo and Mixed Mexico yielded 870 and 824 kg/ha in the 1st season and 1020 and 1080 kg/ha in the 2nd season, resp. At the Rwerere exptl. station, var. Bataaf yielded 1080 kg/ha in the 1st season. (CIAT)

2193

27002 CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL . 1986. GENETIC IMPROVEMENT. CHARACTER IMPROVEMENT. VARIABILITY FROM INTERSPECIFIC HYBRIDIZATION. IN -----, BEAN PROGRAM, ANNUAL REPORT 1985. CALLI, COLOMBIA. WORKING DOCUMENT NO.14. PP.117-122. ALSO IN SPANISH. EN.

PHASEOLUS VULGARIS; CROSSBREEDING; PHASEOLUS COCCINEUS; SELECTION;
RESISTANCE; ASCOCHYTA; OPHIOMYIA PHASEOLI; COLOMBIA; RWANDA; CIAT-1.

THE OBJECTIVES OF THE COLLABORATIVE PROJECT BETWEEN CIAT AND THE FACULTY OF AGRONOMY OF GEMBOUX (BELGIUM) ARE FOCUSED ON THE IMPROVEMENT OF PHASEOLUS VULGARIS THROUGH A PROGRAM OF WIDE CROSSES WITH OTHER PHASEOLUS SPECIES. SEVERAL SPECIES WERE EVALUATED AND USED IN CROSSES, MAINLY OF THE GROUP OF P. COCCINEUS. IN ADDITION, SEVERAL ACCESSIONS OF THE SUBSPECIES POLYANTHUS WERE EVALUATED IN POPAYAN, COLOMBIA, FOR THEIR REACTION TO ASCOCHYTA LEAF SPOT, AND WITHIN THE GREAT LAKES PROJECT, 22 ACCESSIONS OF THE SUBSPECIES COCCINEUS AND POLYANTHUS WERE EVALUATED IN RWANDA FOR THEIR REACTION TO THE BEAN FLY. THE RESULTS OF THESE TRIALS ARE PRESENTED IN TABLE FORM. (CIAT)

2194

30445 DELEPIERRE, G. 1972. Evolution des cultures au paysannat pilote de Muhero. (Crop evolution in the Muhero pilot rural community). Rubona, Institut des Sciences Agronomiques du Rwanda. Note Technique no.8. 19p. Fr., Sum. Fr., IL.

Phaseolus vulgaris. Statistical data. Production. Socioeconomic aspects. Timing. Planting. Intercropping. Manihot esculenta. Zea mays. Rwanda.

Prevailing ecological conditions in Muhero, Rwanda, where 90 families participated in a pilot rural community, are described. Tab with data on the evolution of the cultivated area during the 1957-71 period are included. Data are given on area planted (square meters) to beans and different associations (bean-maize, sorghum-bean, cassava-bean, cassava-bean-maize, banana-bean, banana-bean-maize, and banana-bean-sorghum. Beans are usually planted in the 1st season (October) and are the 2nd major crop after sorghum, with a mean area planted of 6000 square meter/family/yr. (CIAT)

2195

27762 DESSERT, K. 1986. COMPATABILITY OF ON-FARM EVALUATION OF BEAN COOKING TIME IN RWANDA WITH BAR DROP COOKING TIME INDEX. BEAN IMPROVEMENT COOPERATIVE. ANNUAL REPORT 29:122-123. EN. (INST. DES SCIENCES AGRONOMIQUES DU RWANDA, B.P. 138, BUTARE, RWANDA)

PHASEOLUS VULGARIS; SEEDS; COOKING; TIMING; CULTIVARS; TECHNOLOGY EVALUATION; RWANDA.

TWENTY RWANDAN FARMERS WHO HAD PARTICIPATED IN ON-FARM BEAN VAR. TRIALS DURING THE 2ND GROWING SEASON OF 1985 WERE REQUESTED TO PREPARE AND CONSUME EACH OF THE VAR. IN THEIR HOMES UNDER TRADITIONAL PREPARATION METHODS. AFTER CONSUMING EACH OF THE VAR., THE FARMERS EVALUATED COOKING TIME USING A 5 POINT HEDONIC SCALE. SAMPLES WERE ALSO EVALUATED IN THE LAB. USING THE BAR METHOD. THIS METHOD CONSISTS OF PLACING 25 SEEDS, SOAKED OVERNIGHT, IN A COOKER WITH A 90 G METAL ROD RESTING ON TOP OF EACH BEAN. COOKING TIME IS THAT REQUIRED FOR 13 OF THE 25 RODS TO PERFORATE THE SEEDS. GOOD COMPATIBILITY BETWEEN FARMERS' EVALUATION OF COOKING TIME UNDER TRADITIONAL METHODS AND THE LAB. COOKING INDEX WAS OBTAINED. IKINIMBA AND RUBONA 5 WERE RATED AS THE LONGEST COOKING VAR. BOTH ON-FARM AND IN THE LAB. THE RANGE IN COOKING TIME INDEX BETWEEN IKINIMBA AND KIRUNDO WAS 15 MIN. (CIAT)

2196

29792 GRAF, W.; TRUTMANN, P. 1987. RESULTS AND METHODOLOGY OF DIAGNOSTIC TRIALS ON COMMON BEANS (PHASEOLUS VULGARIS) IN RWANDA: A CRITICAL APPRAISAL. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 10P. EN., SUM. EN., 5 REF., IL. (CIAT GREAT LAKES BEAN PROGRAM, BP 138, BUTARE, RWANDA)

PHASEOLUS VULGARIS; DEVELOPMENTAL RESEARCH; EXPERIMENT DESIGN; TECHNOLOGY; RWANDA.

THE NATIONAL BEAN PROGRAM OF THE INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA CARRIED OUT ON-FARM DIAGNOSTIC TRIALS IN COLLABORATION WITH CIAT, IN 6 NATURAL ZONES OF RWANDA BETWEEN 1984-86. THREE DESIGNS WERE USED: PLUS ONE, MINUS ONE, AND PLUS ONE EXTENDED. PLUS ONE TRIALS TENDED TO UNDERESTIMATE THE IMPORTANCE OF SOIL FERTILITY AS A YIELD CONSTRAINT BUT SHOWED CLEARLY THE IMPORTANCE OF DISEASES. MINUS ONE DESIGNS MADE THE IMPORTANCE OF BOTH FACTORS VISIBLE AND PLUS ONE TRIALS SHOWED A STRONG POSITIVE INTERACTION WHEN DISEASE CONTROL WAS COMBINED WITH FERTILIZATION. NONE OF THE DESCRIBED DESIGNS, HOWEVER, IS ABLE TO COMPLETELY EXPLAIN THE INTERACTIONS BETWEEN TESTED FACTORS. GIVEN THE VARIOUS ADVANTAGES AND DISADVANTAGES DESCRIBED ABOVE, THE RESEARCHERS RECOMMEND THAT IF DIAGNOSTIC TRIALS ARE DETERMINED TO BE NECESSARY IN AN AREA, A CONSIDERABLE EFFORT SHOULD BE DONE TO FIND REPRESENTATIVE SITES OFF-FARM (SCHOOLS, ETC.) TO PERMIT THE INSTALLATION OF COMPLETE FACTORIAL TRIALS. IN ADDITION, SEVERAL PLUS ONE TRIALS COULD BE ESTABLISHED ON-FARM, WHICH WOULD COMBINE A POWERFUL DESIGN AND TRIALS MAKING THE INTERACTION WITH FARMERS EASY AND ALLOWING DIRECT CONCLUSIONS TO BE MADE ON THE POTENTIAL EFFECT OF NEW TECHNOLOGIES AND INTERACTIONS. PLUS ONE DESIGNS ALONE MAY BE APPROPRIATE WHEN NO INTERACTIONS ARE EXPECTED, BUT IN THIS CASE ONE SHOULD SERIOUSLY THINK OF TESTING DIFFERENT LEVELS OF A TREATMENT AND CONSIDER THE TRIAL AS A STEP IN TECHNOLOGY TESTING RATHER THAN A DIAGNOSTIC TRIAL. THE METHODOLOGY TO USE ALSO DEPENDS ON RESOURCES AVAILABLE TO THE RESEARCH PROGRAM. FOR RWANDA IT IS RECOMMENDED THAT THE RESEARCH PROGRAM BE FOCUSED ON TECHNOLOGIES THAT CONTROL BOTH DISEASES AND FERTILITY AT THE SAME TIME OR TO TARGET TECHNOLOGIES TO SITUATIONS WHERE 1 FACTOR IS CONTROLLED THROUGH EXISTING PRACTICES, SUCH AS DISEASE CONTROL THROUGH THE USE OF CLIMBING BEANS. TECHNOLOGIES TO CONTROL PESTS SHOULD HAVE 2ND PRIORITY BUT CAN PLAY AN IMPORTANT ROLE IN SOME AREAS FROM SEASON TO SEASON. THEREFORE IT MAY STILL BE JUSTIFIED TO CARRY OUT RESEARCH ON TECHNOLOGIES THAT SEEM EASY TO GENERATE AND DIFFUSE, SUCH AS SEED TREATMENT AGAINST THE BEANFLY WITH ENDOSULFAN. (AS)

2197

33907 GRAF, W.; DESSERT, K.; NYABYENDA, P. 1986. Methodologie et résultats des essais d'adaptabilité du haricot en milieu rural, 1986. (Methodology and results of bean adaptability trials in rural conditions). Cali, Colombia, Centro Internacional de Agricultura Tropical. Sp. En., 7 Ref., 11.

Phaseolus vulgaris. On-farm research. Adaptation. Plant introductions. Cultivars. Yields. Cultivation. Rwanda. CIAT-1.

On-farm trials were established by the Institut des Sciences Agronomiques du Rwanda (ISAR) to test bean adaptability in various sites with different agroecological conditions. The farmer's cultural techniques regarding planting density and date, sowing method, and crop cultivation were strictly respected. In the high and middle altitude regions, yields of bean var. introduced by the ISAR were usually lower than those from the farmer's mixture whereas in low altitude regions (Muhazi), var. Kilyumukwe yielded 43 percent more than the local mixture. This var. was also highly appreciated by farmers at harvest time; observations during the 1st semester of 1987 indicated that it was often replanted and disseminated. Based on these results, bean var. Kilyumukwe is recommended for dissemination in the Eastern Plateau. (CIAT)

2198

31423 HAKIZIMANA, A. 1987. Bean BNF in Rwanda. In Hakizimana, A. Limit and potentiality of fertilization in Rwanda: a report. Rubona, Rwanda, Institut

des Sciences Agronomiques du Rwanda. pp.13-15. En. Paper presented in IFDC Conference, Nairobi, Kenya, 1987. [ISAR-Rubona B.P. 138 Butare, Rwanda]

Phaseolus vulgaris. *Rhizobium phaseoli*. Cultivars. Strains. Nodulation. Acetylene reduction. Yields, pH. Rwanda. CIAT-2.

Field trials conducted in Rwanda in 1986 confirmed that the spontaneous nodulation of *Phaseolus vulgaris* is a function of soil fertility and bean var. In comparative trials with bean var. Master, Caru 27, Bayomex, and Rubonas, overall mean values of the vol. of nodules (ml)/5 plants were 2.64 and 0.52 for fertile and poor soils, resp. Data from observations carried out in Rwanda, compared with data from similar trials in Cameroon in which CIAT 899 strain was used, show the competitiveness and infectivity of introduced vs. native strains. Since soil acidity (pH less than 4.0) in some Rwandan regions inhibits plant fertilizer absorption and the effectiveness of *Rhizobium-legume* symbiosis, liming is recommended although it is too expensive for farmers. Seed lime-pelleting is an inexpensive technique that enables a better *Rhizobium-legume* symbiosis by increasing the pH around roots. Further studies on the double-pelleting technique (1st coat of lime and 2nd coat of inoculant) are suggested. (CIAT)

2199

31424 INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. 1985. Légumineuses: haricot (*Phaseolus vulgaris* L.). (Legume crops: beans). In Institut des Sciences Agronomiques du Rwanda. Rapport Annuel 1985. Rubona, Rwanda, pp.8-59. Fr., II.

Phaseolus vulgaris. Production. Selection. Cultivars. Yields. *Ascochyta phaseolorum*. *Isariopsis griseola*. *Pseudomonas syringae* pv. *phaseolicola*. *Colletotrichum lindemuthianum*. *Xanthomonas campestris* pv. *phaseoli*. *Ramularia phaseoli*. Climbing beans. Dwarf beans. Fertilizers. Manures. Intercropping. Timing. Organoleptic properties. Survey. Rwanda.

The importance of beans as the major food crop in Rwanda is highlighted as shown by data on production (256,956 t) and area planted (305,603 ha) in 1983. CIAT's role in bean research since 1984 is mentioned; research conducted by the Institut des Sciences Agronomiques du Rwanda in 1985 are reported. The selection scheme is included, indicating the duration of the process and the criteria used in each stage. Results of screening, var. comparative, multilocal, regional, and adaptation trials are given in tables. The economic importance of diseases and pests was determined and the resistance of plant material to *Ascochyta phaseolorum*, *Isariopsis griseola*, *Pseudomonas syringae* pv. *phaseolicola*, *Colletotrichum lindemuthianum*, *Xanthomonas campestris* pv. *phaseoli*, BCMV, and *Ramularia phaseoli* was also evaluated. Other trials were established to (1) determine the best planting distances and staking densities for climbing bean var. Cajamarca, (2) compare the effect of organic manure and mineral fertilizers on bean yields, (3) determine the best planting dates, and (4) study the performance of beans intercropped with peas. Yields of dwarf and semi-climbing beans were compared with those of staked and associated climbing beans. The new bean var. were also evaluated for culinary characteristics and preference. A survey was conducted in the Butare region to estimate preference for consumption. Bean var. distributed in 1985 are listed in a table indicating amount of seed (kg) distributed. (CIAT)

2200

27357 INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA . 1983. LEGUMINEUSES: HARICOTS (*PHASEOLUS VULGARIS* L.). (LEGUMES: COMMON BEAN). IN -----, RAPPORT ANNUEL 1983. RUBONA. PP.3-18. FR.

PHASEOLUS VULGARIS; PLANT INTRODUCTIONS; SELECTION; CULTIVARS; DWARF BEANS; CLIMBING BEANS; YIELDS; ADAPTATION; STAKING AND TRELLISING; RHIZOBIUM; RWANDA; CIAT-2.

THE DIFFERENT RESEARCH WORK CARRIED OUT ON BEANS IN 1983 AT THE EXPTL. STATIONS OF RUBONA, RWERERE, AND KARAMA OF THE INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA ARE REPORTED. THEY DEALT WITH THE INTRODUCTION OF NEW VAR. (ESPECIALLY FROM CIAT), PEDIGREE SELECTION, SCREENING TRIALS FOR YIELD, COMPARATIVE TRIALS OF BUSH, CLIMBING, AND SEMICLIMBING BEAN VAR., AND TRIALS ON CULTURAL PRACTICES (STAKING METHODS, PLANTING DISTANCES IN CLIMBING BEANS, RHIZOBIUM IN CLIMBING BEANS). PRELIMINARY RESULTS ARE GIVEN IN TABLE FORM. (CIAT)

2201

33228 LAMB, E.M.; HARDMAN, L.L. 1986. Survey of bean varieties grown in Rwanda: final report January, 1984-June, 1985.. United States, Agency for International Development, University of Minnesota. 169p. En., Sum. En., 21 Ref., 11. AID-RWANDA Local Crop Storage Cooperative Research. LCS/FSM II (Research Component).

Phaseolus vulgaris. Survey. Geographical distribution. Planting. Harvesting. Seed production. Storage. Cultivars. Germplasm. Production. Seed color. Plant architecture. Rwanda.

During a survey of bean seed types grown in Rwanda, 589 mixtures of beans were collected from 483 farms, 115 mixtures from 39 markets, and 66 samples from farmers selling beans to the National Grain Storage Board (GRENARWA) at 3 warehouses. The av. no. of seed types present in the collected mixtures was 11, with a range from 1 to 27. Bean planting and harvesting occur during 2 different periods but climatic differences around the country result in variation in the specific timing of these activities. Seventy-eight percent of Rwandan farmers produce their own seed for the following season. Fifty-one percent of them sell a part of their bean production. Fifty-six percent of farmers use specific mixtures for specific field conditions, including soil type, plant type, length of growing season and type of crop association. Mixtures are stored separately in only 25 percent of the farms visited. Factors which limit production vary with area of the country but climate, soil fertility, and insects are the most common. Plant and seed characteristics were associated; high yield and tolerance to infertile soil were most often mentioned for small-seeded types while large-seeded types were often said to have good taste, fast cooking time, and high market prices. Of the 171 seed types most frequently found in the country, 57 percent are small-seeded; 49 percent are monochrome with a high percentage of these being red to pink. A division of important seed types by area of the country illustrates the regional producer preferences. There are 284 seed types included in a var. reference collection at the Institut des Sciences Agronomiques du Rwanda at Rubona. Written descriptions and color photographs of each seed type complete the collection. (AS)

2202

33225 MUNYEMANA, A. 1987. Contribution à l'étude de l'*Ascochyta phaseolorum* (Sacc) agent de l'*Ascochytose* du haricot au Rwanda. (Contribution to study of *Ascochyta phaseolorum*). Thèse Ing.Agr. Butare, Université Nationale du Rwanda. 127p. Fr., Sum. Fr., 53 Ref., 11.

Phaseolus vulgaris. *Ascochyta phaseolorum*. Climbing beans. Cultivars. Resistance. Yields. Isolation. Culture media. Rwanda.

The morphology, physiology, and pathogenicity of *Ascochyta phaseolorum* was studied; pathotypes, found in certain regions of Rwanda, were identified.

The resistance of various bean var. to this pathogen was also determined under greenhouse and field conditions as well as the correlation between infection rates and yields. Cat meal-dextrose-agar was determined as the best culture medium for the mycelium growth of *A. phaseolorum* whereas FDA favored its sporulation. Under field conditions, climbing bean var. were generally more resistant to the pathogen than bush bean var. Isolates from high alt. (Rubangeri and Gisenzi) were more aggressive than those from low to medium alt. (Kibungo). Mean yield losses for var. Rubona 5, Tostado, and Shikashike were estimated in 51, 35, and 64 percent, resp., when compared with noninoculated test plants. Yield losses were higher when infection occurred at the flowering stage. (CIAT)

2203

23495 NEUMANN, I.F. 1984. LA PROMOTION DES CULTURES ASSOCIEES AU PROJET. (PROMOTION OF ASSOCIATED CROPPING SYSTEMS IN THE PROJECT). NYABISINDU, RWANDA, PROJET AGRO-PASTORAL DE NYABISINDU. ETUDES ET EXPERIENCES NO.4. 80P. FR., 6 REF., IL.

AGRICULTURAL PROJECTS; INTERCROPPING; PHASEOLUS VULGARIS; RWANDA; ZEA MAYS.

THE EXPERIENCES OF THE PROJET AGRO-PASTORAL DE NYABISINDU, RWANDA, RELATED TO THE DEVELOPMENT OF IMPROVED CROP ASSOCIATIONS, THEIR DISSEMINATION AND IMPORTANCE, ARE DESCRIBED. THE TRADITIONAL ASSOCIATED CROPPING SYSTEMS ARE SUMMARIZED AND ANALYZED BASED ON THE RESULTS OF THE SURVEY CARRIED OUT BY THE PROJECT AMONG 66 FARMERS. RECOMMENDATIONS ON THE DISSEMINATION OF ASSOCIATED CROPPING TO CONTROL DISEASES AND EROSION ARE GIVEN. THE MAIZE-BEAN ASSOCIATION IS GROWN AS A VEGETABLE. WITH A 0.55 X 0.50 M SPACING AND 35 T MANURE/HA, 133 AND 41 G, RESP., OF MAIZE AND BEANS ARE OBTAINED PER PLANT. (CIAT)

2204

24652 NYABYENDA, P.; MPABANZI, A. 1980. RESULTATS DE DEUX ESSAIS COMPARATIFS VARIETAUX, SUR HARICOTS NAINS (RHC1 77-79) ET VOLUBILES (RHC2 77-79) A RUBONA. (RESULTS OF TWO COMPARATIVE VARIETAL TRIALS WITH BUSH (RHC1 77-79) AND CLIMBING (RHC2 77-79) BEANS IN RUBONA). RUBONA, INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. RESULTATS D'ESSAIS NO.5. 17P. FR., 3 REF., IL.

PHASEOLUS VULGARIS; CULTIVARS; ADAPTATION; DWARF BEANS; CLIMBING BEANS; YIELDS; RWANDA.

DURING 1977-78 A TRIAL WITH BUSH BEANS WAS CARRIED OUT AT THE RUBONA STATION (RWANDA) TO FIND HIGHER YIELDING VAR. THAN VAR. SAXA AND WITHOUT THRESHING PROBLEMS. VAR. EMMA AND MUNYU OBTAINED BATAAF, AND CARU 3 WAS EQUIVALENT TO BATAAF. VAR. EMMA PRESENTED A HIGH PROTEIN CONTENT, EARLINESS, AND RESISTANCE TO CRYPTOGAMIC DISEASES AND TO LODGING, IN ADDITION TO GOOD SEED SIZE AND COLOR. HOWEVER, IT ADAPTED BETTER TO GOOD SOILS THAN TO POOR SOILS. IN ANOTHER SIMILAR TRIAL WITH CLIMBING VAR., 8 VAR. OF DIFFERENT PHENOTYPIC CHARACTERISTICS WERE COMPARED TO IDENTIFY A HIGHER YIELDING VAR. THAN VAR. 54 VAR. GISENYI 1 WAS STATISTICALLY SUPERIOR TO THE CHECK WITH 1939, 656, 1562, AND 1376 KG/HA FOR 4 CROPPING SEASONS. VAR. GISENYI 2 WAS ALSO OUTSTANDING. (CIAT)

2205

24651 NYABYENDA, P.; MPABANZI, A. 1980. RESULTATS D'UN ESSAI D'INDUCTION DE MUTATION DE LA COULEUR DU TEGUMENT NOIR DU HARICOT VOLUBILE WULMA. (RESULTS OF A MUTATION INDUCTION TRIAL OF THE BLACK TEGUMENT COLOR OF CLIMBING BEAN WULMA). RUBONA, INSTITUT DES SCIENCES AGRONOMIQUES DU RWANDA. NOTE TECHNIQUE NO.1. 11P. FR., 3 REF.

PHASEOLUS VULGARIS; MUTATION; CULTIVARS; SEED COLOR; FLOWERS; PROTEIN CONTENT; YIELDS; RWANDA.

A MUTATION INDUCTION TRIAL OF THE BLACK TEGUMENT COLOR OF VAR. WULMA WAS CARRIED OUT AT RUBONA STATION (RWANDA) DURING 1980. EMS (0.04-0.08 MOLAR FOR 6-12 H) WAS USED FOR A TOTAL OF 6 TREATMENTS WITH 200 SEEDS EACH. THE WASHED SEEDS WERE PLANTED IN THE FIELD (2ND CROPPING SEASON OF 1972); ONLY 600 SEEDLINGS WERE ESTABLISHED, WHICH WERE PLANTED IN POTS IN THE GREENHOUSE. SUBSEQUENTLY, PLANTS WITH GREEN HYPOCOTYL WERE SELECTED. THE TRIAL CONTINUED DURING 8 GENERATIONS AND A COMPARATIVE TRIAL WAS CARRIED OUT WITH 15 STABLE LINES. SEVERAL TYPES OF MUTATION WERE OBTAINED, NOTABLY CHANGES IN FLOWER AND SEED COLOR AND INCREASES IN 1000-SEED WT. AND PROTEIN CONTENT. THE LINES KEPT WULMA'S VEGETATIVE CYCLE AND ALSO ITS SUSCEPTIBILITY TO VIROSES. LINE WUCA 5 OUTYIELDED WULMA (NOT SIGNIFICANTLY) AND HAD PRODUCTION STABILITY. (CIAT)

SENEGAL

2206

31407 SENEGAL. DIRECTION GENERALE DE LA PRODUCTION AGRICOLE. 1983. Statistiques de production; cultures maraicheres 1982-1983; haricot. (1982-1983 statistics on the production of vegetables: beans). In Sénégal. Direction Générale de la Production Agricole. Rapport Annuel, campagne 1982-1983. Sénégal, Ministère du Développement Rural. pp.52-53. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Yields. Production. Senegal.

Statistics are presented on area planted (ha), yields (kg/ha), and production (t) of various vegetable crops (including beans) for different regions of Senegal during 1982-83. Total data for 1981-82 are also included. (CIAT)

2207

31384 SENEGAL. MINISTERE DU PLANT ET DE LA COOPERATION. DIRECTION DE LA PLANIFICATION. 1976. Travaux groupe mixte Sénégal/FAO, Rome Septembre/Octobre 1976: rapport de mission. (Collaborative work Senegal/FAO, Rome September/October 1976: mission report). Sénégal, 13p. Fr.

Phaseolus vulgaris. Statistical data. Consumption. Production. Senegal.

Results of an analysis of statistics collected in Senegal in 1974 indicated that the availability of beans was 0.3 kg/yr. No availability per day and per capita was calculated for this legume. (CIAT)

SOUTH AFRICA

2208

30695 AUSTIN, M.N.; MARAIS, J.N. 1987. Methods of presenting intercropping results and preliminary results with *Zea mays* and *Phaseolus vulgaris*. South African Journal of Plant and Soil 4(1):1-6. Sum. En., Af., 15 Ref., Il. (Dept. of Agronomy, University of Fort Hare, Alice, Ciskei, South Africa)

PHASEOLUS VULGARIS; INTERCROPPING; ZEA MAYS; RAINFALL; SOUTH AFRICA.

Replacement intercropping trials with maize and dry beans were conducted to provide information which could lead to a cropping strategy that would reduce the risk of rainfed crop production in Ciskei, South Africa.

Attention is focused on the problem of analyzing intercropping expt. It was concluded that more than 1 method of analysis was necessary. The gross yields obtained as well as the competition effects in terms of the proportion harvested rather than the proportions sown must be examined. Replacement intercropping of maize and beans does not appear to provide a strategy for reducing the risk of rainfed cropping in Ciskei. (AS)

2209

28965 BOELEMA, B.H. 1985. A GLASSHOUSE TEST FOR SCREENING GREEN BEAN CULTIVARS FOR RESISTANCE TO HALO BLIGHT CAUSED BY PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA. PHYTOPHYLACTICA 17(2):99-100. EN., SUM. EN., AF., 5 REF. (HORTICULTURAL RESEARCH INST., PRIVATE BAG X293, PRETORIA, 0001, SOUTH AFRICA).

PHASEOLUS VULGARIS; SNAP BEANS; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; CULTIVARS; RESISTANCE; LABORATORY EXPERIMENTS; SOUTH AFRICA.

A METHOD WAS DEVELOPED FOR TESTING GREEN BEAN CV. FOR RESISTANCE TO HALO BLIGHT CAUSED BY PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA. THE METHOD WAS BASED ON INFECTIVITY TITRATIONS. LEAVES AND PODS WERE PRICKED WITH A MICROSYRINGE AND AT THE SAME TIME A DOSE OF LOW TITER OF THE PATHOGEN, AVERAGING BETWEEN 6-7 CELLS/FRICK, WAS APPLIED. (AS)

2210

25073 BOELEMA, B.H. 1984. INFECTIVITY TITRATIONS WITH RACE 2 OF PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA IN GREEN BEANS (PHASEOLUS VULGARIS). PHYTOPHYLACTICA 16(4):327-329. EN., SUM. EN., AF., 5 REF., IL. (HORTICULTURAL RESEARCH INST., PRIVATE BAG X293, PRETORIA 0001, SOUTH AFRICA).

CULTIVARS; INOCULATION; PHASEOLUS VULGARIS; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; RACES; SNAP BEANS; SOUTH AFRICA.

A STUDY WAS MADE OF THE DOSE/RESPONSE RELATIONSHIPS BETWEEN RACE 2 OF PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA AND TRIFOLIATE LEAVES AND PODS OF GREEN BEAN CV. A VAR. OF RELATIONSHIPS INDICATED EITHER INDEPENDENT ACTION OF THE CELLS OF THE PATHOGEN, OR ANTAGONISM OR FACULTATIVE SYNERGISM AMONG THESE CELLS. FACULTATIVE SYNERGISM WAS FOUND ONLY IN INFECTIVITY TITRATIONS WITH PODS. IN 1 PATHOGEN/CV. COMBINATION, A STRONG INTERACTION AMONG THE CELLS OF THE PATHOGEN WAS FOUND AT THE HIGHEST INOCULUM DOSE. THE CONSEQUENCES OF THESE FINDINGS FOR THE SIZE OF THE INOCULUM DOSE TO BE USED IN CV. RESISTANCE TRIALS IN A GLASSHOUSE ARE DISCUSSED. (AS)

2211

31054 BOTHA, F.C.; SMALL, J.G.C.; BURGER, A.L. 1987. Characterisation of pyrophosphate dependent phosphofruktokinase from germinating bean seeds. Plant Science 51(2-3):151-157. En., Sum. En., 34 Ref., Il. [Dept. of Botany, Univ. of the Orange Free State, Bloemfontein 9300, South Africa]

Phaseolus vulgaris. Seed. Germination. Enzymes. South Africa.

The pyrophosphate D-fructose-6-phosphate 1-phosphotransferase (PFK) from germinating Phaseolus vulgaris cv. Top Crop seeds was purified to a specific activity of 6.5 micromoles/(mg protein)/min. No difference in the pH optimum for the forward and reverse reactions was found; activation of the enzyme by fructose-2,6-bisphosphate (fru-2,6-P₂) did not affect the pH optimum. The concn. of fru-2,6-P₂ needed for half activation (K_{av}) was 1.0 micromolar. Phosphate has a marked effect on the affinity of the enzyme for the activator, increasing the K_{av}-value to 2.0, 2.8, and 4.5 micromolar in the presence of 1.0, 5.0, and 10.0 micromolar orthophosphate, resp. The enzyme exhibits an absolute requirement for a divalent cation and exhibits

Michaelis-Menton kinetics both in the presence and absence of fru-2,6-P₂. The steady-state substrate interaction data and pattern of orthophosphate inhibition (uncompetitive towards pyrophosphate and mixed towards fructose-6-phosphate) suggest a mechanism involving a sequential ternary complex. (AS)

2212

30715 BOTHA, F.C.; SMALL, J.G.C.; ARMSTRONG, D.J. 1987. Comparison of the activities and some properties of pyrophosphate and ATP dependent fructose-6-phosphate 1-phosphotransferases of *Phaseolus vulgaris* seeds. *Plant Physiology* 83(4):772-777. En., Sum. En., 37 Ref., Il. (Dept. of Botany, Univ. of the Orange Free State, Bloemfontein 9300, Republic of South Africa)

PHASEOLUS VULGARIS; SEEDS; ENZYMES; COTYLEDONS; ATP; SOUTH AFRICA.

The distribution of pyrophosphate: fructose 6-phosphate phosphotransferase (PF₂) and ATP: fructose-6-phosphate 1-phosphotransferase (PFK) was studied in germinating bean cv. Top Crop seeds. In the cotyledons the PF₂ activity was comparable with that of PFK; however, in the plumule and radicle plus hypocotyl, PF₂ activity exceeds that of PFK. Approx. 70-90 percent, depending on the stage of germination, of the total PF₂ and PFK activities were present in the cotyledons. Highest specific activity of both enzymes, however, occurred in the radicle plus hypocotyl (64-90 nanomoles/min/mg protein). Fractionation studies indicate that 40 percent of the total PFK activity was associated with the plastids while PF₂ is apparently confined to the cytoplasm. The cytosolic isozyme of PFK exhibits hyperbolic kinetics with respect to fructose 6-P and ATP with K_m values of 320 and 46 micromolar, resp. PF₂ also exhibits hyperbolic kinetics both in the presence and absence of the activator fructose-2,6-P₂. The activation is caused by lowering the K_m for fructose 6-P from 18.0 to 1.1 millimolar and that for pyrophosphate (PP_i) from 40 to 25 micromolar, resp. Levels of fructose 2,6-P₂ and PP_i in the seeds are sufficient to activate PF₂ and thereby enable a glycolytic role for PF₂ during germination; however, the fructose 6-P content appears to be well below the K_m of PF₂ for this compound and would therefore preferentially bind to the catalytic site of PFK, which has a lower K_m for fructose 6-P. The ATP content appears to be at saturating levels for PFK. (AS)

2213

29108 BRIDGLALL, S.S.; VAN STADEN, J. 1985. EFFECT OF AUXIN ON ROOTING AND ENDOGENOUS CYTOKININ LEVELS IN LEAF CUTTINGS OF *PHASEOLUS VULGARIS* L. *JOURNAL OF PLANT PHYSIOLOGY* 117(4):287-292. EN., SUM. EN., 30 REF., IL. (PLANT DEVELOPMENT RESEARCH UNIT, DEPT. OF BOTANY, UNIV. OF NATAL, PIETERMARITZBURG 3200, SOUTH AFRICA)

PHASEOLUS VULGARIS; AUXINS; ROOTING; CYTOKININS; PETIOLES; SOUTH AFRICA.

TREATMENT OF THE PETIOLES OF LEAF EXPLANTS OF *PHASEOLUS VULGARIS* WITH IBA STIMULATED ROOT INITIATION AND ROOT DEVELOPMENT ON THE PETIOLES. BEST RESULTS WERE OBTAINED WITH A CONC. OF 20 MG/LITER OF THE AUXIN. IMMEDIATELY AFTER THE AUXIN TREATMENT THE LEVELS OF ENDOGENOUS CYTOKININS IN THE TREATED EXPLANTS WERE HIGHER THAN IN THE UNTREATED MATERIAL. MOST OF THIS DETECTED CYTOKININ WAS FOUND IN THE LEAF LAMINA. AUXIN TREATMENT APPARENTLY RESULTED NOT ONLY IN INCREASED LEVELS OF NONPOLAR CYTOKININS IN THE EXPLANTS BUT APPARENTLY ALSO BROUGHT ABOUT A REDISTRIBUTION OF THESE HORMONES. THIS RESULTED IN LOW LEVELS OF THESE HORMONES IN THE TREATED PETIOLES, A CONDITION WHICH IS WELL DOCUMENTED TO BE FAVORABLE FOR THE ROOTING PROCESS. (AS)

2214

29169 COETZEE, J.; VAN DER MERWE, C.F. 1986. THE INFLUENCE OF PROCESSING PROTOCOL ON THE ULTRA- STRUCTURE OF BEAN LEAF CELLS. SOUTH AFRICAN JOURNAL OF BOTANY 52(2):95-99. EN., SUM. EN., AF., 15 REF., IL. (ELECTRON MICROSCOPY UNIT, UNIV. OF PRETORIA, PRETORIA, 0002, REPUBLIC OF SOUTH AFRICA)

PHASEOLUS VULGARIS; LEAVES; ANALYSIS; LABORATORY EXPERIMENTS; CYTOLOGY; PROCESSING; SOUTH AFRICA.

BEAN LEAF CELLS EXHIBIT ULTRASTRUCTURAL DAMAGE WHEN GLUTARALDEHYDE FIXATIVES OR BUFFER WASHES ARE APPLIED FOR PROLONGED PERIODS. THE MAX. TIMES IN THESE PROCESSING STEPS ARE INFLUENCED BY THE CHOICE OF BUFFER. PROLONGED PERIODS IN LOW CONC. OF ACETONE ALSO CAUSE DAMAGE. THIS DAMAGE IS PROGRESSIVELY LESS OBVIOUS IN HIGHER CONC. EXTENDED HOLDING TIMES IN ANHYDROUS ACETONE ARE POSSIBLE, ESPECIALLY IF PHOSPHATE OR CACODYLATE BUFFERS ARE EMPLOYED DURING FIXATION. (AS)

2215

28660 DE VILLIERS, O.T.; KOCH, H.M. 1985. THE EFFECT OF THE HERBICIDE CHLORSULFURON ON PHOTOCHEMICAL REACTIONS IN ISOLATED CHLOROPLASTS OF PHASEOLUS VULGARIS. SOUTH AFRICAN JOURNAL OF BOTANY 51(4):262-264. EN., SUM. EN., AF., 17 REF. (DEPT. OF AGRONOMY & PASTURES, UNIV. OF STELLENBOSCH, STELLENBOSCH, 7600 REPUBLIC OF SOUTH AFRICA)

PHASEOLUS VULGARIS; CHLOROPLASTS; CARBON FIXATION; HERBICIDES; NUTRIENT TRANSPORT; SOUTH AFRICA.

THE EFFECT OF CHLORSULFURON ON DIFFERENT PHOTOCHEMICAL REACTIONS WAS STUDIED IN ISOLATED CHLOROPLASTS OF KIDNEY BEANS. CHLORSULFURON (10(-4) MOL/DM(3)) INHIBITED BOTH CYCLIC AND NONCYCLIC PHOTOPHOSPHORYLATION AND CO2 FIXATION BY 15, 22, AND 17 PERCENT, RESP., AND STIMULATED ELECTRON TRANSPORT BY 10 PERCENT. ALTHOUGH CHLORSULFURON AT HIGH CONC. FUNCTIONED AS AN UNCOUPLER OF PHOTOPHOSPHORYLATION IN CHLOROPLASTS, IT DID NOT OPERATE PRIMARILY AS AN INHIBITOR OF PHOTOSYNTHESIS. (AS)

2216

27792 LECLEZIO, M.F.A.; LEA, J.D.; MOBERLY, P.K. 1984. INTERCROPPING OF BEANS (PHASEOLUS VULGARIS L.) AND SUGAR-CANE: THE EFFECT OF INTER-SPECIFIC COMPETITION ON THE GROWTH OF PLANT CANE. SOUTH AFRICAN JOURNAL OF PLANT AND SOIL 2(2):59-66. EN., SUM. EN., AF., 24 REF., IL. (SOUTH AFRICAN SUGAR ASSOCIATION EXPERIMENT STATION, MOUNT EDGEcombe 4300, REPUBLIC OF SOUTH AFRICA)

PHASEOLUS VULGARIS; INTERCROPPING; SACCHARUM OFFICINARUM; RAINFALL; WATER REQUIREMENTS; YIELDS; SPACING; PLANTING; SOUTH AFRICA.

THE COMPETITIVE EFFECTS OF INTERCROPPED BEANS ON THE GROWTH, TILLER DEVELOPMENT, AND YIELD OF SUGARCANE IN THE SUBHUMID COAST-HINTERLAND OF NATAL (REPUBLIC OF SOUTH AFRICA) WERE INVESTIGATED OVER 2 SEASONS. IN THE 1ST SEASON RAINFALL WAS EXCEPTIONALLY LOW AND INTERCROPPING REDUCED TILLER EMERGENCE, LEAF AREA, AND DM PRODUCTION IN THE SUGARCANE. LOWER SOIL AND LEAFWATER POTENTIALS WERE MEASURED IN THE INTERCROPPED TREATMENTS. BEANS APPEARED TO BE THE STRONGER COMPETITOR AND PRODUCED YIELDS OF UP TO 940 KG/HA. SECOND SEASON RAINFALL WAS FAVORABLE AND TILLER EMERGENCE WAS MORE PROLIFIC IN THE INTERCROPPING TREATMENTS. THIS, COMBINED WITH A HIGHER DEGREE OF TILLER MORTALITY IN THE MONOCULTURE IN THE PRECEDING AUTUMN AND WINTER, COMPENSATED FOR REDUCED DM PRODUCTION IN THE INTERCROPPED TREATMENTS IN THE 1ST SUMMER. AVAILABILITY OF SOIL MOISTURE WAS THE MAJOR FACTOR AFFECTING PLANT RESPONSE TO INTERCROPPING. (AS)

2217

28208 MCGILL JUNIOR, J.A. 1978. DRY BEAN PRODUCTION IN SOUTH AFRICA. MICHIGAN DRY BEAN DIGEST 2(2):12-14. EN., IL.

PHASEOLUS VULGARIS; PRODUCTION; TRADE; STATISTICAL DATA; CONSUMPTION; USES; YIELDS; SOUTH AFRICA.

INFORMATION IS GIVEN ABOUT DRY BEAN PRODUCTION, MARKETING, EXPORT/IMPORT, CONSUMPTION, USE AND PROMOTION, AND RESEARCH IN SOUTH AFRICA. AGROECOLOGICAL CONDITIONS OF THE AREAS WHERE THIS CROP IS GROWN ARE MENTIONED. MORPHOLOGICAL CHARACTERISTICS OF THE MAIN BEAN VAR. GROWN IN THE COUNTRY, LARGE WHITE KIDNEY BEAN, ARE DESCRIBED. ON THE OTHER HAND, NEP II IS CONSIDERED A PROMISING VAR. YIELDING UP TO 2070 KG/HA. (CIAT)

2218

28219 MICHIGAN, UNITED STATES, AND WORLD DRY BEAN STATISTICS. 1985 MICHIGAN DRY BEAN DIGEST 9(3):14-18,22. EN., IL.

PHASEOLUS VULGARIS; PRODUCTION; TRADE; STATISTICAL DATA; MEXICO; ARGENTINA; CHILE; INDIA; VENEZUELA; USA; SOUTH AFRICA; BRAZIL.

STATISTICAL DATA ON PRODUCTION, SUPPLY, AND DISTRIBUTION OF BEANS DURING 1983-85 ARE GIVEN IN TABLE FORM FOR MEXICO, ARGENTINA, CHILE, INDIA, VENEZUELA, AND USA (NORTH DAKOTA). STATISTICAL DATA ON US EXPORTS OF DIFFERENT BEAN TYPES DURING 1983-84 ARE ALSO INCLUDED AND THE SOUTH AFRICAN BEAN SITUATION IS BRIEFLY DESCRIBED. (CIAT)

2219

26087 NIEUWOUDT, C.J.L. 1984. BAYCOR, A NEW FOLIAR APPLIED FUNGICIDE FOR THE CONTROL OF RUST CAUSED BY UROMYCES APPENDICULATUS (PERS.) UNGER ON BEANS (PHASEOLUS SPP.). PFLANZENSCHUTZ-NACHRICHTEN BAYER 37(1):21-33. EN., SUM. EN., FR., ES., 7 REF., IL.

PHASEOLUS VULGARIS; UROMYCES PHASEOLI; DISEASE CONTROL; CHEMICAL CONTROL; SOUTH AFRICA.

RESULTS OF FIELD TRIALS COMPARING VARIOUS RATES AND FORMULATIONS OF BITERTANOL WITH TRIFORINE DURING 1977-82 IN SOUTH AFRICA ARE GIVEN. THE CURRENT FORMULATION, BAYCOR 300 EC, IS REGISTERED FOR USE AT 420 ML/HA (126 G A.I./HA) FOR GROUND APPLICATION AND 840 ML/HA (252 G A.I./HA) FOR AERIAL APPLICATION. IN EACH CASE ADDITION OF AGRI-DEX SPREADER-STICKER AT 625 ML/HA IS RECOMMENDED. (REVIEW OF PLANT PATHOLOGY)

2220

26911 NOBLE, A.D.; LEA, J.D.; FEY, M.V. 1985. GENOTYPIC TOLERANCE OF SELECTED DRY BEAN (PHASEOLUS VULGARIS L.) CULTIVARS TO SOLUBLE AL AND TO ACID, LOW P SOIL CONDITIONS. SOUTH AFRICAN JOURNAL OF PLANT AND SOIL 2(3):115-119. EN., SUM. EN., AF., 10 REF., IL. (DEPT. OF CROP SCIENCE, UNIV. OF NATAL, P.O. BOX 375, PIETERMARITZBURG 3200, REPUBLIC OF SOUTH AFRICA)

AL; CULTIVARS; P; PH; PHASEOLUS VULGARIS; RESISTANCE; SOUTH AFRICA; TOXICITY.

TWELVE DRY BEAN CV. WERE GROWN FOR 7 DAYS ON FILTER PAPER SOAKED WITH NUTRIENT SOLUTION CONTAINING A RANGE OF UP TO 10 MMOL AL/CUBIC DECIMETER. DIFFERENTIAL RESPONSE TO AL TOXICITY, MEASURED AS TAPROOT ELONGATION, OCCURRED AT AL CONC. OF GREATER THAN OR EQUAL TO 2 MMOL/CUBIC DECIMETER. FIFTEEN CV. (INCLUDING 4 CV. CLASSIFIED IN TERMS OF AL TOLERANCE BY THE NUTRIENT-SOLUTION METHOD) WERE GROWN IN POTS CONTAINING AN ACID (6% PERCENT ACID SATURATION OF CATION EXCHANGE CAPACITY), P-DEFICIENT CLAY LOAM SUBSOIL

(PLINTHIC PALEUDULT), DIFFERENTIALLY TREATED WITH $Ca(OH)_2$ AND $CaHPO_4 \cdot 2H_2O$. AFTER 35 DAYS THE PLANTS WERE CLASSIFIED IN TERMS OF TOLERANCE TO ACID, LOW P SOIL CONDITIONS, ON THE BASIS OF RELATIVE TOP GROWTH YIELDS. THREE OF 4 CV. SCREENED BY BOTH METHODS WERE CLASSIFIED IDENTICALLY: IAPAR-RAI-54 AND W126 AS TOLERANT, AND BAT331 AS SENSITIVE. (AS)

2221

29621 VAN HENSBURG, E.; VAN DYK, L.P. 1986. THE PERSISTENCE IN SOIL AND PHYTOTOXICITY ON DRY BEANS OF ALACHLOR AND METOLACHLOR AS AFFECTED BY CLIMATIC FACTORS. SOUTH AFRICAN JOURNAL OF PLANT AND SOIL 3(3):95-98. EN., SUM. EN., AF., 17 REF., IL. (PLANT PROTECTION RESEARCH INST., PRIVATE BAG X134, PRETORIA 0001, REPUBLIC OF SOUTH AFRICA)

PHASEOLUS VULGARIS; HERBICIDES; TEMPERATURE; RELATIVE HUMIDITY; TOXICITY; SOUTH AFRICA.

THE PERSISTENCE OF ALACHLOR AND METOLACHLOR IN SOIL WAS DETERMINED OVER AN 80-DAY PERIOD AT TEMP. RANGING FROM 5 TO 50 DEGREES CELSIUS. SOILS WERE MAINTAINED AT EITHER 50 OR 100 PERCENT OF FIELD CAPACITY. THE HERBICIDES WERE LESS PERSISTENT AT HIGH TEMP., BUT THE GREATER THE SOIL MC, THE SLOWER THE OVERALL DEGRADATION RATE. THE EFFECT OF TEMP. ON THE PHYTOTOXICITY OF THESE 2 SOIL-APPLIED HERBICIDES WAS ALSO DETERMINED. THE PHYTOTOXIC EFFECT OF ALACHLOR AND METOLACHLOR ON BEAN CV. KAMBERG WAS GREATEST AT 40 DEGREES CELSIUS. BEANS WERE NOT INJURED AT 30 DEGREES CELSIUS WHEN TREATED WITH METOLACHLOR AT 1.5 LITERS/HA AND ALACHLOR AT 4.0 LITERS/HA. AT HIGHER DOSAGERATES OF 3.0-7.5 LITERS METOLACHLOR/HA AND 8.0-20.0 LITERS ALACHLOR/HA, BEANS SHOWED EVIDENCE OF INJURY. AT TEMP. OF 35 AND 40 DEGREES CELSIUS, ALL THE DOSAGE RATES HAD ADVERSE EFFECTS ON THE BEANS. (AS)

2222

27714 VAN STADEN, J.; FORSYTH, C. 1985. CYTOKININ BIOSYNTHESIS IN PHASEOLUS VULGARIS LEAF EXPLANTS. JOURNAL OF PLANT PHYSIOLOGY 119(1):159-168. EN., SUM. EN., 33 REF., IL. (PLANT DEVELOPMENT RESEARCH UNIT, DEPT. OF BOTANY, UNIV. OF NATAL, PIETERMARITZBURG 3200, SOUTH AFRICA)

PHASEOLUS VULGARIS; LEAVES; AUXINS; NUTRIENT SOLUTION; ROOTING; CYTOKININS; SOUTH AFRICA.

BEAN LEAF EXPLANTS, TREATED WITH AUXIN TO ENCOURAGE ROOTING, WERE INCUBATED IN HOAGLAND'S NUTRIENT SOLUTION TO WHICH HAD BEEN ADDED $(U(-14)C)ADENOSINE$. AFTER 3, 5, AND 7 DAYS THE EXPLANTS AND THE RESP. NUTRIENT MEDIA WERE ANALYZED SEPARATELY FOR THE PRESENCE OF LABELLED COMPOUNDS. TOTAL RADIOACTIVITY RECOVERED FROM THE MEDIA AND THE ETHANOLIC EXTRACTS OF THE EXPLANTS DECREASED WITH TIME, ADENOSINE APPEARED TO BE TAKEN UP BY THE PETIOLES RELATIVELY RAPIDLY SINCE AFTER 5 DAYS THERE WAS NO DETECTABLE $(14)C-ADENOSINE$ IN THE MEDIA. $(14)C-ADENOSINE$ LEVELS DETECTED IN BOTH THE LAMINAE AND IN THE PETIOLES PLUS ROOTS ALSO DECREASED DURING THE EXPTL. PERIOD AND APPEARED TO BE METABOLIZED TO ADENINE AND 3 MORE POLAR COMPOUNDS. THESE POLAR COMPOUNDS DID NOT RESPOND TO EITHER ALKALINE PHOSPHATASE OR BETA-GLUCOSIDASE TREATMENTS AND THEIR IDENTITY IS, AS YET, UNKNOWN. LABELLED FREE CYTOKININS WERE NOT DETECTED IN ANY EXTRACT. ASPECTS OF THIS METABOLISM AND THE POSSIBLE EFFECTS OF AUXIN ON THE SYSTEM ARE DISCUSSED. (AS)

2223

29727 VISSER, R.; HOLZAPFEL, W.H.; BEZUIDENHOUT, J.J.; KOTZE, J.M. 1986. ANTAGONISM OF LACTIC ACID BACTERIA AGAINST PHYTOPATHOGENIC BACTERIA. APPLIED AND ENVIRONMENTAL MICROBIOLOGY 52(3):552-555. EN., SUM. EN., 36 REF., IL.

(DEPT. OF MICROBIOLOGY & PLANT PATHOLOGY, UNIV. OF PRETORIA, 0002 PRETORIA, SOUTH AFRICA)

PHASEOLUS VULGARIS; XANTHOMONAS CAMPESTRIS PV. PHASEOLI; ERWINIA CAROTOVORA; PSEUDOMONAS SYRINGAE PV. SYRINGAE; DISEASE CONTROL; BIOLOGICAL CONTROL; LACTOBACILLUS PLANTARUM; INOCULATION; SOUTH AFRICA.

A VAR. OF LACTIC ACID BACTERIA, ISOLATED FROM PLANT SURFACES AND PLANT-ASSOCIATED PRODUCTS, WERE FOUND TO BE ANTAGONISTIC TO TEST STRAINS OF THE PHYTOPATHOGENS XANTHOMONAS CAMPESTRIS, ERWINIA CAROTOVORA, AND PSEUDOMONAS SYRINGAE. EFFECTIVE IN VITRO INHIBITION WAS FOUND BOTH ON AGAR PLATES AND IN BROTH CULTURES. IN POT TRIALS, TREATMENT OF BEAN PLANTS WITH A LACTOBACILLUS PLANTARUM STRAIN BEFORE INOCULATION WITH PSEUDOMONAS SYRINGAE CAUSED A SIGNIFICANT REDUCTION OF THE DISEASE INCIDENCE. (AS)

2224

29622 WATTS, J.E.; DE VILLIERS, O.T. 1986. THE EFFECT OF 2,4,5-TP ON THE ACTIVITY OF CELLULASE, PECTIN METHYLESTERASE AND POLYGALACTURONASE IN BEAN EXPLANTS. SOUTH AFRICAN JOURNAL OF BOTANY 52(3):241-245. FN., SUM. FN., AF., 27 REF., IL. (DEPT. OF BOTANY, UNIV. OF STELLENBOSCH, STELLENBOSCH, 7600 REPUBLIC OF SOUTH AFRICA)

PHASEOLUS VULGARIS; ABSCISSION; ENZYMES; PETIOLES; SOUTH AFRICA.

BEAN EXPLANTS WERE USED AS A MODEL SYSTEM TO STUDY THE EFFECT OF 2-(2,4,5-TRICHLOROPHENOXY) PROPIONIC ACID (2,4,5-TP) ON CERTAIN ENZYMES WHICH ARE INVOLVED IN ABSCISSION. AN INCREASE IN CELLULASE ACTIVITY IN FULVINI, PETIOLES, AND ABSCISSION ZONES DURING THE COURSE OF ABSCISSION WAS SIGNIFICANTLY INHIBITED BY 2,4,5-TP. DURING ABSCISSION THE GRADIENT OF PECTIN METHYLESTERASE ACTIVITY IN CONTROL EXPLANTS DECREASED SIGNIFICANTLY, BUT 2,4,5-TP MAINTAINED THIS GRADIENT BY INCREASING PECTIN METHYLESTERASE ACTIVITY IN ABSCISSION ZONES AND MAINTAINING IT IN FULVINI AND PETIOLES. THE ACTIVITY OF EXO-POLYGALACTURONASE WAS NOT AFFECTED BY 2,4,5-TP; HOWEVER, THE ACTIVITY OF ENDO-POLYGALACTURONASE INCREASED FROM ZERO TO A MAX. IN CONTROL EXPLANTS, WITH 2,4,5-TP MAINTAINING THE ACTIVITY AT ZERO. 2,4,5-TP WAS FOUND TO PREVENT ABSCISSION IN BEAN EXPLANTS BY MAINTAINING A FORM(S) OF PECTIN CONSTITUTING A MORE RIGID COMPLEX IN MIDDLE LAMELLAE. (AS)

SUDAN

2225

34104 SALIM, F.A. 1984. Haricot bean (*Phaseolus vulgaris* L.). (Beans). In Sudan. Agricultural Research Corporation. Annual Report of Hudeiba Research Station 1979-1980. Sudan. Ministry of Agriculture. pp.43-51. En.

Phaseolus vulgaris. Curly top virus. Resistance. Fertilizers. N. F. Yields. Cultivars. Selection. Planting. Timing. Sudan.

Research on beans carried out in 1979 at the Hudeiba Research Station, Sudan, is reported. A regional trial and a single plant selection pilot trial were established. The performance of new introductions of white beans from FAO was evaluated. Selections showing tolerance to curly top virus were used in a yield test. The effects of N fertilization, sowing method, and plant density on the yield of bean var. RO/2/1 were studied as well as the responses of this var. to different levels of N and P. The effect of planting time on the grain yield of different bean var. was also studied. The results of the trials, expt., and tests are given in tables. (CIAT)

TANZANIA

2226

24635 ALLEN, D.J.; NDUNGURU, B.J. 1984. RECENT ADVANCES IN CONTROL OF LEGUME DISEASES. IN HAWKSWORTH, D.L., ED. ADVANCING AGRICULTURAL PRODUCTION IN AFRICA, ARUSHA, TANZANIA, 1984. PROCEEDINGS. FARNHAM ROYAL, SLOUGH, ENGLAND, COMMONWEALTH AGRICULTURAL BUREAUX. PP.101-105. EN., 19 REF. (CIAT, APARTADO AEREO 6713, CALI, COLOMBIA)

PHASEOLUS VULGARIS; PLANT BREEDING; BEAN COMMON MOSAIC VIRUS; COLLETOTRICHUM LINDEMUTHIANUM; ISARIOPSIS GRISEOLA; UROMYCES PHASEOLI; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; DISEASE CONTROL; TANZANIA; CIAT-2.

OVERALL PROGRESS ACHIEVED IN THE CONTROL OF LEGUME DISEASES WORLDWIDE, WITH EMPHASIS ON GROUNDNUTS, BEANS, AND COWPEAS, IS REVIEWED. DISEASES, AS PRODUCTION CONSTRAINTS, ARE DISCUSSED, STRESSING CIAT'S BEAN IMPROVEMENT STRATEGY THAT HAS GIVEN HIGH PRIORITY TO BCMV, COLLETOTRICHUM LINDEMUTHIANUM, ISARIOPSIS GRISEOLA, UROMYCES PHASEOLI, AND PSEUDOMONAS PHASEOLICOLA. THE OVERALL STRATEGY OF HOST PLANT RESISTANCE IS DISCUSSED WITHIN THE CONTEXT OF RECENT ADVANCES IN DISEASE MANAGEMENT. DISEASE RESISTANCE BREEDING APPEARS TO HAVE BEEN BASED ON THE EXTENSIVE COLLECTIONS OF GERMPLASM HELD AT THE INTERNATIONAL CENTERS, IMPROVED METHODS OF EVALUATION OF THE AVAILABLE GENETIC DIVERSITY, THE USE OF OFF-SEASON NURSERIES TO ACCELERATE BREEDING, AND THE ESTABLISHMENT OF MULTIDISCIPLINARY RESEARCH TEAMS WORKING ON A SINGLE COMMODITY. FUTURE CHALLENGES ARE DISCUSSED. (CIAT)

2227

26001 BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM. U.S.A. 1984. ANNUAL REPORT. 1. TECHNICAL SUMMARY. EAST LANSING, MICHIGAN STATE UNIVERSITY. 240P. EN.

AGRICULTURAL PROJECTS; BOTSWANA; BRAZIL; CAMEROON; DEVELOPMENTAL RESEARCH; DOMINICAN REPUBLIC; ECONOMICS; ECUADOR; ENTOMOLOGY; GUATEMALA; HONDURAS; KENYA; MALAWI; MEXICO; NIGERIA; NUTRITIVE VALUE; PHASEOLUS VULGARIS; PLANT BREEDING; SENEGAL; SOCIOECONOMIC ASPECTS; TANZANIA.

A TECHNICAL SUMMARY OF RESEARCH FINDINGS ON BEANS AND COWPEAS DURING 1984 IN THE DIFFERENT HOST COUNTRIES OF THE BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM IS PRESENTED; FUTURE PLANS ARE ALSO MENTIONED. RESEARCH PROJECTS ARE CONCERNED WITH BEAN GENETICS AND PLANT BREEDING, ENTOMOLOGY, PATHOLOGY, AGRONOMY, ECONOMICS, NUTRITION, AND SOCIOCULTURAL FACTORS. THE MAJOR FINDINGS ARE REPORTED FOR 18 COLLABORATIVE PROJECTS IN BOTSWANA, BRAZIL, CAMEROON, DOMINICAN REPUBLIC, ECUADOR, GUATEMALA, HONDURAS, KENYA, MALAWI, MEXICO, NIGERIA, SENEGAL, AND TANZANIA. THE OBJECTIVES, STRUCTURE, AND ADVANCES IN RESEARCH AND TRAINING ARE SUMMARIZED. (CIAT)

2228

26949 BUCHUKUNDI, A.N.M.; KESWANI, C.L. 1985. STUDIES ON THE SUSCEPTIBILITY OF VARIOUS BEAN LINES TO BEAN COMMON MOSAIC VIRUS. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKICINE UNIVERSITY OF AGRICULTURE. PP.87-92. EN., SUM. EN., 11 REF. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKICINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

BEAN COMMON MOSAIC VIRUS; CULTIVARS; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA; YIELDS.

THE SUSCEPTIBILITY OF 6 BEAN VAR./LINES (TMO 107, TMO 115, TMO 121, TMO 216, TMO 224, AND TMO 125-SELIAN WONDER) TO BCMV WERE INVESTIGATED IN A

SPLIT-PLOT EXPT. AT THE FARMS OF SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA). ONE MAIN PLOT WAS INOCULATED WITH BCMV WHILE THE OTHER WAS USED AS CONTROL. YIELD LOSSES WERE HIGHLY SIGNIFICANT ($P = 0.01$) FOR TMO 115, TMO 107, AND TMO 125, BUT INSIGNIFICANT FOR TMO 216, TMO 124, AND TMO 224. YIELD LOSS FOR TMO 124 WAS ONLY SIGNIFICANT AT THE 95 PERCENT LEVEL. TMO 216 CAN BE GROWN TO AN ADVANTAGE UNDER THE PREVAILING CONDITIONS. (AS)

2229

29179 CHINGAIPE, T.M. 1985. EARLY GROWTH OF EUCALYPTUS CAMALDULENSIS UNDER AGROFORESTRY CONDITIONS ATMAFIGA, MOROGORO, TANZANIA. FOREST ECOLOGY AND MANAGEMENT 11(4):241-244. EN., SUM. EN., 3 REF. (DEPT. OF FORESTRY & WOOD SCIENCE, U.C.N.W., BANGOR, GWYNEDD LL57 2UW, UNITED KINGDOM)

PHASEOLUS VULGARIS; INTERCROPPING; EUCALYPTUS CAMALDULENSIS; ZEA MAYS; YIELDS; SPACING; TANZANIA.

THE GROWTH OF EUCALYPTUS CAMALDULENSIS CLEAN-WEEDED, SPOT-WEEDED, AND INTERCROPPED WITH MAIZE AND BEANS WAS STUDIED. AT 4 X 4 M AND 5 X 5 M SPACINGS, TREES WERE SIGNIFICANTLY SHORTER AFTER 15 MO. UNDER A CONVENTIONAL SPOT WEEDING REGIME THAN WITH CLEAN WEEDING OR INTERCROPPING WITH BEANS. A SATISFACTORY MAIZE YIELD (683 KG/HA) WAS RECORDED FROM PLOTS WITH TREES SPACED AT 5 X 5 M. NO SIGNIFICANT EFFECTS ON BEAN YIELD (AV. OF 83.7 KG/HA) WERE DETECTED. PLOTS WHERE TREES WERE SPACED AT 4 X 4 M AND 3 X 3 M GAVE SIGNIFICANTLY LOWER YIELDS (444 AND 283 KG/HA, RESP.). (AS)

2230

31758 DUE, J.M.; RUGAMBISA, J.; MBIHA, E. 1987. Socio-economic aspects of bean (*Phaseolus vulgaris*) research in Africa. Bean Improvement Cooperative. Annual Report 30:28-29. En., IL.

Phaseolus vulgaris. Socioeconomic aspects. Production. Costs. Income. Yields. Consumption. Tanzania.

Some socio-economic aspects of beans in rural areas of Tanzania are briefly described and analyzed. They include av. farm size, area planted to beans, percentage of production for human consumption, costs and income per crop, net income, and av. yield/ha. Beans provide between 8-19 percent net income. Although production ranges between 334-607 kg/ha, consumption is only between 33-67 percent. In spite of this, there is a high percentage of malnutrition in the population. (CIAT)

2231

28266 DUE, J.M.; MBIHA, E.; ROCKE, T.; SCHWARTZ, R.; WHITE, M. 1986. FARMING SYSTEMS DATA AND ON-FARM TRIALS OF BEANS (*PHASEOLUS VULGARIS*) MGETA AND KILOSA AREAS, TANZANIA, 1985. MOROGORO, TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE, DEPARTMENT OF RURAL ECONOMY. TECHNICAL REPORT NO.5. 103P. EN., SUM. EN., 25 REF., IL.

PHASEOLUS VULGARIS; CULTIVARS; TECHNOLOGY EVALUATION; YIELDS; ADAPTATION; TANZANIA.

DURING THE 1985 CROP YR., 2 VAR. OF THE BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM WERE TESTED ON FARMERS' FIELDS IN THE MOROGORO REGION OF TANZANIA; KAPANIMA, THE VAR. FOR THE HIGH ALT. RAINFALL AREA, WAS TESTED ON FARMS IN THE MGETA AREA AND TMO 101. THE VAR. FOR THE LOW ALT. AREA, WAS TESTED IN THE KILOSA AREA. IN ADDITION, FARMING SYSTEMS DATA WERE GATHERED FROM A SAMPLE OF 59 FARM FAMILIES IN THE KILOSA DISTRICT. THE RESULTS OF THESE TRIALS AND FARMING SYSTEMS DATA ARE SUMMARIZED. KAPANIMA OUTFIELDED THE TRADITIONAL VAR. KENIA IN MGETA BY 225 PERCENT AND TMO 101 OUTFIELDED THE TRADITIONAL VAR. BY 68 PERCENT IN KILOSA IF ALL 8 FARMERS ARE INCLUDED OR BY 133 PERCENT IF THE FARMER WITH THE EXCESSIVELY HIGH YIELDS IS OMITTED.

FARMERS IN BOTH AREAS LIKED THE NEW HIGH YIELDING VAR. BUT THE SAMPLE OF FARMERS TESTING EACH WAS TOO SMALL TO ENABLE MUCH GENERALIZATION OF FINDINGS. SINCE THE RESEARCHERS WERE ANXIOUS TO REPURCHASE AS MUCH OF THE HIGH YIELDING SEED AS POSSIBLE FOR FURTHER SEED GENERATION, IT WAS NOT POSSIBLE TO ALLOW FARMERS TO KEEP SEED FOR TASTE AND COOKING TESTING. FARMERS WHO GREW TMO 101 LIKED THE COMPACTNESS OF THE PLANT AND ITS UPRIGHT STAND, WHICH KEEPS THE PODS OFF THE GROUND AND REDUCES THE CHANCE OF FUNGAL GROWTH THAT CAN REDUCE YIELDS. COMPACTNESS MAKES HARVESTING FASTER AND THRESHING EASIER. TMO 101 APPEARED NOT TO BE MORE RESISTANT TO DISEASES AND INSECTS THAN THE LOCAL VAR. TMO 101 MATURED EVENLY WHILE THE TRADITIONAL CV. MATURED AT MORE VARIED RATES AND IT DISPLAYED DROUGHT RESISTANCE CHARACTERISTICS DURING 1985, AN UNUSUALLY DRY YEAR IN THE AREA. THE COLOR OF TMO 101 IS THE LOCALLY PREFERRED COLOR (RED/BROWN). THE FEW FAMILIES TESTING TMO 101 FOUND IT TO BE PALATABLE WITH COOKING TIME COMPARABLE WITH TRADITIONAL VAR. (AS (EXTRACT))

2232

26989 DUE, J.M. 1986. SUMMARY OF FARMING SYSTEMS BEAN RESEARCH IN TANZANIA, 1982-85. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:12-15. EN., SUM. EN.

PHASEOLUS VULGARIS; CULTIVATION SYSTEMS; SOCIOECONOMIC ASPECTS; HUMAN NUTRITION; TANZANIA.

THE RESULTS OF RESEARCH ON FARMING SYSTEMS WITH BEANS IN TANZANIA, CARRIED OUT DURING 1982-85, ARE SUMMARIZED. DATA ON SIZE AND NATURE OF FARMING UNIT AND IMPORTANCE OF BEANS IN THE FARMING SYSTEMS WERE GATHERED FROM 262 SMALL FARM FAMILIES FROM DIFFERENT REGIONS OF THE COUNTRY. SOME CONSIDERATIONS ON CALORIE AND PROTEIN ADEQUACY AND SOCIOECONOMIC CHARACTERISTICS OF THE FAMILIES ARE GIVEN. (CIAT)

2233

26956 DUE, J.M. 1985. SUMMARY OF FARMING SYSTEMS BEAN RESEARCH IN TANZANIA, 1982-85. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE, PP.146-151. EN., SUM. EN., 6 REF. (UNIV. OF ILLINOIS AT URBANA-CHAMPAIGN, 305 MUMFORD HALL, 1301 WEST GREGORY DRIVE, URBANA, IL 61801, USA)

PHASEOLUS VULGARIS; SOCIOECONOMIC ASPECTS; TANZANIA.

ONE OF THE OBJECTIVES OF THE BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM IN TANZANIA WAS THE DEVELOPMENT OF HIGH YIELDING PHASEOLUS VULGARIS VAR. WHICH WOULD BE DROUGHT, INSECT, AND DISEASE RESISTANT AND ACCEPTABLE TO CONSUMERS. IF NEW BEAN VAR. ARE DEVELOPED AND ADOPTED BY SMALL FARM FAMILIES, THEY MUST FIT VIABLY INTO THE PRESENT FARMING SYSTEM AS WELL AS BEING ACCEPTED BY CONSUMERS. TO PROVIDE INFORMATION TO THE BEAN BREEDERS, DATA WERE GATHERED ON THE PRESENT FARMING SYSTEMS IN MAJOR BEAN GROWING AREAS OF TANZANIA REGARDING THE PRESENT PREFERRED VAR., THE IMPORTANCE OF BEANS FOR CONSUMPTION AND INCOME, THE IMPORTANCE OF BEANS RELATIVE TO OTHER CROPS, LABOR AND OTHER INPUTS UTILIZED, AND SOCIOECONOMIC CHARACTERISTICS OF THE FAMILIES. DATA FROM THE FARMING SYSTEMS STUDIES UNDERTAKEN FROM 1982 TO 1985 ARE SUMMARIZED. (AS (EXTRACT))

2234

33222 GONDWE, B. 1987. Weed control in beans in Tanzania. Moshi, Tanzania Agricultural Research Organization. 9p. En., Sum. En., 2 Ref. [TARO Lyamungu, Box 3004, Moshi, Tanzania]

Phaseolus vulgaris. Herbicides. Weeding. Tanzania.

Field expt. conducted during 1985 and 1986 in Kilimanjaro, Tanzania, showed that the pre-emergence application of metobromuron and metolachlor in beans resulted in satisfactory weed control. Postemergence application of fenoxaprop-ethyl and fluazifop-butyl effectively controlled grass weeds. Handweeding, 14 and 35 days after planting, and a combination of herbicide treatment followed by 1 handweeding 35 days after planting gave season-long weed control and significantly higher bean yields. (AS)

2235

26950 GONDWE, B. 1985. SCREENING BEAN FOR RESISTANCE TO HALO BLIGHT BACTERIA. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.93-100. EN., SUM. EN., 10 REF. (TANZANIA AGRICULTURAL RESEARCH ORGANIZATION, P.O. BOX 3004, MOSHI, TANZANIA)

CULTIVARS; ISOLATION; PHASEOLUS VULGARIS; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; RESISTANCE; SELECTION; TANZANIA.

THIRTY BEAN CV./LINES WERE TESTED IN 1985 GROWING SEASON UNDER FIELD CONDITIONS IN LAMBO AND LYAMUNGU IN THE KILIMANJARO REGION OF TANZANIA FOR RESISTANCE TO 2 MBEYA ISOLATES OF PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA. FURTHER TESTS WERE DONE IN A SHADED NURSERY IN LYAMUNGU TO CONFIRM FIELD RESULTS. DISEASE DEVELOPMENT WAS LOW IN LAMBO WHEREAS HIGH DISEASE RATINGS WERE OBSERVED IN LYAMUNGU. FIVE OF THE DRY BEAN CV./LINES TESTED SHOWED A HIGH LEVEL OF RESISTANCE: GO 7928, MASIA RED, BAT 317, P 285, AND EB/CP 258-2; 2 WERE HIGHLY SUSCEPTIBLE AND THE OTHERS SHOWED INTERMEDIATE LEVELS OF RESISTANCE. (AS)

2236

26943 HAMIS, S.; GILL, B.S.; MISANGU, R.N. 1985. NATIONAL BEAN YIELD TRIAL. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.45-49. EN., SUM. EN., 5 REF. (DEPT. OF CROP SCIENCE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

ADAPTATION; BEAN COMMON MOSAIC VIRUS; CULTIVARS; ISARIOPSIS GRISEOLA; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA; UROMYCES PHASEOLI; YIELDS.

THIRTEEN BEAN CV. WERE EVALUATED FOR WIDE ADAPTABILITY AND DISEASE RESISTANCE (BCMV, ANGULAR LEAF SPOT, AND RUST) UNDER MOROGORO CONDITIONS (TANZANIA). THE VAR. WERE ARRANGED IN A RANDOMIZED COMPLETE BLOCK DESIGN WITH 4 REPLICATIONS. TMO224, TMO216, AND TMO124 SHOWED PROMISING YIELD PERFORMANCE (1487.11, 1360.29, AND 1120.07 KG/HA, RESP.). ALL THE TESTED CV. WERE SUSCEPTIBLE TO BCMV AND ANGULAR LEAF SPOT; HOWEVER, TMO125, TMO224, TMO124, TMO216, AND TMO962 DID NOT SHOW RUST SYMPTOMS. (AS)

2237

26934 HANKANGA, M.D.; TARIMO, A.J.P. 1985. EFFECT OF GRASS MULCH ON NUTRIENT UPTAKE BY BEANS (PHASEOLUS VULGARIS L.). IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.4-7. EN., SUM. EN., 3 REF. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

CA; CULTIVARS; FLOWERING; K; MATURATION; MG; MINERAL CONTENT; MULCHING; N; NUTRIENT UPTAKE; P; PHASEOLUS VULGARIS; SEEDLING; TANZANIA.

THREE BEAN VAR. (KABANIMA, SELIAN WONDER, AND CANADIAN WONDER) GROWN IN FIELD PLOTS EITHER MULCHED OR UNMULCHED (CONTROL) WERE ANALYZED FOR TOTAL N, P, K, MG, AND CA AT THE SEEDLING, BLOOMING, AND MATURITY STAGES OF GROWTH. FOR TOTAL PERCENTAGES OF N, K, AND MG, HIGHEST VALUES WERE OBSERVED AT THE

SEEDLING STAGE, WHEREAS TOTAL PERCENTAGE VALUES OF P AND CA WERE HIGHEST AT THE BLOOMING AND MATURITY STAGES OF GROWTH, RESP., IN ALL VAR. THE MULCH TREATMENT DID NOT SIGNIFICANTLY AFFECT THE AMOUNT OF NUTRIENTS TAKEN BY THE PLANTS. VAR. DID NOT SHOW SIGNIFICANT VARIATIONS IN THEIR ABILITY TO TAKE VARIOUS NUTRIENTS FROM THE SOIL. IT IS CONCLUDED THAT THE STAGE OF GROWTH AND THE TYPE OF NUTRIENT DESIRED MIGHT BE IMPORTANT CONSIDERATIONS FOR NUTRIENT ANALYSIS IN BEANS. (AS)

2238

26944 IRANGA, G.M.; MISANGU, R.N.; GILL, B.S. 1985. SCREENING OF BEAN GERMPLASM FOR THEIR ADAPTABILITY AND RESISTANCE TO THE MOST COMMON BEAN DISEASES UNDER MOROGORO ENVIRONMENT. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA. SOKOINE UNIVERSITY OF AGRICULTURE. PP.50-56. EN., SUM. EN., 4 REF. (DEPT. OF CROP SCIENCE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

ADAPTATION; BEAN COMMON MOSAIC VIRUS; GERMPLASM; ISARIOPSIS GRISEOLA; PHASEOLUS VULGARIS; PLANT HABIT; PLANT INTRODUCTIONS; RESISTANCE; TANZANIA; UROMYCES PHASEOLI; YIELDS; CIAT-2.

SIXTY-SIX BEAN INTRODUCTIONS WERE EVALUATED FOR THEIR IMPORTANT ECONOMIC CHARACTERS AT SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA). CANADIAN WONDER WAS USED AS A CHECK VAR. DUE TO POOR GERMINATION PERCENTAGE AND HIGH DEATH COUNTS, ONLY 22 LINES WERE EVALUATED FOR THE FINAL SEED YIELD CHARACTER. THE INTRODUCTIONS DIFFERED SIGNIFICANTLY IN ALL CHARACTERS, EXCEPT THE NO. OF DAYS TO 50 PERCENT POD MATURITY. AMONG THE TEST LINES, TMO789, TMO803, TMO741, AND TMO984 DID NOT SHOW REACTIONS TO BCMV, ANGULAR LEAF SPOT, AND RUST. BCMV REACTION WAS ONLY NOTED ON TMO900, TMO786, TMO793, AND TMO737, WHICH HAD MODERATE TO SEVERE REACTIONS. TMO800, TMO789, TMO960, TMO803, TMO741, TMO786, TMO969, TMO984, TMO808, AND TMO820 WERE FREE FROM RUST REACTION. ANGULAR LEAF SPOT WAS NOT NOTED IN TMO789, TMO796, TMO979, TMO801, TMO803, TMO741, TMO786, TMO984, AND TMO793. THEREFORE, A BETTER TECHNIQUE IS REQUIRED TO CONFIRM WHETHER OR NOT THESE ACCESSIONS POSSESS TRUE DISEASE RESISTANCE. IF CONFIRMED, THEY CAN BE USED IN THE BREEDING PROGRAM AS SUPERIOR GENOTYPES FOR THE DISEASE RESISTANCE THEY POSSESS. TMO958, TMO806, AND TMO320 SIGNIFICANTLY OUTYIELDED THE STANDARD VAR.; HENCE, THEY CAN BE CONSIDERED AS PROMISING LINES. (AS)

2239

29644 KABISSA, J.; FRONK, W.D. 1986. BEAN FOLIAGE CONSUMPTION BY MEXICAN BEAN BEETLE (COLEOPTERA: COCCINELLIDAE) AND ITS EFFECT ON YIELD. JOURNAL OF THE KANSAS ENTOMOLOGICAL SOCIETY 59(2):275-279. EN., SUM. EN., 8 REF. (ILONGA AGRICULTURAL RESEARCH INST., ILONGA, KILOSA, TANZANIA)

PHASEOLUS VULGARIS; EPILACHNA VARIVESTIS; FOLIAGE; PLANT INJURIES; YIELDS; LABORATORY EXPERIMENTS; TANZANIA.

BEAN FOLIAGE CONSUMPTION BY EPILACHNA VARIVESTIS LARVAE WAS DETERMINED UNDER GREENHOUSE CONDITIONS AT 22-26 DEGREES CELSIUS TO BE 14.3 SQUARE CENTIMETERS/LARVA, OF WHICH 87 PERCENT WAS CONSUMED DURING THE FINAL 2 INSTARS. ADULT CONSUMPTION WAS 4.5 SQUARE CENTIMETERS/24 H. DRY WT. CONSUMPTION FOR LARVAE AND ADULTS WAS ALSO DETERMINED. PERCENTAGE YIELD LOSS DUE TO 2ND, 3RD, AND 4TH INSTARS AND ADULTS FEEDING TO THE END OF THE SEASON AT A DENSITY OF 50 INSECTS/5 PLANTS WAS DETERMINED TO BE 2.0, 2.1, 8.3, AND 54.9 PERCENT OF THE TOTAL LOSS, RESP. THE DURATION AND SURVIVAL OF LARVAL INSTARS AND PUPAE IN THE FIELD ARE GIVEN. (AS)

2240

31430 KAPIYA, J.A. 1986. Promising agronomic varieties of Phaseolus vulgaris L., for drought stricken areas. Biological Memoirs 12(2):123-132. En., Sum.

En., 10 ref. [Botany Dept., University of Dar-es-Salaam, P.O. Box 35060, Dar es Salaam, Tanzania]

Phaseolus vulgaris. Cultivars. Water stress. Drought. Resistance. Flowers. Abscission. Transpiration. Stomata. Pods. Tanzania.

Field expt. were conducted in Tanzania with 164 bean var. to assess their proneness to flower abscission given standard conditions of soil, manuring, and watering. Six var., 3 with low abscission and 3 with high abscission were selected for greenhouse expt. under drought treatment, withholding normal watering for an interval of 6 days as 1 cycle of water stress. Besides flower abscission, water saturation deficit, rate of transpiration, and stomatal resistance were also assessed at the 3rd stress cycle. Bean var. UAC 77 and UAC 293 were suitable for drought stricken areas. (AS)

2241

29175 KAPUYA, J.A. 1985. COMPARATIVE WATER ECONOMY IN THREE LOCAL AGRONOMIC VARIETIES OF *PHASEOLUS VULGARIS* OF TANZANIA. *BIOLOGIA AFRICANA* 2(1):1-7. EN., SUM. EN., FR., 23 REF., IL. (DEPT. OF BOTANY, UNIV. OF DAR ES SALAAM, P.O. BOX 35060, DAR ES SALAAM, TANZANIA)

PHASEOLUS VULGARIS; CULTIVARS; WATER REQUIREMENTS; RESISTANCE; DROUGHT; STOMATA; TRANSPIRATION; WATER STRESS; TANZANIA.

THE WATER RELATIONS OF 3 *PHASEOLUS VULGARIS* VAR., KIGOMA NJANO NDEFU, BUKOBA GOROLI KAHAWIA Y ULYANKULU KITENGE NYEUSI WERE COMPARED. VAR. BUKOBAGOROLI KAHAWIA WAS THE BEST ADAPTED TO DROUGHT STRESS, REFLECTED BY ITS HIGH STOMATAL RESISTANCE, LOW TRANSPIRATION RATE, LOW WATER SATURATION DEFICIT, AND SIGNIFICANT REDUCTION IN THE NO. OF OPEN STOMATA/UNIT OF LEAF AREA. THESE VAR. DIFFERENCES MAY HAVE A BIOCHEMICAL BASIS AS THE ACCUMULATION OF PROLINE IN VAR. BUKOBA GOROLI KAHAWIA WAS HIGHER THAN IN THE OTHER 2 VAR. (AS)

2242

26582 KAPUYA, J.A.; BARENDSE, G.W.M.; LINSKENS, H.F. 1985. WATER STRESS TOLERANCE AND PROLINE ACCUMULATION IN *PHASEOLUS VULGARIS* L. *ACTA BOTANICA NEERLANDICA* 34(3):293-300. EN., SUM. EN., 11 REF., IL. (BOTANY DEPT., P.O. BOX 35060, DAR ES SALAAM, TANZANIA)

ABSCISSION; CULTIVARS; FLOWERS; *PHASEOLUS VULGARIS*; PODS; PROLINE; RESISTANCE; STOMATA; TANZANIA; WATER STRESS.

WATER STRESS TOLERANCE WAS DETERMINED IN 5 BEAN VAR. (BURUNDI, NJANO FUPI, ULYANKULU MPANDA KITENGE, BUKOBA GOROLI KAHAWIA, KIGOMA NJANO NDEFU, AND ULYANKULU KITENGE NYEUSI) OF DIVERSE GEOGRAPHICAL ORIGIN WITHIN TANZANIA, USING AS INDICATORS: WATER SATURATION DEFICIT, STOMATAL RESISTANCE, AND DEGREE OF FLOWER AND POD ABSCISSION. PROLINE ACCUMULATION UNDER STRESS WAS DETERMINED FOR 3 OF THE VAR. A POSITIVE CORRELATION WAS DETECTED BETWEEN WATER STRESS TOLERANCE AND PROLINE ACCUMULATION. SIGNIFICANT DIFFERENCES OCCURRED BETWEEN VAR. FOR THE TRAITS MEASURED. BUKOBA GOROLI KAHAWIA WAS THE MOST STRESS-TOLERANT VAR. IT IS CONCLUDED THAT DETERMINATION OF PROLINE ACCUMULATION CAPACITY UNDER STRESS COULD BE A USEFUL INDEX WHEN SELECTING STRESS TOLERANT VAR. (AS)

2243

28811 KAREL, A.K.; SCHOONHOVEN, A. VAN 1986. USE OF CHEMICAL AND MICROBIAL INSECTICIDES AGAINST PESTS OF COMMON BEANS. *JOURNAL OF ECONOMIC ENTOMOLOGY* 79(6):1692-1696. EN., SUM. EN., 12 REF., IL.

PHASEOLUS VULGARIS; INSECTICIDES; BIOLOGICAL CONTROL; THYSANOPTERA; MARUCA TESTULALIS; HELIOTHIS ZEA; INSECT CONTROL; TANZANIA; CIAT-1.

THE EFFECTS OF THE APPLICATION OF CHEMICAL INSECTICIDES AND A MICROBIAL INSECTICIDE TO CONTROL INSECT PESTS ON BEAN YIELD WERE INVESTIGATED. TWO PREFLOWERING APPLICATIONS OF LINDANE OR CARBARYL, 2 POSTFLOWERING APPLICATIONS OF BACILLUS THURINGIENSIS, AND A SPRAY OF LINDANE OR CARBARYL EFFECTIVELY CONTROLLED BEAN PESTS. LINDANE OR CARBARYL APPLICATIONS CONTROLLED PREFLOWERING PESTS AND FLOWER THRIPS (TAENIOTHIRIPS SJOSTEDTI). TWO APPLICATIONS OF B. THURINGIENSIS DURING THE POSTFLOWERING GROWTH STAGE OF BEAN PLANTS CONTROLLED THE LARVAE OF THE POD BORERS MARUCA TESTULALIS AND HELIOTHIS ARMIGERA AS EFFECTIVELY AS 2 APPLICATIONS OF LINDANE OR CARBARYL OVER THE SAME PERIOD. TWO APPLICATIONS OF LINDANE DURING THE PREFLOWERING AND THE LATE POD STAGES, COMBINED WITH 2 APPLICATIONS OF B. THURINGIENSIS GAVE HIGH SEED YIELDS OF 1308 AND 1307 KG/HA FOR 1982 AND 1983 TRIALS, RESP. THUS, B. THURINGIENSIS IS AS EFFECTIVE AS CHEMICAL INSECTICIDES IN CONTROLLING POD BORERS. INTEGRATED USE OF CHEMICAL AND BIOLOGICAL INSECTICIDES COULD BE USED FOR CONTROLLING BEAN PESTS. (AS)

2244

27753 KAREL, A.K.; MATEE, J.J. 1986. YIELD LOSSES IN COMMON BEANS FOLLOWING DAMAGE BY BEANFLY, OPHIOMYIA PHASEOLI TRYON (DIPTERA: AGROMYZIDAE). BEAN IMPROVEMENT COOPERATIVE. ANNUAL REPORT 29:115-116. EN., 2 REF. (DEPT. OF CROP SCIENCE, SOKOINE UNIV. OF AGRICULTURE, BOX 3005, MOROGORO, TANZANIA)

PHASEOLUS VULGARIS; CULTIVARS; INSECT CONTROL; INSECTICIDES; OPHIOMYIA PHASEOLI; YIELDS; TANZANIA.

YIELD LOSSES OF BEAN VAR. SELIAN WONDER, KABANIMA, T8, AND T3 CAUSED BY THE BEAN FLY (OPHIOMYIA PHASEOLI) WERE EVALUATED AT SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA) DURING 1983. THE MAIN TREATMENTS WERE PLOTS SPRAYED WEEKLY WITH LINDANE AT 500 G A.I./300 LITERS WATER/HA FOR 6 WK., AND UNSPRAYED PLOTS. OVIPOSITION BY THE BEAN FLY STARTED WHEN PLANTS WERE 7 DAYS OLD. THE LARVAL-PUPAL COUNTS WERE SIGNIFICANTLY MORE IN CONTROL THAN IN TREATED PLOTS. SEED YIELD WAS SIGNIFICANTLY HIGHER IN TREATED THAN IN CONTROL PLOTS (713 AND 477 KG/HA, RESP.). SEED YIELD LOSSES OF 33 PERCENT WERE RECORDED DUE TO DAMAGE BY THE BEAN FLY. (CIAT)

2245

26936 KOINANGE, E.M.K.; MMBAGA, M.E.T.; MBUYA, O.S. 1985. EFFECT OF NUMBER OF BEAN SEED PER HILL ON GRAIN YIELD. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.13-15. EN., SUM. ENGL., 1 REF. (TANZANIA AGRICULTURAL RESEARCH ORGANIZATION, LYAMUNGU RESEARCH INST., P.O. BOX 3004, MOSHI, TANZANIA)

PHASEOLUS VULGARIS; PLANTING; SPACING; TANZANIA; YIELDS.

FOUR DIFFERENT NO. OF BEAN SEEDS/HILL, PLANTED AT DIFFERENT SPACINGS, WERE EVALUATED USING A RANDOMIZED COMPLETE BLOCK DESIGN WITH 4 REPLICATIONS. YIELD TREND OBSERVED FOR 3 CONSECUTIVE YEARS SHOWED THAT PLANTING 1, 2, 3, AND 4 SEEDS/HILL SPACED AT 50 X 10, 50 X 20, 50 X 30, AND 50 X 40 CM, RESP., DOES NOT AFFECT GRAIN YIELD SIGNIFICANTLY (P LESS THAN 0.05). HOWEVER, 2 AND 3 SEEDS/HILL HAD HIGHER 100-SEED WT. AND GRAIN YIELD. FOUR SEEDS/HILL HAD LOWER GRAIN YIELD AND POOR SEED QUALITY. FARMERS COULD THEREFORE BE ADVISED TO PLANT 2 OR 3 SEEDS/HILL, SPACED 50 X 20 OR 50 X 30 CM, RESP., IN ORDER TO SAVE LABOR AND TIME USED DURING PLANTING AND WEEDING. (AS)

2246

26935 KOINANGE, E.M.K.; MMBAGA, M.E.T.; MBUYA, O.S. 1985. SCREENING BEAN CULTIVARS FOR INTERCROPPING WITH MAIZE. IN MINJAS, A.N.; SALEMA, M.P., EDS.

WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.8-12. EN., SUM. EN., 8 REF. (TANZANIA AGRICULTURAL RESEARCH ORGANIZATION, LYAMINGU RESEARCH INST., P.O. BOX 3004, MOSHI, TANZANIA)

CULTIVARS; INTERCROPPING; PHASEOLUS VULGARIS; TANZANIA; YIELDS; ZEA MAYS.

TWELVE BEAN CV. WERE EVALUATED UNDER SOLE CROPPING AND IN ASSOCIATION WITH MAIZE (H632) FOR 5 YR IN LAMBO (TANZANIA) IN AN ATTEMPT TO IMPROVE LAND USE EFFICIENCY IN SUBSISTENCE FARMING. A RANDOMIZED COMPLETE BLOCK DESIGN WAS USED WITH 25 TREATMENT COMBINATIONS REPLICATED 4 TIMES. MOST OF THE BEAN CV. INCLUDED IN THE TRIAL YIELDED HIGHER UNDER SOLE CROPPING. MAIZE GRAIN YIELD WAS NOT SIGNIFICANTLY (P LESS THAN 0.05) REDUCED BY INTERCROPPING WITH BEANS. ALTHOUGH LOWER BEAN YIELDS WERE OBTAINED WITH INTERCROPPING, SIGNIFICANTLY HIGH LER WERE OBTAINED WITH MOST CV. THIS INDICATES THAT MOST POTENTIAL BEAN CV. ALSO PROVE SUPERIOR UNDER INTERCROPPING CONDITIONS AND FARMERS CAN STILL BE ENCOURAGED TO INTERCROP BEANS WITH MAIZE. (AS)

2247

26957 KWINBERE, D.J.; MBIHA, E.R. 1985. A CASE STUDY OF BEAN MARKETING AT THE PRODUCER LEVEL IN MGETA DIVISION, MOROGORO REGION. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.152-154. EN., SUM. ENGL., 1 REF. (DEPT. OF RURAL ECONOMY, SOKOINE UNIV. OF AGRICULTURE, MOROGORO, TANZANIA)

MARKETING; PHASEOLUS VULGARIS; PRICES; TANZANIA.

THE ECONOMICS OF BEAN MARKETING IN MGETA (MOROGORO, TANZANIA) IS EXAMINED. THERE IS MUCH CONCERN OVER THE PRICE SPREAD BETWEEN FARMER AND URBAN CONSUMER. UNDER CURRENT CONDITIONS, MARKETING MARGINS CAN BE EXPECTED TO BE WIDE. THE STUDY HAS REVEALED THAT THE MAIN PROBLEMS FARMERS FACE ARE LACK OF FARM INPUTS, LOW PRODUCT PRICES, POOR MARKETING SERVICES, AND INADEQUATE TRANSPORT FACILITIES. THIS SITUATION MAKES THE MARKETING SYSTEM FULL OF RISKS AND UNCERTAINTIES. AS A RESULT, RURAL-URBAN TRADERS TAKE ADVANTAGE BY CHARGING LOW PRICES FOR PRODUCE WHILE FARMERS HAVE TO PAY HIGH PRICES FOR OTHER CONSUMER GOODS AND FARM INPUTS. (AS)

2248

26951 LYIMO, H.F.; TERI, J.M.; ISHABAIRU, T.R. 1985. SUMMARY REPORT OF THE EFFECT OF BEAN CULTIVAR MIXTURES ON DISEASE SEVERITY AND YIELD--1983-1985. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.101-114. EN., SUM. EN., 12 REF., 1L. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

ISARIOPSIS GRISEOLA; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA; UROMYCES PHASEOLI; VARIETAL MIXTURES; YIELD COMPONENTS; YIELDS.

THE EFFECT OF BEAN CV. MIXTURES ON DISEASE (RUST AND ANGULAR LEAF SPOT) SEVERITY AND ON YIELD AND YIELD COMPONENTS WAS STUDIED AT THE U. FARM (MOROGORO, TANZANIA) DURING THE 1983, 1984, AND 1985 CROPPING SEASONS. COMMON BEAN CV. WERE USED IN MIXTURES IN DIFFERENT PROPORTIONS; THE LOCAL LANDRACE EX-MGETA MARKET WAS INCLUDED. A RANDOMIZED COMPLETE BLOCK DESIGN WAS USED. DISEASE SEVERITY REMAINED LOWER IN THE CV. MIXTURES THAN IN CV. GROWN IN PURE STANDS. THE MEAN YIELD OF MIXTURES WAS HIGHER THAN THAT OF THE INDIVIDUAL COMPONENTS GROWN IN PURE STANDS. THE RESULTS OBTAINED ARE SUMMARIZED. (AS)

2249

26948 MAEDA, E.E.; ROCKE, S. 1985. COOKABILITY OF BEAN CULTIVARS. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS, TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.78-86. EN., SUM. EN., 1 REF., IL. (DEPT. OF FOOD SCIENCE & TECHNOLOGY, SOKOINE UNIV. OF AGRICULTURE, MOROGORO, TANZANIA)

COOKING; CULTIVARS; PHASEOLUS VULGARIS; TANZANIA; TIMING.

THIRTY BEAN CV. OF OUTSTANDING AGRONOMIC CHARACTERISTICS WERE EVALUATED FOR THEIR COOKABILITY USING THE MATTSON-TYPE EXPTL. COOKER. A HIGH DEGREE OF VARIABILITY WAS OBSERVED. MULTIPLE CORRELATION ANALYSIS REVEALED THAT THE VARIATION IN COOKABILITY WAS LARGELY DUE TO DIFFERENCES IN MOISTURE IMBIBITION ABILITY AMONG THE BEAN CV. ($r = -0.52$). THE PERCENTAGE SEED COAT AND THE RELATIVE SEED SIZE WERE NOT SIGNIFICANTLY CORRELATED WITH COOKABILITY. DETERMINATION OF MOISTURE IMBIBED/100 G OF SEED IS PROPOSED AS A RATIONAL CRITERIUM FOR ESTABLISHING THE RELATIVE COOKABILITY OF A LARGE COLLECTION OF BEAN CV. INSTEAD OF CARRYING OUT ACTUAL COOKING STUDIES. THE COOKING TIME IN MIN CAN THEN BE PREDICTED WITH A REASONABLE DEGREE OF ACCURACY BY SUBSTITUTING THE DETERMINED MOISTURE IN SIMPLE REGRESSION EQUATIONS. (AS)

2250

26958 MAGAYANE, F.T.T.M. 1985. OPINIONS OF THE PARTICIPANTS OF THE FIRST FARMER AND EXTENSION WORKER SHORT COURSE ON IMPROVED BEAN PRODUCTION HELD AT SOKOINE UNIVERSITY OF AGRICULTURE FROM 26-30 AUGUST, 1985. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS, TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.155-158. EN. SUM., EN., 1 REF.

PHASEOLUS VULGARIS; TANZANIA; TRANSFER OF TECHNOLOGY.

A 4-DAY COURSE FOR FARMERS AND EXTENSION WORKERS FROM MGETA AND MAGOLE DIVISION (MOROGORO REGION, TANZANIA) WAS HELD AT SOKOINE U. OF AGRICULTURE. TO EQUIP THE PARTICIPANTS WITH IMPROVED BEAN PRODUCTION TECHNIQUES. COURSE PARTICIPANTS EVALUATED THE COURSE AS MODERATELY TO HIGHLY USEFUL, THEREFORE IT IS RECOMMENDED THAT SUCH COURSES BE HELD FROM TIME TO TIME. (AS (EXTRACT))

2251

26937 MASASHUA, P.S.M.; TARIMO, A.J.P. 1985. OPTIMUM PLANTING DATE FOR BEANS UNDER MOROGORO CONDITIONS. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS, TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.16-20. EN., SUM. EN., 6 REF. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

CULTIVARS; PHASEOLUS VULGARIS; PLANTING; TANZANIA; TIMING; YIELD COMPONENTS; YIELDS.

TWO BEAN VAR., KABANIMA AND SELIAN WONDER, WERE PLANTED 5 TIMES DURING THE 1985-86 CROPPING SEASON IN A RANDOMIZED COMPLETE BLOCK DESIGN AT SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA). DATA WERE RECORDED OF GRAIN YIELD AND YIELD COMPONENTS (PODS/PLANT, SEEDS/POD, AND 100-SEED WT.). DUE TO THE UNRELIABILITY OF RAINFALL DURING THE SEASON, THE RESULTS WERE NOT SYSTEMATIC WITH THE DATES OF PLANTING (FROM MARCH TO APRIL, 1985). HOWEVER, THE YIELD POTENTIAL DIFFERENCES INHERENT IN THE 2 VAR. STUDIED WAS SIGNIFICANT. VAR. SELIAN WONDER YIELDED HIGHEST AT ALL PLANTINGS COMPARED WITH VAR. KABANIMA. HIGHEST YIELDS IN BOTH VAR. WERE OBSERVED FROM THE PLOTS PLANTED ABOUT 3 WK. AFTER THE PEAK RAINFALL PERIOD. (AS)

2252

26959 MBIHA, E.R. 1985. PRELIMINARY REPORT ON THE 1984/85 SOCIO-ECONOMIC INVESTIGATION OF SMALL SCALE BEAN FARMERS IN MGETA DIVISION, MOROGORO DISTRICT. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.159-161. EN., SUM. EN., 2 REF. (DEPT. OF RURAL ECONOMY, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3007, MOROGORO, TANZANIA)

PHASEOLUS VULGARIS; SOCIOECONOMIC ASPECTS; TANZANIA.

ADDITIONAL SOCIOECONOMIC INFORMATION WAS GATHERED FOR THE BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM DURING 1984-85. HIGH YIELDING BEAN VAR. KABANIMA AND TMO 101 WERE INTRODUCED INTO MGETA AND MAGOLE DIVISIONS, RESP., IN THE MOROGORO REGION (TANZANIA). SUBSTANTIAL SOCIOECONOMIC INFORMATION USEFUL TO PLANT SCIENTISTS AND DATA ON THE PERFORMANCE OF VAR. KABANIMA WILL BE AVAILABLE AFTER COMPLETE DATA ANALYSIS. HOWEVER, PRELIMINARY RESULTS INDICATE THAT THIS VAR. IS SUPERIOR TO THE LOCAL BEAN CV. IN MANY RESPECTS (YIELDS, DROUGHT TOLERANCE, DESIRABLE STANDING CHARACTERISTICS, AND SEED COLOR). (AS)

2253

28240 MBUYA, O.S. 1986. EFFECTIVE NUMBER OF BEAN (PHASEOLUS VULGARIS L.) PLANTS PER HILL IN ASSOCIATION WITH MAIZE. MOSHI, TANZANIA AGRICULTURAL RESEARCH ORGANIZATION, LYAMUNGU RESEARCH INSTITUTE. 6P. EN., 6 REF. PAPER PRESENTED AT THE BEAN RESEARCH WORKSHOP IN TANZANIA AT SOKOINE UNIVERSITY OF AGRICULTURE, 5TH., MOROGORO, TANZANIA, 1986. (TANZANIA AGRICULTURAL RESEARCH ORGANIZATION, LYAMUNGU RESEARCH INSTITUTE, P.O. BOX 3004, MOSHI, TANZANIA)

PHASEOLUS VULGARIS; INTERCROPPING; ZEA MAYS; CULTIVARS; PLANTING; SPACING; YIELDS; YIELD COMPONENTS; TANZANIA.

A FIELD TRIAL WAS CARRIED OUT IN LAMBO, TANZANIA, IN 1986 DURING THE LONG GRAINS TO DETERMINE THE EFFECTIVE NO. OF BEAN SEEDS/HILL TO BE GROWN IN ASSOCIATION WITH MAIZE, WITHOUT REDUCING THE YIELDS OF THE 2 CROPS. TWO BEAN CV. (LYAMUNGU 85 AND MASAI RED) WERE EVALUATED IN PURE STAND AND IN ASSOCIATION WITH MAIZE CV. H 632 USING A SPLIT PLOT DESIGN WITH 4 BLOCKS. SOLE CROP BEANS WERE SOWN AT A SPACING OF 50 X 20 CM, 2 SEEDS/HILL, AND BEANS IN ASSOCIATION WITH MAIZE AT 75 X 7 CM, 75 X 14 CM, AND 75 X 21 CM USING 1, 2, AND 3 SEEDS/HILL, RESP. BEAN YIELDS WERE SUPERIOR WHEN SOWN IN PURE STAND THAN IN ASSOCIATION WITH MAIZE; HOWEVER, THERE WERE NO SIGNIFICANT ($P = 0.05$) YIELD DIFFERENCES AMONG THE DIFFERENT NO. OF PLANTS/HILL WITHIN A CV. IN ASSOCIATED CULTURE. CONSIDERING THE YIELD COMPONENTS, SOLE CROP BEAN YIELDS WERE SUPERIOR TO ANY OF THE INTERCROPS ONLY DUE TO THE SIGNIFICANTLY ($P = 0.05$) HIGHER NO. OF PODS/PLANT IN THE FORMER. (CIAT)

2254

31422 MBUYA, O.S. 1986. Safari report to CIAT (Colombia) (28 September-28 November, 1986). Moshi, Tanzania, Tanzania Agricultural Research Organisation, Lyamungu Research Institute. 5p. En., [Tanzania Agricultural Research Organisation, Lyamungu Research Institute P.O. Box 3004, Moshi, Tanzania]

Phaseolus vulgaris. On-farm research. Intercropping. Zea mays. Monocropping. Cultivation. Dwarf beans. Soil conservation practices. Colombia. CIAT-2. Tanzania.

On-farm research on beans conducted in Colombia from Sept. to Nov. 1986 in collaboration with CIAT is reported. Trials were established in 2

localities of Nariño (Funes and El Tambo) and in Antioquia (Colombia). The major agro-climatic characteristics of the bean growing areas in the above mentioned departments are described as well as the bean cultivation systems. In Nariño, bush and climbing beans are planted both in monocropping and intercropped with maize; no soil conservation measures are taken by farmers to control soil erosion. In Antioquia, climbing beans are planted as a relay crop with maize and soil conservation practices are taken to reduce soil erosion. Further on-farm research should be carried out to take advantage of intercropping. The need for a multidisciplinary approach to accomplish this goal is highlighted. (CIAT)

2255

26938 MBUYA, O.S.; KOINANGE, E.M.K.; MBEAGA, M.E.T. 1985. OPTIMUM BEAN (PHASEOLUS VULGARIS) DENSITY IN ASSOCIATION WITH MAIZE. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.21-28. EN., SUM. EN., 7 REF. (TANZANIA AGRICULTURAL RESEARCH ORGANIZATION, LYAMUNGU RESEARCH INST., P.O. BOX 3004, MOSHI, TANZANIA)

CULTIVARS; INTERCROPPING; PHASEOLUS VULGARIS; PLANTING; SPACING; TANZANIA; YIELD COMPONENTS; YIELDS; ZEA MAYS.

FOUR BEAN CV. (CANADIAN WONDER, P311-A-L, T23, AND T3) WERE EVALUATED AT 3 DENSITIES (102,564, 148,148, AND 190,476 PLANTS/HA) IN ASSOCIATION WITH MAIZE IN LAMBO (TANZANIA). A RANDOMIZED COMPLETE BLOCK DESIGN WITH 4 REPLICATIONS WAS USED. VAR. DIFFERENCES IN BEAN SEED YIELD WERE OBSERVED IN BOTH MONOCULTURE AND ASSOCIATED CROPPING. THE 3 BEAN DENSITIES SHOWED NO SIGNIFICANT (P LESS THAN 0.05) SEED YIELD DIFFERENCES, INDICATING THAT ANY OF THE DENSITIES CAN BE USED IN ASSOCIATION WITH MAIZE. INCREASING BEAN DENSITY ALSO DID NOT REDUCE MAIZE GRAIN YIELD SIGNIFICANTLY. HOWEVER, BEAN SEED YIELD INCREASED WITH INCREASING BEAN DENSITY, THUS SUGGESTING THAT AT LOWER DENSITIES GROWTH RESOURCES ARE NOT FULLY EXPLOITED. BEARING IN MIND THE HIGH PRICES OF SEED BEAN, THE ECONOMICS OF SEED SHOULD BE WORKED OUT TO JUSTIFY THE INCREASED REVENUE OBTAINED BY USING THE HIGHEST DENSITY. HOWEVER, WHERE SEED BEAN IS CHEAP, THE HIGHEST DENSITY OF 190,476 PLANTS/HA (75 X 7 CM) IS RECOMMENDED. (AS)

2256

26945 MHINA, G.A.; MISANGU, R.N.; GILL, B.S. 1985. PRELIMINARY BEAN YIELD TRIAL. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.57-61. EN., SUM. EN., 5 REF. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

BEAN COMMON MOSAIC VIRUS; CROSSBREEDING; CULTIVARS; ISARIOPSIS GRISEOLA; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA; UROMYCES PHASEOLI; YIELDS.

TWENTY BEAN CROSSES AND 2 STANDARD VAR. WERE TESTED IN A PRELIMINARY YIELD TRIAL TO EVALUATE YIELD PERFORMANCE AND DISEASE REACTION (ANGULAR LEAF SPOT, BCMV, AND RUST) AT THE SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA). YIELD DATA OBTAINED WERE SUBJECTED TO VARIANCE ANALYSIS. DESPITE THE BAD WEATHER AND DISEASE ATTACK, THE BEAN CROSSES TMO 232, TMO 241, AND TMO 242 SHOWED PROMISING YIELD PERFORMANCE, YIELDING HIGHER THAN THE STANDARD VAR. CANADIAN WONDER. DISEASE SYMPTOMS WERE OBSERVED ON ALL BEAN CROSSES EXCEPT TMO 308, WHICH DID NOT SHOW RUST SYMPTOMS. (AS)

2257

26933 MINJAS, A.N.; SALEMA, M.P., EDS. 1985. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE

UNIVERSITY OF AGRICULTURE, 188P. EN., IL. (DEPT. OF CROP SCIENCE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

ADAPTATION; BEAN COMMON MOSAIC VIRUS; DROUGHT; GERMPLASM; INTERCROPPING; ISARIOPSIS GRISEOLA; MARKETING; OPHIOMYIA PHASEOLI; PHASEOLUS VULGARIS; PLANTING; RESISTANCE; SOCIOECONOMIC ASPECTS; SPACING; TANZANIA; TIMING; UROMYCES PHASEOLI; YIELDS.

THE PAPERS PRESENTED AT THE 4TH WORKSHOP ON BEAN RESEARCH IN TANZANIA, HELD IN 1985 AS PART OF THE BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM/SOKOINE U. OF AGRICULTURE, ARE COMPILED. THE MAJOR OBJECTIVE IS TO DEVELOP FOR SMALL FARMERS HIGH YIELDING AND WIDELY ADAPTED BEANS THAT ARE RESISTANT TO MAJOR DISEASES AND INSECTS, AND TO HEAT AND DROUGHT STRESSES; LIKEWISE, THEY SHOULD COOK QUICKLY AND BE ABLE TO FIX THEIR OWN ATMOSPHERIC N. RESEARCH RESULTS ARE PRESENTED IN AGRONOMY AND PHYSIOLOGY (USE OF MULCHES, INTERCROPPING SYSTEMS WITH MAIZE, PLANTING DATES AND DENSITIES, AND TOLERANCE TO DROUGHT), APPROPRIATE TECHNOLOGY (HUMAN-POWERED BEAN THRESHER), BREEDING (YIELD TRIALS), ENTOMOLOGY (OPHIOMYIA PHASEOLI), NUTRITIONAL IMPROVEMENT (COOKABILITY), AND PATHOLOGY (BCMV, PHAEOISARIOPSIS GRISEOLA, COLLETOTRICHUM LINDEMUTHIANUM, PSEUDOMONAS SYRINGAE, AND UROMYCES PHASEOLI). SUPPORTIVE RESEARCH WORK IS ALSO PRESENTED ESPECIALLY REGARDING FARMER SOCIOECONOMIC ASPECTS AND TECHNOLOGY TRANSFER. (CIAT)

2258

26952 MMBAGA, M.T.; MWATEBA, H. 1985. SCREENING FOR MULTIPLE DISEASE RESISTANCE IN BEANS (PHASEOLUS VULGARIS L.). IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE, PP.115-122. EN., 7 REF. (BOTANY DEPT., UNIV. OF DAR ES SALAAM, P.O. BOX 35065, DAR ES SALAAM, TANZANIA)

BACTERIOSES; COLLETOTRICHUM LINDEMUTHIANUM; CULTIVARS; ISARIOPSIS GRISEOLA; PHASEOLUS VULGARIS; RESISTANCE; SELECTION; TANZANIA; UROMYCES PHASEOLI; VIROSES.

SIXTY-TWO LOCAL BEAN CV. AND 100 IBRN (INTERNATIONAL BEAN RUST NURSERY) VAR. WERE EVALUATED FOR MULTIPLE DISEASE RESISTANCE (COLLETOTRICHUM LINDEMUTHIANUM, PHAEOISARIOPSIS GRISEOLA, PSEUDOMONAS SYRINGAE, VIRAL INFECTION, AND UROMYCES PHASEOLI) IN TANZANIA. TMO 62 WAS THE ONLY LOCAL VAR. SHOWING RESISTANCE TO ALL 5 DISEASES AT ALL GROWTH STAGES DURING THE SHORT AND LONG RAINS IN UYOLE AND THE LONG RAINS IN MOROGORO. TMO 25, 33, 40, 59, AND 64 SHOWED RESISTANCE OR INTERMEDIATE REACTIONS TO ALL THE DISEASES AND NONE WERE SUSCEPTIBLE IN MBEYA OR MOROGORO. A LARGE NO. OF IBRN VAR. WERE RESISTANT TO ALL 5 DISEASES IN MOROGORO AND MBEYA. THE DISEASE REACTIONS ARE PRESENTED FOR ALL THE MATERIALS. (CIAT)

2259

26947 MOHAMED, A.H.; KAHIL, A.K. 1985. EFFECT OF PLANT POPULATION DENSITY ON INSECT PESTS AND SEED YIELD OF COMMON BEANS INTERCROPPED WITH MAIZE. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE, PP.69-77. EN., SUM. EN., 18 REF. (DEPT. OF CROP SCIENCE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3042, MOROGORO, TANZANIA)

INJURIOUS INSECTS; INTERCROPPING; PHASEOLUS VULGARIS; PLANTING; SPACING; TANZANIA; VARIETAL MIXTURES; YIELDS; ZEA MAYS.

THE EFFECT OF 4 PLANT POPULATION DENSITIES ON INSECT PESTS AND ON SEED YIELD OF COMMON BEANS INTERCROPPED WITH MAIZE WAS STUDIED AT THE SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA). MAIN TREATMENTS WERE PURE STANDS AND MIXTURES OF THE COMPONENT CROPS, AND SUBTREATMENTS WERE THE 4 PLANT

POPULATION DENSITIES. RESULTS SHOWED HIGHER PEST INCIDENCE AND INSECT DAMAGE IN PURE STAND BEANS THAN IN MIXTURES. HIGHER PLANT POPULATION DENSITIES HAD HIGHER PEST INCIDENCE AND DAMAGE, EXCEPT FOR BEAN FLY INCIDENCE AND DAMAGE BY LEAPHOPPERS AND POD-SUCKING BUGS; THESE WERE HIGH IN PLOTS WITH LOW BEAN PLANT POPULATION DENSITY. THE MIXTURES HAD A YIELD ADVANTAGE AT ALL PLANT POPULATIONS, EXCEPT FOR THE 1/3 MAIZE AND 2/3 BEANS MIXTURE. THE HIGHEST YIELD ADVANTAGE WAS OBTAINED FOR THE 2/3 MAIZE AND 1/3 BEANS TREATMENT, SUGGESTING THAT IT IS THE OPTIMUM COMBINED PROPORTION FOR THE 2 SPECIES. LOW POPULATION OF IMPORTANT INSECT PESTS AND EFFICIENT UTILIZATION OF ENVIRONMENTAL RESOURCES ARE DISCUSSED AS POSSIBLE REASONS FOR YIELD ADVANTAGES IN MIXTURES. (AS)

2260

26960 MSUYA, J.M.; MEIHA, E.R. 1985. RESOURCE USE EFFICIENCY OF SMALLHOLDER BEAN PRODUCERS IN MGETA AND MAGOLE DIVISIONS, MOROGORO REGION. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS, TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.162-165. EN., SUM. EN., 2 REF. (DEPT. OF RURAL ECONOMY, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3067, MOROGORO, TANZANIA)

LABOR; PHASEOLUS VULGARIS; SOCIOECONOMIC ASPECTS; TANZANIA.

THE RESOURCE USE EFFICIENCY OF SMALLHOLDER BEAN PRODUCERS IN MGETA AND MAGOLE DIVISIONS (MOROGORO REGION, TANZANIA) WAS STUDIED DURING THE 1984-85 CROPPING SEASON. DATA WILL BE ANALYZED USING THE COBB-DOUGLAS TYPES OF PRODUCTION FUNCTION AND CALCULATION OF SIMPLE STATISTICS. THE MARGINAL VALUE PRODUCT CRITERION WILL BE USED TO DETERMINE EFFICIENCY AND INEFFICIENCY OF THE RESOURCES USED. (AS)

2261

26946 MUSHEBEZY, D.M.K.; KAREL, A.K. 1985. RESISTANCE TO BEANFLY (OPHIOMYIA PHASEOLI TRYON) IN COMMON BEANS. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS, TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.62-68. EN., SUM. EN., 7 REF. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

CULTIVARS; OPHIOMYIA PHASEOLI; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA; YIELDS.

TWELVE COMMON BEAN CV. WERE EVALUATED FOR RESISTANCE TO THE BEANFLY (OPHIOMYIA PHASEOLI). RESISTANCE WAS ASSESSED BASED ON THE LARVAL-PUPAL COUNTS. CV. PAC 90, BAT 1500, BAT 1505, KAPANIMA, TMO 117, CHIPULUPULU, AND KABLANKETI WERE RATED AS HAVING LOW RESISTANCE. LOW LARVAL-PUPAL COUNTS WERE ASSOCIATED WITH THIN STEMS (NARROW STEM DIAMETER). LARVAL-PUPAL COUNTS WERE POSITIVELY CORRELATED WITH OVI-PUNCTURE COUNTS. RESISTANT CV. GENERALLY HAD LOWER OVI-PUNCTURE COUNTS. A NEGATIVE CORRELATION WAS FOUND BETWEEN OVI-PUNCTURE COUNTS AND THE NO. OF TRICHOMES, INDICATING AN INTERFERENCE IN OVIPOSITION WHEN TRICHOME DENSITY WAS HIGHER. BEANFLY OVI-PUNCTURE COUNTS WERE POSITIVELY CORRELATED TO LEAF AREA. CV. WITH LOW RESISTANCE TO THE BEANFLY HAD SIGNIFICANTLY HIGHER SEED YIELD COMPARED WITH SUSCEPTIBLE CV. (AS)

2262

26953 MWANDILA, N.J.K.; KESWANI, C.L. 1985. STUDIES ON THE RESISTANCE OF EIGHT BEAN (PHASEOLUS VULGARIS L.) LINES TO PHAEOISARIOPSIS GRISEOLA. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS, TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.123-128. EN., SUM. EN., 15 REF. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

CULTIVARS; ISARIOPSIS GRISEOLA; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA.

STUDIES WERE CONDUCTED TO ASSESS THE REACTION OF 8 DIFFERENT BEAN LINES/ACCESSIONS TO THE CAUSAL ORGANISM OF ANGULAR LEAF SPOT (PHASEOLISARIOPSIS GRISEOLA) UNDER FIELD AND GREENHOUSE CONDITIONS. ANGULAR LEAF SPOT-INFECTED PLANT MATERIAL WAS COLLECTED FROM FARMERS' FIELDS IN THE MGETA AND KILOSA AREAS IN THE MOROGORO REGION, TANZANIA. THE PATHOGEN WAS SUCCESSFULLY ISOLATED ON V-8 JUICE CULTURE MEDIA. CULTURES WERE INCUBATED AT TEMP. RANGING FROM 20 TO 24 DEGREES CELSIUS. BEAN ACCESSIONS TMO 324, TMO 333, TMO 334, TMO 338, TMO 341, TMO 354, TMO 357, AND TMO 191 (KABANIMA) WERE INOCULATED IN THE FIELD AND GREENHOUSE. RIGHT LINES/ACCESSIONS WERE RESISTANT TO ANGULAR LEAF SPOT. INOCULATED PLANTS DID NOT SHOW DISEASE SYMPTOMS UNTIL 13 DAYS AFTER INOCULATION, AND EVEN WHEN THE DISEASE SYMPTOMS APPEARED, THEY WERE MILD. THE NONAPPEARANCE OF THE DISEASE AND THE MILDNESS IN DISEASE SYMPTOMS ARE NOT NECESSARILY DUE TO PLANT RESISTANCE BUT POSSIBLY TO UNFAVORABLE ENVIRONMENTAL CONDITIONS. (AS)

2263

26954 MWATEBA, R.; MMBAGA, M.T. 1985. VARIABILITY OF BEAN RUST PATHOGEN. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.129-134. EN., 4 REF. (DEPT. OF BOTANY, UNIV. OF DAR ES SALAAM, P.O. BOX 35065, DAR ES SALAAM, TANZANIA)

CULTIVARS; FLOWERING; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA; UROMYCES PHASEOLI; CIAT-2.

ONE HUNDRED IBRN (INTERNATIONAL BEAN RUST NURSEERY) BEAN VAR. WERE EVALUATED FOR THEIR REACTION TO UROMYCES PHASEOLI IN MBEYA AND MOROGORO, TANZANIA. FIFTY-SEVEN VAR. SHOWED SIMILAR REACTIONS AT BOTH SITES AND WERE RESISTANT DURING THE POD FILLING STAGE. THE LARGE SIMILARITY IN DISEASE REACTION INDICATES THAT U. PHASEOLI PERHAPS DOES NOT DIFFER MUCH GENETICALLY AND THAT THERE ARE PROBABLY FEW RACES IN BOTH AREAS. THE CHARACTERISTIC OF SLOW RUSTING WAS OBSERVED. THE VAR. THAT SHOWED RESISTANCE DURING BOTH SHORT AND LONG RAINS IN MBEYA CAN BE USED IN BREEDING AS SOURCES OF RESISTANCE GENES. (CIAT)

2264

26961 NGETTI, M.M.S.; MBIHA, E.R. 1985. THE SOCIAL AND ECONOMIC ROLES OF WOMEN IN THE FARMING SYSTEMS; A CASE STUDY OF SOME SELECTED VILLAGES IN MOROGORO RURAL AND KILOSA DISTRICTS. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.166-168. EN., SUM. EN., 2 REF. (DEPT. OF RURAL ECONOMY, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3007, MOROGORO, TANZANIA)

PHASEOLUS VULGARIS; SOCIOECONOMIC ASPECTS; TANZANIA.

CURRENT SOCIAL AND ECONOMIC ROLES OF TANZANIAN WOMEN IN BOTH ECONOMIC AND HOUSEHOLD DUTIES WERE STUDIED. FACTORS THAT AFFECT THEIR PARTICIPATION IN FARMING SYSTEMS ARE ALSO ANALYZED. STUDY AREAS WERE THE MGETA AND MAGOLE DIVISIONS, WHICH BOTH INCLUDE MAIZE AND BEANS IN THEIR FARMING SYSTEMS AND THEIR DIETS. SINCE THE DATA ARE STILL BEING ANALYZED ONLY GENERAL STATEMENTS CAN BE DRAWN FROM THE RESEARCH FINDINGS. (1) WOMEN ARE MORE INVOLVED IN THE DECISION-MAKING PROCESS IN MGETA THAN IN MAGOLE. (2) IN MGETA WOMEN ARE MORE INVOLVED IN THE MARKETING OF VEGETABLES AND FRUITS, WHEREAS IN MAGOLE, WOMEN RARELY PARTICIPATE IN THE MARKETING OF FARM PRODUCTS. (3) MOST HUSBANDS IN MAGOLE HAVE MORE THAN 1 WIFE. (4) WHEREAS IN MGETA THE TASK OF FETCHING FIREWOOD IS SHARED BETWEEN WIVES AND HUSBANDS, IN MAGOLE THE TASK RESTS SOLELY ON WOMEN'S SHOULDERS. (CIAT)

2265

26939 NGOLI, G.P.; TARIMO, A.J.P. 1985. EFFECT OF GRASS MULCH ON GRAIN AND TOTAL DRY MATTER YIELD OF FIELD BEANS (*PHASEOLUS VULGARIS* L.). IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.29-34. EN., SUM. FN., 10 REF., IL. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

CULTIVARS; DRY MATTER; MULCHING; *PHASEOLUS VULGARIS*; TANZANIA; YIELD COMPONENTS; YIELDS.

AN EXPT. WAS CONDUCTED AT THE SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA) TO STUDY THE EFFECTS OF A GRASS MULCH ON GRAIN AND TOTAL DM YIELD OF 3 BEAN VAR. (KABANIMA, CANADIAN WONDER, AND SELIAN WONDER). TWO TREATMENTS, MULCHED (M1) AND CONTROL (M0), WERE USED. THE RESULTS SHOWED THAT MULCHING HAD NO SIGNIFICANT EFFECT ON EITHER GRAIN OR TOTAL DM YIELDS OF THE 3 VAR. LIKEWISE, THE YIELD COMPONENTS PODS/PLANT AND SEEDS/POD WERE NOT AFFECTED BY THE MULCHING TREATMENT. THE SHELLING PERCENTAGE WAS, HOWEVER, HIGHER IN THE UNMULCHED THAN IN THE MULCHED PLOTS, INDICATING THAT MULCHING MIGHT HAVE INFLUENCED DM PARTITIONING TO THE PODS. THE SHELLING PERCENTAGES WERE 58.3 AND 55.1 FOR M0 AND M1, RESP. OF THE 3 VAR. CANADIAN WONDER YIELDED THE HIGHEST; GRAIN YIELDS WERE 0.162, 0.141, AND 0.047 KG/SQUARE METER FOR CANADIAN WONDER, SELIAN WONDER, AND KABANIMA, RESP. THE VAR. DIFFERENCES REFLECTED OTHER ENVIRONMENTAL RESPONSES RATHER THAN THE MULCHING TREATMENTS. MULCHING OF BEANS SEEMS TO HAVE MORE EFFECT ON THE MORPHOLOGICAL CHARACTERISTICS THAN ON THE ACCUMULATION OF EITHER ECONOMIC OR BIOLOGICAL YIELDS. (AS)

2266

26962 NJEBELE, C.W.; MBIHA, E.R. 1985. STUDY OF THE ECONOMIC VIABILITY OF IMPROVED BEAN CULTIVARS FOR SMALL SCALE FARMERS IN MGETA AND MAGOLE DIVISIONS, MOROGORO REGION. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.169-172. EN., SUM. ENGL., 1 REF. (DEPT. OF RURAL ECONOMY, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3007, MOROGORO, TANZANIA)

PHASEOLUS VULGARIS; SOCIOECONOMIC ASPECTS; TANZANIA.

SOCIOECONOMIC FACTORS AFFECTING BEAN PRODUCTION IN TANZANIA AND THE ECONOMIC IMPACT OF HIGH YIELDING VAR. SUCH AS KABANIMA AND TMO101 IN THE SELECTED BEAN GROWING AREAS IN MOROGORO REGION WERE STUDIED IN ORDER TO PROVIDE BACKGROUND INFORMATION FOR RESEARCH. EDUCATIONAL LEVEL, RESOURCE ENDOWMENT, PESTS AND DISEASES, DROUGHT, INPUTS, AND PERFORMANCE OF BOTH LOCAL AND HIGH YIELDING VAR. WERE ASSESSED. INSTITUTIONAL CONSTRAINTS AND OTHER RELATED PROBLEMS LIKE EXTENSION SERVICES AND VILLAGE LEADERSHIP ARE ALSO DISCUSSED. THE SUCCESS OF THE PROJECT WILL ENABLE SMALL-SCALE FARMERS TO PRODUCE HIGHER YIELDS THROUGH THE USE OF HIGH YIELDING VAR. AND HENCE INCREASE INCOMES AS WELL AS PROVIDE A GOOD AND INEXPENSIVE SOURCE OF PROTEIN, ESPECIALLY FOR POOR FAMILIES WHO CANNOT AFFORD ANIMAL PROTEIN. (AS)

2267

26942 SAXENA, N.C.; VICTOR, E.N.; KYANDO, P.H.M. 1985. DESIGN CONSIDERATIONS FOR A HUMAN POWERED BEAN THRESHER. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.41-44. EN., SUM. EN., 3 REF. (DEPT. OF AGRICULTURAL ENGINEERING & LAND PLANNING, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3003, MOROGORO, TANZANIA)

AGRICULTURAL EQUIPMENT; *PHASEOLUS VULGARIS*; TANZANIA; THRESHING.

SEVERAL ASSOCIATED FACTORS TO BE CONSIDERED IN THE DESIGN OF AN APPROPRIATE BEAN THRESHER FOR SMALL FARMERS ARE LISTED. EACH FACTOR IS DISCUSSED WITH PARTICULAR REFERENCE TO THE LOCAL MANUFACTURE OF THE MACHINE. THE ROLE OF RURAL WOMEN IN THE DESIGN AND USE IS DETAILED. (AS)

2268

26507 SEMU, E.; SINGH, B.R.; SELMER-OLSEN, A.R.; STEENBERG, K. 1985. UPTAKE OF HG FROM (203)HG-LABELED MERCURY COMPOUNDS BY WHEAT AND BEANS GROWN ON AN OXISOL. PLANT AND SOIL 87(3):347-355. EN., SUM. EN., 27 REF., IL. (DEPT. OF SOIL SCIENCE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3008, MOROGORO, TANZANIA)

GERMINATION; MERCURY; NORWAY; PHASEOLUS VULGARIS; TANZANIA; TRANSLOCATION.

STUDIES WERE CONDUCTED TO EVALUATE THE UPTAKE OF HG BY WHEAT AND BEANS GROWN ON AN OXISOL WITH DIFFERENT LEVELS OF MEMC AND HGCL2. GERMINATION OF BEANS GROWN WITH BOTH COMPOUNDS AT 50 MG HG/KG SOIL FAILED COMPLETELY, EVEN AFTER REPEATED SOWING. YIELDS WERE DECREASED, THOUGH NOT SIGNIFICANTLY, BY HGCL2 UP TO 5 MG HG/KG SOIL. THE CONC. OF HG IN BEAN STRAW, BUT NOT GRAIN, INCREASED SIGNIFICANTLY WITH INCREASING LEVELS OF MEMC AND HGCL2 APPLICATION, AND WAS GREATER IN PLANTS GROWN WITH HGCL2. TRANSLOCATION TO GRAIN WAS LOW, WITH LITTLE DIFFERENCE BETWEEN PLANTS GROWN WITH MEMC OR HGCL2. (AS (EXTRACT))

2269

26082 SHAO, F.M.; TERI, J.M. 1985. YIELD LOSSES IN PHASEOLUS BEANS INDUCED BY ANTHRACNOSE IN TANZANIA. TROPICAL PEST MANAGEMENT 31(1):60-62. EN., SUM. EN., 15 REF., IL. (UYOLE AGRICULTURAL CENTRE, P.O. BOX 400, MBEYA, TANZANIA)

PHASEOLUS VULGARIS; COLLETOTRICHUM LINDEMUTHIANUM; CULTIVARS; DISEASE CONTROL; CHEMICAL CONTROL; YIELDS; RESISTANCE; TANZANIA.

THE EXTENT OF YIELD LOSSES RESULTING FROM ANTHRACNOSE WAS DETERMINED IN 3 BEAN CV. PLANTED AS MAIN PLOTS IN A SPLIT PLOT EXPT. IN UYOLE, TANZANIA. DIFFERENT LEVELS OF THE DISEASE WERE MAINTAINED IN THE SUBPLOTS BY SPRAYING WITH THE FUNGICIDE BENOMYL. THERE WERE HIGHLY SIGNIFICANT DIFFERENCES IN DISEASE LEVELS AND YIELD BETWEEN THE RESISTANT AND SUSCEPTIBLE CV. AND BETWEEN THE SPRAYED AND UNSPRAYED PLOTS. HIGHLY SIGNIFICANT YIELD LOSSES OF 86 PERCENT OCCURRED IN THE HIGHLY SUSCEPTIBLE CV. T8 AND 27 PERCENT IN THE MODERATELY SUSCEPTIBLE CV. MEXICAN 142. ESTIMATED NET GAINS/HA RESULTING FROM CONTROLLING ANTHRACNOSE BY BENOMYL AND BY GROWING AN ANTHRACNOSE-RESISTANT CV. UNDER TANZANIAN CONDITIONS ARE GIVEN. (AS)

2270

29671 SHAO, F.M.; TERI, J.M. 1981. PROMISING PHASEOLUS BEAN LINES RESISTANT TO ANTHRACNOSE IN TANZANIA. EAST AFRICAN AGRICULTURAL AND FORESTRY JOURNAL 47(1-4):14-16. EN., SUM. EN., 6 REF.

PHASEOLUS VULGARIS; CULTIVARS; SELECTION; RESISTANCE; COLLETOTRICHUM LINDEMUTHIANUM; TANZANIA.

TWENTY BEAN LINES WERE SCREENED FOR RESISTANCE TO ANTHRACNOSE BY ARTIFICIALLY INOCULATING THEM WITH DIFFERENT ISOLATES OF COLLETOTRICHUM LINDEMUTHIANUM IN THE FIELD (MOROGORO, TANZANIA) AND IN THE GREENHOUSE. ONE LINE, P-260, WAS IMMUNE TO ANTHRACNOSE AND 5 LINES, UAC 57, UAC 79, P-304, P-618, AND P-774, WERE HIGHLY RESISTANT. LINES UAC 41, EAI 2889, EAI 4110, P-2, P-360, AND P-504 WERE MODERATELY RESISTANT. THE REMAINING LINES WERE SUSCEPTIBLE. THE IMMUNE AND RESISTANT LINES HAVE SOME UNDESIRABLE CONSUMER CHARACTERISTICS AND THEY CAN THEREFORE BE USED AS SOURCES OF RESISTANT GENES

IN BREEDING PROGRAMS. ALTERNATIVELY, THEY CAN BE IMPROVED TO ELIMINATE THE UNDESIRABLE CHARACTERISTICS SINCE SOME OF THEM ARE ALSO HIGH YIELDING. (AS)

2271

28249 SILBERNAGEL, M.J.; MILLS, L.J.; WANG, W.-Y. 1986. TANZANIAN STRAIN OF BEAN COMMON MOSAIC VIRUS. PLANT DISEASE 70(9):839-841. EN., SUM. EN., 21 REF.

PHASEOLUS VULGARIS; BEAN COMMON MOSAIC VIRUS; RACES; PATHOGENICITY; GENES; TANZANIA.

A STRAIN OF BCMV ISOLATED FROM SEED OF PHASEOLUS VULGARIS GROWN IN TANZANIA WAS FOUND TO BE SIMILAR PATHOGENICALLY AND SEROLOGICALLY TO TEMP.-INSENSITIVE STRAINS FOUND INITIALLY IN EUROPE AND RECENTLY IN THE USA. THIS IS THE 1ST REPORT OF A STRAIN OF BCMV FROM TANZANIA. THE TANZANIAN STRAIN (TN-1) INDUCED TYPICAL MOSAIC MOTTLE ON CV. WITH THE RECESSIVE II GENE BUT CAUSED LETHAL SYSTEMIC VASCULAR NECROSIS (BLACK ROOT) ON MANY RESISTANT CV. WITH THE DOMINANT II GENE AT NORMAL (23-27 DEGREES CELSIUS) GROWING TEMP. THE COMBINATION OF THE DOMINANT II GENE AND UNIDENTIFIED PRESUMED-RECESSIVE GENES GAVE COMPLETE PROTECTION TO BOTH THE MOSAIC MOTTLE AND THE SYSTEMIC NECROSIS PHASES OF TN-1. (AS)

2272

26041 SILBERNAGEL, M.J.; DUE, J.M.; NDUNGURU, B.J.; KESWANI, C.L.; TERI, J.M.; MBAGA, M.; DOTO, A.L.; MISANGU, R.; KAFEL, A.K.; MPHURU, A.N.; QUENTIN, M.E.; SEENAPPA; SEMOKA, J.M.R.; JANA; CHONDHURY, M.S.; ANANDAJAYASEKERAM, P. 1982. BREEDING BEANS FOR DISEASE AND INSECT RESISTANCE AND DETERMINATION OF ECONOMIC IMPACT ON SUBSISTENCE FARM FAMILIES. IN BEAN/COWPEA COLLABORATIVE RESEARCH SUPPORT PROGRAM. U.S.A. 1982 ANNUAL REPORT. EAST LANSING, MICHIGAN STATE UNIVERSITY. PP.89-92. EN.

AGRICULTURAL PROJECTS; BEAN COMMON MOSAIC VIRUS; COLLETOTRICHUM LINDEMUTHIANUM; GERMPLASM; INJURIOUS INSECTS; ISARIOPSIS GRISEOLA; PHASEOLUS VULGARIS; PSEUDOMONAS SYRINGAE PV. PHASEOLICOLA; RESISTANCE; SELECTION; TANZANIA.

THE OBJECTIVES AND ACHIEVEMENTS OF THE PROJECT TO BREED BEANS FOR DISEASE AND INSECT RESISTANCE AND TO DETERMINE ITS ECONOMIC IMPACT ON SUBSISTENCE FARM FAMILIES IN TANZANIA ARE PRESENTED. ON-GOING RESEARCH WORK, INCLUDING GERMPLASM SCREENING FOR RESISTANCE TO MAJOR DISEASE (BCMV, PSEUDOMONAS PHASEOLICOLA, COLLETOTRICHUM LINDEMUTHIANUM, ISARIOPSIS GRISEOLA) AND ISOLATION OF STRAINS, IS BRIEFLY DESCRIBED. FERTILITY STUDIES SHOWED THAT VAR. KABANIMA WAS MORE RESPONSIVE TO N AND P THAN OTHER VAR. SEVEN ECONOMICALLY IMPORTANT INSECT PESTS WERE IDENTIFIED: BEAN FLY, FOLIAH BEETLE, BEAN APHID, THRIPS, POD BORERS, POD SUCKING BUGS, AND BEAN BRUCHIDS; A SYNTHETIC PYRETHROID, RIPCORD, GAVE BEST OVERALL INSECTICIDAL CONTROL, AND INTEGRATED CONTROL STUDIES INDICATED THAT BACILLUS THURINGIENSIS + Y-HCH WAS EFFECTIVE AND INCREASED YIELDS. NO VAR. HAS BEEN FOUND RESISTANT TO ALL DISEASES (BCMV, C. LINDEMUTHIANUM, I. GRISEOLA, AND XANTHOMONAS PHASEOLI); A BREEDING PROGRAM HAS BEGUN TO COMBINE MULTIPLE DISEASE RESISTANCE. OTHER AGRONOMIC PRACTICES ARE BEING STUDIED IN RELATION TO DISEASE CONTROL. (CIAT)

2273

30055 TANZANIA. MINISTRY OF AGRICULTURE AND LIVESTOCK DEVELOPMENT. 1985. Price policy recommendations for the 1985 agricultural price review. v.2. Sorghum, millet, cassava and beans (prices for 1986/87 marketing season). Dar es Salaam, Marketing Development Bureau. 47p. En., Sum. En., Il.

Phaseolus vulgaris. Production. Marketing. Consumption. Costs. Prices. Statistical data. Maps. Tanzania.

Past trends and the current situation of production, consumption, costs of production and marketing, sales and price figures in Tanzania are analyzed for various food crops (including beans) and price policy recommendations are made for the period 1986-87. An increase in the official producer prices for drought staples for 1986-87 was estimated in 10 percent over the 1985-86 prices, representing a decline in real price of over 24 percent (35 percent inflation rate). Bean price is expected to rise by 58 and 17 percent in nominal and real terms, resp., over the 1984-85 consumer prices. Monthly sales during 1984-85 are also recorded as well as the marketing costs of beans during 1985-86. (CIAT)

2274

29317 TANZANIA. MINISTRY OF FINANCE AND PLANNING. BUREAU OF STATISTICS. 1979. Planted area by crops and size of holding. In Tanzania. Ministry of Finance and Planning. Bureau of Statistics. Agricultural census of Tanzania 1971/72. Peasant farming. Dar es Salaam, v.1, pp.1-28, 60-65, 69, 71, 73, 87, 90, 94, 99, 104, 115, 117, 121, 124, 126, 130, 133, 139, 144, 149, 152-153, 155, 158-159, 162, 167-168, 176-177, 179, 182, 184, 467. En., 7 Ref., Dat.num.

Phaseolus vulgaris. Statistical data. Monocropping. Intercropping. *Zea mays*. *Mandbot esculenta*. *Coffea arabica*. *Solanum tuberosum*. Survey. Farm size. Production. Tanzania.

The methodology used to collect and analyze data for the agricultural census in Tanzania in 1971-72 is described. Statistics per farm size and region, are given on area planted (ha) and no. of cultivated farms for all main crops and associations. When applicable, data are given separately for beans as a major crop and in association with banana, maize, sorghum, coffee, cassava, millet, castor beans, groundnut, and potato. Kigoma, Mbeya, Tanga, West Lake, and Tanzania Mainland were the regions in which beans were identified in different cropping systems. (CIAT)

2275

26940 TESHA, A.J. 1985. COMPARATIVE DROUGHT TOLERANCE IN SELECTED COMMON BEAN CULTIVARS. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.35-37. EN., SUM. EN., 4 REF. (DEPT. OF BOTANY, UNIV. OF DAR ES SALAAM, P.O. BOX 35060, DAR ES SALAAM, TANZANIA)

CULTIVARS; DROUGHT; *PHASEOLUS VULGARIS*; RESISTANCE; TANZANIA; WATER STRESS; YIELDS.

TWELVE BEAN CV. WERE TAKEN FOR INITIAL SCREENING FOR DROUGHT TOLERANCE IN THE GREENHOUSE DURING 1983. BASED ON THE RESULTS OBTAINED, CV. TMO 101 AND TMO 125 WERE CONSIDERED FAIRLY DROUGHT TOLERANT WHILE TMO 104 AND TMO 110 WERE SUSCEPTIBLE. THESE 4 CV. WERE TAKEN FOR FURTHER STUDIES DURING 1984-85 TO DETERMINE ELECTRICAL CONDUCTIVITY IN THE GREENHOUSE AND SEED YIELD IN THE FIELD (DAR ES SALAAM, TANZANIA). FIELD RESULTS CONFIRMED THE EARLIER FINDINGS THAT TMO 125 IS HIGHLY TOLERANT WHILE TMO 110 IS HIGHLY SUSCEPTIBLE. THERE WAS A HIGH NEGATIVE CORRELATION BETWEEN ELECTRICAL CONDUCTIVITY AND CROP YIELD UNDER WATER STRESS CONDITIONS. (AS)

2276

24947 TESHA, A.J. 1983. DROUGHT RESISTANCE IN SOME BEAN VARIETIES (*PHASEOLUS VULGARIS*) GROWN IN TANZANIA. MOROGORO, TANZANIA, UNIVERSITY OF DAR ES SALAAM. 10P. EN., 6 REF., IL.

PHASEOLUS VULGARIS; CULTIVARS; RESISTANCE; DROUGHT; SELECTION; WATER CONTENT; WATER ABSORPTION; TANZANIA.

A POT EXPT. UNDER GREENHOUSE CONDITIONS WAS CONDUCTED WITH 15 BEAN VAR. FROM TANZANIA IN ORDER TO SEARCH FOR A RAPID AND RELIABLE DROUGHT RESISTANCE SCREENING METHOD. PLANT HEIGHT, MC, ELECTRICAL CONDUCTIVITY, AND ROOT:SHOOT RATIO WERE MEASURED, AND CORRELATIONS BETWEEN THESE PARAMETERS WERE CALCULATED. PLANT HEIGHT WAS OF LITTLE VALUE FOR DROUGHT RESISTANCE DETERMINATION, SINCE IT DID NOT CORRELATE WITH WATER RETENTION CAPACITIES. DIFFERENT IN THEIR WATER RETENTION CAPACITIES; THIS CRITERION HAS BEEN SHOWN TO BE RELATED TO DROUGHT RESISTANCE. A SIGNIFICANTLY NEGATIVE CORRELATION ($R = -0.81$) WAS FOUND BETWEEN WATER RETENTION AND ELECTRICAL CONDUCTIVITY VALUES. A POOR CORRELATION WAS FOUND BETWEEN THE ROOT:SHOOT RATIO AND WATER RETENTION AND CONDUCTIVITY ($R = -0.369$ AND -0.311 , RESP.) INDICATING THAT WHILE THE FORMER COULD BE IMPORTANT IN MAINTAINING WATER UPTAKE, THE MAINTENANCE OF MEMBRANE INTEGRITY IS MORE IMPORTANT UNDER SEVERE DROUGHT CONDITIONS. BOTH WATER RETENTION AND ELECTRICAL CONDUCTIVITY MEASUREMENTS PROVED SUCCESSFUL IN INDICATING DROUGHT TOLERANCE IN BEANS, BUT FOR LARGE SAMPLES THE LATTER METHOD SHOULD BE PREFERRED. (CIAT)

2277

29716 TIISEKWA, B. 1985. LABORATORY STUDIES ON PRODUCTION OF CANNED MBOGA YA MAHARAGE. 2. HEAT PROCESSING AND PRODUCT QUALITY. MEDEDELINGEN VAN DE FACULTEIT LANDBOUWET ENSCHAPPEN RIJKSUNIVERSITEIT GENT 50(4):1393-1399. EN., SUM. EN., NL., 8 REF. (LABORATORY OF FOOD CHEMISTRY & MICROBIOLOGY, FACULTY OF AGRICULTURAL SCIENCES, STATE UNIV. OF GHENT, COUPURE LINKS, 653 B-9000, GHENT, BELGIUM)

PHASEOLUS VULGARIS; CANNED BEANS; TEMPERATURE; TIMING; ORGANOLEPTIC PROPERTIES; PROTEIN CONTENT; NUTRITIVE VALUE; TANZANIA; BELGIUM.

HEAT PROCESSING FACTORS AND THEIR EFFECT ON THE QUALITY OF CANNED MBOGA YA MAHARAGE A FOOD EATEN WITH RICE, MAIZE, CASSAVA, OR BANANA MEAL, WERE STUDIED. A BEAN:SAUCE RATIO OF 45.0:68.5 (WT./WT.) WAS FOUND SATISFACTORY FOR FILLING CANS. RETORTING CANNED MBOGA AT 121 DEGREES CELSIUS FOR 36 MIN GAVE A PRODUCT OF ACCEPTABLE ORGANOLEPTIC QUALITY AND PROMISING STORAGE PROPERTIES. CHARACTERISTIC COMPOSITION OF THE FINISHED CANNED MBOGA ARE: TOTAL SOLIDS, 29.4 PERCENT; PH 5.6; CP, 8.7 PERCENT; AND ETHER EXTRACT, 3.7 PERCENT. FURTHER INVESTIGATION IS REQUIRED TO DETERMINE THE STABILITY OF THE PRODUCT IN DIFFERENT STORAGE CONDITIONS, AS WELL AS THE FEASIBILITY OF USING LARGER CANS TO CONTAIN MORE PRODUCT IN ORDER TO FAVOR BOTH THE PRODUCER AND THE CONSUMER. (AS)

2278

26963 TIMOTHY, R. 1985. ON-FARM TRIAL OF A HIGH YIELDING BEAN CULTIVAR IN KILOSA DISTRICT MOROGORO REGION. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.173-176. EN., SUM. EN., 1 REF.

ADAPTATION; BEAN COMMON MOSAIC VIRUS; CULTIVARS; DROUGHT; PHASEOLUS VULGARIS; RESISTANCE; TANZANIA; YIELDS.

FARMERS IN 3 VILLAGES OF THE KILOSA DISTRICT (MOROGORO, TANZANIA) WERE GIVEN THE HIGH YIELDING BEAN VAR. TMO 101 TO BE COMPARED WITH THEIR LOCAL VAR. TMO 101 WAS ALWAYS SUPERIOR AND OUTSTANDING IN TERMS OF YIELD, TOLERANCE TO DROUGHT, AND UPRIGHT AND COMPACT ARCHITECTURE. HOWEVER, THE VAR. IS SUSCEPTIBLE TO BCMV. TASTE AND COLOR OF TMO 101 WERE ALSO HIGHLY ACCEPTABLE TO FARMERS. (CIAT)

2279

29158 TUSEKWA, B. 1985. LABORATORY STUDIES ON PRODUCTION OF CANNED MBOGA YA MAHARAGE. 1. PRE-HEATPROCESSING OPERATIONS. MEDEDELINGEN VAN DE FACULTEIT LANDBOUWETENSCHAPPEN RIJKSUNIVERSITEIT GENT 50(4):1383-1391. EN., SUM. EN.,

NL., 17 REF., IL. (LABORATORY OF FOOD CHEMISTRY & MICROBIOLOGY, FAC. OF AGRICULTURAL SCIENCES, STATE UNIV. OF GHENT, COUPURE LINKS, 653 B-9000 GHENT, BELGIUM)

PHASEOLUS VULGARIS; HUMAN NUTRITION; CANNED BEANS; TIMING; PROCESSING; TANZANIA.

A PROCESS FOR THE HOME PREPARATION OF MBOGA YA MAHARAGE, A FOOD OF SOFT CONSISTENCE SERVED WITH RICE, MAIZE, CASSAVA, OR BANANA MEAL IN TANZANIA AND OTHER AFRICAN, ASIAN, AND LATIN AMERICAN COUNTRIES, IS DESCRIBED. BASED ON THIS RECIPE, THE SOAKING AND BLANCHING TIMES OF NAVY BEANS AND THE FORMULATION OF INGREDIENT PROPORTIONS SUITABLE FOR CANNING WERE ESTABLISHED. SOAKING AND BLANCHING TIMES WERE DETERMINED TO BE 20 H AT 6 DEGREES CELSIUS AND 2 MIN AT 98 DEGREES CELSIUS, RESP. A SAUCE FORMULA CONTAINING WATER, GROUNDNUTS, TOMATE PUREE, CURRY POWDER, SALT, CHILLI, AND ONIONS WAS ALSO MADE. (AS)

2280

26941 ULOMI, J.W.A.; TARIMO, A.J.P. 1985. PERFORMANCE OF BEANS AND MAIZE GROWN IN ASSOCIATION AT VARYING DENSITIES. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA, 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE, PP.38-40. EN., SUM. EN., 7 REF. (DEPT. OF CROP SCIENCE, FACULTY OF AGRICULTURE, SOKOINE UNIV. OF AGRICULTURE, P.O. BOX 3005, MOROGORO, TANZANIA)

INTERCROPPING; PHASEOLUS VULGARIS; PLANTING; SPACING; TANZANIA; YIELDS; ZEA MAYS.

BEANS OR MAIZE WERE GROWN IN MONOCULTURE OR IN ASSOCIATION AT SOKOINE U. OF AGRICULTURE (MOROGORO, TANZANIA) AT 3 DENSITY COMBINATIONS: 1/4 MAIZE AND 3/4 BEANS, 1/2 MAIZE AND 1/2 BEANS, OR 3/4 MAIZE AND 1/4 BEANS. BOTH MONOCROPPED MAIZE AND BEANS WERE GROWN AT POPULATIONS MUCH HIGHER THAN THE OPTIMA FOR GRAIN YIELD. THE DENSITY COMBINATIONS DECREASED THE POPULATION OF EITHER CROP TOWARD THE MAX. RESULTS SHOWED THAT YIELDS WERE LOWEST IN THE MONOCROPS AND HIGHEST IN THE ASSOCIATED CROPS. COMPARATIVE ADVANTAGES OF INTERCROPPING BEANS WITH MAIZE WERE EXAGGERATED BY THE HIGH LER VALUES OBSERVED. THESE RESULTS REFLECT COMMON TRENDS IN TRADITIONAL AGRICULTURE IN MOST OF THE SEMIARID TROPICS, WHERE MAIZE AND BEANS ARE COMMONLY INTERCROPPED. (AS)

2281

27045 WARREN, A. 1985. TANZANIA: BEAN PRODUCTION STATISTICS. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 3P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PRODUCTION; MARKETING; TANZANIA.

STATISTICAL DATA OF BEAN SEED SALES IN THE NORTHERN REGION OF TANZANIA ARE PRESENTED FOR THE YEARS 1976-85. BEAN PRODUCTION ESTIMATES MADE BY REGIONAL AGRICULTURAL DEVELOPMENT OFFICES ARE ALSO INCLUDED. (CIAT)

2282

27047 WARREN, A. 1985. TANZANIA: BREEDING. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 3P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PLANT BREEDING; GERMPLASM; CULTIVARS; TANZANIA; CIAT-2.

BEAN BREEDING ACTIVITIES AT SOKOINE U. AND UYOLE AGRICULTURAL CENTER (TANZANIA) ARE BRIEFLY DESCRIBED. SPECIAL EMPHASIS IS MADE ON THE PRELIMINARY AND ADVANCED YIELD TRIALS, UNIFORM CV. TRIALS, AND ON-FARM TRIALS. MATERIAL ENTERING THESE TRIALS WAS OBTAINED MAINLY FROM LOCAL COLLECTIONS AND FROM CIAT. VAR. RELEASED WERE KABANIMA, T 3, AND UYOLE 84. (CIAT)

2283

27043 WARREN, A. 1985. TANZANIA: ENTOMOLOGY. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 2P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; CULTIVARS; RESISTANCE; OPHIOMYIA PHASEOLI; OOTHECA; THYSANOPTERA; SPACING; PLANTING; TIMING; INTERCROPPING; ZEA MAYS; INSECT CONTROL; TANZANIA; CIAT-2.

BRIEF INFORMATION IS PRESENTED OF THE BEAN ENTOMOLOGY ACTIVITIES AT THE SOKOINE U. (MOROGORO, TANZANIA). EMPHASIS HAS BEEN MADE ON PLANT RESISTANCE TO THE BEAN FLY, OOTHECA, AND TO TAENIA THRIIPS. ADDITIONALLY, STUDIES HAVE BEEN CONDUCTED ON THE EFFECT OF PLANT DENSITY, TIME OF PLANTING, AND INTERCROPPING ON INSECT PESTS. (CIAT)

2284

27048 WARREN, A. 1985. TANZANIA: FOOD SCIENCE AND NUTRITION. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 3P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PRODUCTION; TANZANIA.

STATISTICAL DATA ARE PRESENTED OF BEAN PRODUCTION, PLANTED AREA, AND CONSUMPTION FOR 20 GEOGRAPHICAL REGIONS OF TANZANIA DURING THE 1982-83 AND 1983-84 SEASONS. FUTURE PLANS ARE BRIEFLY DESCRIBED. (CIAT)

2285

27046 WARREN, A. 1985. TANZANIA: SEED BEANS FOR EXPORT (GREEN BEAN VARIETIES FOR EUROPE). IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 2P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; SNAP BEANS; TRADE; LAND PREPARATION; INSECT CONTROL; TANZANIA.

PRODUCTION PROSPECTS AND CONSTRAINTS OF BEAN CULTIVATION IN TANZANIA ARE DISCUSSED. BRIEF INFORMATION IS ALSO PRESENTED OF INPUTS AND PRICES, LAND PREPARATION, INSECTS (MAINLY HELICHTHIS SPP.), DISEASES, AND YIELDS. (CIAT)

2286

27044 WARREN, A. 1985. TANZANIA: SOILS. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; NITROGEN FIXATION; INTERCROPPING; ZEA MAYS; TANZANIA.

AN EXPT. TO STUDY N FIXATION IN DIFFERENT MAIZE/BEAN INTERCROPPING SYSTEMS IN TANZANIA IS BRIEFLY OUTLINED. (CIAT)

2287

33227 AGOSSOU, V. 1985. Reconnaissance agro-pedologique de deux perimetres dans les districts de Cove et Zagnanado. Etude no.267. (Agropedological survey of two areas in the districts of Cove and Zagnanado. Study no.267). Benin, Ministere de L'Enseignement Superieur et de la Recherche Scientifique. 13p. Fr., Il.

Phaseolus vulgaris. Snap beans. Irrigation. Growth. Podding. Flowering. Abscission. Soil analysis. Soil fertility. Soils. Flooding. Togo.

An agropedological survey was conducted in the Koussin and Bame areas, Togo, to determine the causes of low podding, often due to early flower shedding, in a snap bean crop under gravity irrigation. Soil samples were taken and analyzed; plant disturbances observed in each sample area are described in detail as well as common cultivation practices. The fertility level of sandy and clayey soils from the Koussin area ranged from low to moderate; liming is recommended to increase their pH. The fertility level of the sandy soil from Bame was low; fractioned fertilization is recommended to improve its fertility. The management of irrigation water was unsuitable as soil remained flooded for a long time, resulting in plant stunting and root rot. Spray irrigation is recommended especially in sandy soils; improvement of gravity irrigation by land smoothing (to avoid flooding) or by digging a draining channel is suggested. Another cultivation practice recommended consists on either building large and discontinous ridges to allow draining or high beds for planting on flat land. P fertilization for the Koussin area is also recommended; further studies on climatic and edaphic requirements of this cv. are suggested. (CIAT)

2288

32268 PLAN 3e. quinquennal de développement du Togo (1976-1980). 2. Le développement rural. (Third quinquennial plan for the development of Togo (1976-1980). 2. Rural development). Bulletin de l'Afrique Noire no.874:17.055-17.058. 1976. Fr.

Phaseolus vulgaris. Statistical data. Production. Togo.

Statistics on the production of different commodities (including beans) in Togo are given for 1975 as well as the production expected for 1980. In 1975, the total bean production was 15,000 t. The estimate for 1980 is 17,200 t. Estimates on area (ha) planted to beans and production (t) expected in 1980 are also given for the different Togolese regions. (CIAT)

2289

31349 TOGO. DIRECTION DES ENQUETES ET STATISTIQUES AGRICOLES. 1986. Prix moyens a la production des principaux produits vivriers: haricot. (Average production prices of the main food crops: beans). Togo, 17p. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Prices. Production. Yields. Togo.

Statistics are presented on av. production prices/yr. of the main food crops (including beans) in Togo during 1976-83. Data are also included on area planted to beans (ha), yields (t/ha), and production (t) for different regions during 1972-85. (CIAT)

TUNISIA

2290

29721 SLAMA, F. 1986. EFFECT DU CHLORURE DE SODIUM SUR LA CROISSANCE ET LA NUTRITION MINERALE DE SIX ESPECES DE PLANTES CULTIVEES (EFFECT OF SODIUM CHLORIDE ON THE GROWTH AND MINERAL NUTRITION OF SIX SPECIES OF CROP PLANTS). AGRONOMIE TROPICALE 41(1):21-26. FR., SUM. FR., EN., ES., 25 REF., IL. (INAT, 43, AVENUE CHARLES NICOLLE, 1002 TUNIS, TUNISIE)

PHASEOLUS VULGARIS; NUTRIENT UPTAKE; NA; CL; GROWTH; NUTRIENT SOLUTION; LEAVES; STEMS; ROOTS; SALINITY; TUNISIA.

THE EFFECT OF SALT ON THE GROWTH AND MINERAL NUTRITION OF PLANTS WAS STUDIED. SIX PLANT SPECIES (AMONG THEM BEANS), EACH REPRESENTED BY 2 VAR., WERE CULTIVATED IN WATER CULTURE UNDER CONTROLLED CONDITIONS, IN THE ABSENCE OR PRESENCE OF 3 G NA₂CO₃/LITER. RESULTS SHOWED THAT BEANS ACCUMULATED LITTLE OR NO NA₂CO₃ IN THE LEAVES (EXCLUSIVE PLANTS). THE EXCLUSIVE (NO ACCUMULATION) OR INCLUSIVE (ACCUMULATION) CHARACTER OF NA IN THE LEAVES WAS INSUFFICIENT TO ASSESS THE SENSIBILITY OR THE TOLERANCE OF THE VAR. TO NA₂CO₃. THE EXCLUSIVE CHARACTER DID NOT APPEAR IN THE STEMS, WHICH ACCUMULATED MORE NA THAN THE ROOTS. THE REDUCTION BY CL OF ANIONS, OTHER THAN THE CL PROVISIONING OF THE LEAVES, APPEARED TO BE A SENSIBLE CRITERION TO CLASSIFY PLANTS ACCORDING TO THEIR TOLERANCE TO SALT. (AS)

2291

28939 SLAMA, F. 1986. INTERVENTION DES RACINES DANS LA SENSIBILITE OU LA TOLERANCE A NA₂CO₃ DE PLANTES CULTIVEES. (INVOLVEMENT OF ROOTS IN NA₂CO₃ TOLERANCE AND SENSITIVITY OF CULTIVATED PLANTS). AGRONOMIE 6(7):651-658. EN., SUM. FR., EN., 34 REF., IL. (INST. NATIONAL AGRONOMIQUE, LABORATOIRE D'AGRONOMIE, 43, AVENUE CHARLES-NICOLLE, 1002 TUNIS, TUNISIE)

PHASEOLUS VULGARIS; GROWTH; NA; CL; ROOTS; RESISTANCE; LEAVES; TRANSLOCATION; SHOOTS; NUTRIENT TRANSPORT; TUNISIA.

GROWTH IN WATER CULTURE AND NA(+) AND Cl(-) DISTRIBUTION WERE STUDIED IN PLANTS OF PHASEOLUS VULGARIS, CUCURBITA SP., SUNFLOWERS, MAIZE, CUCUMIS MELO, AND COTTON DIFFERING IN THEIR RESISTANCE TO NA₂CO₃. SEVERAL FEATURES OF NA(+) DISTRIBUTION SEEMED TO BE ASSOCIATED WITH THE EDAPHIC STATUS OF THE PLANTS. ONLY THE TOLERANT SPECIES AND CV. ACCUMULATED NA(+) IN THEIR LEAVES. VARIOUS TREATMENTS WERE USED TO SPECIFY THE INVOLVEMENTS OF ROOTS IN THESE BEHAVIORS (KCN IN THE MEDIA, ROOT COOLING, LOWERING THE AIR HUMIDITY, OR TIME-LIMITED NA₂CO₃ APPLICATIONS). THE GENERAL CONCLUSION WAS THAT THE ROOTS OF SENSITIVE PLANTS WERE LESS EFFECTIVE THAN THOSE OF TOLERANT PLANTS IN TRANSPORTING NA(+) INTO THE XYLEM, AND MORE EFFECTIVE IN ACCUMULATING NA(+) IN THEIR TISSUES. THESE PROPERTIES COULD NOT EXPLAIN NA(+) EXCLUSION FROM LEAVES IN LONG-DURATION NA₂CO₃ TREATMENTS. IT WAS CONCLUDED THAT THE DIFFERENCE BETWEEN INCLUDER AND EXCLUDER BEHAVIOR RESULTED RATHER FROM THE RECIRCULATION OF NA(+) FROM SHOOTS TO ROOTS IN SENSITIVE PLANTS. (AS)

UGANDA

2292

33211 BAFOKUZARA, N.D. 1987. A strategy for maximizing bean yields in nematode-infested soils. Kampala, Uganda, Department of Agriculture. Kawanda Research Station. 6p. En., 11 Ref. [Dept. of Agriculture, Kawanda Research Station, P.O.Box 7065, Kampala, Uganda]

Phaseolus vulgaris. *Meloidogyne incognita*. Resistance. Cultivars. Inoculation. Isolation. *Pratylenchus*. Uganda.

A short bibliographic review is presented on yield losses in beans caused by *Meloidogyne* and *Pratylenchus* species in Uganda. Under some conditions, bean var. growing in nematode-infested areas did not show any serious damage symptoms. A study was conducted at Kawanda exptl. station to identify nematode-resistant bean cv. and develop management strategies for major rootknot nematodes. The methodology used for isolating and identifying the *M. incognita* race I is described as well as the procedure for inoculating bean seedlings and evaluating their resistance to this nematode. No resistance was found in any of the cv. tested (Kanyebwa, K 20, and Mutike); however, Khaki had an intermediate (tolerant) reaction. Rootknot nematodes are a serious problem on legume crops and could be a constraint in bean production in this country. It is important to ensure that the field where beans will be grown is not heavily nematode-infested. Crops to be grown in sequence with beans should be carefully selected to avoid a build up of nematode populations to economic injury level. Further research is suggested on other aspects of resistance including rate of larval penetration into host roots, fecundity, host cell reaction, and sources of resistance. (CIAT)

2293

24862 POSTER, H.L. 1971. PERMANENT FERTILIZER TRIALS (1959-1967); (1968-1971). IN UGANDA. KAWANDA RESEARCH STATION. CHEMISTRY SECTION. ANNUAL REPORT PART.2, 1970-1971. UGANDA. PP.1-9. EN., SUM. EN.

PHASEOLUS VULGARIS; FERTILIZERS; N; P; K; MG; AGRICULTURAL LIME; GREEN MANURES; ROTATIONAL CROPS; CA; YIELDS; UGANDA.

THE SUMMARIES OF 4 PUBLICATIONS DEALING WITH PERMANENT FERTILIZER TRIALS BETWEEN 1959-67 AND 1968-71 AT 9 EXPTL. STATIONS IN UGANDA ARE PRESENTED. THE EFFECTS OF APPLYING FERTILIZERS, MANURE, LIME, AND TRACE ELEMENTS WERE DETERMINED AND THE CHANGES IN YIELDS AND FERTILIZER RESPONSES IN CONTINUOUS CROPPING ROTATIONS IN SOUTHERN AND WESTERN UGANDA WERE MEASURED. ON FREQUENTLY CROPPED, STRONGLY FERRALITIC SOILS, BEANS AND MAIZE WERE THE MOST RESPONSIVE TO N. COTTON, SWEET POTATO, AND BEANS DID NOT RESPOND TO LIME IN 23 TRIALS WHERE SOIL PH WAS ABOVE 5.25, BUT SIGNIFICANT RESPONSES WERE OBSERVED IN 8 OF 18 TRIALS WITH SOIL CA LEVELS BELOW 6 MEQ/100 G AND A PH LESS THAN 5.25. AV. YIELDS FOR BEANS FOR YEARS 1-4 AND 5-8 AT THE 9 STATIONS, INCLUDING PERCENTAGE RESPONSE TO N, P, K, MG, LIME, AND MANURE, ARE GIVEN. AV. YIELDS ACROSS STATIONS FOR YEARS 1-4 AND 5-8 WERE 589 AND 572 KG/HA, RESP., WHILE PERCENTAGE RESPONSES TO N, P, K, MG, AND MANURE WERE 11, 7, 2, 0, AND 15 PERCENT, RESP., FOR YEARS 1-4, AND 19, 11, 8, 14, AND 11 FOR N, P, K, LIME, AND MANURE, RESP., FOR YEARS 5-8. RESULTS OF PERMANENT FERTILIZER TRIALS WITH BEANS DURING 1969 ARE GIVEN. (CIAT)

2294

33210 KISAKYE, J.; NABASIRYE, N.; TUSHEMERERWE, W.; BAKAMWANGIRAKI, C.; KAVUMA, J.B. 1987. A diagnostic survey of Kabale District. Kampala, Uganda. 16p. En., Sum. En., 1 Ref.

Phaseolus vulgaris. Survey. Intercropping. *Zea mays*. *Solanum tuberosum*. Planting. Timing. Cultivars. *Colletotrichum lindemuthianum*. *Pseudomonas syringae* pv. *phaseolicola*. *Xanthomonas campestris* pv. *phaseoli*. *Isariopsis griseola*. Bean common bacterial blight. *Uromyces phaseoli*. *Acanthoscelides obtectus*. Fungicides. Harvesting. Marketing. Socioeconomic aspects. Resistance. Uganda.

A survey was conducted in 1987 in the Kabale district, Uganda, to study the existing farming systems and to identify the farmer's key constraints in

bean production. Information was collected by interviewing 27 farmers from the villages of Hamurwa, Kwamucucu, Maziba, and Kabanyonyi. The area surveyed is described. Although sorghum was found as a priority crop, bush beans are included among other important crops. They are usually intercropped with maize, sorghum, potatoes, peas, pumpkins, sweet potatoes, or bananas. Other cultivation systems were relay intercropping and staggered planting. The main advantages of intercropping are enumerated. The major bean planting seasons are February-May and August-September. Planting methods commonly used by farmers are briefly described. The preference for var. Rushare, K 20, Kikoona, Ewesesi, and Ewanalesi is due to taste, early maturation, cooking time, yield, color, and tolerance to diseases and pests; however, most farmers grow landraces which are very susceptible to diseases and pests, and thus result in low yields. Regarding fertilization, only manure is applied no herbicides are used to control weeds. Diseases observed include *Colletotrichum lindemuthianum*, *Isariopsis griseola*, *Pseudomonas syringae* pv. *phaseolicola*, *Xanthomonas campestris* pv. *phaseoli*, BCMV, and *Uromyces phaseoli*. *Acanthoscelides obtectus* was a common pest in stored beans. Fungicides are used by farmers in Maziba and Kahan yonyi. General information is also given on harvesting, marketing, and socioeconomic aspects. Diseases and pests along with lack of chemicals to control them were identified as the major constraints for bean production in this area. Research aiming at assessing yield losses due to the previous constraints is suggested as well as the introduction of resistant var. (CIAT)

2295

33217 MUSAANA, S.; MALE-KAYIWA, E.; SENGOCBA, T. 1987. Evaluation and utilisation of bean germplasm at Kawanda. Kampala, Uganda, 15p. En., Sum. En., 10 Ref., 11.

Phaseolus vulgaris. Plant breeding. Plant introductions. Resistance. *Colletotrichum lindemuthianum*. *Xanthomonas campestris* pv. *phaseoli*. *Isariopsis griseola*. *Uromyces phaseoli*. Bean common mosaic virus. *Ramularia phaseoli*. Yields. Cultivars. Cooking. Uganda. CIAT-2.

The Uganda bean germplasm collection, formed by local and exotic sources (the latter introduced mainly from CIAT), was evaluated for several characters such as reaction to major diseases (*Colletotrichum lindemuthianum*, *Xanthomonas campestris* pv. *phaseoli*, *Isariopsis griseola*, *Uromyces phaseoli*, BCMV, and *Ramularia phaseoli*), seed color, and plant habit (bush and climbing). A great genetic variation was found among these characters especially within introductions. In trials with local and introduced materials, significantly higher yields were obtained with BAT 1220 (introduced var.), a red and medium-size bean whose color is similar to that of var. Kainya (local), characteristics that make it easily acceptable at the Eastern, Central, and Western Uganda markets. The rest of the introductions (BAC 36, A-33, A-140, Catu, Carioca, and A-162) are cream colored and can easily be accepted in the North and North Eastern Uganda markets. Based on the results of expt. to determine the cooking time and moisture absorption of several bean var., it is important to establish whether cooking times in the lab. are compatible with those obtained with the consumer's cooking methods, since consumer preferences for var. Kanyebwa, Kampulike, and K 20 (based on fast cooking) were not reflected in those results. (CIAT)

2296

31686 NANGGITI, N.J.K 1987. Objectives and achievements of on-farm demonstrations and trials of improved production technology of field crops in Eastern and Northern Uganda. In Holmes, J.C. ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations, pp.282-288. En., Sum. En., 6 Ref.

Phaseolus vulgaris. Agricultural projects. On-farm research. Intercropping. Zea mays. Fertilizers. N. P. Food security. Uganda.

The main objective of the Agricultural Development Program (ADP), started by the Uganda government in 1986, is the production of enough food for both self-consumption and exports. The specific objectives of the Adaptive Research Program (ARP), one of the ADP components, are enumerated. Preliminary results of exploratory surveys are given; the on-farm research program for 1987 is presented. A maize-bean intercropping population fertilizer trial was designed for the Tororo district. Three alternative methods of intercropping will be compared with the farmer's method; all plots will be non fertilized or fertilized with N and P. (CIAT)

2297

33216 OPIO, A.F. 1987. Beans (*Phaseolus vulgaris* L.) as a symptomless carrier of *Pseudomonas solanacearum* E.F. Smith. Kampala, Uganda, Kawanda Research Station. 10p. En., 9 Ref. [Kawanda Research Station, P.O. Box 7065, Kampala, Uganda]

Phaseolus vulgaris. Cultivars. *Corynebacterium flaccumfaciens*. Isolation. Symptomatology. Disease transmission. Uganda.

Seven bean var. K 20, Kanyebe, K 130, Kayinja, White haricot, Mutike, and Banja 2) were tested for reaction to *Corynebacterium flaccumfaciens* under shade conditions at the Kawanda Research Station on Kampala, Uganda, in 1982 and 1983. None of the bean var. showed symptoms of bacterial wilt although the bacterium *C. flaccumfaciens* was isolated from all of them. The isolated bacterium caused 90-100 percent wilting when inoculated in tomato indicating that bean plants were symptomless carriers of the bacterium. Var. K 20 and K 130 were better carriers of the bacterium than Mutike and Banja 2. (AS)

2298

33215 OWERA, S.A.P. 1987. Makerere University's role in Regional Programmes on Beans in Africa. Uganda, Makerere University. Department of Crop Science. 10p. En., 8 Ref. [Dept. of Crop Science, Faculty of Agriculture & Forestry, Makerere Univ., Uganda]

Phaseolus vulgaris. Agricultural projects. Plant breeding. Developmental research. Socioeconomic aspects. Entomology. Pest control. Bean common mosaic virus. Uganda.

Generalities on the development of bean improvement programs in Uganda are given, mentioning the role of Makerere University. At 1st, the goal was to improve protein and met. content, yields, and disease resistance rather than considering the role of beans under each farming system. Since researchers involved in bean improvement programs ignored cost considerations and entomological research efforts were min., 3 main areas of concern for possible cooperative projects were identified at Makerere University. The 1st consists on a socioeconomic project where the importance of the collaboration between social and biological scientists is highlighted. The 2nd project, insect pest research and control, involves aspects such as polyphagy, pests of stored beans, biology and ecology of some field pests of beans in East Africa, and biological control. The 3rd project deals with bean virology and its efforts will focus on the importance and distribution of BCMV. (CIAT)

2299

33908 SENGCOBA, T.; MUSAANA, S.M., comps.; WORTMANN, C., ed. 1987. Annual Report 1986. Kampala, Uganda, National Bean Research Programme. 31p. En., 11. [Kawanda Research Station, P.O. Box 7065, Kampala, Uganda]

Phaseolus vulgaris. Germplasm. Selection. CIAT-2. Uganda.

Research conducted at Kawanda, Bukalasa, and Kachwekano (Uganda) during 1986 is reported. Aspects studied were germplasm collection and evaluations, disease nurseries, segregating materials, the African bean yield and adaptation nursery, IBYANs from CIAT, and evaluation of bush beans from local and CIAT collections. (CIAT)

2300

33909 SENGCOBA, T.; MUSAANA, S.M., comps.; WORTMANN, C., ed. 1987. Germplasm collection and evaluation; experiments carried out at Kawanda and Bukalasa. In Sengcooba, T.; Musaana, S.M., comps.; Wortmann, C., ed. Annual Report 1986. Kampala, Uganda, National Bean Research Programme, pp.3-17. En., [Kawanda Research Station, P.O.Box 7065, Kampala, Uganda]

Phaseolus vulgaris. Selection. Germplasm. Adaptation. *Xanthomonas campestris* pv. *phaseoli*. *Uromyces phaseoli*. *Colletotrichum lindemuthianum*. *Isariopsis griseola*. Yields. Ethiopia. Rwanda. Tanzania. Uganda. Zambia. Burundi. Zaire. CIAT-2.

Expt. conducted at Kawanda and Bukalasa (Uganda) involved germplasm collection and evaluations, disease nurseries, segregating material, and the African bean yield and adaptation nursery (ABYAN). Out of the 50 germplasm samples collected in Eastern Uganda, 38 came from markets and 22 from farmers. In the process of germplasm collection, farmers were asked about the source of origin of their seeds, how long they had been growing beans, which agronomic practices (planting time, cultivation systems, chemical control of diseases and pests, and fertilization) they used, their reasons for growing bean types or mixtures, preferences, methods of preparation, storage, and sale of surplus seed. Local and CIAT bean collections were evaluated for resistance to diseases (*Xanthomonas campestris* pv. *phaseoli*, *Colletotrichum lindemuthianum*, *Uromyces phaseoli*, and *Isariopsis griseola*), variation in seed color and plant habit, and yields. The performance of CIAT's material, as shown in the tables, justifies its introduction since it allows for improving local material. In the disease nurseries, tables are included with the reaction of bean var. to *U. phaseoli* and *X. campestris* pv. *phaseoli*. The segregating material (for resistance to *X. campestris* pv. *phaseoli*) received from CIAT was grown during both seasons in 1986; progeny rows from single plant selection were planted in 1987. A table is included with the performance of each of the 25 entries of the ABYAN established with bean var. coming from Ethiopia, Rwanda, Tanzania, Uganda, Zambia, Burundi, Zaire, and CIAT. (CIAT)

2301

33910 SENGCOBA, T.; MUSAANA, S.M., comps.; WORTMANN, C., ed. 1987. International Bean Yield and Adaptation Nurseries from Ciat; experiments carried out at Kachwekano. In Sengcooba, T.; Musaana, S.M., comps.; Wortmann, C., ed. Annual Report 1986. Kampala, Uganda, National Bean Research Programme, pp.18-28. En., II. [Kawanda Research Station, P.O.Box 7065, Kampala, Uganda]

Phaseolus vulgaris. Dwarf beans. Climbing beans. Selection. *Uromyces phaseoli*. *Pseudomonas syringae* pv. *phaseolicola*. *Ascochyta phaseolorum*. *Colletotrichum lindemuthianum*. *Isariopsis griseola*. Yields. Resistance. Cultivars. Uganda. CIAT-2.

Three IBYANs from CIAT were planted at Kachwekano, Uganda, during the 1st and 2nd seasons of 1986. Tables showing the performance of each are included. The introduced materials were similar to local check Rusipi in days to flowering and physiological maturity, and yields. In the IBYAN,

climbing red code 708414, entries ACV 8311, ZAV 8359, ACV 8340, ZA 8343, ACV 8363, and ACV 8349 outyielded the local check, indicating a possibility of identifying better material than Rusipi. A high *Uromyces phaseoli* pressure was observed during the season; some introductions such as ACV 8340, ZA 8394, ZA 8385, and ZA 8382 showed very high resistance. The season did not favor screening for any other disease (*Isariopsis griseola*, *Pseudomonas syringae* pv. *phaseolicola*, *Ascochyta phaseolorum*, and *Colletotrichum leodemuthianum*); however, the last was almost virtually absent. Bush bean var. from the Kawanda and CIAT collections were also evaluated; their performance is presented in a table. (CIAT)

2302

29109 SENGCOBA, T.N.; MUKIIRI, J. 1986. STUDIES ON INOCULUM SOURCES OF ANGULAR LEAF SPOT OF BEANS CAUSED BY *PHAEOSIARIOPSIS GRISEOLA* IN UGANDA. TROPICAL PEST MANAGEMENT 32(4):288-291. EN., SUM. EN., 12 REF. (DEPT. OF AGRICULTURE, KAWANDA RESEARCH STATION, P.O. BOX 7065, KAMPALA, UGANDA)

PHASEOLUS VULGARIS; *ISARIOPSIS GRISEOLA*; CULTIVARS; SEED TRANSMISSION; ETIOLOGY; UGANDA.

THE SOURCES OF INOCULUM FOR ANGULAR LEAF SPOT OF BEANS WERE INVESTIGATED. THE CAUSAL FUNGUS WAS CONFIRMED AS SEED-BORNE IN ALL THE CV. TESTED (BANJA 2, K20, K111, K112 Y K113). THE FUNGUS CAUSED SEED DISCOLORATION BUT NOT ALL INFECTED SEEDS WERE DISCOLORED. SEED TO SEEDLING TRANSMISSION WAS LOW. THE FUNGUS SURVIVED IN INFECTED CROP DEBRIS FOR A MAX. OF 9 AND 4-6 MO. UNDER INDOOR AND OUTSIDE CONDITIONS, RESP. UNDER SOIL, THE FUNGUS SURVIVED FOR ONLY 2 MO. INFECTED OFF-SEASON CROPS AND VOLUNTEER PLANTS WERE PRESENT AT THE TIME OF PLANTING THE SEASONS' CROPS AND WERE AN OBVIOUS SOURCE OF THE INOCULUM. IT IS CONCLUDED THAT THE SEED, CROP DEBRIS, OFF-SEASON CROPS, AND VOLUNTEER PLANTS ARE ALL POSSIBLE SOURCES OF *ISARIOPSIS GRISEOLA* INFECTION UNDER THE LOCAL CONDITIONS OF KAMPALA, UGANDA. (AS)

2303

26955 SENGCOBA, T.N. 1985. FUNGICIDAL CONTROL OF ANGULAR LEAF SPOT OF BEANS (*PHASEOLUS VULGARIS* L.) IN UGANDA. IN MINJAS, A.N.; SALEMA, M.P., EDS. WORKSHOP ON BEAN RESEARCH IN TANZANIA. 4TH., MOROGORO, TANZANIA, 1985. PROCEEDINGS. TANZANIA, SOKOINE UNIVERSITY OF AGRICULTURE. PP.135-144. EN., SUM. EN., 8 REF., IL. (KAWANDA RESEARCH STATION, P.O. BOX 7065, KAMPALA, UGANDA)

CHEMICAL CONTROL; CULTIVARS; DISEASE CONTROL; *ISARIOPSIS GRISEOLA*; *PHASEOLUS VULGARIS*; UGANDA; YIELDS.

THE CONTROL OF ANGULAR LEAF SPOT (*PHAEOSIARIOPSIS GRISEOLA*) IN UGANDA WAS STUDIED USING 3 FUNGICIDES (BENOMYL, TRIPHENYL TIN ACETATE, AND MANCOZEB). THE VARIABLES INCLUDED RATE, FREQUENCY, NO. OF APPLICATIONS, AND CV. THE NO. OF APPLICATIONS WAS VARIED BY CHANGING THE INITIAL OR FINAL SPRAYING DATES. THE 3 FUNGICIDES USED CHECKED LEAF DEFOLIATION BUT BENOMYL GAVE THE BEST RESULTS. THE RATES OF 1.0, 0.6, AND 0.5 KG/HA FOR MANCOZEB, BENOMYL, AND TRIPHENYL TIN ACETATE, RESP., WERE SUFFICIENT TO CONTROL THE DISEASE. WEEKLY SPRAYS GAVE BETTER RESULTS THAN APPLICATIONS EVERY 14 OR 28 DAYS. THE EARLIER THE SPRAYING STARTED, THE MORE EFFECTIVE WERE THE CONTROL TREATMENTS. THE MIN. NO. OF FUNGICIDAL APPLICATIONS WHICH GAVE SIGNIFICANT DISEASE CONTROL WERE 1, 3, AND 5 FOR BENOMYL, TRIPHENYL TIN ACETATE, AND MANCOZEB, RESP. IN THE TRIAL WHICH INVOLVED 6 DIFFERENT CV., SIGNIFICANT INCREASES IN YIELD WERE OBTAINED IN 5 OF THE CV. FOLLOWING FUNGICIDAL APPLICATIONS. RUST (*UROMYCES PHASEOLI*), ANOTHER IMPORTANT DISEASE THAT DEVELOPED ON THE CROPS, WAS EFFECTIVELY CONTROLLED BY MANCOZEB AND TRIPHENYL TIN ACETATE BUT NOT BY BENOMYL. (AS)

2304

29092; UGANDA. DEPARTMENT OF AGRICULTURE 1966. District and province percentaged by crop acreages and maps of agricultural systems, population, rainfall and temperature. Uganda, pp.24-29. En., Il.

Phaseolus vulgaris. Statistical data. Production. Maps. Uganda.

Data are provided on the percentage of area devoted to major crops per province and district in Uganda in 1966. Maps are included showing distribution of agricultural systems, population (1948 census), annual rainfall, and annual av. temp. Beans accounted for 11, 6, 9, and 8 percent of the area planted in the Buganda, Eastern, Western, and Northern provinces, resp. (CIAT)

2305

29090 UGANDA. DEPARTMENT OF AGRICULTURE. 1962. Crop production: estimated acreages under crops, 1961 and 1962, African cultivation. In Uganda. Department of Agriculture. Annual Report 1962. Uganda, pp.52-56. En., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Uganda.

Data on estimated area planted to beans and other crops in 1961 and 1962 in Uganda are tabulated per province per district. The provinces and districts included were Buganda (Mengo, Masaka, and Mubende), Eastern (Busoga, Bugisu, Bukedi, Teso, and Karamoja), Western (Ankole, Bunyoro, Kigezi, and Toro), and Northern (Lango, Acholi, West Nile/Madi). (CIAT)

2306

29086 UGANDA. DEPARTMENT OF AGRICULTURE. 1958. Revised crop acreage estimates 1945-1956. Area of beans and all major food crops per district. Uganda, pp.3,8-20,23-24. En., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Uganda.

Acreage estimates per district for beans (and other crops) in Uganda from 1945 to 1956 are presented in table form. A comparative estimate for 1939 is also included. Data indicate that Buganda (districts of Mengo, Masaka, and Mubende), Eastern Province (districts of Busoga, Mbale, Bukedi, and Teso), Western Province (districts of Ankole, Bunyoro, Kigezi, and Toro), and Northern Province (districts of Lango, Acholi, West Nile/Madi, and Karamoja) account for 32, 29, 19, and 20 percent, resp., of the total area planted to beans in the country. (CIAT)

2307

29085 UGANDA. DEPARTMENT OF AGRICULTURE. 1955. Crop production: estimated acreages under crops--1954 and 1955. African cultivation. In Uganda. Department of Agriculture. Annual Report 1955. Uganda, pp.22-26,32. En., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Uganda.

Data on estimated area planted to beans and other crops in 1954 and 1955 in Uganda are tabulated per province and per district. The provinces and districts included were Buganda (Mengo, Masaka, and Mubende), Eastern (Busoga, Bugisu, Bukedi, and Teso), Western (Ankole, Bunyoro, Kigezi, and Toro), and Northern (Lango, Acholi, West Nile/Madi, and Karamoja). (CIAT)

2308

29083 UGANDA. DEPARTMENT OF AGRICULTURE. 1947. Beans. In Uganda. Department of Agriculture. Annual Report 1947. Uganda, pp.60. En.

Phaseolus vulgaris. Cultivars. Yields. Uganda.

Bean research activities carried out in Uganda in 1947 are briefly reported. In the 1st rains, var. Victory and Abundance performed best, with yields of 201.6 and 199.3 kg/ha, resp. (Full text)

2309

24804 UGANDA. KAWANDA RESEARCH STATION. 1971. Bean breeding. In -----, Annual Report 1970-71, Uganda. pp.10-12. En.

PHASEOLUS VULGARIS; GERMLASM; CULTIVARS; CROSSBREEDING; BEAN COMMON MOSAIC VIRUS; YIELDS; ADAPTATION; UGANDA.

Breeding activities in beans in Uganda during 1970-71 are summarized. Over 200 accessions were evaluated for yield during the 1st season. The 10 crosses made during the year and their F1 grown during the 2nd season are listed. Short notes on origin and performance (disease resistance and yields) of 8 basic parent collections used in hybridization are provided. BYMV-like symptoms were observed in over 1300 single-plant selections from various crosses. In preliminary yield trials in Bukalasa and Kawanda, several selections yielded significantly more than cv. Banja 2. District var. trials have not rendered many high yielding, acceptable bean var. and even these need further improvement. K20 appears promising, with higher yields than Banja 2 and resistant to *Colletotrichum lindemuthianum*. (CIAT)

2310

33219 WAJJA-MUSUKWE, N. 1967. The problem of pre-mature pod abscission in the common bean (*Phaseolus vulgaris*). Kampala, Uganda. Kawanda Research Station. 10p. En., Sum. En., 18 Ref., 11. [Kawanda Research Station, P.O. Box 7065, Kampala, Uganda]

Phaseolus vulgaris. Flowering. Anthesis. Podding. Abscission. Yields. Yield components. Uganda.

Greenhouse expt. were carried out on the postflowering reproductive development of a determinate 5-noded bean cv. to determine flowering patterns and reproductive abscission of individual nodes on the main stem. Individual flowers were tagged at anthesis and monitored through abscission or pod maturity. Date of flowering, pod setting, and flower or pod abscission were recorded. Abscission was calculated on a per node basis. No. of mature pods/node, seeds/pod, and seed/wt. were recorded for each main stem node. Flower and pod production at different levels within the canopy were variable; the lowest node produced more flowers and pods than the others. Flower abscission was not significant under the exptl. conditions; nearly every flower that opened developed into a pod, and for the whole plant, there was only 4 percent flower abscission. Pod abscission was a more serious problem than flower shedding, the whole plant losing up to 65 percent of its pods. Early opening of flowers had a greater likelihood of producing pods that reached maturity. There were no marked differences in the av. no. of seeds/pod and seed/wt. for the different nodes. The differences in seed yield between nodes were largely due to differences in the no. of pods/node. (AS)

2311

33220 ZAKE, J.Y.K.; SILVER, M.C.; NKWIINE, C. 1967. Preliminary investigations on symbiotic nitrogen fixation of *Rhizobium* beans (*Phaseolus vulgaris*) symbiosis on ferrallitic soil at Makerere University Farm-Kabanyolo, Uganda. Kampala, Uganda, Makerere University. Soil Science Departement. 10p. En., Sum. En., 12 Ref., 11.

Phaseolus vulgaris. Fertilizers. N. Dry matter. Inoculation. Nodulation.
Rhizobium. Strains. Kenya. Uganda.

Preliminary results of research on the *Rhizobium*-bean symbiosis are reported. Field trials were established at the Makerere University Farm-Kayambolo (Kampala, Uganda) since 1987 in a ferrallitic soil with low N content (0.068 percent) and a medium pH (5.9). Treatments included uninoculated and inoculated bean seeds interacting with different levels of ammoniacal and nitrate N fertilizers (0, 20, 40, and 60 kg/ha). Inoculum strains were obtained from Kenya. No significant differences were observed between the effect of N sources on the mean no. of nodules/plant 3 or 6 wk. after planting. However, a highly significant difference was observed in the mean no. of nodules/plant at both sampling times in the same treatment. The fertilization with 40 kg N/ha combined with inoculation gave the highest mean no. of nodules/plant (20.56), over double those of the control (8.81). Differences in nodule wt. (mg) observed between the means of each treatment at both sampling times were mainly due to the developmental process of the nodules. No significant differences were observed between the effect of N sources on the mean dry shoot wt./plant (mg); the application of 60 kg N/ha combined with inoculation gave the highest value (4.64). An analysis of a graph on the trends of mean no. of nodules/plant and mean nodule wt. (mg) indicated that a high no. of nodules was associated with a decrease in nodule mass; high nodule mass was associated with uninoculated plots. Native rhizobia seemed to form bigger though fewer nodules than the inoculum strains introduced from Kenya which formed many nodules but with low nodule mass. The effectiveness of the *Rhizobium* legume symbiosis is usually indicated by nodule mass. (CIAT)

ZAIRE

2312

31397 BUREAU D'ANALYSE ECONOMIQUE DU SERVICE D'ETUDES ET PLANIFICATION DU DEPARTMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. ZAIRE. 1986. Synthèse de la situation actuelle de l'agriculture Zairoise. Projet d'Etudes Sectorielles de l'Agriculture. Projet 070. (Synthesis of the current agricultural situation in Zaire). Kinshasa, Zaire, 93p. Fr., 29 Ref., Il.

Phaseolus vulgaris. Statistical data. Production. Consumption. Income. Maps. Economics. Zaire.

The current situation of the production and commercialization of main food crops (including beans) in Zaire is summarized and analyzed. Statistics are presented on the evolution of bean and pea production as a whole from 1974 to 1984. Data on the evolution of the production indexes of the same crops are given for 1976-84. A marked decrease in the bean and pea production was observed in 1982. Statistics are given on bean consumption (kg/capita/yr) for groups with different levels of income (low, mean, and high) in Kinshasa in 1969-70. A map is included showing the bean commercialization networks operating in the different Zairian regions. Some recommendations for policy improvement in the agricultural sector are given. A synthesis of the production and commercialization of agro-industrial products is also included. (CIAT)

2313

31398 INSTITUT NATIONAL DE LA STATISTIQUE. ZAIRE. 1982. Annuaire statistique du Zaire 1979. (1979 Zaire statistics yearbook). Zaire, Commissariat Général au Plan. v.3, pp.1-8, 107-268, 480-495. Fr., Dat.num.

Phaseolus vulgaris. Prices. Consumption. Marketing. Statistical data. Zaire.

Statistics are presented on the evolution of bean av. retail prices in 1978 in the Zairian markets of Kinshasa, Kananga, Kisangani, Bukavu, Kikwit, Matadi, Mbandaka, and Mbuji-Mayi. Statistics on the evolution of av. retail prices in 1976 are only included for the last 5 markets. For the Matadi, Kikwit, Kisangani, Lubumbashi, Bukavu, Kananga and Mbuji-Mayi markets, data on av. retail price/quarter are given separately for 1979. Data for 1978 are only given for the last 3 markets. Statistics on the evolution of bean wholesale prices in 1978 and 1979 are included for the Kananga and Bukavu markets, resp. (CIAT)

2314

24613 INSTITUT NATIONAL POUR L'ETUDE AGRONOMIQUE DU CONGO BELGE. 1951. Legumineuses: *Phaseolus vulgaris*. (Legumes: *Phaseolus vulgaris*). In Institut National Pour l'Etude Agronomique du Congo Belge. Rapport Annuel 1951. Zaire, Station de Nioka. pp.15-18,31-35. Fr.

Phaseolus vulgaris. Cultivars. Fertilizers. P. Manures. Yields. Rotational crops. Intercropping. Manihot esculenta. Protein content. Zaire.

Comparative trials conducted in Zaire in 1950-51 confirmed the superiority of bean cv. Linhagen H35, Cuarentino H6, and Caraotas H7. Results of 3 expt. on bean cultural practices are also presented. The 1st studied the effect of different fertilizer rates (400, 600, and 1000 kg Reno superphosphate/ha, and 600 kg Reno superphosphate + 40 t manure/ha) applied at the beginning of the rotation scheme beans/sunflower/beans/maize/cassava/beans on the relative yields of the latter compared with an unfertilized control. Increases on bean yields were 23.5, 27.0, and 11.7 percent. The effect of farm manure was especially marked during the 1st cropping season. No significant differences in bean yield were observed in a 2nd expt. between the traditional method of burning crop residues and the practices of burying them or using them as mulch. In a 3rd expt., the intercropping of cassava with beans was particularly interesting since the protein content of the tuber increased significantly. (CIAT)

2315

31440 INSTITUT NATIONAL POUR L'ETUDE ET LA RECHERCHE AGRONOMIQUE. ZAIRE. 1966?. Synthese des travaux de recherche sur le haricot a l'INERA-M'vuazi. (Synthesis of research on beans at INERA M'vuazi). Zaire, 11p. Fr., 4 Ref.

Phaseolus vulgaris. *Phaseolus acutifolius*. *Phaseolus aureus*. *Phaseolus lunatus*. Cultivars. Yields. Selection. On-farm research. Chromosomes. Production. Zaire.

Research on beans conducted since 1950 at the M'vuazi exptl. station, Zaire, is summarized. That year, var. Lombo Mvula, Bamba, Bwenge, and Kaki gave the best yields in a var. trial involving 13 var. The results of on-farm trials conducted in 1956 and 1957 in a total area of 19 and 38.98 ha, resp., and with 56 and 95 farmers, resp., are summarized in tables. The chromosome length is given for 6 *Phaseolus* species (*P. vulgaris*, *P. acutifolius*, *P. aureus*, *P. mungo*, *P. lunatus*, and *P. calcartum*). The results of on-farm trials conducted in 1958 with 146 farmers in a total area of 46.6 ha are also summarized in a table. The main criteria for bean selection are enumerated. Tuta (PV.73) and Ntendesl were the bean var. distributed among the growers of the M'vuazi region. The best 8 var. of 1965 are listed in a table, including their origin, name, and yields. (CIAT)

2316

31620 KADER, A.; FAHEM, F. 1978. Agriculture. (Agriculture). In Atlas de la République du Zaïre. Paris, France, Editions Jeune Afrique. pp.40-49. Fr., Il.

Phaseolus vulgaris. Statistical data. Maps. Production. Zaïre.

The general characteristics of agriculture in Zaïre are described as well as the different stages of agricultural development. Commonly used techniques in the traditional sector are also described. Statistics are given on the production evolution of the main commodities (including beans and peas) as a whole from 1961 to 1972. A map of the agricultural regions is included showing the bean producing areas and the importance of this crop in relation to others. (CIAT)

2317

30865 THORIGNE, J. 1983. Note sur le secteur vivrier au Zaïre: politique et structure des prix (coûts et marges de commercialisation-avril 1983). (Note on the Zaïre food sector: price policy and structure (costs and commercialisation margins-April 1983)). In Fromageot, M.. Prix et politique des prix des produits vivriers en République Populaire du Congo: annexes. Rome, Italy, Food and Agriculture Organization of the United Nations. pp.35-48. Fr.

Phaseolus vulgaris. Statistical data. Prices. Production. Consumption. Zaïre.

The price structure is analyzed for the major commodities (including beans) commercialized in Zaïre in April 1983. A gross margin of 20 percent was found for the collector-distributor. Transportation costs from lower Zaïre account for 6 percent of the purchase price and the net margin for 7 percent. The gross margin for the urban distributor was 17 percent (net margin being 10 percent). Costs and margins between prices to grower and prices to consumer reached 41 percent; transportation accounts for 10 percent, net margin for 20 percent, and other costs for 11 percent. A table is included showing area (ha) planted to beans and production (t) in the different Zaïrian regions during 1980, 1981, and 1986. (CIAT)

2318

31405 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Cultures principales: superficie, rendement, production 1974-1978: haricot. (Major crops: area, yields, and production for 1974-1978: beans). In Zaïre. Département de l'Agriculture. Annuaire des Statistiques Agricoles 1977-1978. Kinshasa, Zaïre, Direction des Etudes et Politique Agricole. Division de la Statistique. pp.57. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Yields. Zaïre.

2319

31406 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Importations, exportations des produits agricoles 1977: haricots. (1977 imports and exports of agricultural products: beans). In Zaïre. Département de l'Agriculture. Annuaire des Statistiques Agricoles 1977-1978. Kinshasa, Zaïre, Direction des Etudes et Politique Agricole. Division de la Statistique. pp.111,114. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Trade. Prices. Zaïre.

2320

31569 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Superficie et production végétale. 1974-1978. A. Tableaux récapitulatifs. (Area and plant

production. 1974-78. Comprehensive tables). In Zaire. Departement de l'Agriculture. Annuaire des statistiques agricoles 1977-1978. Kinshasa, Zaire, Direction des Etudes et Politique Agricoles. Division de la Statistique.. pp.8-17. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Production. Yields. Zaire.

Statistics are given on area planted (ha) to different crops (including beans), yields (t/ha), and production (t) in Zaire for 1974-78. Av. data on the same parameters, for 1970-74, are also included. Data on indexes of area planted and production are given for the same periods. (CIAT)

2321

31570 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Superficie et production végétale. B. Tableaux regionaux. (Area and plant production. B. Regional tables). In Zaire. Département de l'Agriculture. Annuaire des statistiques agricoles 1977-1978. Kinshasa, Zaire, Direction des Etudes et Politique Agricole. Division de la Statistique. pp.18-41. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Yields. Production. Zaire.

Statistics are given on area planted (ha) to different crops (including beans), yields (t/ha), and production (t) for the different regions of Zaire in 1974-78. Av. data on the same parameters are also included for 1970-74. (CIAT)

2322

31571 ZAIRE. DEPARTEMENT DE L'AGRICULTURE. 1980. Superficie et production vegetale. C. Tableaux comparatifs. (Area and plant production. C. Comparative tables). In Zaire. Département de l'Agriculture. Annuaire des statistiques agricoles 1977-1978. Kinshasa, Zaire, Direction des Etudes et Politique Agricole. Division de la Statistique. pp.42-47. Fr., Dat.num.

Phaseolus vulgaris. Statistical data. Yields. Production. Zaire.

Statistics are presented on area planted (ha), yields (t/ha), and production (t) of various agricultural products (including beans) in different regions of Zaire in 1977 and 1978. (CIAT)

2323

31577 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1987. Situation actuelle de l'agriculture Zairoise. (Current situation of the Zairian agriculture). Zaire, Division de Stratégie et de Planification agricole. Projet 660-070/USAID/PRAGMA CORP. 577p. Fr., 126 Ref., Il.

Phaseolus vulgaris. Statistical data. Agricultural projects. Production. Yields. Zaire.

Statistics from the 1982-84 Zairian Agricultural Reactivation Plan are presented on expected and real production of major commodities (including beans). Ituri, a subregion of Upper Zaire, and the areas of Masisi, Beni, and Lubero in Kivu are the major bean-growing regions. A table showing the evolution of the area planted (ha) to beans and peas, production (t), and yields (t/ha) for 1970-84 is included. Another table presents data on expected and real production in the different Zairian regions during 1982-84. All regions met their production goals, except for Kinshasa and Lower Zaire in 1982 and 1983, when production was higher than expected. (CIAT)

2324

31565 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1986. Annuaire des statistiques agricoles 1979-1985. (1979-1985 Yearbook on

agricultural statistics). Kinshasa, Zaire, Service d'Etudes et de Planification Agricole. Division de la Statistique Agricole. 102p. Fr., Dat.num., Il.

Phaseolus vulgaris. Statistical data. Production. Zaire.

Statistics are presented on area planted (ha) and production (t) of various crops (including beans) in Zaire from 1979 to 1985. Data are given for the whole country and by regions. Statistics on the regional distribution of area planted (ha) and production (t) are also given for each year. Graphs showing the evolution of the area planted to this legume and production are included for the same period. (CIAT)

2325

31401 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. La commercialisation des légumes frais et du poisson frais à Kinshasa. (Marketing of fresh vegetables and fish in Kinshasa). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 8p. Fr.

Phaseolus vulgaris. Marketing. Trade. Production. Zaire.

A survey was carried out to determine the amount of fresh legumes (including beans) consumed in Zaire in 1985, their origin, and their distribution networks. Statistics are presented on the Kinshasa fresh legume supply (t) for the producing regions of Lower Zaire, Bandundu, the 2 rural areas of Kinshasa (Maluku and Mont Ngafula), and the vegetable-growing area around Kinshasa. Data on the amount of beans supplied by the Kivu region and from imports are also given; most bean imports come from Belgium. An effort to reduce imports by increasing bean production in Zaire is recommended. (CIAT)

2326

30894 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. Evolution et structure des prix des produits vivriers 1^{er} trimestre 1985. (Evolution and price structure of food products, 1st quarter of 1985). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 26p. Fr., Il.

Phaseolus vulgaris. Statistical data. Consumption. Prices. Costs. Marketing. Zaire.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including white and colored beans) in 9 markets of Kinshasa (Zaire), for the 1st quarter of 1985. Differences are compared and analyzed with data for the preceding quarter. Graphs showing weekly variations of bean prices are also included for 1984 and for the 1st quarter of 1985. (CIAT)

2327

30893 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. Evolution et structure des prix des produits vivriers. 2^{eme} trimestre 1985. (Evolution and price structure of food crops, 2nd quarter of 1985). Zaire, Direction des marchés, Prix et Crédits de Campagne. 25p. Fr., Il.

Phaseolus vulgaris. Statistical data. Prices. Costs. Consumption. Marketing. Zaire.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food crops (including white and colored beans) in 9 markets of Kinshasa, Zaire, for the 2nd quarter of 1985. Differences are compared and analyzed with data for the 1st quarter. Graphs showing weekly variations of retail prices of beans for the 2nd quarter of 1985 are

included. Graphs are also included for weekly variations of semi-wholesale prices of beans during 1984 and during the 1st and 2nd quarters of 1985. (CIAT)

2328

30892 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1985. Evolution et structure des prix des produits vivriers. 3eme trimestre 1985. (Evolution and price structure of food products. 3rd quarter of 1985). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 20p. Fr., Il.

Phaseolus vulgaris. Statistical data. Consumption. Prices. Costs. Marketing. Zaire.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including white and colored beans) in 9 markets of Kinshasa, Zaire, for the 3rd quarter of 1985. Differences are compared and analyzed with data for the 1st and 2nd quarters. Graphs showing weekly variations of bean prices from the 1st to the 3rd quarter of 1985 are also included. (CIAT)

2329

31324 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Evaluation de la campagne de commercialisation 1984. (Evaluation of the 1984 commercialization campaign). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 36p. Fr., Sum. Fr.

Phaseolus vulgaris. Statistical data. Trade. Prices. Consumption. Zaire.

The commercialization situation of various commodities (including beans) in 1984 is described and analyzed for different Zairian regions. In upper Zaire, beans (coming from Ituri and northern Kivu) are bought by middlemen directly from the growers and then sold to Kisangani operators. There, some are sold for regional consumption and the rest is sent to Kinshasa. A marked decrease on bean commercialization was noted because of drought conditions prevailing in northern Kivu, where beans were the major commodity commercialized out of the region, mainly in Goma. Beans grown in the Masisi area are also sent to Goma and then to Kisangani and Kinshasa. Tables are included showing bean av. retail prices for producers according to region for 1984, monthly bean av. retail prices for the main Kinshasa markets in the same year, and bean supplies from April to Sept. 1984. (CIAT)

2330

31323 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Evolution et structure des prix des produits vivriers. 3eme trimestre 1984. (Evolution and price structure of food crops, 3rd quarter of 1984). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 18p. Fr., Il.

Phaseolus vulgaris. Statistical data. Prices. Costs. Consumption. Marketing. Zaire.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including white and colored beans) in 9 markets of Kinshasa, Zaire, for the 3rd quarter of 1984. Differences are compared and analyzed with data for the 2nd quarter. Graphs showing weekly variations of bean prices are also included for the 1st, 2nd and 3rd quarters of 1983 and 1984. (CIAT)

2331

30888 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Structure des prix des produits vivriers, 1er trimestre 1984. (Price

structure of food crops, 1st quarter of 1984). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 15p. Fr., Il.

Phaseolus vulgaris. Statistical data. Prices. Costs. Consumption. Marketing. Zaire.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including white and colored beans) in 9 markets of Kinshasa, Zaire, for the 1st quarter of 1984. Graphs showing weekly variations of bean prices are also included for the same period. (CIAT)

2332

30890 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1984. Structure des prix des produits vivriers, 2eme trimestre 1984. (Price structure of food crops, 2nd quarter of 1984). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 15p. Fr., Il.

Phaseolus vulgaris. Statistical data. Consumption. Prices. Costs. Marketing. Zaire.

Data on av. retail and semi-wholesale prices, costs, and margins are presented for several food products (including white and colored beans) in 9 markets of Kinshasa, Zaire, for the 2nd quarter of 1984. Differences are compared and analyzed with data for the 1st quarter. Graphs showing weekly variations of bean prices for the 1st and 2nd quarters of 1984 are also included. (CIAT)

2333

31338 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Evaluation de la commercialisation des produits vivriers 1981, 1982, 1983. (Evaluation of food product commercialization for 1981, 1982, 1983). Zaire, Direction des Marchés, Prix et Crédits de Campagne. 11p. Fr.

Phaseolus vulgaris. Marketing. Prices. Consumption. Zaire.

Statistics are given on the evolution of prices to producer for various crops (including beans) in Zaire in 1981, 1982, and 1983. (CIAT)

2334

30871 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Structure des prix des produits vivriers, 1er trimestre 1983. (Structure of food product prices (1st quarter of 1983)). Zaire, 12p. Fr., Il.

Phaseolus vulgaris. Statistical data. Prices. Costs. Consumption. Zaire.

Data on av. retail prices, costs, and margins are presented and analyzed for several food products (including beans) in 9 markets of Kinshasa, Zaire, for the 1st quarter of 1983. A gross margin of 20 percent was found for the harvester-distributor; transportation accounted for 6 percent of it. The gross margin for the urban distributor was 17 percent; 10 percent corresponding to net margin. Costs and margins as a whole represented 41 percent; 10, 20, and 11 percent corresponded to transportation, net margin, and other costs, resp. Since bean prices are high, the relative cost value was lower for products other than beans. A graph showing the weekly variations of bean prices during the 1st quarter of 1983 is also included. (CIAT)

2335

30889 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Structure des prix des produits vivriers, 2eme trimestre 1983. (Price

structure of food products. 2nd quarter of 1983). Zaire, Direction des Marchés, Prix et Crédit de Campagne. 8p. Fr., Il.

Phaseolus vulgaris. Statistical data. Prices. Costs. Consumption. Marketing. Zaire.

Data on av. prices, costs, and margins are presented for several food products (including beans) in 9 markets of Kinshasa, Zaire, for the 2nd quarter of 1983. Differences are compared and analyzed with data for the 1st quarter. (CIAT)

2336

30891 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1983. Structure des produits vivriers, 3eme trimestre 1983. (Price structure of food products, 3rd quarter of 1983). Zaire, Direction des Marchés, Prix et Crédit de Campagne. 10p. Fr., Il.

Phaseolus vulgaris. Statistical data. Prices. Costs. Consumption. Marketing. Zaire.

Data on av. prices, costs, and margins are presented for several food products (including beans) in 9 markets of Kinshasa, Zaire, for the 3rd quarter of 1983. Differences are compared and analyzed with data for the preceding quarter. A graph showing weekly variations of bean retail prices is also included for the 1st, 2nd, and 3rd quarters of 1983. (CIAT)

2337

31575 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1982. Plan de relance agricole 1982-1984. (1982-1984 Agricultural reactivation plan). Zaire, 210p. Fr.

Phaseolus vulgaris. Statistical data. Production. Agricultural projects. Zaire.

Data are given on bean production in Zaire in 1980-81 and production objectives for 1982-84 for the integrated rural development projects of the Mwaka area (Western Kasai) and the Eastern Kasai maize project. Statistics are also given for 1981-84 for the Kwango-Kwilu agricultural development project. The bean production objectives for the Luala and Mbanza-Ngungu projects are given for 1982-85. For the latter, data are also included for 1980-81. The annual growth rate of beans, peas, and bambara groundnuts (as a whole) from 1981 to 1984 was 2.6 percent. A table is included with statistics on production of these legume crops as a whole by region for 1978-81. Production objectives for 1982-84 are also presented. (CIAT)

2338

31576 ZAIRE. DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1982. Situation actuelle de l'agriculture Zairoise. (Current situation of the Zairian agriculture). Zaire, Division d'Etudes et de Programation. Bureau de Planification Agricole. Projet 660-070 USAID. 331p. Fr., 79 Ref., Il.

Phaseolus vulgaris. Statistical data. Production. Yields. Agricultural projects. Zaire.

Statistics are presented on the production objectives established by the Zairian Agricultural Reactivation Plan for 1982-84 for various commodities (beans, peas, and bambara groundnuts included as a whole). Ituri, a subregion of Upper Zaire and the areas of Masisi, Beni, and Lubero in Kivu, are the major bean-growing regions. A table showing the evolution of area planted (ha) to beans and peas, production (t), and yields (t/ha) for

1970-80 is included. Another table presents data on the production (t) expected by the legume program (beans, peas, and bambara groundnuts as a whole) for the different Zairian regions for 1982-1984. (CIAT)

2339

31402 ZAIRE, DEPARTEMENT DE L'AGRICULTURE ET DU DEVELOPPEMENT RURAL. 1979. Synthese sur le programme de production de principales denrées alimentaires: les légumineuses (haricots, arachide et soja). (Synthesis of the production program for the major food crops: legumes (beans, groundnuts, and soybeans)). In Zaire. Département de l'Agriculture et du Développement Rural. L'Agriculture Zairoise: situation courante et contraintes. Kinshasa, Zaire, pp.46-48. Fr., Det.num.

Phaseolus vulgaris. Statistical data. Production. Zaire.

Statistics are presented on the production of the main legume crops (including beans) in Zaire from 1973 to 1978. Low production is a result of poor transportation and communication and other limitations established by some agronomic and socioeconomic aspects of the country. Measures aiming at changing this situation are enumerated. (CIAT)

ZAMBIA

2340

31823 DOUGNAC, M. 1987. The use of residual moisture in wetlands. An alternative for food production in the dry season. In Holmes, J.C., ed. Improving food crop production on small farms in Africa. Rome, Food and Agriculture Organization of the United Nations. pp.253-271. En., Sum. En., 7 Ref., Il.

Phaseolus vulgaris. Soil moisture. Land use. Fertilizers. Zambia.

An exptl. program started in Northern Zambia in 1984 to identify why farmers do not use wetlands and to assess the farming possibilities of these areas for food production in the dry season. The main characteristics of wetlands are described in detail and information is given on the performance of various crops (beans included) after 3 yr. of consecutive cultivation. The main constraints regarding soil chemistry and land use are mentioned. Almost all crops evaluated can be grown if recommendations on management practices are followed. (CIAT)

2341

28987 KANNAIYAN, J.; HACIWA, C.H.; GREENBERG, D.C.; MBEWE, M.N. 1986. ZAMBIA: ASCOCHYTA BLIGHT OF BEAN IN ZAMBIA. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:10-11. EN. (GRAIN LEGUME RESEARCH TEAM, MBEKERA REGIONAL RESEARCH STATION, P.O. BOX 510089, CHIPATA, ZAMBIA)

PHASEOLUS VULGARIS; ASCOCHYTA PHASEOLORUM; CULTIVARS; RESISTANCE; SELECTION; ZAMBIA.

BACKGROUND INFORMATION IS GIVEN ON ASCOCHYTA LEAF SPOT (ASCOCHYTA PHASEOLORUM) IN ZAMBIA, A MINOR DISEASE WHICH APPEARED IN A SEVERE FORM IN A NO. OF BEAN TRIALS DURING THE 1984-85 SEASON IN MBALA, NORTHERN PROVINCE. OF THE 835 BEAN LINES SCREENED FOR THEIR REACTION TO THE DISEASE, 8 WERE HIGHLY RESISTANT, 6 OF WHICH WERE FROM THE CIAT BEAN PROGRAM: ZAA, ZAA 84007, ZAA 84072, A-345, A-484, AND A-493; LINE G-05477 FROM USA AND MURAGIRAKI FROM UGANDA WERE ALSO HIGHLY RESISTANT. BEAN LINES A-345, A-484, AND A-493 WERE ALSO RESISTANT TO ANGULAR LEAF SPOT, RUST, AND ANTHRACNOSE, RESP.; THEREFORE THEY MAY BE USEFUL IN DEVELOPING MULTIPLE DISEASE-RESISTANT CV. (CIAT)

2342

33283 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean disease nursery - BCMV differential test. In Eastern Province Agricultural Development Project, Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.22-23. En.

Phaseolus vulgaris. Cultivars. Resistance. Bean common mosaic virus. *Isariopsis griseola*. *Uromyces phaseoli*. *Pseudomonas syringae* pv. *phaseolicola*. CIAT-2. Yields. Zambia.

BCMV strains prevalent in Zambia were identified with a set of 20 differential bean cv. All cv. were also screened for *Isariopsis griseola*, *Uromyces phaseoli*, and *Pseudomonas syringae* pv. *phaseolicola*. As shown in a table based on their reaction to BCMV, the differentials were grouped into 5 categories (resistant, moderately resistant with local lesion, moderately resistant with mild mosaic, susceptible with severe mosaic, and susceptible with severe black root). The results were sent to the CIAT bean virologist for his opinion on the type of BCMV present in Zambia. Great Northern-31 and -123, Red Mexican-34 and -35, Puregold Wax, Michelite, and Widusa-b showed multiple resistance (1-5 score) to all diseases. Only BAT-1426 and ZPV-191 gave grain yields of above 650 kg/ha in comparison to only 80 kg/ha given by Misamfu Speckled Sugar (control). There were highly significant correlations between yields and BCMV and *I. griseola* severity scores indicating the importance of these diseases. (CIAT)

2343

33288 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean disease nursery - CIAT *Ascochyta* blight nursery. In Eastern Province Agricultural Development Project, Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.28-29. En.

Phaseolus vulgaris. Cultivars. *Ascochyta phaseolorum*. Resistance. Yields. CIAT-2. Zambia.

Local and CIAT bean lines were evaluated for reaction to *Ascochyta phaseolorum* in Mbala, Zambia. Out of 26 lines screened, 4 (G 6040, G-10800, VRA-81018, and G-5960) were resistant (1-3 score) whereas 13 were tolerant (3.5-5.0 score). The performance of these lines is presented in a table. The resistant line G 6040 gave the highest yields (2700 kg/ha), followed by Carioca, a susceptible control (1953 kg/ha). There was a significant correlation between grain yields and 1st *Ascochyta* score ($r = -0.44$). (CIAT)

2344

33285 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean disease nursery- CIAT International Bean Angular Leaf Spot Test. In Eastern Province Agricultural Development Project, Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.25. En.

Phaseolus vulgaris. Cultivars. Selection. Yields. *Isariopsis griseola*. Resistance. Statistical analysis. CIAT-2. Zambia.

CIAT bean lines were evaluated for resistance to *Isariopsis griseola* in Mbala, Zambia. Disease severity was moderate; out of 98 lines screened, 13 yielded significantly more (1329-1592 kg/ha) than the control Mbala Local (708 kg/ha). Promising lines are listed in a table. There was a significant correlation between grain yield and disease severity. (CIAT)

2345

33286 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean disease nursery - CIAT International Bean Anthracnose Test. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.26. En.

Phaseolus vulgaris. Cultivars. *Colletotrichum lindemuthianum*. Resistance. *Ascochyta phaseolorum*. Yields. CIAT-2. Zambia.

The CIAT bean lines evaluated in Mbala, Zambia, resistance to *Colletotrichum lindemuthianum* showed, in general, low to moderate disease severity. They also screened for resistance to *Ascochyta phaseolorum*. The 20 anthracnose-resistant lines that yielded more than 900 kg/ha are listed in a table. (CIAT)

2346

33287 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean disease nursery - CIAT International Bean Rust Nursery. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.27. En.

Phaseolus vulgaris. Cultivars. Selection. Resistance. Yields. *Uromyces phaseoli*. *Ascochyta phaseolorum*. CIAT-2. Zambia.

The CIAT lines evaluated in Mbala, Zambia, for resistance to *Uromyces phaseoli* showed a very low disease severity. They were also screened for *Ascochyta phaseolorum*. The 27 entries yielding above 800 kg/ha, in comparison to the yield of 621 kg/ha given by the control Mbala Local, are listed in a table. (CIAT)

2347

33282 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean disease nursery (SPS-BCMV). In Eastern Province Agricultural Development Project, Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.21. En.

Phaseolus vulgaris. Cultivars. Selection. Yields. Bean common mosaic virus. *Uromyces phaseoli*. *Isariopsis griseola*. *Pseudomonas syringae* pv. *phaseolicola*. Resistance. Zambia.

Bean single plant selections were evaluated in Msekera, Zambia, for resistance to BCMV, *Isariopsis griseola*, *Uromyces phaseoli*, and *Pseudomonas syringae* pv. *phaseolicola*. The original BCMV-susceptible line Mexico 142 was screened repeatedly resulting in 2 multiple resistant lines with a good yield potential of 783 and 1042 kg/ha in comparison with the control Misamfu Speckled Sugar (246 kg/ha). Two PI-150414 selections showed multiple disease tolerance and yielded more than 1000 kg/ha. From the Mbala Local seed mixtures, white and brown speckled seed types showed moderate resistance to BCMV in comparison to severe BCMV in original Mbala Local and had higher yields (611 and 630 kg/ha, resp.) than Mbala Local (380 kg/ha). The promising bean lines are listed in a table. (CIAT)

2348

33290 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean disease nursery-survey for bean diseases. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.31-32. En.

Phaseolus vulgaris. *Uromyces phaseoli*. *Isariopsis griseola*. *Ascochyta phaseolorum*. *Colletotrichum lindemuthianum*. *Phoma*. *Elsinoe phaseoli*. Disease transmission. Viruses. Zambia.

The prevalence of various bean diseases (*Uromyces phaseoli*, *Ascochyta phaseolorum*, *Colletotrichum lindemuthianum*, *Isariopsis griseola*, *Phoma*, and *Elsinoe phaseoli*) and their relative importance were studied in the major bean growing areas of Zambia. Observations were recorded at 7 locations; the size of the plots observed varied from 0.2 to 2.0 ha. Beans were grown as a sole crop in a loamy soil and were in flowering and podding stages when the study was conducted. *U. phaseoli* was recorded in all localities and its severity ranged from low to moderate, as shown in a table. *A. phaseolorum*, *C. lindemuthianum*, and *I. griseola* were recorded more frequently than *Phoma* and *E. phaseoli*. In Msekera, a virus disease named "X" was recorded mostly in VEF and IBYAN being severe in 11 lines. The seeds collected from these lines were planted in a greenhouse; 1 mo. after planting, typical virus disease symptoms were recorded in 8 lines. The percentage of seed transmission varied from 0.0 to 31.6, clearly indicating the seed-borne nature of the causal agent. Further studies are in progress. (CIAT).

2349

33284 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. Bean disease nursery-Zambia scab resistance nursery. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.24. En.

Phaseolus vulgaris. Cultivars. Selection. *Elsinoe phaseoli*. Resistance. *Isariopsis griseola*. *Ascochyta phaseolorum*. Yields. Zambia.

Bean lines were evaluated for resistance to *Elsinoe phaseoli* in Mbala, Zambia. Out of the 91 lines screened, 81 showed resistance to the disease (1-3 score). The promising bean entries that yielded over 400 kg/ha are listed in a table. The control A-485 yielded only 22 kg/ha. There was a significant correlation between grain yield and severity of *E. phaseoli*, indicating the importance of this disease in relation to *Isariopsis griseola* and *Ascochyta phaseolorum*. (CIAT)

2350

33281 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. Bean disease resistance nursery (BCMV). In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.20. En.

Phaseolus vulgaris. Cultivars. Bean common mosaic virus. *Isariopsis griseola*. *Uromyces phaseoli*. *Pseudomonas syringae* pv. *phaseolicola*. Resistance. Yields. Statistical analysis. Zambia.

Bean lines were evaluated in Msekera, Zambia, for resistance to BCMV, *Isariopsis griseola*, *Uromyces phaseoli*, and *Pseudomonas syringae* pv. *phaseolicola*. Out of the 66 entries, 14 BCMV-resistant lines, which yielded significantly higher than the control (Misamfu Speckled Sugar), are listed in a table. Multiple disease resistance was shown by lines ZPV-291, -292, -299, and -318 a multiple regression of the grain yield against the disease severity scores gave a highly significant multiple correlation with *I. griseola* (P less than 0.001), BCMV (P less than 0.01), and *Pseudomonas syringae* pv. *phaseolicola* (P less than 0.05), giving significant yield reductions with high disease scores. (CIAT)

2351

33289 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. Bean foliar disease control trial. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.30. En.

Phaseolus vulgaris. Fungicides. *Elsinoe phaseoli*. *Isariopsis griseola*. *Ascochyta phaseolorum*. *Colletotrichum lindemuthianum*. Yields. Zambia.

The effectiveness of 4 different fungicides (chlorothalonil, benomyl, maneb, and mancozeb at rates of 3 liter and 2, 2, and 2.5 kg/ha a.i., resp) was evaluated in controlling various bean leaf diseases (*Elsinoe phaseoli*, *Isariopsis griseola*, *Ascochyta phaseolorum*, and *Colletotrichum lindemuthianum*). Yield losses due to these diseases were also estimated. Benomyl, chlorothalonil, and maneb controlled all diseases significantly better than mancozeb and the control (water spray). Even though fungicide sprays increased grain yields (15 and 39 percent for mancozeb and benomyl, resp.) no significant differences were observed between treatments. (CIAT)

2352

33280 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. Bean germplasm. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.18. En.

Phaseolus vulgaris. Germplasm. Yields. Bean common mosaic virus. *Xanthomonas campestris* pv. *phaseoli*. *Pseudomonas syringae* pv. *phaseolicola*. Resistance. Zambia.

Of the 384 bean germplasm accessions screened in Msekera, Zambia, for yield potential and resistance to BCMV, *Xanthomonas campestris* pv. *phaseoli*, and *Pseudomonas syringae* pv. *phaseolicola*, only 11 gave a reasonable grain yield of 700 kg/ha. Eight lines were free of BCMV and 129 showed resistance. Only 1 line was free of *Xanthomonas campestris* pv. *phaseoli* and 130 more were resistant. The lines that gave a reasonable grain yield are listed in a table. (CIAT)

2353

33291 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. Bean pest resistance; beanfly tolerance trial. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.33-35. En.

Phaseolus vulgaris. *Ophiomyia phaseoli*. Cultivars. Resistance. Bean common mosaic virus. Yields. Lodging. Zambia.

Bean cv. showing tolerance to *Ophiomyia* spp. attacks were identified at Msekera exptl. station, Zambia. Two planting dates were selected since, in previous trials, 1 species of beanfly (*O. phaseoli*) appeared earlier in the season than the other species (*O. spencerella*). There was no significant difference in the total no. of beanflies emerging from stem samples between entries tested in the 1st planting date. It was also demonstrated that there is no significant correlation between the no. of beanflies emerging from a specific entry and its grain yield, since in many cases, entries giving the highest yield were also susceptible to beanfly attack. Dead plant score and lodging score were established as valid methods to assess the effect to beanflies in the various entries. In the 1st planting date, both scores were inversely related to yield and were positively correlated with each other. In the 2nd planting date, plant loss was severe due to

diseases (especially BCMV) and beanfly attacks, however, the tolerance of var. Carioca observed at both planting dates was particularly noticeable. (CIAT)

2354

33293 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean seed treatment trial. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.38-39. En.

Phaseolus vulgaris. *Ophiomyia phaseoli*. Insecticides. Seed treatment. Fertilizers. N. Yields. Insect control. Planting. Timing. Zambia.

Bean seed protection against *Ophiomyia* sp. given by insecticide (endosulfan) treatment was determined as well as the effect on yield of a basal fertilization with and without seed dressing. Expt. were conducted at the Msekera exptl. station, Zambia, using the bean low yielding var. Misamfu Speckled Sugar and 2 planting dates. Excellent control of the beanfly was obtained by seed dressing prior to planting; no flies emerged from stem samples taken from treated plots at either planting dates. At both planting dates, significantly more flies emerged from plants in plots with fertilizer alone compared with the untreated control, since N fertilization attracts more insect species because of a vigorous plant development. There were no significant differences in dry bean yield in the 1st planting date; in the 2nd, dry bean yield was significantly higher only in the seed dressing and fertilizer combination which yielded almost twice the yield of the control. (CIAT)

2355

33277 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Bean variety nodulation evaluation. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.13-14. En.

Phaseolus vulgaris. Cultivars. Nodulation. Fertilizers. Urea. Yields. Zambia.

Promising bean lines were evaluated in Mbalo, Zambia, for nodulation and yield under 2 fertilizer rates (0 and 70 kg urea/ha). Nodule no./plant at 28 days after planting was higher in the plots without N as expected whereas at 59 days after planting, the nodule no. score showed significant differences among var., with BAT 85, Carioca, A439, and A442 showing the best nodulation scores (low score equal to high nodule no.). Bean line A442 outyielded all lines tested, followed by Carioca and A439. A highly significant correlation (P less than 0.001) was observed between yield and nodule no. score, with higher yield being associated with a higher no. of nodules. (CIAT)

2356

33279 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. CIAT Dwarf Bean VEF 1985 (Viveros del equipo de frijol). In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.17. En.

Phaseolus vulgaris. Cultivars. Yields. Bean common mosaic virus. *Xanthomonas campestris* pv. *phaseoli*. *Isariopsis griseola*. Resistance. CIAT-2. Zambia.

The CIAT bean lines selected for Africa were evaluated for yield and resistance to BCMV, *Xanthomonas campestris* pv. *phaseoli*, and *Isariopsis*

griseola. Lines yielding 1000 kg/ha and over and the controls (Caricca and Misamfu Speckled Sugar) are listed in a table. In general, line performance was poor; however, the AFR lines (from the CIAT's breeding program for Africa) performed rather well and so did the PAI- and PAT-lines. The 10 lines which yielded more than 1150 kg/ha were selected for the preliminary bean var. trial for the coming season. (CIAT)

2357

33276 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. CIAT International Bean Yield and Adaptation Nursery 1985 nos.258557B, 258558B, 258526C, 258528C, 258539D, 258540D, 458507, 458508. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.7-12. En.

Phaseolus vulgaris. Cultivars. Resistance. Yields. Bean common mosaic virus. *Isariopsis griseola*. *Ascochyta phaseolorum*. *Uromyces phaseoli*. *Elsinoe phaseoli*. *Colletotrichum lindemuthianum*. *Xanthomonas campestris* pv. *phaseoli*. *Pseudomonas syringae* pv. *phaseolicola*. CIAT-2. Zambia.

Various IBYANs were established at Msekera exptl. station and Mbala, Zambia, to test the performance of promising var. from the CIAT bean program. In the 1st IBYAN at Msekera, out of the 20 lines screened for resistance to BCMV, *Isariopsis griseola*, *Xanthomonas campestris* pv. *phaseoli*, *Pseudomonas syringae* pv. *phaseolicola* and to *I. griseola*, *Elsinoe phaseoli*, and *Uromyces phaseoli* in Mbala, only PVA 340 showed multiple disease tolerance at both sites. The performance of the 18 entries forming the 2nd IBYAN, regarding resistance to BCMV, *I. griseola*, *Xanthomonas campestris* pv. *phaseoli*, *E. phaseoli*, *U. phaseoli*, and *Colletotrichum lindemuthianum*, is given in a table. There were no particularly promising lines in these IBYANs. The best line (PVA 773) gave a mean yield of 654 kg/ha. In the 3rd IBYAN, PAI 106 gave a mean yield of 1108 kg/ha over the 2 sites and showed low scores regarding resistance to all the diseases evaluated (BCMV, *I. griseola*, *X. campestris* pv. *phaseoli*, *Ascochyta phaseolorum*, *E. phaseoli*, *C. lindemuthianum*, and *U. phaseoli*). In the 4th IBYAN, established in Mbala and Misamfu, out of the 16 entries screened for resistance to *E. phaseoli*, *C. lindemuthianum*, *U. phaseoli*, and *I. griseola*, only 2 (MAM-6 and ZAV-83-6) showed multiple disease tolerance. In most of the material evaluated, BCMV, *I. griseola*, *E. phaseoli*, and *C. lindemuthianum* closely correlated to yield whereas *U. phaseoli*, *A. phaseolorum*, *X. campestris* pv. *phaseoli*, and *P. syringae* pv. *phaseolicola*, though severe, did not correlate to grain yield. (CIAT)

2358

33296 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. CIAT International Bean Yield and Adaptation Nursery 708512: climbing beans, small red seed. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. p.43. En.

Phaseolus vulgaris. Cultivars. Adaptation. *Zea mays*. Intercropping. Temperature. *Ascochyta phaseolorum*. Yields. Bean common mosaic virus. CIAT-2. Zambia.

Promising lines from the CIAT bean program were tested for adaptability in Mbala, Zambia. The 14 bean lines were intercropped with maize MMV 600. Since the bean lines are supposedly adapted to higher temp., incidence of *Ascochyta phaseolorum* (more severe under low temp.) was very high. ACV 8312 was the only outstanding and outyielding bean line. The severity of *A. phaseolorum* was very closely correlated with yield; ACV 8312 showed the

Least disease severity and was free of BCMV. Other 5 lines (ACV 8311, ACV 8316, ACV 8326, ACV 8327, and ACV 8342) were also found free of BCMV. (CIAT)

2359

33297 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA, 1986. CIAT International Bean Yield and Adaptation Nursery 858506; assorted coloured climbing beans, cool climate. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.44-45. En.

Phaseolus vulgaris. Cultivars. Zea mays. Adaptation. Intercropping. Ascochyta phaseolorum. Bean common mosaic virus. Yields. Climbing beans. Temperature. CIAT-2. Zambia.

Promising lines from the CIAT bean program were tested for adaptability in Mbala, Zambia. The 16 bean lines were intercropped with maize MMV 600. Less Ascochyta phaseolorum severity was observed; however, bean yields were better in the previous climbing bean trial. Though these lines were selected for Ascochyta resistance (a character supposedly important for climbing beans in cooler climates), they were not effectively selected for higher yields. Line VCB 81012 gave the highest yields (1446 kg/ha), was selected for the next season's national trial, and had the highest Ascochyta score among the test lines. Only 2 entries (ZAV-8369 and ZAV-8371) showed combined resistance to A. phaseolorum and BCMV, and 5 entries (ZAV-8395, ZAV-8391, VCB 81012, VCB 81020, and Mbala Local) were completely free of BCMV. The severity of this disease was more closely related to yield than did the severity of Ascochyta. (CIAT)

2360

33292 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA, 1986. CIAT regional beanfly resistance nursery. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.36-37. En.

Phaseolus vulgaris. *Ophiomyia phaseoli*. Cultivars. Resistance. CIAT-2. Yields. Stems. Lodging. Zambia.

The sources and mechanisms of resistance to *Ophiomyia* spp. were identified in a bean trial carried out by CIAT at the Msekera exptl. station, Zambia. In spite of the very low yields (the highest being 267 kg/ha) given by the 20 bean entries, some useful information was obtained regarding the effect of beanfly infestation between the different cv. The mean no. of beanflies emerging from a sample of 5 stems/plot ranged from 1.34 for G 5653 to 3.69 for TMO 97; the mean lodging score, on a 1-9 scale, ranged from 2.00 for G 5653 to 6.75 for G 5751. There was no correlation between yield and no. of beanflies emerging from stem samples and between lodging score and no. of beanflies; however, there was a significant negative correlation between lodging score and yield ($r = -0.302$). *Ophiomyia spencerella*, *O. phaseoli*, and *O. centrosematis* were identified at rates of 88, 8, and 4 percent, resp. The 1st species is of special interest since it appears to be the most harmful for bean crops in Zambia. (CIAT)

2361

33278 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA, 1986. 1985/86 preliminary bean inoculation trial. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.15-16. En.

Phaseolus vulgaris, *Rhizobium phaseoli*. Strains. Fertilizers. N. Inoculation. Nodulation. Yields. Zambia.

The effectiveness of 3 *Rhizobium phaseoli* strains in a mixture was evaluated and compared with N fertilization on bean var. Carioca. At 28 days after planting, a higher no. of nodules (67) was observed in the inoculation treatment as compared with the other treatments (8, 13, and 4 nodules/plant for the low, medium, and high N, resp.). By 53 days after planting, there was less variation in nodulation as the non-inoculated treatments also produced considerable no. of nodules. The inoculated treatment by then had a significantly better nodule no. score (3) than the N-fertilized treatments (5), with the control being intermediate (4). Differences in yield were almost but not quite significant (P equal to 0.05) over treatments; however, higher yields were obtained with the inoculation and the higher N treatments (1603 and 1552 kg/ha, resp.) if compared with the control and the medium N treatments (1316 and 1258 kg/ha, resp.), indicating the possible value of inoculation. (CIAT)

2362

33294 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. Zambia National Bean Variety: climbing beans intercropped with maize. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.40-41. En.

Phaseolus vulgaris, *Zea mays*. Intercropping. Yields. Bean common mosaic virus. *Isariopsis griseola*. *Ascochyta phaseolorum*. Resistance. Cultivars. Zambia.

Some bean lines were evaluated in 3 localities of Zambia for suitability to intercropping with maize. Bean lines ZAV 8344, ZAV 8313 and VRA 81054 gave mean yields of over 1500 kg/ha in all sites. ZAV 8332, ZAV 8349, and VCA 81007 also performed well, giving mean yields of around 1400 kg/ha. There was no significant correlation between the yields of beans and those of associated maize, though at the Msekera exptl. station, the sole cropped maize outyielded most intercrops. The data for maize yield in Nount Makulu is not reliable since part of the crop was stolen resulting in a high coefficient of variation. In Mbala, beans outyielded the companion maize; maize as a sole crop was not better than intercropped maize. The latter was extremely pale and stunted due to low soil pH. This performance makes the maize-bean intercrop very useful; yield is more than double thus increasing the farmer's income since bean prices are higher than those of maize in this locality. Low to moderate severity of BCMV and *Isariopsis griseola* was recorded at the Msekera exptl. station. VCA 81007, VRA 81054, ZAV 8332, ZAV 8344, and ZAV 8394 were resistant to these diseases. In Mbala, *Ascochyta phaseolorum* caused severe damage to most of the entries; however, the severity of BCMV was low. Mbala Local, VCA 81007, and ZAV 8313 were free of BCMV. (CIAT)

2363

33274 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT. ZAMBIA. 1986. Zambia National Dwarf Bean Variety. Advanced disease resistance nursery. In Eastern Province Agricultural Development Project. Zambia. Grain Legume Research. Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station. pp.1-4. En.

Phaseolus vulgaris. Cultivars. Adaptation. Yields. Bean common mosaic virus. *Pseudomonas syringae* pv. *phaseolicola*. *Isariopsis griseola*. *Xanthomonas campestris* pv. *phaseoli*. *Colletotrichum lindemuthianum*. *Elsinoe phaseoli*. Resistance. Zambia.

The performance of 20 bean var. which showed promise in Zambia in previous years was tested in different localities. The newly released var. Carioca (932 kg/ha) and the lines A429 (999 kg/ha), A439 (881 kg/ha), and A442 (1058 kg/ha) showed outstanding performance at all sites and gave 4 times and more the yield of the control Misamfu Speckled Sugar (216 kg/ha). A442 gave the highest yield; its seed size (slightly larger than Carioca's) seems to favor it; it also showed a remarkable yield stability. Disease scores recorded from Msekera, Mbala, Misamfu, Mutanda, and Mount Makulu are summarized in a table. At Msekera, *Pseudomonas syringae* pv. *phaseolicola*, BCMV, *Isariopsis griseola*, and *Xanthomonas campestris* pv. *phaseoli* were recorded. ZPV-292 was immune to BCMV and BAT 1426 and A463 were tolerant; multiple resistance to all 4 diseases was shown by BAT 1426 and PV 791. At Mbala, bean var. were screened for *Elsinoe phaseoli*, BCMV, *Uromyces phaseoli*, and *Colletotrichum lindemuthianum*. Carioca, A 429, A439, and PV359 showed multiple resistance to the 4 diseases. *C. lindemuthianum* and *I. griseola* at Mount Makulu and *I. griseola* at Mutanda were also recorded. Entries A429, PV781, and PV791 showed multiple disease resistance across sites. Carioca also showed similar multiple disease resistance across sites, except at Msekera, where it was susceptible to BCMV. A regression analysis between grain yields and disease scores carried out at the former sites indicated that *I. griseola*, *C. lindemuthianum*, and *E. phaseoli* were the most important diseases in terms of yield reductions. (CIAT)

2364

33295 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Zambia preliminary bean variety trial; climbing beans intercropped with maize. In Eastern Province Agricultural Development Project, Zambia, Grain Legume Research, Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station, p.42. En.

Phaseolus vulgaris. *Zea mays*. Intercropping. Yields. Climbing beans. Cultivars. Bean common mosaic virus. *Pseudomonas syringae* pv. *phaseolicola*. *Ascochyta phaseolorum*. *Isariopsis griseola*. Resistance. Zambia.

Some climbing bean var. were evaluated for suitability to intercropping with maize at the Msekera exptl. station and in Mbala, Zambia. The performance of the 10 best lines is given in a table. Lines ACV 84032 and ACV 84029 gave the highest mean yields at both sites (1042 and 999 kg/ha, resp.); however, disease severity resulted in lower yields as compared with the best lines of the national trial. All entries were screened for BCMV and *Pseudomonas syringae* pv. *phaseolicola* at the Msekera exptl. station and to BCMV and *Ascochyta phaseolorum* at Mbala. At both sites, ACV 84034 was more resistant to these diseases than the other entries. There was a highly significant correlation between BCMV severity and yields at both sites and between *A. phaseolorum* severity and yields at Mbala. There was no correlation between *Pseudomonas syringae* pv. *phaseolicola* and *Isariopsis griseola* with yield at Msekera exptl. station; climbing beans may escape the rain-splash-borne diseases more effectively because of their climbing on the maize. (CIAT)

2365

33275 EASTERN PROVINCE AGRICULTURAL DEVELOPMENT PROJECT, ZAMBIA, 1986. Zambia preliminary dwarf variety trial. Disease resistance nursery. In Eastern Province Agricultural Development Project, Zambia, Grain Legume Research, Annual Report 1985-1986. Chipata, Zambia, Msekera Regional Research Station, pp.5-6. En.

Phaseolus vulgaris. Dwarf beans. Cultivars. Resistance. Bean common mosaic virus. *Xanthomonas campestris* pv. *phaseoli*. *Isariopsis griseola*. *Pseudomonas syringae* pv. *phaseolicola*. *Elsinoe phaseoli*. *Uromyces phaseoli*. *Colletotrichum lindemuthianum*. *Ascochyta*. Yields. CIAT-2, Zambia.

Results of a preliminary dwarf bean var. trial/disease resistance nursery, established in Msekera and Mbala (Zambia), are reported. Lines PAT 10, PAT 12, PAI 16, PAI 26, PAI 78, PAI 133, and A 369, with a mean yield of over 1200 kg/ha, were selected for a subsequent national var. trial. From the 100 lines evaluated for resistance to major diseases (BCMV, Xanthomonas campestris pv. phaseoli, Isariopsis griseola, Pseudomonas syringae pv. phaseolicola, Elsinoe phaseoli, Uromyces phaseoli, Colletotrichum lindemuthianum, and Ascochyta sp.), only G-2338 (a CIAT germplasm line) showed multiple disease resistance. Other 16 lines (listed in a table) showed reasonable tolerance to all diseases. E. phaseoli and C. lindemuthianum significantly reduced yields in Mbala as well as BCMV and I. griseola in Msekera. (CIAT)

2366

27053 WARREN, A. 1985. ZAMBIA: BCMV. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; CULTIVARS; CROP LOSSES; BEAN COMMON MOSAIC VIRUS; RESISTANCE; ZAMBIA.

AREAS AFFECTED AND CROP LOSSES CAUSED BY BCMV IN ZAMBIA ARE BRIEFLY MENTIONED. OF 3 OFFICIALLY RELEASED BEAN VAR. (BAT 331, NEP 2, AND CARIOKA, BAT 331 HAD THE HIGHEST LEVEL OF RESISTANCE TO THE VIRUS. (CIAT)

2367

27052 WARREN, A. 1985. ZAMBIA: BEAN NUTRITION/SOILS. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; FERTILIZERS; N; P; K; S; MALAWI.

FERTILIZER (N, P, K, S) APPLICATION RATES RECOMMENDED BY THE MINISTRY OF AGRICULTURE ARE GIVEN FOR BEANS CULTIVATED IN LOW, MEDIUM, AND HIGH FERTILITY SOILS IN ZAMBIA. SOIL CHARACTERISTICS IN FARMERS' FIELDS IN THE NORTHERN REGION ARE DESCRIBED. (CIAT)

2368

27055 WARREN, A. 1985. ZAMBIA: BEAN PRODUCTION DATA. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 4P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PRODUCTION; ZAMBIA.

STATISTICAL DATA ON CULTIVATED AREA, PRODUCTION, AND CONSUMPTION OF BEANS DURING THE YEARS 1983-84 ARE PRESENTED FOR 48 ZAMBIAN DISTRICTS. (CIAT)

2369

27054 WARREN, A. 1985. ZAMBIA: BEAN SEED. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; SEED PRODUCTION; ZAMBIA.

THE REASONS WHY BEAN SEED PRODUCTION HAS DECLINED IN ZAMBIA ARE MENTIONED AND PLANTING AND FERTILIZATION PRACTICES ARE BRIEFLY DESCRIBED. (CIAT)

2370

26047 ZAMBIA. MINISTRY OF AGRICULTURE AND WATER DEVELOPMENT. 1985. BEAN OBSERVATION PLOTS. IN ----- . GRAIN LEGUME RESEARCH. ANNUAL REPORT 1984/85. CHIPATA, MSEKERA REGIONAL RESEARCH STATION. PP.18-20. EN.

INSECT BIOLOGY; OPHIOMYIA CENTROSEMATIS; OPHIOMYIA PHASEOLI; OPHIOMYIA SPENCERELLA; PHASEOLUS VULGARIS; PREDATORS AND PARASITES; ZAMBIA.

BEAN OBSERVATION PLOTS WERE ESTABLISHED AT 11 ZAMBIAN SITES TO OBTAIN DATA ON THE BIOLOGY OF THE SPECIES OF BEAN FLY. THREE OPHIOMYIA SPECIES WERE IDENTIFIED, NAMELY O. PHASEOLI, O. SPENCERELLA, AND O. CENTROSEMATIS, THE FORMER 2 BEING OF MAJOR IMPORTANCE. O. SPENCERELLA APPEARS TO PREFER HIGHER RAINFALL AREAS AT MEDIUM TO HIGHER ALT., WHILE O. CENTROSEMATIS APPEARS TO PREFER MEDIUM TO LOW ALT.; O. PHASEOLI WAS FOUND AT ALL SITES. MARKED SEASONAL DIFFERENCES OCCURRED BETWEEN O. PHASEOLI AND O. SPENCERELLA; THE FORMER IS PREDOMINANT IN THE EARLY PART OF THE SEASON (MID-DEC. TO EARLY JAN.), BOTH OCCUR IN THE MID-SEASON, AND THE LATTER IS PREDOMINANT IN THE LATE PART OF THE SEASON. OPIUS MELANAGROMYZAE APPEARS TO PLAY AN IMPORTANT ROLE IN REGULATING OPHIOMYIA SPP. POPULATIONS IN THE MID TO LATE SEASON. (CIAT)

2371

26045 ZAMBIA. MINISTRY OF AGRICULTURE AND WATER DEVELOPMENT. 1985. BEAN PEST RESISTANCE NURSERY. IN ----- . GRAIN LEGUME RESEARCH. ANNUAL REPORT 1984/85. CHIPATA, MSEKERA REGIONAL RESEARCH STATION. PP.14-16. EN.

APHIS CRACCIVORA; CULTIVARS; MARUCA TESTULALIS; OOTHECA; OPHIOMYIA PHASEOLI; OPHIOMYIA SPENCERELLA; PHASEOLUS VULGARIS; RESISTANCE; ZAMBIA.

THIRTY-TWO BEAN CV. WERE EVALUATED FOR RESISTANCE/TOLERANCE TO INSECT PESTS IN ZAMBIA. A FEW CV. SHOWED MODERATE TO SEVERE DAMAGE BY APHIS CRACCIVORA, MARUCA TESTULALIS, AND OOTHECA SP. TEN CV. WERE TOLERANT/RESISTANT TO OPHIOMYIA PHASEOLI. CV. G04485, G04489, AND G05658 ALSO SHOWED RESISTANCE TO OPHIOMYIA SPENCERELLA. (CIAT)

2372

26044 ZAMBIA. MINISTRY OF AGRICULTURE AND WATER DEVELOPMENT. 1985. BEAN SEED TREATMENT TRIAL. IN ----- . GRAIN LEGUME RESEARCH. ANNUAL REPORT 1984/85. CHIPATA, MSEKERA REGIONAL RESEARCH STATION. PP.12-13. EN.

CHEMICAL CONTROL; INSECT CONTROL; OPHIOMYIA PHASEOLI; PHASEOLUS VULGARIS; SEED TREATMENT; ZAMBIA.

AN EXPT. WAS CONDUCTED AT MSEKERA REGIONAL STATION (ZAMBIA) IN 1984-85 TO STUDY THE PROTECTION AGAINST OPHIOMYIA PHASEOLI BY INSECTICIDE TREATMENTS (PIRIMIPHOS-ETHYL, DIELDRIN, AND ENDOSULFAN) OF BEAN SEED AT 3 PLANTING DATES (DEC. 6 AND 29, JAN. 17). DIELDRIN AND ENDOSULFAN GAVE EXCELLENT CONTROL. EARLY PLANTINGS BENEFIT FROM SEED DRESSINGS, BUT PLANTINGS AFTER MID-JAN. WOULD PROBABLY NOT BENEFIT DUE TO A NATURAL REGULATION OF THE PEST BY PARASITES. IT IS RECOMMENDED THAT EARLY-PLANTED BEANS, ESPECIALLY IN A MAIZE/BEAN INTERCROP, SHOULD RECEIVE AN INSECTICIDE SEED DRESSING, PARTICULARLY ENDOSULFAN. (CIAT)

2373

26046 ZAMBIA. MINISTRY OF AGRICULTURE AND WATER DEVELOPMENT. 1985. THE EFFECT OF MAIZE/BEAN INTERCROPPING ON INSECT PEST ATTACK ON BEANS. IN ----- . GRAIN LEGUME RESEARCH. ANNUAL REPORT 1984/85. CHIPATA, MSEKERA REGIONAL RESEARCH STATION. P.17. EN.

APHIS CRACCIVORA; HELIOTHIS ZEA; INTERCROPPING; OPHIOMYIA PHASEOLI; PHASEOLUS VULGARIS; PLANT INJURIES; PLANTING; TIMING; ZAMBIA; ZEA MAYS.

THE BEAN CV. MISAMFU SPECKLED SUGAR WAS PLANTED ALONE AND INTERCROPPED WITH MAIZE VAR. R 215 TO STUDY THE EFFECT OF INTERCROPPING ON INSECT PEST ATTACKS ON ZAMBIAN BEANS AT DIFFERENT RELATIVE SOWING DATES. DAMAGE DUE TO OPHIOMYIA PHASEOLI WAS HEAVY IN ALL SOWINGS AND IT APPEARS THAT INTERCROPPING CONFERRED NO PROTECTION AGAINST IT. DAMAGE BY HELIOTHIS ARMIGERA AND MARUCA TESTUALALIS WAS REDUCED IN THE INTERCROPS COMPARED WITH MONOCROPPED BEANS. THE INCIDENCE OF APHIS CRACCIIVORA WAS MUCH LESS IN ALL BEAN INTERCROPS THAN IN MONOCROPPED BEANS. (CIAT)

2374

26042 ZAMBIA. MINISTRY OF AGRICULTURE AND WATER DEVELOPMENT. 1985. GRAIN LEGUME RESEARCH. ANNUAL REPORT 1984/85. CHIPATA, MSEKERA REGIONAL RESEARCH STATION. 99P. EN.

ADAPTATION; CULTIVARS; ELSINOE PHASEOLI; GERMPLASM; INSECT BIOLOGY; INSECT CONTROL; INTERCROPPING; OPHIOMYIA PHASEOLI; PHASEOLUS VULGARIS; RESISTANCE; YIELDS; ZAMBIA; ZEA MAYS.

THE RESULTS OF RESEARCH WORK WITH GRAIN LEGUMES (BEANS AND COWPEAS) IN ZAMBIA DURING 1984-85 ARE SUMMARIZED. THE RESULTS ARE GIVEN FOR THE COUNTRY'S NATIONAL BEAN VAR. TRIAL, THE BEAN SEED TREATMENT TRIAL TO CONTROL OPHIOMYIA PHASEOLI, THE BEAN PEST RESISTANCE NURSERY, THE STUDY ON THE EFFECT OF INTERCROPPING MAIZE/BEANS ON INSECT PEST ATTACKS, AND THE BEAN OBSERVATION PLOTS. FURTHERMORE, TABLES ARE INCLUDED. (CIAT)

2375

26043 ZAMBIA. MINISTRY OF AGRICULTURE AND WATER DEVELOPMENT. 1985. ZAMBIA NATIONAL BEAN VARIETY TRIAL. IN -----, GRAIN LEGUME RESEARCH. ANNUAL REPORT 1984/85. CHIPATA, MSEKERA REGIONAL RESEARCH STATION. PP.3-11. EN.

ADAPTATION; COLOMBIA; CULTIVARS; ELSINOE PHASEOLI; GERMPLASM; PHASEOLUS VULGARIS; PLANTING; RESISTANCE; TIMING; YIELDS; ZAMBIA; CIAT-2.

THE RESULTS OF THE 1984-85 ZAMBIAN NATIONAL BEAN VAR. TRIAL, CONDUCTED AT 7 SITES, ARE PRESENTED AND DISCUSSED. ACROSS ALL SITES, CARIOCA WAS OUTSTANDING AND YIELDED AN AV. OF 901 KG/HA FOLLOWED BY BAT 1671. BAT 85, A 436, AND BAT 331 (856, 846, 801, AND 784 KG/HA, RESP.). THESE CV. AND A 439 CARRY THE DOMINANT I-GENE RESISTANCE TO BCMV. IN THE ADVANCED BEAN DISEASE RESISTANCE NURSERY IN MSEKERA, CARIOCA AND BAT 1671 SHOWED COMPLETE AND ALMOST COMPLETE RESISTANCE, RESP., TO ELSINOE PHASEOLI. OUTSTANDING BEAN GERMPLASM WAS SELECTED FROM THE CIAT IBYAN (DWARF BEANS) AND THE ZAMBIAN PRELIMINARY BEAN VAR. TRIALS FOR FURTHER TESTING IN NEXT YEAR'S NATIONAL BEAN VAR. TRIAL. OUTSTANDING GERMPLASM WAS ALSO IDENTIFIED FROM VARIOUS CIAT NURSERIES (DWARF BEAN ADVANCED LINES AND CLIMBING BEANS OF VARIOUS COLORS FOR WARM AND COOL CLIMATES), WITH RESISTANCE TO MAJOR DISEASES. IN ON-FARM TRIALS CARIOCA WAS CONSIDERED AN AGRONOMICALLY EXCELLENT VAR., BUT THERE IS SOME UNCERTAINTY REGARDING FARMER ACCEPTABILITY. THE RESULTS OF VARIOUS CIAT BEAN DISEASE RESISTANCE NURSERIES (RUST, ANTHRACNOSE, AND ANGULAR LEAF SPOT) ARE PRESENTED AND BRIEFLY DISCUSSED. IN AN EXPT. TO STUDY THE EFFECT OF PLANTING DATE ON DISEASES THE HIGHEST YIELD (902 KG/HA) OF BEAN CV. MBALA LOCAL WAS OBTAINED AT THE EARLIEST PLANTING DATE (JAN. 15). (CIAT)

2376

29131 ZULU, J.N.; WHEELER, B.E.J. 1981. LEVEL OF DISEASE INCIDENCE ON TRIFOLIOLATE LEAVES OF BEANS (PHASEOLUS VULGARIS) IN RELATION TO PRIMARY INFECTION ON SIMPLE LEAVES INFECTED WITH THRASAME FUNGUS. ZAMBIA JOURNAL OF SCIENCE AND TECHNOLOGY 6(1):14-19. EN., SUM. EN., 4 REF., IL.

PHASEOLUS VULGARIS; CULTIVARS; UROMYCES PHASEOLI; INOCULATION; LEAVES; RESISTANCE; ZAMBIA.

EXPT. WITH PLANTS OF PHASEOLUS VULGARIS CV. PRINCE SHOWED THAT 1ST TRIFOLIOLATE LEAVES INOCULATED WITH RUST (UROMYCES PHASEOLI) DEVELOPED SIGNIFICANTLY FEWER PUSTULE NO., IF THE SIMPLE LEAVES OF THE SAME PLANTS WERE INFECTED WITH THE SAME RUST DISEASE; HOWEVER, EXPT. WITH CV. PINTO (MORE SUSCEPTIBLE) DID NOT SHOW THIS ASSOCIATION. INOCULATING THE SIMPLE LEAVES OF CV. PRINCE WITH A HIGHER CONC. OF THE INOCULUM DID NOT INCREASE THE RESISTANCE OF THE 1ST TRIFOLIOLATE LEAVES. SIMILARLY, INOCULATING THE SIMPLE LEAVES OF PRINCE WITH A NONCOMPATIBLE RUST (U. VICIAE-FABAE) DID NOT INDUCE RESISTANCE TO U. PHASEOLI IN THE 1ST TRIFOLIOLATE LEAVES. (AS)

ZIMBABWE

2377

21722 TAYLOR, C.E. 1959. CONTROL OF THE BEAN STEM MAGGOT BY INSECTICIDAL DRESSINGS. (STUDY ON SOME BIOLOGICAL ASPECTS OF ANDRECTOR ARCUATUS, A. RUFICORNIS, AND GYNANDROBROTICA EQUESTRIS (COLEOPTERA: CHRYSOMELIDAE, IMPORTANT PESTS OF BLACK BEANS)). BOLETIN DE ENTOMOLOGIA VENEZOLANA 4(5):33-44 BEAN IMPROVEMENT COOPERATIVE. ANNUAL REPORT 23:121A-121B. EN., 5 REF. (INST. DE ZOOLOGIA AGRICOLA, FACULTAD DE AGRONOMIA, UNIV. CENTRAL DE VENEZUELA, APARTADO 4579, MARACAY, VENEZUELA)

OPHIOMYIA PHASEOLI; INSECT CONTROL; CHEMICAL CONTROL; PEST CONTROL; ZIMBABWE.

EIGHT INSECTICIDES IN THE FORM OF EMULSIONS WERE EVALUATED FOR THE TREATMENT OF BEAN SEEDS AGAINST AGROMYZA (OPHIOMYIA) PHASEOLI ATTACK IN TRIALS CARRIED OUT IN SALISBURY, ZIMBABWE. EVALUATIONS MADE 70 DAYS AFTER PLANTING (1ST TRIAL) INDICATED THAT INFESTATION WAS NIL OR VERY LOW IN TREATMENTS WITH ENDRIN, DIELDRIN, AND ALDRIN (0, 0, AND 0.5 PERCENT OF INFESTED PLANTS, RESP.), COMPARED WITH THE UNTREATED CHECK (80.0 PERCENT INFESTATION). IN THE 2ND TRIAL, THE TREATMENTS WITH DIELDRIN AND ALDRIN SHOWED 1.0 AND 3.0 PERCENT INFESTATION, RESP., AT THE 1ST COUNT 5 WK. AFTER PLANTING, AND 7.0 AND 6.0 PERCENT AT THE FINAL COUNT (10 WK.). ENDRIN DID NOT GIVE SUCH AN EFFECTIVE PROTECTION AS IN THE 1ST TRIAL, BUT THE FINAL INFESTATION FIGURE WAS ONLY 10.0 PERCENT. THESE 2 TRIALS SHOW THAT ENDRIN, DIELDRIN, AND ALDRIN EMULSIONS, APPLIED AS SEED DRESSINGS AT THE RATE OF 0.2 PERCENT ACTUAL INSECTICIDE (WT./WT. OF SEED), GIVE ALMOST COMPLETE PROTECTION AGAINST A. PHASEOLI. (CIAT)

2378

28991 VENGE, C.Z. 1986. BEAN IMPROVEMENT RESEARCH IN ZIMBABWE. PHASEOLUS BEANS NEWSLETTER FOR EASTERN AFRICA NO.5:16-18. EN. (CROP BREEDING INST., P.O. BOX 8100, CAUSEWAY, ZIMBABWE)

PHASEOLUS VULGARIS; PLANT BREEDING; PLANT INTRODUCTIONS; CROSSBREEDING; CANNED BEANS; ZIMBABWE; CIAT-2.

MAJOR CONSTRAINTS TO BEAN PRODUCTION IN ZIMBABWE AND GENERAL OBJECTIVES OF THE BEAN BREEDING PROGRAM IN THAT COUNTRY, INITIATED IN 1984, ARE MENTIONED. THE APPROACH USED AND THE ACTIVITIES CARRIED OUT BY THE 2 COMPONENTS OF THE PROGRAM, THE EDIBLE DRY BEAN PROGRAM AND THE SPECIALIZED WHITE CANNING BEAN PROGRAM, ARE DESCRIBED. FURTHERMORE, THE OBJECTIVES AND LOCATION OF THE DIFFERENT ONGOING TRIALS ON BEANS ARE MENTIONED. (CIAT)

2379

27061 WARREN, A. 1985. ZIMBABWE: BEAN CROPPING SYSTEMS. IN BEAN PRODUCTION IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL. 3P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; CULTIVATION SYSTEMS; CULTIVATION; ZIMBABWE.
THE MAIN BEAN CROPPING SYSTEMS IN ZIMBABWE ARE BRIEFLY DESCRIBED.
INFORMATION IS GIVEN ON CULTIVATED VAR., PLANTING DATES, CULTIVATED AREA,
YIELDS, AND PRODUCTION CONSTRAINTS. (CIAT)

2380

27060 WARREN, A. 1985. ZIMBABWE: BEAN DISEASES. IN BEAN PRODUCTION IN
TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY
IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL.
1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; DISEASES AND PATHOGENS; ZIMBABWE.

BEAN DISEASE PROBLEMS ARE RELATIVELY FEW IN ZIMBABWE DUE TO THE PLANTING OF
BEANS ONLY DURING THE DRY WINTER SEASON. HOWEVER, AT THE 2 LOW YELD RESEARCH
STATIONS, SPRAY IRRIGATION HAS RESULTED IN A HIGHER INCIDENCE OF BLIGHTS,
ANTHRACNOSE, RUST, AND RHIZOCTONIA. THE SMALL-SCALE IRRIGATION SCHEMES USING
FLOOD IRRIGATION WERE NOT AFFECTED. IN THE HIGH VELD, BEAN RUST, COMMON
BACTERIAL BLIGHT, ALTERNARIA LEAF SPOT, BCMV, AND ANTHRACNOSE WERE IMPORTANT
IN 6 TRIALS CARRIED OUT OVER THE LAST 2 YR. (CIAT)

2381

27058 WARREN, A. 1985. ZIMBABWE: BEAN NUTRITION. IN BEAN PRODUCTION IN
TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY
IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL.
1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; FERTILIZERS; N; P; K; RHIZOBIUM; ZIMBABWE.

NPK FERTILIZER RECOMMENDATIONS ARE GIVEN FOR DIFFERENT REGIONS IN ZIMBABWE
ACCORDING TO ALT. ALSO, THE ACTIVITIES REGARDING RHIZOBIUM INOCULATION ARE
BRIEFLY DESCRIBED. (CIAT)

2382

27057 WARREN, A. 1985. ZIMBABWE: BEAN PRICING. IN BEAN PRODUCTION IN
TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY
IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL.
1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PRICES; ZIMBABWE.

THE METHODS USED BY THE MINISTRY ECONOMISTS TO ARRIVE AT THE CONTROL PRICES
OF CROPS IN ZIMBABWE ARE BRIEFLY DESCRIBED. PROBLEMS CONCERNING BEAN PRICING
ARE DISCUSSED. (CIAT)

2383

27062 WARREN, A. 1985. ZIMBABWE: BEAN PRODUCTION DATA. IN BEAN PRODUCTION
IN TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION
SURVEY IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA
TROPICAL. 5P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; PRODUCTION; CONSUMPTION; ZIMBABWE.

STATISTICAL DATA ON BEAN PRODUCTION IN COMMERCIAL FARMS IN ZIMBABWE IS
PRESENTED FOR THE YEARS 1976-83. INFORMATION INCLUDES NO. OF FARMS, AREA
PLANTED TO BEANS, PRODUCTION, AND YIELDS. (CIAT)

2384

27059 WARREN, A. 1985. ZIMBABWE: GREEN BEANS. IN BEAN PRODUCTION IN
TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY

IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL.
1P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; SNAP BEANS; CULTIVARS; ZIMBABWE.

MAIN GREEN BEAN VAR. GROWN IN ZIMBAEWE ARE TOP CROP, CONTENDER, SEMINOLE,
AND SLENDER WHITE. MAJOR PROBLEMS (DISEASES AND PESTS) ARE MENTIONED. (CIAT)

2385

27056 WARREN, A. 1985. ZIMBABWE: SEED BEANS. IN BEAN PRODUCTION IN
TANZANIA, MALAWI, ZAMBIA AND ZIMBABWE. REPORT OF A BEAN INFORMATION SURVEY
IN AFRICA. CALI, COLOMBIA, CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL.
2P. EN. (9 HILLSIDE, ALLCRAFT ROAD, READING, ENGLAND)

PHASEOLUS VULGARIS; TRADE; PRODUCTION; ZIMBAEWE.

BEAN EXPORTS IN ZIMBAEWE IN 1985 MAY BE 800-900 T, OF WHICH HALF WILL GO TO
EUROPE. BEANS ARE PLANTED AFTER MID-FEB.; MANY FARMERS PLANT THE CROP AFTER
TOBACCO, SOYBEANS, OR GROUNDNUTS. BONUS IS THE MAIN VAR. GROWN BECAUSE OF
ITS GOOD YIELDS. MAJOR PRODUCTION CONSTRAINTS ARE INSECTS (BEAN FLY),
DISEASES (ANTHRACNOSE AND ALTERNARIA LEAF SPOT), AND THRESHING DIFFICULTIES.
(CIAT)

ABBREVIATIONS AND ACRONYMS

A	Angstrom(s)	DM	Dry matter
ABA	Abscisic acid	DNA	Deoxyribonucleic acid
ac	Acre(s)	EC	Emulsifiable concentrate
Af.	Afrikaans	EDTA	Ethylenediaminetetraacetic acid
a.i.	Active ingredient	EEC	European Economic Community
alt.	Altitude	e.g.	For example
AMV	Alfalfa mosaic virus	ELISA	Enzyme-linked immunosorbent assays
approx.	Approximate(ly)	EMS	Ethyl methane sulfonate
Ar.	Arab	En.	English
atm.	Atmosphere	EP	Preliminary Trials, CIAT
ATP	Adenosine 5'-triphosphate	Es.	Spanish
av.	Average	expt.	Experiment(s)
BAP	6-Benzylaminopurine	exptl.	Experimental
BBMV	Broad bean mosaic virus	Fr.	French
BCMV	Bean common mosaic virus	ft-ca	Foot candles (10.76 lux)
Bg.	Bulgarian	FYM	Farmyard manure
BGMV	Bean golden mosaic virus	g	Gram(s)
BGYMV	Bean golden yellow mosaic virus	G	Giga (10 ⁹)
BOD	Biochemical oxygen demand	GA	Gibberellic acid
BPMV	Bean pod mottle virus	gal	Gallon(s)
BRMV	Bean rugose mosaic virus	GE	Gross energy
BSMV	Bean southern mosaic virus	GERs	Glucose entry rates
BV	Biological value	GLC	Gas-liquid chromatography
EYMV	Bean yellow mosaic virus	Gr.	Greek
ca.	About (circa)	h	Hour(s)
CAMD	Cassava African mosaic disease	ha	Hectare(s)
CMV	Cassava African mosaic virus	HCN	Hydrocyanic acid
CBB	Cassava bacterial blight	HDP	Hydroxypropyl distarch phosphate (modified cassava starch)
CBSD	Cassava brown streak disease	He.	Hebrew
CEC	Cation exchange capacity	Hi.	Hindi
CER	CO ₂ exchange rate	HI	Harvest index
CF	Cassava flour	hp	Horsepower
CGR	Crop growth rate	Hu.	Hungarian
Ch.	Chinese	IAA	Indoleacetic acid
CLM	Cassava leaf meal	IBA	Indolebutyric acid
CLV	Cassava latent virus	IBYAN	International Bean Yield and Adaptation Nursery, CIAT
CM	Cassava meal	Il.	Illustrations
cm	Centimeter(s)	in.	Inches
COD	Chemical oxygen demand	In.	Indonesian
concnr.	Concentration	It.	Italian
CP	Crude protein	IU	International unit
Cs.	Czech	J	Joule
CSL	Calcium stearyl lactylate	Ja.	Japanese
CSW	Cassava starch wastes	kat	Katal (amount of enzymatic activity that converts 1 mole of substrate/s)
C.V.	Coefficient of variation	kcal	Kilocalorie(s)
cv.	Cultivar(s)	kg	Kilogram(s)
2,4-D	2,4-dichlorophenoxyacetic acid		
Da.	Danish		

De.	German	kJ	Kilojoule
km	Kilometer(s)	pp.	Pages
KNap	Potassium naphthenate	pphm	Parts per hundred million
Ko.	Korean	PPI	Preplanting incorporation
kR	Kiloroentgen(s)	ppm	Parts per million
La.	Latin	PSA	Potato sucrose agar
LAD	Leaf area duration	Pt.	Portuguese
LAI	Leaf area index	pv.	Pathovar
lat.	Latitude	Ref.	Reference
lb	Pound(s)	resp.	Respective(ly)
LD50	Mean lethal dose	Rf	Retardation factor-
LER	Land efficiency ratio		chromatography
LPC	Leaf protein concentrate	RGR	Relative growth rate
lx	Lux	RH	Relative humidity
M	Mega	RNA	Ribonucleic acid
m	Meter(s)	Ro.	Romanian
Mal.	Malay	rpm	Revolutions per minute
max.	Maximum	Ru.	Russian
MC	Moisture content	s	Second
ME	Metabolizable energy	SBM	Soybean meal
meq	Milliequivalent(s)	SCN	Thiocyanate
met.	Methionine	SCP	Single cell protein
mg	Milligram(s)	SDS	Sodium dodecyl sulfate
mho	Reciprocal ohm	Sk.	Slovak
min.	Minimum	Sn.	Slovene
min	Minute(s)	sp.	Species
ml	Milliliter(s)	spp.	Species
mm	Millimeter(s)	SSL	Sodium stearyl-2-lactylate
mo.	Month	Sum.	Summary
mol. wt.	Molecular weight	Sv.	Swedish
m.p.	Melting point	t	Ton(s)
NAA	Alpha-naphthalene acetic acid	TEN	Total digestible nutrients
NAD	Nicotinamide adenine dinucleotide	temp.	Temperature
NADH	Nicotinamide adenine dinucleotide, reduced form	TIA	Trypsin inhibitor activity
NAR	Net assimilation rate	TIBA	2,3,5-Triiodobenzoic acid compound with N-methylmethanamine
NCE	Net CO2 exchange	TLC	Thin-layer chromatography
NE	Northeast	TMV	Tobacco mosaic virus
NER	Net energy ratio	Tr.	Turkish
Nl.	Dutch	TSH	Thyroid-stimulating hormone
nm	Nanometer(s) (10 ⁻⁹ m)	UDPG	Uridine diphosphate glucose
no.	Number(s)	Uk.	Ukrainian
No.	Norwegian	UMS	Unmodified cassava starch
NPFs	Negative production factors	Ur.	Urdu
NPR	Net protein ratio	UV	Ultraviolet
NPU	Net protein utilization	var.	Variety(ies), varietal
NW	Northwest	VEF	Bean Team Nursery, CIAT
OM	Organic matter	VFA	Volatile fatty acids
oz	Ounce(s)	vol.	Volume
p.	Page	VFD	Vapor pressure deficit
P	Probability	vpm	Volume per million
Pa	Pascal(s)	vs.	Versus
PAN	Peroxyacetic nitrate	W	West, watt
PCNE	Pentachloronitrobenzene	wk.	Week
PDA	Potato dextrose agar	WP	Wettable powder
PER	Protein efficiency ratio	wt.	Weight
pH	Hydrogen ion concentration	yr	Year(s)
Pl.	Polish	/	Per

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