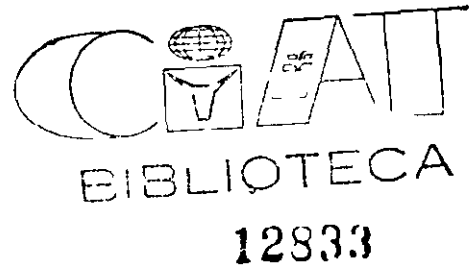


SB  
327  
M403



FIFTH MEETING  
HELD  
AT THE PRESIDENT HOTEL,  
GABORONE, BOTSWANA  
ON 3-4 NOVEMBER, 1988



22 SET. 1993

15814

MINUTES OF THE FIFTH MEETING OF THE STEERING COMMITTEE OF THE SADCC/CIAT REGIONAL PROGRAMME ON BEANS IN SOUTHERN AFRICA, HELD AT THE PRESIDENT HOTEL, GABORONE, BOTSWANA ON 3-4 NOVEMBER, 1988

Those present

- Miss Olivia Venge, Department of Research & Specialist Services, P O Box 81009, Causeway, Harare, Zimbabwe,  
(Lady Chairman)
- Miss Mmasera Manthe, Sebele Research Station, Private Bag 033, Gaborone, Botswana
- Ms Betty Gondwe, Acting National Coordinator, TARO-Lyamungu, P O Box 3004, Moshi, Tanzania
- Dr Kennedy Kanenga, Acting for Dr Joyce Mulila-Mitti, Nsekera Research Station, P O Box 510089, Chipata, Zambia
- Mr Castro Canarada, Faculdade de Ciencias Agrarias, CP 236, Huambo, Angola
- Mr Simon Moima, Maseru Research Station, P O Box 829, Maseru 100, Lesotho
- Dr Garry Massey, Maseru Research Station, P O Box 829, Maseru 100, Lesotho
- Dr Dennis Wanchinga, SACCAR, Private Bag 00108, Gaborone, Botswana
- Mr Chris George, CIDA, Ottawa, Canada
- Dr Roger Kirkby, CIAT, P O Box 67, Debre Zeit, Ethiopia
- Dr David Allen, SADCC/CIAT Regional Bean Programme, P O Box 2704, Arusha, Tanzania

Absent

- Dr Wilson Msuku, Bunda College of Agriculture, P O Box 219, Lilongwe, Malawi, (with apologies)
- Mr Manuel Amame, INIA, C P 3658, Mavalane, Maputo, Mozambique
- Mr John Pali-Shikhulu, Malkerns Research Station, P O Box 4, Malkerns, Swaziland

1 Introduction

Miss Olivia Venge, the Lady Chairman, opened the meeting at 0815 hrs on 3rd November and asked Miss Mmasera Manthe to offer a welcome to the participants to Botswana

2 Agenda

After introduction of the new participants on the Steering Committee (SC), the Lady Chairman drew attention to the proposed Agenda (Appendix 1), asking if there were amendments. Chris George asked if the budget was to be discussed, and David Allen, the Regional Coordinator, replied that a revised budget had been drafted and was subject to discussion at CIAT

headquarters in December when it was presumably to be submitted to CIDA for approval The Agenda was ADOPTED

3 Minutes of the 4th SC, held in Harare on 12-13 May, 1988 were read, and the following corrections were made

p 5 (iii) Y Kanenga (not Kamenga)

p 8 b(i) Amend final sentence to read at present OFR in Angola was effectively impossible in some bean production areas

p 9 (v) The Committee (not committe)

It was PROPOSED by Manthe that the Minutes be adopted as a true and accurate record of the 4th Meeting, and this was SECONDED by Gondwe

4 Matters arising from those Minutes

P 8c(1) The Regional Coordinator NOTED that no nominations had been received for the weed management course Kirkby ANNOUNCED that, in fact, this course had been postponed, it was now to be held from 17-28 April, 1989 in Kampala 3-4 graduate participants from SADCC could be accommodated, if firm nominations are received by Allen before the end of January

P 10 e Allen asked Chris George about the status of the post-doctoral fellowship (PDF) After reminding the committee of the background to the establishment of the PDF, George said that he would be following up on this position when he next visits CIAT headquarters, after a rethinking of the RP budget Some members of the COMMITTEE suggested that there might be greater need for using the PDF money instead to establish additional academic scholarships at the MSc (or perhaps even the BSc) level, but no firm recommendation was made

P 11 g(1) Kirkby drew attention to the summary of the proceedings of the Soil Fertility (= Agronomy) Workshop (Appendix 2) which makes recommendations of potential consequence to Steering Committees, including the establishment of certain working groups This was NOTED by the COMMITTEE

P 14 9 Allen reported that nominations for the African Bean Research Prize from the three RPs on beans in Africa had been submitted to CIAT-HQ where the winner would be chosen Kirkby added that, since the Prize was to be awarded annually, the SC should be considering new nominations while news of the 1988 winner was awaited

5 Regional Coordinators Report on 1988, and Workplan for 1988/89

The Lady Chairman asked the Regional Coordinator to present his report for the year since Nov 1987, when the last RC report was presented at the 3rd SC Allen began by stating that, this year, his report would not cover the technical progress made by

national programmes because no reports had been received from National Coordinators. Abstracts from reports (later received for Angola, Tanzania, Zambia and Zimbabwe) would be included in a revised edition, it was noted that the report from Lesotho would be made available to the RC in January 1989. The Report and Workplan were ACCEPTED by the COMMITTEE, subject to incorporation of NP reports, and subject to revisions made to the Workplan. Amended editions of each are attached as Appendix 3, and the suggested amendments and other discussions are summarized below.

(1) Discussion on RC's Report

It was mentioned that applications for the Training Officer position were invited. Copies of the Announcement (Appendix 4) were distributed to National Coordinators and SACCAR, and others will be distributed shortly by post to Directors of Research, Deans and the local press.

With regard to breeding materials distributed for CIAT to NPs, Massey mentioned that of the materials listed (p 5 of RC's Rep), only the Sugar Bean Nursery had been received. AFBYAN II had also been received. Lesotho requests also a Drought Nursery. Allen agreed to follow-up on this with the Regional Breeder, Dr. Smithson. It was further noted that the Drought Nursery should be sent direct to recipients, not via Zambia, Kirkby, who is distributing the nursery, was asked to note this.

Allen emphasized that it was vital that National Coordinators did not comment on the Workplan, which should meet the needs of NPs, and Chris George echoed this, remarking too that the RC's report was a very thorough one.

With regard to CIAT's Economist (Dr. W. Grisley), now stationed at Kawanda, Uganda, Kirkby asked what uses are foreseen for this position in the SADCC region, to which one third of his time will be appointed. Allen suggested that there were perhaps three areas of potential use, their importance varying with the country. These areas are the gathering of production statistics for bean mapping, the design and use of socioeconomic surveys at the diagnostic stage of on-farm research, and impact studies on recently released cultivars. In response from a question from Wanchinga about support of the position, Kirkby confirmed that the Economist was entirely funded by the Eastern Africa project, only costs of his travel to Southern Africa would be charged to the SADCC programme. Specific requests for input from the Economist are summarized as follows:

Angola Economics not yet relevant. An FAO Statistics Unit is working on crop production data.

Lesotho Macro-economic input is critical. And guidance on market opportunities (e.g. in Europe) useful.

Tanzania Priorities are to gather secondary production

data nationally, and to initiate microeconomic surveys at the diagnostic level of on-farm research in target areas (Lushoto and Kagera)

Zambia A visit to Mbala (late March/April 89) would be useful, to establish links with ARPT

Zimbabwe A stop-over (e.g. en route to Maseru) would be welcome, to consider a programme

With regard to other proposed travel by the regional scientists, Camarada stressed that as the Angolan programme was young, input from the Breeder would be useful to supplement the planned visit of the Regional Coordinator in November 1988. The second season (March 1989) might be suitable. Massey requested that regional scientists visit Lesotho as often as possible, particularly around the Breeder's Workshop to allow sufficient time in the field.

## 6 National Coordinators Reports (see also Appendix 3)

### (1) ANGOLA

The main points reported by Camarada were that progress had been made in acquiring scientific literature from CIAT headquarters, collection of local germplasm had been made and these had been evaluated and early maturing lines had been identified among 94 entries at Chianga. Through the national seed programme, trials were also run at Malanje where mean seed yields of some entries exceeded 1100 kg/ha relative to the local check, Ervilha (700 kg). It was noted that progress had also been made in training and staff development.

### (11) LESOTHO

Dr Massey reported a very successful year, with much rain in Spring (Oct/Nov 87), followed by a January drought then heavy rain again. Pinto types continue to be very promising, and the programme is occupied with seed multiplication (in the absence of a national seed industry). Common bacterial blight (CBB) is the chief disease problem, and pollen beetle is considered the worst pest. Dual 960 has proved a highly effective herbicide in beans. It was noted that Mr Seth Nkobole, on secondment by the Regional Programme to Lesotho where LAPIS pays his salary, is highly regarded. We couldn't ask for anyone better was the sentiment expressed. The complete Annual Report of the Lesotho programme will be available by the end of ~~Jan~~ 1989.

After this presentation, Allen noted the need for CBB resistance in Lesotho and suggested to Massey that a positive screening of the International Common Bacterial Blight Nursery be run next season.

### (111) TANZANIA

The Acting National Coordinator, Ms Betty Gondwe, reported

that 1987/88 had been a very active year with 3 major activities genetic improvement, agronomic practices appropriate to improved cultivars, and weed control. The superior performance of Lyamungu 85 had been confirmed on-station and on-farm, and extensive seed multiplication was underway. Other promising materials include G 05021, BAC (= XAN) 60, Carioca, EMP 86 and Selection 8.

It was noted that on-farm research had been expanded and work in Lushoto District, a new area, had been particularly successful.

On-farm yields were approximately half those obtained on-station, attributable in Gondwe's view to an important extent to weed competition. On-station research on weeds had identified Dlal as an effective herbicide, the critical weeding time was shown to be during the first 5 weeks.

Work in Arusha had shown that endosulfan is effective against pod borers. Recent studies on halo blight had identified partial resistance in local landraces. Both races 2 and 3 of the halo blight pathogen had been identified in Tanzania, where a brown pigmented variant of race 2 had also been found.

Ms Gondwe concluded with a description of the structure of bean research in Tanzania, stating that collaboration between the 3 separate national institutions (TARO, UAC and SUA) had been further strengthened with the assistance of the regional programme. National varietal trials were to continue, stratified by ecological zone for each of which a separate institution would assume responsibility.

Discussion following Ms Gondwe's report was led by Massey, who suggested that work on weed competition was site-specific. There was often an interaction with drought stress. Allen commented that the practical use of herbicides was liable to depend on the degree of commercialization of bean production, it was possible that the seed bean industry in northern Tanzania might adopt results from Gondwe's work more readily than food bean producers whose farms were usually smaller scale and less commercially orientated.

Kirkby remarked that the efficacy of endosulfan in controlling insect pests of beans was not new, nor was it very safe. This emphasizes the need to find safer insecticides. Massey added that simple practices are sometimes very effective in controlling pests. In Lesotho, cutworms are very important in maize, winter ploughing gives excellent control.

#### (iv) ZAMBIA

Mr Kanenga reported good progress during the year. The recently released cultivar Carioca was outyielded two-fold by DOR 335 and BAC (=XAN) 76, however noting that DOR 335 was small-seeded like Carioca. In the AFBYAN, A 197 and BAC 76 excelled,

out-performing the check ZPV 292 by 80/ A 197 will be promoted to National trials next year

Waterlogging at Msekera had damaged the Sugar bean Nursery and the VEF (in which 18 entries were superior to Carioca) In the ABFRN, A 74 showed resistance to bean fly and was the heaviest yielder

Allen added that a Technical Assistant has been recruited under the Regional Programme to help Zambia's Grain Legume Research Team in Mbala, particularly to help bridge the gap between the commodity team and the Adaptive Research Planning Team who are responsible for on-farm trials Kirkby remarked that national structures can sometimes militate against full coordination of research on a commodity and that such bridges could help to counteract perceived gaps

#### (v) ZIMBABWE

Ms Venge reported that 28 new crosses had been made, and segregating populations of previous crosses were advanced Yield data from Preliminary Variety Trials revealed that 71 entries outyielded the control, Natal Sugar In the Intermediate Cultivar Trials, all entries had out-performed the check, producing mean yields in the range of 2.1-3 t/ha Carioca will be tested in on-farm trials next season A 86, B 80-37, PAN 10 and Puebla 152 Cafe have entered pre-release testing

The presence of necrotic strains of BCMV in Zimbabwe was confirmed PAD 10 exhibited neither mosaic nor black root Preliminary results from a virus survey conducted by Dr H J Vetten, as part of a CIAT/Braunschweig special project, has also identified cucumber mosaic virus infections in beans in Zimbabwe

Bean fly infestation at two sites (Kadoma and Panmure) wiped out trials No significant differences between chemical treatments for the control of bean fly were detected at Panmure There was little agronomic research conducted

### 7 Regional Collaborative Research Sub-projects

#### (i) Revised proposals

The Lady Chairman asked Ms Gondwe to present the revised proposal from Tanzania (Dr Margaret Mmbaga) on rust From the new proposal (Appendix 4) the COMMITTEE NOTED that the title, format and budget now confirmed to the recommendations made at the 4th SC However, it was also NOTED that Dr Mmbaga was likely to accept a research fellowship offered her at the University of Nebraska The COMMITTEE ACCEPTED the Proposal, CONDITIONAL upon Dr Mmbaga's being in situ (in Dar es Salaam), in which case the full \$10,500 for the first year would be awarded Further awards would depend on satisfactory progress being reported at the 7th SC (approx Oct 89)

#### (ii) New proposals

Ms Gondwe went on to present a new proposal from Tanzania, on behalf of Prof Femi Lana of Sokoine University of Agriculture, on BCMV (Appendix 5). Substantial discussion ensued. Noting that there was a related subproject in Uganda (Dr Samson Owera, Makerere Univ), the COMMITTEE RECOMMENDED that the two proposals be merged, with a view to sharing both facilities and (high) costs. It was AGREED that a visit of Lana to Makerere (or Owera to SUA) be supported, in order to develop a single proposal and single budget. The budget should be split two-ways, with equipment being chargeable to CIAT's RP for Eastern Africa and operational costs covered by the SADCC RP. The revised proposal should be submitted at the next SC (March for E Africa, April for SADCC), and Allen/Kirkby to write a letter to inform Lana/Owera accordingly.

Mr Kanenga asked Allen to present a new proposal from Zambia, on behalf of Dr Sithanatham of Msekera, because he had received it direct from Dr Mulila-Mitti. The proposal, on aphids (Appendix 6), it was NOTED by the COMMITTEE, was in need of revision. It should follow the required format, should give details of the intended cooperators and the nature of linkages, possibly including those with experience of aphids outside the SADCC region (e.g. Dr Autrique, Burundi, Dr Khaemba, Kenya). Reference to relevant work elsewhere should be made (e.g. Susan Halbert's work on aphids of soyabeans in Illinois, published in Ann appl Biol). Trapping methods should be included.

A second new proposal from Zambia was presented, on behalf of Dr Joyce Mulila-Mitti (Appendix 7), on the genetic improvement of Carioca. Various queries were raised, centering on the need to give details of the parents with which Carioca is crossed. To what extent are these seed types widely acceptable? Are back crosses planned? Will seed quantities in the F3 be sufficient for distribution to 3 countries from 1990? Information is also required on the choice of sites as BCMV black root hot spots. Questions over the budget focussed on the lab supplies item. The COMMITTEE CONCLUDED that the proposal be SUPPORTED now, principally so as to avoid losing a year, on CONDITION that satisfactory changes are made (by 6th SC) in answering the above queries, with careful review of the budget.

#### (iii) Sub-project Agreements

The COMMITTEE ASKED Dr Wanchinga to present a proposal on behalf of SACCAR at the 6th SC.

The session ended with a plea from Kirkby, as Regional Coordinator for Eastern Africa, that sub-project leaders liaise adequately with counterpart subproject leaders in other regions.

#### B Status of Research Equipment

(1) Noting the position as summarized in the Regional



Coordinator's Report (Table 8, Appendix 3), the COMMITTEE AUTHORIZED the Regional Coordinator now to PROCEED in ordering altimeters for national programmes (p 12, 4th SC Minutes), adding also Lesotho

(11) Allen was ASKED by the COMMITTEE to INVESTIGATE the status of repair of the seed stores in Tanzania, at SUA and UAC (Dr O Mwandemele should be consulted) For Zambia, the COMMITTEE asked Mr Kanenga to INVESTIGATE and REPORT back on seed storage status at Msekera, including an airconditioner. Meanwhile, Allen is asked to obtain information on storage jars

(111) For Angola, Camarada requests a small, manual and portable typewriter (with Portuguese script AZERTY), and this was APPROVED

(1V) Ms Gondwe indicated that Tanzania needs two motorized knapsack sprayers, for pathogen inoculation. These were APPROVED

(v) Mr Moima on behalf of Lesotho stressed the need for several larger threshers for seed multiplication. Long discussion ended in agreement that such a request was not appropriate, but an order for one other small bundle thresher for research purposes would be placed

(vi) Moima requested a binocular dissecting microscope for Lesotho. This was APPROVED

## 9 Consultancies

(1) Noting that Dr S K Mughogho had accepted an offer of a consultancy in soils (p 4, Regional Coordinator's Report) the COMMITTEE asked Allen to contact Dr Msuku to determine the progress made

(11) With regard to independent consultants, Dr Wanchinga confirmed that SACCDAR was working on guidelines for their appointment. The Regional Coordinator added that the revised budget of the RP would consider the merit of including a line item for consultancy fees

## 10 Training and Workshops

### (1) New applications for short-term training at CIAT

General discussion led to the conclusion that both structured (courses) and unstructured (personal, discipline-specific) training was required. Kirkby outlined recent proposals for changes in training at CIAT Headquarters, including the conduct of an English language multidisciplinary course in alternate years

Five nominations were made, as follows

Adalberto Sereno (AN), Soil Fertility (J Lynch)  
Dr Alex Mkwandawire (MW), Drought (J White)  
Kennedy Kanenga (ZA), Agronomy /OFR  
Dr A Tesha (TZ), Drought (J White)  
Patrick Ndakidemı (Tz), Agronomy

Conclusions drawn by the COMMITTEE were that Sereno was APPROVED, for a 3 month period (March-June, 89), followed by two seasons collaborative research with Dr J Lynch, PROVIDED THAT Sereno drafts a proposal for an appropriate sub-project and that he participates in a soil fertility working group on his return. Mkwandawire's training was also APPROVED by the COMMITTEE who NOTED that the intended period at CIAT followed-up usefully from the Drought Working Group and sub-project.

Conversely, Tesha's proposed visit to CIAT on the same subject drought, was NOT ACCEPTED. Instead, it was URGED that Dr Tesha become involved in the Drought sub-project, which had developed from the Working Group meeting (which he had been unable to attend). Noting that there was now no suitable scientist in the Bean Program at CIAT headquarters to give training in agronomy/on-farm research, the COMMITTEE CONCLUDED that in the cases of both Kanenga and Ndakidemı, some kind of training within the region was more appropriate (see below).

Massey proposed that future short-term trainees at CIAT should be required to write reports on their return. This was ACCEPTED.

#### (11) Status of short-term training in region

The regional Coordinator reported that plans for the SADCC/GLIP technical training course to be held in Maputo in March for the Lusophone countries were progressing satisfactorily. Camarada confirmed that he expected 10 (not 5-7, as previously reported) Angolan nominations to be made. Details were asked to be given to Allen as soon as possible.

It was NOTED that the weed management course to be held in Kampala had been postponed, to 17-28 April, 1989. Kirkby confirmed 3-4 graduate participants could be accommodated. Nominations direct to Allen (by end Jan 89).

There was a need to design individual training in on-farm research within the region (for Kanenga and Ndakidemı, as above). Possibilities were considered to be as follows, Allen to follow-up a total 2-3 months programme perhaps involving visits to areas where active OFR is in progress, including Rwanda, Ethiopia and the Lushoto District of Tanzania.

#### (111) Workshops

The Regional Coordinator drew attention to an Intercropping Workshop (Appendix B) proposed by CIMMYT who had invited CIAT to

take part in its support and planning, it would be held in Lilongwe in late Jan 89. Allen said that this proposal had arisen in July, subsequent to the 4th SC, and that it had been made clear to CIMMYT that firm commitment by CIAT's regional programmes was subject to Steering Committee discretion. Substantial discussion led to the COMMITTEE'S ACCEPTANCE that the RP provides support of the CIMMYT/CIAT Workshop, NOTING that the 40-50% share of the costs will be in turn shared between CIAT's three RPs. The COMMITTEE PLACES ON RECORD its regret of non-consultation, implicit in such a short lead-time. The technical importance of the topic was recognized.

It was NOTED that plans for the Breeders's Workshop were proceeding well. It was further NOTED that Mr Lepheana (in addition to Mrs) should be invited.

During discussion of the First SADCC Regional Bean Workshop, to which commitment in principle had already been made, it was AGREED that it would be desirable to append the CRSP/Malawi Genetic Resources workshop, if possible. (In the absence of Dr Msutu, it was not possible to pursue this). Dates (sometime in late Sept/Oct) should be fixed with this in mind. An appropriate venue might be Mbabane, in the absence of a representative from Swaziland, this would require clearance.

The need for further discipline-specific Working Group meetings was discussed. It was CONCLUDED that an Entomology working group should be held, preferably in the period 7-8th August 1989 in Nairobi, so that it would be a satellite to an international entomology conference to which presumably some relevant participants are going. From a total of 12-15 scientists, the following entomologists from SADCC should be invited: Dr Giga (ZW), Mrs Pomela (LO), either Dr Sithananthar or Mr Sohata (ZA), Mr Kantiki (MW), Mr Kabungu (TZ/UAC) and Mr Silumpa (TZ/TARO). The regional Entomologist should draft a specific programme for presentation at the 6th SC.

Allen suggested the possibility of a virus working group and it was AGREED that he should draft a first proposal (and contact IITA, with the possibility of a joint coverage of potyvirus diseases of beans and cowpeas in Africa), also for submission at 6th SC.

#### (iv) Academic Scholarships

The COMMITTEE NOTED with satisfaction the progress made toward the recent securing of PhD places for Venge at Cambridge, Maphanyane at Cornell, and Koinange at Univ of California, Davis for where he had already left.

The Regional Coordinator expressed some concern over the apparent insecurity of PhD places for Mloza-Banda (at Iowa) and Mrs Pomela (at Utah State). After discussion, it was AGREED that Allen should telephone directly to these two universities. If he was satisfied that reasonably firm PhD places had been

offered, then the RP should proceed in committing the scholarships

wanchinga had pointed out that there was always some element of risk all scholars are subject to obtaining satisfactory grades, so that Allen should not be alarmed unnecessarily

Noting that the RP had funds until 31 3 92, Chris George was asked about the implications inherent in committing funds for academic scholarships which extended beyond that date George agreed to confer on this point and to draw up guidelines

It was AGREED that remaining funds should be devoted to scholarships at the Masters level Allen raised the suggestion that a revised budget might consider establishing closed scholarships, tied to particular universities, for instance to those in the SADCC region, or perhaps to Brazil for the Lusophone countries Wanchinga supported this idea, saying it would be very attractive to SACCAR George said that he believed this thinking would also appeal to CIDA, so supporting the idea of developing regional 'centres of excellence

The COMMITTEE AGREED that since the need for an MSc place for Angola had been noted previously (4th SC), Mr Camarada should proceed with his search for a suitable place It was further noted that he had applied to Reading for a one year course Since there would be some saving on the brevity of the course, the SC ACCEPTED that Camarada be permitted to take a 3 month English language course beforehand (approx June 89) Both new and previously received applications for further academic scholarships at the MSc level should be appraised at the 6th SC Seeking nominations would be the responsibility of National Coordinators

#### 11 Election of Chairman, venue and time of 6th SC

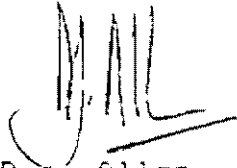
Miss Mmasera Manthe was unanimously elected the next Lady Chairman It was agreed to hold the next (6th) SC meeting in Maputo (subject to confirmation from Mozambique), preferably in early April 1989 when it might be run as a satellite to the proposed monitoring tour

#### 12 Any other Business

(1) Kanenga asked about logistics of seed movements for the drought sub-project It was agreed that information/requirements should be directed to Kirkby, who was multiplying/distributing seed from Ethiopia

(11) Kirkby mentioned that there was to be a Directors of Research meeting in Nairobi later in November, to provide guidance for a 10-year planning exercise He asked that National Coordinators pass their thoughts urgently to their respective Directors

There being no further business, the Lady Chairman closed the meeting at 12 00 noon on 4th November, 1988



D J Alien  
Regional Coordinator  
SADCC/CIAT  
Arusha  
22 November, 1988

M Manthe  
Lady Chairman, SADCC/  
CIAT Steering  
Committee

APPENDIX 1

BB TENTATIVE AGENDA AS FOLLOWS (WITH OLIVIA IN CHAIR)

1. INTROD (MS MANTHE)
  2. AGENDA
  3. MINUTES 4TH SC
  4. MATTERS ARISING
  5. REG COORD'S REPORT / WORKPLAN
  6. NAT COORD'S REPS ON RESEARCH PROGRESS, 1987-83
  7. REGIONAL COLLAB RES SUB PROJECTS
    - A) REVISED PROPOSALS
    - B) NEW PROPOSALS
    - C) SUB-PROJECT AGREEMENTS
  8. TRAINING
    - A) SHORT-TERM AT CIAT NEW APPLICATIONS
    - B) SHORT-TERM COURSES IN REGION NEW PROPOSALS
    - C) ACADEMIC SCHOOLS STATUS / NEW APPLICANTS
    - D) REGIONAL WORKSHOPS PLANS / PROPOSALS
  9. CONSULTANCIES
  10. EQUIPMENT NEEDS
  11. VENUE / ELECTION CHAIRMAN 6TH SC
  12. AOB
-

Summary Report

Objectives To bring together a group of agronomists and soil scientists having relevant experience of soil-related constraints to productivity of beans in the cropping systems of Central, Eastern and Southern Africa, for the following purposes

- a) To document and assess past research in this area
- b) To identify the needs and priorities for future research
- c) To review research methods with a view to standardizing the approaches used within the region
- d) To devise strategies for regional collaboration in this field

Participants 21 scientists from Ethiopia, Kenya, Uganda (Eastern Africa), Angola, Malawi, Tanzania, Zimbabwe, Zambia (SADCC Region), Burundi, Rwanda, Zaire (Great Lakes Region)

5 CIAT bean agronomists based in Africa and Colombia

1 representative from ICRAF

Programme

Workshop Part A Six formal sessions on Days 1 and 2  
Each session was introduced by one or two invited presentations, followed by comments from an invited discussant and then general discussion

- 1 Traditional systems of soil fertility management
  - description and assessment
- 2 Diagnosis of soil fertility problems
  - review of past and current research
  - review of research methods
- 3 Plant nutritional requirements
- 4 Use of inorganic fertilizers and farmyard manure
  - review of past and current research
  - review of research methods
- 5 Green manuring and agroforestry in relation to soil fertility
  - review of current and past research
  - review of research methods
- 6 Management of organic manures, composting, residues and mulch
  - review of past and current research
  - review of research methods

Field trip to IAR Melkassa Research Station and farms in the Rift Valley, on Day 3

Workshop Part B Three working groups discussed the following themes on Days 4 and 5

Group 1 Diagnosis of soil fertility constraints

- Group 2 in bean growing areas of Africa  
Group 2 Soil fertility improvement  
Group 3 Improvement of traditional bean  
cropping systems

## Findings and Recommendations of Working Groups

### Group 1 Diagnosis of soil fertility constraints

Five problems were identified

- 1 The bean growing areas of Africa are not well defined
- 2 Edaphic Zones in the bean growing areas need to be defined to facilitate collaboration between research organisations and to allow for extrapolation of research results from one area to other areas
- 3 Adequate information on the principal soils in bean growing areas is not available
- 4 Resources available for the diagnosis of soil fertility constraints are often inadequate
- 5 Regional coordination of soil fertility research on beans is lacking

Recommendation I A bean map for Africa should be developed immediately which delineates bean growing areas for the purpose of evaluating edaphic and climatic constraints to production

#### Activities

a) CIAT should provide national programmes with guidelines to assist them in supplying the necessary information to the CIAT Agroecological Unit

b) The CIAT Agroecological Unit should evaluate and compile this information, and determine any additional information needs

c) CIAT should take the necessary steps, in collaboration with national programmes, to collect further information needed for the development of the bean map

Recommendation II Edaphic Zones in the bean growing areas of Africa should be defined

#### Activities

a) The CIAT Agroecological Unit should define edaphic zones using information obtained pursuant to Recommendation I

Recommendation III The principle soils in the bean growing areas of Africa should be identified and characterised

#### Activities

a) The CIAT Agroecological Unit should collate existing information on the principal soils

b) Benchmark sites should be identified by a soil fertility working group together with the respective national programmes and these should be characterised in collaboration with



## IBSNAT

c) Regional programmes should encourage one or more students to conduct MSc thesis research on the Fertility Capability Classification System, to determine its utility for African soils and to classify major soils

Recommendation IV The capacity of national agricultural research organisations to diagnose soil fertility constraints of beans should be improved

### Activities

a) Short course training in diagnostic techniques, including the use of soil and plant tissue analysis, nutritional screening trials and use of visual symptoms, should be provided

b) Soil and plant tissue analytical procedures should be standardised

c) MSc training should be provided in soil fertility and plant nutrition

d) The Diagnosis and Recommendation Integrated System (DRIS) for the interpretation of bean plant tissue analysis results should be developed for African soils. This should be the subject of one or more MSc research projects

e) CIAT should prepare audio-tutorial units, in French and English, on nutritional disorders of beans

Recommendation V Coordination of soil fertility research on beans should be improved

### Activities

a) A soil fertility working group for beans in Africa should be formed. This group would be responsible for coordinating soil fertility research activities, identifying benchmark sites, etc

Recommendation VI A standard set of genotypes should be assembled and used in soil fertility research

### Activities

a) National and regional bean breeders should identify 25 broadly adapted varieties with variable tolerance to soil fertility stress. This might best be done at the CIAT workshop on bean improvement in Africa, to be held in Maseru in January

b) These varieties should be evaluated and characterised under soil fertility stress conditions

c) These varieties should be used in future soil fertility and plant nutrition research

## Group 2 Soil fertility improvement

### Recommendations for NARS

- 1 More attention should be given, in planning soil fertility research, to the likelihood of adoption of results by small farmers
- 2 Increased efforts are required, by both research and extension agencies, to increase productivity through improvements to the supply, conservation and utilisation of organic materials
- 3 Research is needed on the judicious use of inorganic fertilizers to supplement efficiently used organic materials
- 4 Long term research on soil fertility is needed to assess a treatment's residual effects, which may be at least as important for sustainability as its immediate effects. This will include assessments of soil physical characteristics and microbiological processes
- 5 Teamwork involving soil scientists, microbiologists and agronomists is indispensable in implementing the above strategies

### Recommendations for CIAT

- 1 For the many situations in Africa where resource-limited small bean producers are not expected to have access to adequate soil amendments, the genetic approach of breeding for tolerance to specific soil constraints is an appropriate new strategy. Initially, CIAT should concentrate upon screening bean germplasm for tolerance to the Al/Mn toxicity problem of acid soils, and make results available in appropriate forms for use by NARS

## Group 3 Methods for improving traditional bean cropping systems

### Recommendations

- 1 An appropriate research approach should include the following components
  - farmer-based identification of problems
  - long-term experiments to evaluate system sustainability,
  - exploit possibilities for systems transfer, in order to benefit farmers sooner
  - develop various options rather than single solutions
  - involve farmers in all research steps
  - evaluate systems by multiple criteria, including agronomic, economic and social parameters
- 2 Consideration should be given by national programmes and steering committees to the initiation of collaborative research projects to improve the following three cropping systems found in all three regions comprising CIAT's African bean network
  - banana/bean/coffee system
  - bean/maize or bean/sorghum system
  - systems that include in-situ composting
- 3 Close collaboration should be sought and maintained with ICRAF for the development of agroforestry systems with a bean component

## -Plenary Concluding Session

In response to the working group recommendations for greater integration and coordination of soil fertility research, the plenary session decided to form two working groups that would act as organising entities for future soil fertility research efforts on beans in Africa. One working group will deal mainly with soil fertility and soil/plant interactions, whereas the other will be more concerned with cropping systems as they pertain to soil fertility. Each working group is composed of 2 or 3 representatives from each of the existing CIAT regions.

The following participants were elected to the two working groups

### Soil Fertility Working Group

Johnson Semoka (Chairman)	Tanzania
Peter Kamoni	Kenya
Lunze Lubanga	Zaire
Jonathan Lynch	CIAT Colombia
Spider Mughogho	Malawi
Albert Sereno	Angola
Andre Sebahutu	Rwanda
J Y K Zake (in absentia)	Uganda

### Cropping Systems Working Group

John Kavuma (Chairman)	Uganda
Willi Graf	CIAT Great Lakes
Todo Edje	SADCC/CIAT
Wakama Mathias	Burundi
Enos Shumba	Zimbabwe
Teshome Regassa	Ethiopia
Vahiye	Tanzania

SADCC/CIAT REGIONAL PROGRAMME ON BEANS IN SOUTHERN AFRICA

REGIONAL COORDINATOR'S REPORT TO THE 5TH STEERING COMMITTEE  
MEETING, GABORONE, 3-4 NOVEMBER, 1988

INTRODUCTION

The 12 months since the last report to the Steering Committee, at its 3rd Meeting held in Lusaka, has been a period of establishment for the bean component of the SADCC/Grain Legume Improvement Programme. The headquarters in Arusha now enjoys its full complement of senior staff and only the Malawi position remains vacant. Considerable progress has also been made in filling other regional staff positions both in Arusha and elsewhere.

One further Steering Committee Meeting was held, attended by 7 of the 9 National Coordinators and representatives of SACCAF, the donors (CIDA) and the Regional Programme. Equipment needs are being met, overseas training is in progress, funds have been allotted for research, and training courses, monitoring tours and workshops have been organized. SADCC participants have also attended training courses and workshops organized by CIAT HQ and the Eastern African and Great Lakes regional programmes.

FUNDING AND AGREEMENTS

The first full financial year was completed on 31st March. Only 55% of the funds allotted for the period were expended, but this was due principally to delays in filling staff positions, initiating overseas training and the shipment of materials for the project building. Expenditure in the second financial year (from 1 April, 1988) is proceeding according to budget.

RECRUITMENT

All senior staff positions in Arusha are now occupied. The Regional Coordinator/Pathologist (Dr David Allen), Breeder (Dr Barry Smithson) and Croppings Systems Agronomist (Dr O. Todo Edge) were already in position at the time of the last report. The Entomologist (Dr J. Twasi Ampoto) assumed his duties on 22 August 1988.

A candidate for the breeder position in Malawi was not approved and the position has once again been advertised, both within the SADCC region and outside.

Dr Julia Jornegay, the Postdoctoral Fellow (PDF) at CIAT HQ, funded 1/2 by the regional programme, was succeeded by Dr Joe Lohme in March 1988. CIAT has recently proposed a second PDF position at HQ out of contingency funds, open to national scientists of SADCC to provide an opportunity for research experience in an international environment. This is still under

discussion with CIDA but one option is for one year terms for candidates approved by SAC/AN and CIDA conducting research in agreed discipline.

Progress has also been made with other regional staff positions. An administrative and finance assistant was appointed on 10 November 1987 but resigned on 6 May before completing his probation and Mrs R. Traves succeeded him on 1 June 1988. The Secretary and Driver positions are now filled.

Applicants for Training Officer were interviewed but a suitable candidate was not identified and the post has been upgraded to a senior research fellowship (2 yrs) position to be based in Ethiopia from where the three regional programmes can be implemented by CIAI in Africa will be served. Being advertised.

Field technicians have been recruited mainly in Tanzania to assist national programmes to conduct regionally oriented research. In Tanzania technical assistants were recruited for Iagera, Lushoto and Arusha.

Outside Tanzania technical assistants were recruited in response to specific requests from National Programmes. One took up duties on 17 March 1988, in the Autonomy Section at Maseru Research Station in Lesotho where he is supported by the USAID TAFE Project. A second has been recruited for on-farm and on-station operations in Mbala in northern Zambia, a key breeding site for the region. Staffing details are summarised in Table 1.

## BUILDINGS AT TARO-SELIAN

Materials for the building to house the Tanzanian national and regional staff have only recently arrived in Arusha. Erection has now commenced with the aim of completing the building before the end of 1989.

## STEERING COMMITTEE

National Coordinators have now been appointed by all member countries and the Steering Committee is already exercising its full responsibilities in directing the expenditure and activities of the regional programme.

Representation at the meeting is shown in Table 2 which also illustrates the manner in which venue and chairmanship rotated. Three of the four TAFE meetings have been run as satellites to another meeting so as to increase efficiency.

## TRAINING

### a) Academic Scholarship

Mr O. S. Hbuya (Tanzania) left on 27 December 1987 for the University of Florida and has successfully completed his 1st and first semester of his MS in Agronomy.

The Steering Committee approved funding for PhDs for Ms Ollia Venge (Zimbabwe), Mr E M Foinange (Tanzania), Mr Henry Mloza-Panda (Malawi), Ms G Maphanyane (Botswana) and Ms M L Fomela (Lesotho). Table 2 summarizes the status of awarding academic scholarships. Mr Foinange left on 18 September for the University of California at Davis, and Ms Venge will be registered at the University of Cambridge, with effect from the Lent term 1989, conducting her field work in Zimbabwe. Ms Maphanyane has received a firm offer of a place for a PhD at Cornell. Mr Mloza-Panda and Mrs Fomela have each secured places for post-graduate work at US universities but neither, yet has (to the FF's knowledge) a firm offer to a PhD programme.

#### b) Short-term training at CIAT headquarters

Messias Camarada (Angola) and Massamba (Mozambique) spent 4 months at CIAT HQ from February, to May, this year for multidisciplinary and on-farm research training.

Dr Joyce Mulila-Muti (Zambia) visited CIAT to become acquainted with its bean breeding programmes, for two weeks during September, and Mr Dimoso and Ms Marengo (Tanzania) are currently undergoing 2 months training in breeding. Visits to CIAT by two scientists from Angola were approved at 4th SC. These and other possible candidates are presented in Table 4.

#### c) Technical training within region

A field technicians course in Arusha for 6 weeks from 27 May to 1 July, had nine participants from Ethiopia, Lesotho, Malawi, Zambia and Tanzania. A similar course is planned for Maputo for the Lusophone countries, Angola and Mozambique, next March. The status of this cadre of training is shown in Table 5, which also shows that two of the three courses span the grain/legume crops in general being jointly supported by the 2 international centres involved in SADC/GLIF.

#### TRAVEL

Regional scientists travelled in all SADC countries with the exception of Angola (which Dr Allen plans to visit in November 1988). Much of this travel, totalling some 200 days, was with national scientists, discussing and monitoring research activities. A further 2 weeks were devoted to similar travel in CIAT's other regional projects.

#### MEETINGS, WORKSHOPS AND MONITORING TOURS,

Altogether, some 120 days were spent by FF staff in attending meetings and workshops. Those within the region included the SACCHAR Workshop on Integration of Research, Training and Extension in Arusha, SFAAR Workshop on developing a Tanzania Agricultural Research Masterplan, in Arusha, national planning meetings in Tanzania and Zambia, the latter including attendance

of the Groundnut/Grain Legume Seminar, the 7th Bean Research Workshop in Morogoro, and the CIMMYT/TAHU Intercropping Workshop in Arusha, Tanzania. CIAT-organized meetings included a breeders workshop in Colombia, a pathology workshop and regional seminar in Uganda, a drought working group in Harare, an agronomy/soil fertility workshop in Ethiopia, and a biological nitrogen fixation workshop in Rwanda.

Workshops being organized are breeders workshops in Colombia in November and in Lesotho in February, 1989 with 2 and 9 SADCC participants respectively. A CIMMYT/CIAT cereal/legume workshop is also planned for January, 1989. The Steering Committee has also approved a SADCC Regional Bean Research Workshop in alternate years outside of Tanzania, with continued support for the Morogoro workshop. The status of, and participation in, regional workshops is summarised in table 6.

Two group tours were conducted to monitor and discuss research activities in the field. In March, regional and national scientists from Malawi, Tanzania and Zambia travelled together in those three countries. In May, scientists from three Tanzanian institutions concerned with bean research toured Tanzania to monitor and discuss their research programmes in company with regional staff. Four scientists from Malawi, Tanzania, and Zambia participated in a tour in Ethiopia in September. Details are given in Table 7.

The SC allots RF funding for the participation of SADCC national scientists in most of these activities, which form a vital means of strengthening and integrating intra- and inter-regional bean research.

#### EQUIPMENT

The SC has already approved the purchase of various equipment for national programmes, such as motorcycles, balances, threshers, projectors and other items. Items to the value of about USD 70,000 have already been received and a further USD 70,000 worth is in process. Additional requests are to be considered. The status of equipment purchases is shown in table 8.

#### CONSULTANCIES

Consultancies funded by the RF included Dr. White to the Drought Working Group, Dr. Mughogo to the Agronomy/Soil Fertility Workshop, and Dr. Pipe-Noit to the one on Biological Nitrogen Fixation. These visits were funded jointly by the three regional projects. Dr. Tohme accompanied the monitoring tour of Malawi and Zambia and assisted with the evaluation of breeding and other materials at Mbala.

Collaborative projects benefiting the RF but funded from elsewhere include virus survey at Braunschweig in West Germany, halo blight resistance at the National Vegetable Research Station and ICRF at Ule College, in the UK.

## MATERIALS DISTRIBUTED FROM LIAT

A wide range of materials, comprising some 3000 samples, was sent to Tanzania but only 2 were released due to delays in plant quarantine checks. As a result of improved procedures, the prospects of renewed introduction seems promising. Materials distributed to other national programmes were as follows:

### Lesotho

- Large white seeded lines
- International Sugar Bean Nursery
- International Large Red Kidney Nursery
- Bean Team Nursery (VEF)
- International BCMV Nursery

### Malawi

- International Snap Bean Nursery
- International Drought Resistance Nursery

### Swaziland

- International Sugar Bean Nursery
- International BCMV Nursery
- Black root resistant materials
- International Halo Blight Nursery

### Zambia

- International Large Red Kidney Nursery
- International Sugar Bean Nursery
- International Snap Bean Nursery
- Bean Team Nursery (VEF)
- germplasm materials
- International Ascochyta Blight Nursery
- International Bean Anthracnose Nursery
- International Angular Leaf Spot Nursery
- International BCMV Nursery
- Anthracnose differentials
- Rust differentials

## REGIONAL AND NATIONAL RESEARCH

Significant progress is occurring in most national programmes in the region. Notable are the large yield improvements being demonstrated by introduced over local materials in Lesotho, Swaziland, Zambia and Zimbabwe. Some of these have already given rise to improved cultivars, like Lyamungu 85 and Uyole 04 in Tanzania and Carroca and ZPV 292 in Zambia and many others are in the pipeline.

To further strengthen research, the SB have allotted funds for three regional collaborative research sub-projects, on angular



leaf spot and biological nitrogen fixation (both Malawi) and drought (Malawi, Tanzania and Zambia). A fourth project, on rust (Tanzania) is under review and two others, on threshing and seed storage (Tanzania) were rejected by the SC as inappropriate. Further proposals are anticipated (Table 9).

The joint project on drought was developed at the recent drought working group in Harare. Care is also taken to maintain links with research sub-projects being conducted in other regions to complement rather than duplicate research effort.

Inter-regional cooperation is especially important in the establishment of Africa-wide nurseries. An African Bean Yield and Adaptation Nursery (AFBYAN) and the African Beanly Resistance Nursery (ABFRN), both composed of cultivars contributed by national programmes from all three regional projects are already in progress and a Drought Resistance Nursery and disease resistance nurseries are being assembled.

Some 20 nurseries comprising over 2000 samples were requested from CIAT by Lesotho, Malawi, Swaziland and Zambia. After delays due to quarantine in Tanzania about 1000 samples have been cleared for growing in isolation out of season (Note - CIAT takes stringent measures to ensure clean seed is distributed, but to enable rapid dissemination of seeds and reduce the risks of spreading infection, close collaboration with national plant quarantine authorities is essential). However, considerable variability already exists in the region among local and previously introduced materials and still remains to be exploited, notably in Malawi.

In addition to plant improvement, attention is also being given to other improved technology, emphasising reduced dependence on inorganic chemicals and sustainability, for example by the use of leguminous tree species to maintain soil fertility, reduce erosion and provide support for climbing beans.

Regional and national staff are placing much greater emphasis on on-farm testing and extension. The field staff we are employing at the moment will be engaged principally in on-farm research and work has already been expanded in Tanzania - in Arusha, the Usambara Mountains of Lushoto, and in Tagera - and will be expanded in northern Zambia next season, all in collaboration with national organizations. These activities are obviously vital if new technologies are to have impact on our main target, + production.

## PUBLICATIONS

- Allen, D J (1986) Bean Production Systems in Africa (4EB-0110) Audiotutorial Unit, CIAT
- Allen, D J (1987) Principal diseases of beans in Africa (4EB-051) Audiotutorial Unit, CIAT
- Allen, D J, Dessert, M, Trutmann, F and Voss, J (in press) Common beans in Africa and their constraints, in Bean Production Problems (eds Schwartz, H F and Pastor-Corrales, M A) 2nd Ed CIAT
- Edge, D I, Semola, J M F & Haule, T L (1988) Traditional forms of soil fertility maintenance Soil Fertility Research Workshop for Bean Cropping Systems in Africa, Addis Ababa, Ethiopia, 5-9 sept 1988
- Firthby, K A, Smithson, J P, Allen, D J & Habich, G E (1987) CIAT's regional bean programmes in Africa Regional Workshop on Training Needs for Agricultural Research in Eastern & Southern Africa, Arusha, Tanzania, 20-24 July, 1987
- Smithson, J P (1988) Breeding for Africa Internal Research Review, CIAT Colombia, January, 1988
- Smithson, J P & Allen, D J (1988) The regional programme on beans (*Phaseolus vulgaris* L) in Southern Africa strategy and progress in plant improvement IFCR/UNEP/IIIA Workshop on Plant Genetic Resources in Africa, Nairobi, Kenya 26-30 September, 1988

Table 1 Staffing of the SADCC/CIAT Regional Programme

---

D J Allen, BSc (Hort, Lond ), MSc (Econ), PhD (Cantab ),  
 Pathologist/Regional Coordinator (a 7 86)

J K G Ampofo, BSc (Ghana), PhD (Queensl ), Entomologist  
 (22 8 88)

D T Edge, BS, MS (Mich ), PhD (Iowa), Cropping System Agronomist  
 (5 9 87)

J B Smithson, BSc Hons (Newcastle), PhD (Lond ), Breeder  
 (11 2 87)

J A Maimu, BS (Agric , Missouri), Dip Crop Prod , Technical  
 Assistant-Lushoto (1 1 88)

J Mallya, Dip Crop Prod , Technical Assistant-Paragwe  
 (1 12 87)

G F S Saria, Dip Farm Manag , Technical Assistant -Arusha  
 (15 8 88)

Mapepula J Muntanga Technical Assistant -Mbala (1 8 88)

Seth M Niobole Dip Hort Technical Ass stant -Maseru (on  
 secondment to LAPIS, 1 1 88)

B Travas Administrative and Finance Assistant (1 6 88)

P Mziray, Secretary (1 8 88)

A M Ulomi, Driver (1 12 87)

---

Table 2 STEERING COMMITTEES

No	Date	Place	Representation												
			AN	BD	LU	MU	MW	IZ	WD	ZA	ZW	SALLAR	LIDA	CIAT	
1	8 Sept 86	Morogoro, IZ *		x	x	x			x		x		x		U
2	30-31 Mar 87	Lilongwe, MW**	x	x	x		x	U		x	x		x	x	x
3	5-6 Nov 87	Lusaka, ZA	x	x	x	x	U	x		x	x		x	x	x
4	12-13 May 88	Harare, ZW***	x	x	x		x	x		U	x		x	x	x
5	3-4 Nov 88	Gaborone, BD	x	x	x			x		x	U		x	x	x

Circles represent Chairmanship

\* Satellite to 5th Bean Research Workshop

\*\* Satellite to SALLAR/BLIP technicians training course

\*\*\* Satellite to Drought Working Group

Table 3 TRAINING Status of academic scholarships awarded to professionals

Degree	Univ	Discipline	Starting date	Name	Country
MS	Gainesville, Florida	Agron	Jan 88	U S Mbuya	IZ
PhD	Davis, California	Breed	Sep 88	E M K Koinange	IZ
PhD	Cambridge, UK	Breed	Jan 89	Olivia Venge	ZW
PhD	Cornell	Breed	Jan 89	b Maphanyane	BD
PhD	Iowa State	Weed Sci	Jan 89	H Mioza-Banda	MW
PhD	Utah State?	Entom	'	M L Pamela*	LU
MSc	Reading, UK	Agron	89?	L Lamarada**	AN

\* Firm PhD place not yet secured  
 \*\* Place sought

Table 4 TRAINING Status of short-term training of professionals  
at CIAI headquarters 1988-89

Discipline	Period	Name	Country
Agron	Feb-May 88	Lastro Lamarada	AN
Agron	Feb-May 88	Alberto Massamba	NU
Breed	Sep 88	Dr Joyce Mulila -Mitti	ZA
Breed	Oct-Dec 88	Peter Dimoso	IZ
Breed	Oct-Dec 88	Betty Marengo	IZ
Pathol	Mar-June 89	Ermelinda L Laliengue	AN
Soil Sci	Mar-June 89	Jose Alberto Sereno M	AN
Breed	Mid 89	Antonio Francisco Lastame	AN
Physiol	July-Aug 89	Dr A B L Mlandawire	MW

Table 5 TRAINING Status of short-term multidiscipline  
 - training of technicians within the SADCC  
 region, 1987/89

Period	Location	Co-sponsors	Name	Country
14-28 March 87	Lilongwe, MW	CIAT/IITA	E Iqetse	BD
			T Nlago	BD
			P Choana	LD
			T Saiwa	MW
			C Kapunda	MW
			D Jere	MW
			P Mwaishooha	MW
			S Elifunda	TZ
			H Iwulabya	TZ
			B Marende	TZ
			E Ngowi	TZ
			E Moshu	TZ
			L Matemw	TZ
			H Funlulatile	TZ
			H Piozya	TZ
			P Chilembo	ZA
			K Muimui	ZA
			G Mutale	ZA
			Z Mathias	ZA
C Kundembe	ZW			
C Ndebele	ZW			
20 May-1 July 89	Arusha TZ	CIAT	M T Lepheana	LD
			C Kapunda	MW
			K Muimui	ZA
			P Chilembo	ZA
			A R M Gamaha	TZ
			M S Chitemo	TZ
			D J Mugunda	TZ
9-23 March 89	Maputo MO	CIAT/IITA ICRISAT	-	-

Table 6 REGIONAL WORKSHOPS 1988-89

Subject	Venue	Date	Participants (supported by SADCC/CIAT)	Country	Remarks
Groundnut/Grain Legume Seminar	Mruwe ZA	9-11 March 88	O Venge	ZW	Organized by Zambia National Programme CIAT participants D J Allen (Arusha) J E Smithson (Arusha)
Drought Working Group	Harare, ZW	May 88	Dr J Mulila -Mitti O Venge M Manthe F Ndalidemi  Dr A B C Mkandawire Ms Mafola	ZA ZW BD TZ  MW LO	Organized by SADCC/CIAT CIAT participants O T Edge (Arusha) J White (Palmira)
Aeronomy and Soil Fertility Workshop	Addis Ababa Ethiopia	5-9 Sep, 88	F L Haule C Mayona Dr J Semola F Ndalidemi  Dr M Piha Dr E Shumba A Sereno Dr S Mughogho G Mitti	TZ TZ TZ TZ  ZW ZW AN MW ZA	Organized by CIAT E.H. CIAT participants O T Edge (Arusha) R A Kirlby (Debre-Zeja) C Wortmann (Kampala) W Graf (Rubona) J Lynch (Palmira)
7th Bean Res Workshop in Tanzania	Morogoro, TZ	28-30 Sept 88	Dr J Jannaiyan E C Calienque R Kamala  F Ndalidemi C. Mayona  Dr M Mmbaga	ZA AN TZ  TZ TZ  TZ (Univ Dar)	Organized by SUA/CRSP with input from SADCC CIAT CIAT participants D J Allen (Arusha) O T Edge (Arusha) J B Smithson (Arusha) J K Ampofo (Arusha)
Nitrogen Fixation Workshop	Ngazi, RW	27-29 Oct, 88	Dr S Mughogho Dr M P Salema  Dr P Davis	MW TZ  ZW	Organized by CIAT/Bread Lakes CIAT partici- pan's O T Edge (Arusha) J Kipe-Noit (Palmira)



REGIONAL WORKSHOPS (Cont)

Subject	Venue	Date	Participants (supported by SADCC/CIAT)	Country	Remarks
Workshop on Research Methods for Cereal/Legume Intercropping	Lilongwe, MW	23-27 Jan, 89	?		Organized jointly by CIAT/CIMMYT D T Edge (CIAT-Arusha) S Waddington (CIMMYT- Harare)
Breeders Workshop	Maseru, LO	30 Jan- 2 Feb, 89			Organized by SADCC/CIAT J B Smithson (Arusha)
First SADCC regional bean research workshop	Lusaka, ZA?	Sept-Oct, 89?			Organized by SADCC/LIAT D J Allen (Arusha) Consider combining with Genetic Diversity Workshop ?

Table 7 MONITORING TOURS

Participants	Locations	Time	Purpose	Remarks
r S Mughogho (MW) r A B L Mkandawire (MW) r L Kantili (MW) r L Mayona (TZ) r B Mitti (ZA)	Malawi, N Zambia S Tanzania	Mar 88	To visit the main research sites in this small, diverse and important area of bean production spanning three countries at peak season	Accompanied by D J Allen, J B Smithson (LIAI-Arusha) J Iohme (LIAI-Palmira)
r J Muilla -Mitti (ZA) K Kamala (IA)	Ethiopia	Sep 88	To give opportunity for breeders to visit key sites where local and introduced germplasm being evaluated in a well-structured programme	Accompanied by J B Smithson (LIAI-Arusha) and A Acosta (LIAI-Kampala)
r	Mozambique	April 89	To cover the main research sites used for grain legumes nationally, with emphasis on bean cultivar development	

Table 8 EQUIPMENT ORDER SUMMARY

<u>Country</u> <u>Item</u>	<u>Date</u> <u>ordered</u>	<u>Cost</u> <u>USD</u>	<u>Suppliers/</u> <u>agents</u>	<u>Shipped</u>	<u>Status/action</u>
<b>ANGOLA</b>					
Sprayers (4)	29/8/88	\$619	ICC	20/9/88	AWB 706-1333-9852
Projector (1)	18/6/88	\$1180	Dev Corp/ICC	-	In progress
Small Bundle thresher (1)	9/7/88	\$3547	Almaco/ICC	31/10/88	ETA to be advised
Planter (2)	9/7/88	\$5370	Almaco/ICC	31/10/88	-do-

**BOTSWANA**

All items received

**LESOTHO**

Projector	18/6/88	\$1180	Dev Corp/ICC	-	In progress
Small Bundle thresher (1)	15/8/88	\$3182	Almaco/ICC	-	To be shipped to Port Durban on 30/10/88

**MALAWI**

Motorcycles (3)	20/10/87	\$6150	Jackys Dubai	-	In progress
Soil Steri	-	-	-	-	Awaiting quote from WM ref tlx 22/7/88 and message sent via DTE 29/8/88

## EQUIPMENT ORDERS SUMMARY (Cont )

<u>Country</u> <u>Item</u>	<u>Date</u> <u>ordered</u>	<u>Cost</u> <u>USD</u>	<u>Suppliers/</u> <u>agents</u>	<u>Shipped</u>	<u>Status/action</u>
MOZAMBIQUE					
Motorcycles (2)	17/8/88	\$4460	Jaclys Dubai	24/9/88	AWB MAWB 17 706 1267-5497 HAWB D)B-347
Precision Balances (2)	17/8/88	\$1440	Salter UK	18/10/88	Flat FA 205
Tapes (4)	2/9/88	\$812	ICC Nairobi	20/9/88	AWB 706-1333- 2244
Clothing (4)	2/9/88	\$582	ICC Nairobi	20/9/88	-do-
Gumboots (6)	2/9/88	\$304	ICC Nairobi	20/9/88	-do-

## TANZANIA

Small Bundle thresher (1)	9/7/88	\$3742	Almaco/ICC	21/10/88	To be shipped to Dar es Salaam
Precision Balance (1)	17/8/88	\$742	Salter UK	23/10/88	AWB 074 762 70861

## ZAMBIA

All items received

## ZIMBABWE

All items received

Table 2 REGIONAL COLLABORATIVE RESEARCH SUB-PROJECTS

Topic	Investigators	Country	Lineages	Status
Bar leaf spot resistance, plasmid inactivation	Msuluzi & Polosi	MW	Mulungu, Zaire (Fyndji)	Approved by 3rd SC & funded Sites to incl Bunda (MW) Mbalala (ZA) and Mbeva (TZ) (CDN \$11 (not paid)
Screening for inactivation relative to green revolution	Nloza-Banda, Mlandawire & Muhoooho	MW	Rwanda (Athanasie)	Approved by 3rd SC & funded (CDN \$ 2,600 paid)
Light	Mlandawire, Kamenga, Ngalidemi & Mbewe	MW/ ZA/ TZ	Members of Drought Work Group, and Nazret, Ethiopia (Kidane)	Approved by 4th SC & funded (US \$ 10,000 paid)
Race differentiation	Nmbaga	TZ	Nazret, Ethiopia (Habtu)	Subject to revision before 5th SC
Shear design construction	Shemsanga	TZ	-	Deemed inappropriate by SC and rejected
Maize	Shemsanga	TZ	-	Deemed inappropriate by SC and rejected
Common viral virus resistance inactivation	Lana Lannaiyan & Jenge	TZ/ZA /ZW	Malerere Uganda (Owera)	Proposal submitted to 5th SC

Regional Programme Work Plan for the period 1.11.88 -31 10 89

November 1988

Plan and attend 5th SC Meeting, Gaborone	(RL)
Assist in data analysis and report compilation	(EB)
Attend Tanzania Commodity Crop Coordination Meeting Arusha	(RC/IR/LSA/ENT)
Attend Regional Seminar in Bean Research in Great Lakes Bulavu	(ENT)
Tour Kwanda and Burundi to establish contact with national entomologists	(ENT)
Assist in selection of sites for on-farm trials in Arusha Kilimanjaro and Lushoto	(LSA)
Travel to Angola to guide national programme planning	(RL)
Advertise Malawi Breeder position in SADCC region	(RL)

December 1988

Finalize Annual Report and revise Work Plan according to SC recommendations	(RC)
Attend and contribute to CIAT Internal Review	(RL/IR/LSA/ENT)
Finalize editing and plan publication of Drought Workshop proceedings	(LSA)

January 1989

Support staff evaluations	(RL)
Assist in recruitment of Ht Breeder for Malawi and establish operational base at Bunda	(RC)
Finalize plans for CIMMYT/CIAT Intercrop W/shop in Lilongwe	(LSA)
Finalize planning of Breeders W/shop in Maseru	(RB)
Attend Management Training Course, Nairobi	(RL)
Attend and contribute to CIMMYT/CIAT Intercrop W/shop, Lilongwe	(LSA/RL)
Attend and contribute to Breeders W/shop Maseru, and visit field trials	(IR/RL)

February 1989

Travel to Malawi Zimbabwe and Zambia to assist in evaluation of breeding trials/subprojects	(IR/FDI)
Travel to Malawi Zimbabwe and Zambia (with Headquarters Entomologist) to set priorities for cooperative research on insect pests	(ENT)
Travel to Mozambique to finalize plans for training course	(FL)
Finalize plans for on-station agronomy and on-farm trials in Tanzania	(LSA)

March 1989

Assist in evaluation of breeding materials at  
SUA, Morogoro (R)

Conduct SADC/BLIF training course for telephone  
research technicians Ilaputo (R/Z/A)

Finalize field plans for trials in northern  
Tanzania (R/INT)

April 1989

Plan and take part in monitoring tour of grain  
legume research sites in Ho Ambique (R/Z/A)

Attend 6th ST Meeting in Ho Ambique (sub-project  
reports) (R)

Assist in sowing field trials in northern  
Tanzania (R/INT/A)

Finalize compilation and plan production of  
bean pathogen checklist (R)

Plan 1st SADC Regional Bean Research Workshop  
(R/Z/A/INT)

Travel to Zambia to evaluate on-station and  
on-farm trials (R/A/Z/INT)

May 1989

Travel to help evaluate on-station trial in  
southern highlands of Tanzania and on farm  
trials near Mbala Zambia (R/Z/A)

Participate in data collection in field trials  
in northern Tanzania (R/Z/INT/A)

June 1989

Assist with harvest of trials in northern  
Tanzania (R/Z/A/INT)

Complete material for an audiotutorial on field  
pests of beans in Africa (INT)

Draft an outline for an audiotutorial on disease  
evaluation (R)

July 1989

Continue with harvesting and data compilation  
(R/Z/A)

Start preparation of field manual on pests and  
diseases of beans in Africa (R/INT)

Plan on-farm trials for Laragon and Lushoto in  
short rains (R/A)

Complete material for preparation of an audiotutorial  
on design, layout and analysis of field trials (R)

Plan entomology Working Group (INT)

August 1989

Attend SACCAR Board Meeting (RC)  
Prepare for mid-term review (RC)  
Finalize plans and contribute to Entomology Working Group, Nairobi (ENT)  
Assist in sowing of field trials in Lushoto (LSA/HB)  
Plan off-season multiplications (HB)

September 1989

Assist in sowing off-season multiplications, Miwaleni (HB/LSA)  
Finalize plans for 1st SADC Regional Bean Research W/shop (RC)  
Continue preparations for mid-term evaluation (RC)  
Assist in data compilation and analysis (HB/LSA/ENT)

October 1989

Attend and contribute to 1st SADC Regional Bean Research W/shop, Swaziland (RC/HB/LSA/ENT)  
with SO meeting attendance (as satellite to SADC Regional Workshop) (RC)  
Prepare to move RB and NB to Bean building at Selian (RC)



## APPENDIX 4

### SADCC/CIAT REGIONAL COLLABORATIVE RESEARCH SUBPROJECT PROPOSAL

Margaret T. Mmbaga\*

Pathogenic variation within the rust fungus  
(Uromyces appendiculatus (Pers.) Ung.) on beans  
in eastern and southern Africa and its applica-  
tions for resistance breeding

#### 1 INTRODUCTION

Beans (Phaseolus vulgaris L.) are an important source of protein in most African countries. They are grown in highly diverse ecological and climatic conditions ranging from humid highlands to the moderately moist lowland areas. The bulk of bean production is from small scale farms and only a small proportion of beans is grown in large-scale farms. Despite the importance of beans in Africa, yields are very low due to many factors such as poor varieties, soil infertility, disease and pest problems. Yields as low as 200-670 kg per hectare are common in Tanzania compared to the potential of 1 500 kg per hectare (Yarel et al, 1981). This has resulted in inadequate supply compared to demand and escalated prices of this important food item. Diseases such as anthracnose (Colletotrichum lindemuthianum), rust (Uromyces appendiculatus), angular leaflet (Phaeoisariopsis griseola) and bean common mosaic virus are particularly destructive. To date, these diseases have not been adequately controlled and severe losses in yield occur.

Even though pesticides are credited for giving immediate benefit to farmers (Gunn and Stevens 1978), their availability and cost-benefit margins in developing countries show clearly that they should only be used to supplement other methods and should not be the major method for controlling plant diseases. All pesticides have to be imported using limited foreign exchange consequently priority is given to the protection of export crops.

---

\* Senior Lecturer, Department of Botany, University of Dar es Salaam  
P. O. Box 35060 Dar es Salaam

at the expense of food crops. In addition, problems resulting from misuse of certain chemical products, damage to environment and non-target organism, intoxication hazards together with inadequate facilities and limited technical knowledge in pesticides application, often result in extremely high application costs and sometimes in ineffective control of pests and diseases. More appropriate methods for controlling plant diseases are necessary. Disease resistance breeding is perhaps the most important.

## 2 LITERATURE REVIEW

Disease resistance is not always permanent because pathogens are often variable. The selection pressure imposed on a pathogen by the introduction of a variety possessing a new gene for resistance often results in the emergence of a physiologic race against which the new variety is not resistant. It is important therefore to look for durable resistance, that is not rapidly overcome by pathogens (Johnson 1981).

Where variability of the bean rust pathogen has been studied, tremendous variation has been found, for instance, in the U S A alone 57 races have been reported (Stavely 1984), and 150 have been reported from other countries including Australia (Billantyne 1978) Mexico (Crispin and Dongo, 1962) Colombia and other Latin American countries. In East Africa variability of the rust fungus was indicated by Macartney and Howland (1966) Allen (1975) Mwateba and Mmbaga (1985) Mmbaga and Stavely (1986a). Isolates from Mbeya and Morogoro areas in Tanzania alone were found to comprise nine races of Uromyces appendiculatus (Mmbaga and Stavely 1986a).

Evaluations of local and foreign germplasm for resistance to rust have identified some locally adapted cultivars and foreign germplasm which appear to have broad resistance to the pathogen populations in Tanzania (Mmbaga and Stavely 1986a). More extensive study is required to identify and

quantify the variability of the rust pathogen in eastern and southern Africa

### 3 EXPECTED IMPACT OF THE RESEARCH

Identification of the rust races in the region would enable their distribution to be mapped. Such information would in turn help to develop effective breeding strategies, including the proper deployment of the available resistance genes, so increasing the durability of rust resistance in new bean cultivars. Thus impact would be long-term, contributing to more efficient breeding programmes.

### 4 RESEARCH METHODOLOGY

Field work coupled with glasshouse work will be conducted to cover important bean growing areas in the region. The field study will include rust isolate collection and a bean rust nursery to pick out changes in the pathogen virulence. Glasshouse work will include testing the isolates and determining the races in each collection.

#### A RUST ISOLATES

These will be collected from all representative bean growing areas in collaboration with national programme pathologists and CIAT's regional scientists, relying substantially on receipt of dried material by mail.

These isolates will be inoculated onto a set of 19 rust differential cultivars (Stavely et al 1983). The races in each isolate will be determined under glasshouse conditions at the University of Dar es Salaam using single pustule isolates and following methods already used by the author. Existing research facilities in the Botany Dept would require some improvement.

## B STORAGE OF ISOLATES

Since bean rust urediniospores lose viability fast, it is proposed to dry urediniospores for a few hours within anhydrous calcium chloride before deep freezing. Thereafter, cultures would require reinoculation onto a susceptible host at least every two years.

## C BEAN RUST NURSERIES

In order to monitor variability of the rust pathogen over time and location a rust resistance nursery will be developed, including entries from the IBRN, local materials (including TMO 31) which have been selected for being broadly resistant, and other lines identified in the rust research sub-project in Ethiopia, with Ato Habtu Assefa with whom exchange visits will be made. Periodic collection of isolates will be made to supplement information from the nurseries in identifying any new races.

## 5 REFERENCES

- 1 Allen, D J (1975) Breeding Phaseolus beans for resistance to rust  
Ph D thesis, Univ of Cambridge
- 2 Ballantyne, B J (1978) PhD thesis, Univ of Sydney Australia 262 p
- 3 Crispin, M A and Dongo S (1962) Plant Dis Repr 46 411-413
- 4 Gunn, D L and J G R Stavens (1978) Pesticides and Human Welfare  
Oxford Univ Press 273 p
- 5 Horland, A K and J C Macartney (1966) East Africa Agric Forestry J,  
32 208 - 210
- 6 Johnson R (1983) In Durable Resistance in Crops Plenum Press N Y 454p
- 7 Karel A Y et al, (1981) Proceedings of a Regional Workshop held  
at Lilongwe Malawi, March 1 - 14th 1980

- 8 Mwatapa, R and Mmbaga, M I (1985) Proceedings of the 4th Workshop on bean Research in Tanzania held at Morogoro Sept 1985  
129-134
- 9 Mmbaga, M T and Stavely, J R , 1986 (a) In Bean research Vol 1  
66 - 69
- 10 Mmbaga, M T and Stavely J R 1986(b) In Bean Research Vol 1  
56- 65
- 11 Stavely J R Freytag G F Steadman J R and Schwartz H F 1983  
Ann Rept Bean Improv Coop 26 IV-VI

6 PROPOSED BUDGET

	<u>Items</u>	<u>Prices in US \$</u>		
		Year 1	Year 2	Year 3
A	<u>For Laboratory / Glasshouse work</u>			
	Plastic trays	400 00	-	-
	Pot labels	50 00	-	-
	Manilla sheets	100 00	-	100 00
	Hand spray tool with power pack	500 00	500 00	500 00
	Insecticides	300 00	300 00	300 00
	Chlorox bleach	100 00	100 00	100 00
	Ethyl alcohol	250 00	250 00	250 00
	Air conditioners (two)	2000 00	-	-
	Humidifier for construction of incubation moist chamber	250 00	-	-
	Tissue paper	50 00	50 00	50 00
	3 voltage regulators	1800 00	-	-
	Refrigerator for isolate and inoculum storage	1000 00	-	-
	Fluorescent tube lights	200 00	100 00	100 00
	Labour	1000 00	800 00	800 00
B	<u>TRAVELS</u>			
	Return airfare D'ha-ADDIS	1000 00	-	1000 00
	*By air to and from Ethiopia plus subsistence Surface travel (nursery management and isolate collection)	1500 00	1000 00	1000 00
	<b>T O T A L</b>	<b>10500 00</b>	<b>3100 00</b>	<b>3600 00</b>

\*Ethiopia has a sub-project on Rust, exchange visits would be vital at the beginning and end of the project

CIAT/SADCC Regional Collaborative Research Sub-project

Title of Research Proposal	Regional Nursery for Bean Common Mosaic Virus Disease Resistance
Principal Investigator	Allan Femi Lani, P O Bo 3062 Sokoine University of Agric Morogoro, Tanzania
Collaborators	Dr J Kannaiyan (Chipata Zambia) Ms Olivia Venge (Harare Zimbabwe)
Research Objectives	(a) Evaluate breeding materials and sources of resistance to mosaic and black root strain of BCMV for lowland areas  (b) Screen promising materials for partial resistance against BCMV and, perhaps, including seed and vector resistance  (c) Identification of BCMV strains existing in the three participating countries  (d) Survey for natural alternate hosts of BCMV

Knowledge and Importance of the Problems

Bean common mosaic virus disease (BCMV) is present  
in the bean (*Phaseolus vulgaris*) is grown and loss  
to 51-80% (11) have been recorded due to the incidence of  
this disease. Severity of the disease is dependent on  
host/cultivar susceptibility, vector population percentage  
seedborne infection and strain of BCMV. Several strains of  
BCMV have also reported (3, 5, 7, 8, 12). The host-strain  
combination in certain locations can result in severe host  
reactions (11, 12) almost to the point of an epidemic (2, 3).  
In fact, Silbernagel *et al* (11) have indicated that  
depending on the host strain combination, losses up to 90%  
of the potential of seed yield can occur. These strains are  
grouped into two - the temperature insensitive (1) strains  
and the mosaic type inducing strains (3, 8). On basis of a  
study, introduced in 1981 in Africa, it has been demonstrated  
that the temperature inducing and highly pathogenic strain  
is prevalent all over sub-Saharan Africa (11) though to

completely identified most of these strains cause severe infection in bean cultivars of land races in Africa

Temperature insensitive systemic necrosis caused by strains in groups III, VIa and VIb of BCMV induce blackroot syndrome (3). This is a major problem for breeders in Africa as we are ignorant as to how many of these variants exist (5, 6). For instance, we know that cultivars with dominant alleles II of the necrosis gene are susceptible to the black root - unless, of course, they can be protected by additional genes for resistance. Silbernagel *et al* (12) in his report on the identification of the INI strain of BCMV in Tanzania wondered why the BCMV races with many genes for potent pathogenicity are so prevalent in East Africa with no genes for resistance. Kannava *et al* (11) recently indicated the predominance of the 'L2' strain in an agro-ecological zone in Zambia. This situation raises several questions which we expect to answer if funds are provided for this project proposal. VIc

1. Is the prevalence and the pathogenicity of BCMV and its strains in Africa a result of these strains in some unidentified wild or cultivated legumes? This is not yet known but if this is so, any attempt to control the disease by elimination of contaminated seeds is a wasteful exercise. Furthermore, non-identification of an alternate host could contradict Vanderplank's theory that unnecessary pathogenicity genes tend to be eliminated from host population with no resistance genes (Silbernagel - personal communication).
11. Based on previous studies, it seems that the genetics of resistance based on two genes 'I' and 'II' will be the best long range solution to this problem. Certainly, germplasm collection, screening procedure and breeding strategies will be needed to answer these questions.

If we recognize the severity of this disease and the creation of epidemics then there is a need to

1. identify all the strains available in this region
2. identify the alternate hosts for this virus & its strains
3. Use the knowledge from 1 & 2 above to assist plant breeders and virus pathologists in choosing the appropriate breeding promising materials and screen them against all the known strains - hopefully we will in the end, identify resistant cultivars.

Procedure: 1. Promising germplasm accessions and cultivars will be collected from each of the participating countries. The accessions from



each country will be assembled and tested respectively in Morogoro Tanzania, Harare, Zimbabwe and Mselera (Chipata) Zambia. Each testing location will be designated CIAT/SADCC BCMV Resistance Nursery TMO, CHIZA and HAREZIB

2. Using the methods of Culver *et al* (1), Milinga *et al* (9) and Sembozi *et al* (10), 3 sets of field experiments will be carried out in each location
  - (a) In two separate experiments, accession lines will be inoculated separately with the mosaic and necrotic - inducing BCMV strains. The reactions of each line to each strain will be evaluated both on basis of symptom and ELISA (1, 7)
  - (b) Accession lines will be grown and exposed to natural infections of various pathogens with particular references to vector populations, viral symptom development. These factors will be monitored at each location. Leaf samples will be assayed as above (1,7) for type/strain infection
  - (c) Survey of viruses on cultivated and wild legumes will be carried out at each location to determine whether or not there are alternate hosts of BCMV

Results of all field experiments will be complemented/confirmed with greenhouse studies

#### References

1. Culver, J. N. and J. L. Sherwood (1987) Resistance to Peanut Stripe virus in *Arachis* germplasm. *Plant Disease* 71: 1080-1082
2. Davis, J. H. C., F. Morales and M. Castano (1987) Resistance to black root. *Bean Improvement Cooperative* 30: 14-15
3. Drijfhout, E. (1978) Genetic interactions between *Phaseolus vulgaris* L. and bean common mosaic virus with implication for strain identification and breeding for resistance. *Agric. Res. Rep. (Versl. landbouwk. Onderz.)* 872: 98p

- 1 Kannaiya, J K , K Kaneng, S Sithantham and J M Mulika  
(1988) Recent progress in bean improvement in Zambia  
Paper Presented during the 7th Workshop on Bean  
Research in Morogoro, Tanzania 28-30 Sept 1988
- 5 Kelly, J D , A W Sacttler and M Morales (1984) New  
Necrotic Strain of BCMV in Michigan Bean Improvement  
Cooperative 27 38-39
- 6 Kyles, M M and R Provvidenti (1987) A severe isolate  
of bean common mosaic virus - NY - 15 Bean Improvement  
Cooperative 30 87-88
- 7 Lana, Allan Fern, H Louis, L Bos and Jeanne Dijkstra  
(1988) Relationship among strains of bean common mosaic  
virus and blackeye cowpea mosaic virus - members of the  
poty virus group Annals of Applied Biology 113 (in  
press)
- 8 Morales, F J and M Costano (1987) Seed transmission  
characteristics of selected bean common mosaic virus  
strains in different bean culti ars Plant Disease 7  
51-53
- 9 Milinga, K A A , J M Teri and H H Runkulatile (1987)  
Performance of selected bean lines at Morogoro In Bean  
Research 2 91-104
- 10 Sembosi, J S K, J M Teri and R M Misangu (1987)  
Screening of bean hybrids for resistance to black root  
In Bean Research 2 89-93
- 11 Silbernagel M J , G E Mink, C L Kestani and L J  
Mills (1987) Bean common mosaic virus in Phaseolus  
vulgaris L In Bean Research 1 84-87
- 12 Silbernagel, M J , L J Mills and W Y Wang (1986)  
Tanzania strain of bean common mosaic virus Plant  
Disease 70 839-841

## Principal Investigator

One of the major problems there are essential for a proper development and execution of this project particularly since the proposal for which funds are being sought is a virus - pathological project. It will be the first resident plant virus pathologist in Tanzania and he is making efforts to work within a well-laboratory where some basic laboratory virus problems can be easily solved without waiting for advice from a developed laboratory overseas. The expendable materials are also essential if this project is to achieve its desired and desired goals.

## Principal

Principal Investigator (PI) - Allan Fern Lane (Curriculum vitae attached)

Collaborators a Dr J. Fernando, Pathologist,  
Food Legume Research Team  
PO BOX 51007 Chipata Zambia

b Ms. Olivia Lengua  
Plant Protection Research Institute  
P.O. Box 5100  
Chisewa, Harare  
Zimbabwe

Since the importation of seeds into Tanzania from the participating countries is forbidden, these collaborators will assist in preparing long standing accession lines as well as carry out some observations at their different locations. This sort of assistance will make the studies less burdensome on the PI as well as promote international cooperation on a common problem. However, the provision of these services to the PI will be at the expense of the grant to be provided to the PI. As a sort of incentive, each of the collaborators will be expected to visit each of the nurseries. The PI will however do all the inoculations and most of the data collection.

Short term Technical Training An assistant with some considerable level of experience in crop production will be recruited from the Morogoro area. He will be trained in the art of entomology and observation, inoculation and data collection. He will be in charge of the day to day operation of the project while receiving overall direction/instruction from the PI.

Conclusions If this proposal is approved then it will become a pioneer project in plant virology in Tanzania. It

is imperative therefore that a good foundation should be laid in this discipline that will allow the PI's laboratory become a mini-virus laboratory for plant virus-related problems. The non-expendable materials will certainly not be recurrent in the subsequent annual Budget. CIAI/SADCC Regional Programme should take a serious & positive view of this and leave such a lasting legacy behind in Tanzania.

a. ELISA Reader and accessories. This is the most important facet of this project since there is no the reliable way of assaying leaves for BCMV content and to determine strain relationship (7). Up till now, the CIAI/SADCC has had to send virus samples to some developed laboratories abroad. The purchase of an ELISA PLATE READER will certainly be an indispensable item toward an efficient execution of this project. The committee is urged to set aside a special fund for this item as requested in Appendix II.

#### Institutional Units to be involved

1. BEAN/CRSCP Programme in Sokoine, Tanzania
2. Food Legume Research Programme in Chipeta, Zambia
3. Plant Protection Research Institute in Harare, Zimbabwe

Continuous dialogue and contact will lead to an effective collaboration throughout the duration of the project.

## Appendix I

## Proposal Budget

	1st Year		2nd Year		3rd Year	
	TZ	US	US	TZ	US	
Ploughing and Harrowing 2 acres at 3 location	15,000	150	15,000	150	15,000	150
Labour (Plot layout, Planting, Sampling Harvesting 100 mandays at 3 locations at 75/- day	22,500	225	22,500	225	22,500	225
Classhouse Repair & Experiments	40,000	400	40,000	400	40,000	400
Field Materials - bags ropes, agrochemicals at each location	140,000	1400	140,000	1400	140,000	1400
Non Expendable items						
Refrigerator (+ voltage stabilizer)	130,000	1300	-	-	-	-
Deep Freezer ( )	-	-	130,000	1300	-	-
Mortar and pestles \ 3 (at 3 locations)	150,00	150	-	-	-	-
Pots and labels \ 3	20,000	200	-	-	-	-
Insect cages \ 3	90,00	90	-	-	-	-
Micro-Re/Pettors 50, 75, 100 ml 200, 250, 300, 500 ml	28,500	285	-	-	-	-
Expendable Items						
Pesticides						
Laboratory chemicals	100,000	1000	100,000	1000	100,000	1000
Plastic Bags, labels and others	10,000	100	10,000	100	10,000	100
Stationery (+ Computer costs)	80,000	800	80,000	800	80,000	800
ELISA PLATES 10-20 boxes	120,000	1200	120,000	1200	120,000	1200
ELISA accessories	40,000	400	40,000	400	40,000	400
Publications (Plant Disease or Phytopa- thogen or Plant Patho- logy or Annal	-	-	-	-	50,000	500

Appendix I cont

Personnel

Short term Trainee						
2,800 x a	33,600	336	33,600	336	33,600	336
Incentives to labourers	4000	40	4000	40	1000	10
Fringe Benefits to staff & Collaborators	-	1000	-	1000	-	1000

Transport

Local Travel + per diem	50,000	500	50,000	500	50,000	500
International Travel						
DAR - HARARE - CHIPATA	-	500	-	500	-	500
Per diem at \$100 x 14 days		1400		1400		1400
Travels by 2 collaborators	-	800	-	800	-	800
Airfare 100 x 8 x 2	-	300	-	300	-	300
Grand total	1297600	12,976	11,8510	11 851	11,0510	11 051

## SPECIAL BUDGET FOR ELISA EQUIPMENT

1	Fisher Microplate Reader	\$ 7,000
	Cat = 11-400	
	(Fisher Scientific Company)	
2	Artek - Comp - Print Programmable	
	Calculator/Printer	
	Cat - 11 - 399 - 100	\$ 2,000
	Fisher Scientific Company	-----
		\$ 9,000
		=====

ZAMBIA SUB-PROJECT PROPOSAL

"ECOLOGY AND MANAGEMENT OF APHIDS ON BEANS "

Aphids are an important pest of bean in the SADCC region Aphis fabae Scop appears to be the most commonly occurring aphid. Infestation by aphids can take place at different crop growth stages. The extent of crop loss caused not only depends on the crop stage and severity of infestation but also on their role as a vector of the Bean Common Mosaic Virus (BCMV), which causes an important disease in beans in the SADCC region.

Our knowledge on the seasonal and host distribution of bean aphids in the region and their dynamics as direct pests as well as vectors of BCMV is only sketchy. If we clarify some aspects relating to the ecology of aphids and the factors influencing their severity on bean, it is possible to develop suitable strategies so to reduce the losses caused by them both as direct pests and as vectors of BCMV.

The sub-project is proposed with a view to explore some of the relevant areas, listed below

- The species of aphids, their distribution on bean in the region in relation to differing ecologies
- The within season and between seasons shifts in their occurrence in relation to climate, host plants and cultural practices
- The dynamics of their populations in relation to crop phenology and natural enemy activity, their role in the spread of BCMV
- Alternatives available for minimising the crop losses caused by aphids on beans

A three year study of these aspects is envisaged, with Zambia as the main



center, including some collaborative experiments for chosen observations in Malawi and Zimbabwe. The major research sites in Zambia are Msekera and Mbala which represent two distinct and major ecologies in the sub-region. The former with warm conditions and moderate rainfall and the latter relatively cool and high rainfall. The positioning of a full time legume pathologist in the Zambian team can be taken advantage of in related BCMV studies. The breeder and agronomist in the team are also available to assist in areas related to them.

PLAN OF EXPERIMENTS / ACTIVITIES (No OF SEASONS)

	<u>MSE</u>	<u>MBA</u>	<u>MW</u>	<u>ZW</u>
1 Survey for offseason host plants (surrounding major bean areas monthly visits for 4-6 months)	3	3	2	2
2 Effect of planting dates and inter-cropping on aphid and BCMV incidence (collaboration with agronomy-on-farm observation )	3	3	2	2
3 Effect of regimes of protection from aphids on BCMV (collaboration with pathologist) supported by monitoring alates and secondary spread)	3	3	-	-
4 Aphid/BCMV resistance/avoidance studies (collaboration with pathologist breeder, agronomist)	3	3	1	1
5 Population dynamics of aphids (role of natural enemies and weather elements besides crop phenology)	3	3	2	2

BUDGET PROPOSAL (PER YEAR)

	<u>ZA (Msc)</u>	<u>ZA (Mbi)</u>	<u>NW</u>	<u>ZW</u>	<u>TOTAL</u>
1 Field experimentation including supplies and labour	1 000	1 000	500	500	3 000
2 Net house and laboratory experimentation for BCHV and natural enemies	2 000	-	-	-	2 000
3 Consultant/Consultation visits to meet experts/collaborators	1 500	-	500	500	2 500
4 Surveys/training port/subsistence	500	1 000	500	500	2 500
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	5 000	2 000	1 500	1 500	10 000

SADCC/CIAT REGIONAL PROGRAMME ON BEANS  
PROPOSAL FOR REGIONAL COLLABORATIVE RESEARCH  
SUB-PROJECT

TITLE

Introduction of improved seed type and resistance to necrotic strains of BCMV into a Carioca background

SCIENTISTS RESPONSIBLE

Joyce Hulila, National Coordinator, Groundnuts/Grain Legumes, Zambia

Martin Mbewe, Grain Legume breeder, Zambia

COORDINATING INSTITUTION

Msekera Regional Research Station, P O Box 510089, Chipata, Zambia

COLLABORATING SCIENTISTS AND INSTITUTIONS

Dr Ruth Kamala, IAKO, Lyamungu P O Box 3004, Moshi, Tanzania

UNO, Uyoie, P O Box 400 Mbeya, Tanzania

Ms Olivia Verge, DI & SS, Causeway P O Box 8100, Harare, Zimbabwe

IAH station, Meikassa, P O Box 103, Naaret, Ethiopia

RATIONALE

Carioca has performed extremely well in many situations in Africa. It has been released in Zambia. It is being proposed for release in Ethiopia. It is one of the best yielders in variety trials in Tanzania and Zimbabwe. It appears to be tolerant of acid soil conditions and multiple resistant to several important diseases. Its seed is smaller than is generally acceptable and of non-preferred appearance (cream with tan stripes). It is also susceptible to necrotic strains of BCMV.

Segregating populations with Carioca as one parent are now available from CIAT HQ. They offer a means of incorporating improved seed type and resistance to necrotic strains of BCMV into Carioca backgrounds.

EXPECTED IMPACT

Expected impact is medium to long-term but should result in cultivars of improved yield and acceptability and parental

materials for further crossing

## LITERATURE REVIEW

In Zambia, Carioca has been released for cultivation in northern areas (Reports of Zambian National Programme, 1985-1987) Although, its seed type is less than acceptable, it is popular because of its improved yield performance (Allen and Smithson, 1988) It is now being multiplied and distributed in several areas of northern Zambia

In Ethiopia, it has reached the verification trial stage and has been proposed for release this year (Abebe, 1988)

In Tanzania, it was among the three best yielders in TAO Uniform Cultivar Trials in 1988 and has been promoted to National Variety and On-farm trials (TAO Annual Report, 1987-88)

In Zimbabwe, Carioca considerably out-yielded other entries in advanced trials in 1987 (DK&SS Annual Report 1986-87)

In view of its success over such a wide range of situations, Carioca can be expected to perform well in other countries where it has not yet been tested

## PROCEDURES

Dec 1988 - Mar 1989

Increase  $F_2$  seed of segregating populations at Msekera Widely spaced bulks in unreplicated plots in order to obtain sufficient seed for large  $F_3$  populations

Sept/Oct 1989 - Dec/Jan 1990

Large  $F_3$  bulks at Mbala Unreplicated Spreader rows susceptible to major diseases (anthracnose, rust, scab) to be sown every 3rd row, 2 weeks before bulks and inoculated Select single plants for disease resistance agronomic worth and seed type

Dec/Jan - March/April 1990

Progeny rows at Msekera Unreplicated with black-root susceptible spreaders (carrying 1 gene) every 3rd row and frequent local checks (Carioca, ZPV 292 and etc) Select single plants and families for disease resistance, agronomic value and seed type

April 1990 onwards

Seed of  $F_3$  families to Ethiopia (Jun/Jul to Aug/Sept), Tanzania and Zimbabwe (Dec 1990 - March 1991) Select single plants for agronomic value, seed type and disease resistance

In Zambia, F<sub>3</sub> single plants to be grown as F<sub>4</sub> progenies at Mbala Unreplicated but with susceptible spreaders and frequent local checks. Select families for distribution to Ethiopia, Zimbabwe, Tanzania and other countries and single plants for further purification and testing at Msekera and Mbala in Zambia Dec/Jan 1990/91 to March/April 1991

By 1991 early selections from the crosses can be expected to be entering first stage national and regional trials

#### BUDGET

ZAMBIA	1988	1989	1990	Total
Supervision	100	500	500	1100
Cultivation etc	100	200	400	900
Labour	50	150	300	500
Field supplies	60	110	250	420
Lab supplies	150	1000	300	1450
Office supplies	100	150	500	750
Local travel	-	200	-	200
International travel	-	-	1500	1500
Total	560	2310	3950	6820
ETHIOPIA				
Supervision	-	-	300	300
Cultivation etc	-	-	400	400
Labour	-	-	200	200
Field supplies	-	-	150	150
Lab supplies	-	-	1000	1000
Office supplies	-	-	300	300
Local travel	-	-	500	500
International travel	-	1000	1000	2000
Total	-	1000	2850	3850
ZIMBABWE				
Supervision	-	-	300	300
Cultivation etc	-	-	400	400
Labour	-	-	200	200
Field supplies	-	-	150	150
Lab supplies	-	-	1000	1000
Office supplies	-	-	300	300
Local travel	-	-	500	500
International travel	-	1000	1000	2000
Total	-	1000	2850	3850

IANZANIA	1988	1989	1990	total
Supervision	-	-	600	600
Cultivation etc	-	-	800	800
Labour	-	-	400	400
field supplies	-	-	300	300
Lab supplies	-	-	2000	2000
Office supplies	-	-	600	600
Local travel	-	-	1000	1000
International travel	-	2000	2000	4000
Total	-	4000	5700	7600

WORKSHOP ON RESEARCH METHODS FOR CEREAL/LEGUME  
INTERCROPPING IN EASTERN AND SOUTHERN AFRICA

Sponsored by the Government of Malawi, CIMMYT and CIAT  
Lilongwe, Malawi, 23-27 January, 1989

CURRENT LIST OF PARTICIPANTS - 10 November, 1988

1) From Outside Eastern Region and Southern Africa

Dr Roger Mead - Biometrician,  
Department of Applied Statistics  
University of Reading  
Whiteknights  
P O Box 217  
Reading RG6 2AN  
United Kingdom

Agreed to present paper on "Statistical Analysis of  
Intercropping Experiments designed to Address Basic Research  
Issues"

---

Professor Charles Francis - Agronomist  
Department of Agronomy  
University of Nebraska  
Lincoln  
East Campus  
Lincoln NE 68583  
U S A

Accepted, subject to approval from U of Nebraska  
Agreed to present paper entitled "New Innovations in  
Intercropping Research and Implications for Research Methods"

---

Dr Francis Ofori - Agronomist  
Plantations Limited  
Ghana Cocoa Board  
Private Bag  
Accra North  
Ghana

No response yet

---

Dr Philip Thornton - Bioeconomist  
IBSNAT  
Edinburgh School of Agriculture  
Glenbourne  
6 South Oswald Road  
Edinburgh  
Scotland EH9 2HH

Agreed to present paper on "Models in Intercropping"

---

Professor W R Stern - Agronomist  
University of Western Australia  
Nedlands, 6009  
Western Australia  
Australia

Awaiting confirmation of participation

---

2) National Program Staff

Dr M S Reddy - Agronomist  
Maize agronomist  
Mt Makulu Research Station  
P Bag 7  
Chilanga  
Zambia

Agreed to present paper on "Measurement of  
Biological Outputs"

---

Dr A Sutherland- Anthropologist  
ARPT  
Mt Makulu Research Station  
P Bag 7  
Chilanga  
Zambia

Agreed to present a paper on "Measurement of  
socio-economic Outputs"  
- Participation is subject to Zambia  
Government approval

---

Dennis Wanchinga - Manpoer and Training Officer  
SACCAR  
Private Bag 00108  
Gaborone  
Botswana

No response as yet

---

Dr G H Semuguruka  
TARO  
P O Box 9761  
Dar es Salaam  
Tanzania

1010x from T Edge 7 no under 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup> 17<sup>th</sup>  
nominated, with two more expected soon

---



Dr Manuel Moraes  
I N I A  
Caixa Postal 3658  
Mavaline  
Maputo 8  
Mozambique

No response as yet (Reminder telex was sent 1 November,  
1988)

---

Dr B K Patel  
Min of Agriculture  
P O Box 50291  
Lusaka  
Zambia

No response as yet (Reminder telex sent 2 November,  
1988)

---

Dr William Wapakala (Reply from J K Rutto)  
Min of Agriculture  
& Livestock Department  
P O Box 30028  
Nairobi  
Kenya

Nominations	M N Mwanja - Agronomy	Kitale
	J J Chumo (Mrs) Breeding	Kitale
	M Omunyin - Pathology	Thika
	F M Murithi - Ag Economics	Embu
	R L Milikau - Biometrics	N A L

---

Mr Edouard Niyongabo  
ISABU  
B P 795  
Bujumbura  
Burundi

Nominated Mr Rafyikiriri Emmanuel

---

Dr Seme Debela  
Institute of Agricultural Research  
Addis Ababa  
Ethiopia

Live nominations  
Kidane Giogis  
Woldeyesus Sinebo  
Amare Abeba  
Adhanom Negassi  
Legesse Dadi

---

Mr Ron Fenner  
DR&SS  
P O Box 8108  
Causeway  
Harare  
Zimbabwe

Nominations

Dr M Natarajan - Agronomist, Agronomy Institute  
Mr Enos Shumba - Agronomist, FSRU  
Mr I Mharapara - Lowveld Research Station  
Dr Paul Muchena - Nematologist, Plant Protection  
Research Institute

---

Professor Schweppenhauser  
Dept of Crop Science  
University of Zimbabwe  
P O Box MP 167  
Mount Pleasant  
Harare  
Zimbabwe

Nominated Irvine Mariga, Agronomist, Department of Crop  
Science, University of Zimbabwe

---

Secretary for Personnel & Training  
Office of President & cabinet  
P O Box 30227  
Lilongwe 3  
Malawi

Malawi Nominations  
Dr David Munthali - Entomologist  
Chancellor College  
P O Box 280  
Zomba  
Malawi

Dr W Musuku - Pathologist  
Dr A B C Mkandawire - Physiologist  
Bunda College of Agriculture  
P O Box 219  
Lilongwe  
Malawi

Mr D Yiwombe - Extension Officer  
Mrs E Chikagwa - Womans Program Officer  
Ministry of Agriculture  
P O Box 30134  
Capital City  
Lilongwe 3  
Malawi

Dr G Y Mkamanga - Physiologist  
Ministry of Agriculture  
P O Box 30134  
Capital City  
Lilongwe 3  
Malawi

Mr C Chanika - Adaptive agronomist  
Blantyre ADD  
P O Box 30227  
Chichiri  
Blantyre 3

Mr F Nyondo - Adaptive economist  
Karonga ADD  
P O Box 97  
Karonga  
Malawi

Dr P K Sibale - Breeder  
Mrs P Ngwira - Pathologist  
Mr F W Kisombe - Biometrician  
Chitedze Research Station  
P O Box 158  
Lilongwe 3  
Malawi

---

Dr Noel Govinden  
Director of Sugar Industries Research Inst  
MSIRI  
Reduit  
Mauritius

Will present paper on Mauritius research as an example of  
an integrated intercropping research program

---

Professor M J Swift  
Dept of Biological Sciences  
University of Zimbabwe  
P O Box Mp 167  
Mount Pleasant  
Harare  
Zimbabwe

Agreed to present a paper on "sustainability"

---

3) IARC Centre Staff

Dr Cesar Cardona  
CIAT  
Apdo Aero 6713  
Cali  
Colombia

Dr Roger Kirkby  
CIAT, Addis Ababa  
Ethiopia

Dr J Davies  
CIAT, Butare  
Rwanda

Dr D Allen  
CIAT, Arusha  
Tanzania

Dr R Arias  
CIMMYT, Accra  
Ghana

Drs A F E Palmer, J Ransom &  
P Anandajayasekeram  
CIMMYT, Nairobi  
Kenya

Drs A Low, Gelaw  
CIMMYT, Harare  
Zimbabwe

Dr Mahmood Osmanza  
Principal Cereals Agronomist  
SADCC/ICRISAT Sorghum & Millet  
Improvement Program  
P O Box 776  
Bulawayo  
Zimbabwe

Dr Jonathan Woolley - agronomist  
CIMMYT Mexico  
Lisboa 27  
Apdo Postal 6-641  
06600 Mexico D F  
MEXICO

Agreed to present papers on  
"Specific Diagnostic Considerations for Intercropping" and  
"Implementation of Intercrop Experiments"

#### Workshop Organisers

Dr Todo Edge, agronomist  
SADCC/CIAT  
P O Box 2704  
Arusha  
TANZANIA  
Tlx No 42106 CANWHT TZ

Mr Lovewell Ngwira, agronomist  
and Head of Maize Team  
Chitedze Research Station  
P O Box 157  
Lilongwe 3  
MALAWI  
Telephone No 767-222

Dr Stephen Waddington, agronomist  
CIMMYT  
P O Box MP 154  
Mount Pleasant  
HARARE  
Zimbabwe  
Tlx No 2462 CIMMYT ZW

df/9/11/88

WORKSHOP ON RESEARCH METHODS FOR CEREAL/LEGUME  
INTERCROPPING IN EASTERN AND SOUTHERN AFRICA

Sponsored by the Government of Malawi, CIMMYT and CIAT  
Lilongwe Hotel, Lilongwe, Malawi,  
22-27 January, 1989

Program Draft 2 (1 November, 1988)

---

Sunday 22 January

1400-2000 Registration

1900-2030 Reception

Monday 23 January

0800-0805 Welcome to the Workshop Malawi Organiser  
L Ngwira

0805-0815 Welcome Address By a representative of  
the Government of Malawi

0815-0830 Aims of the Workshop S Waddington

0830-0900 Relevance of the  
Workshop to Farming  
in E&S Africa T Edje

SESSION 1 THE FUTURE OF INTERCROPPING  
RESEARCH AND IMPLICATIONS FOR  
RESEARCH METHODS

Chairman W R Stern

0900-0940 New Innovations in  
Intercropping  
Research C Francis

0940-1000 T E A

1000-1040 Effective Use  
of Current  
Intercropping  
Technologies D Yiwombe

1040-1100 Discussion  
(Rapporteur )

SESSION 2	<u>UNDERSTANDING CURRENT INTERCROPPING PATTERNS AND DIAGNOSIS OF INTERCROPPING PROBLEMS IN FARMER'S FIELDS</u>	
	(Chairman )	
1100-1130	<u>General Procedures for Diagnosis</u>	P Ananda
1130-1210	<u>Specific Diagnostic Considerations for Intercropping</u>	J Woolley
1210-1230	Discussion (Rapporteur )	
1230-1400	L U N C H	
SESSION 3	<u>DEVELOPMENT OF AN INTERCROPPING RESEARCH PROGRAMME AND COMPONENT RESEARCH</u>	
	Chairman B Gelaw	
1400-1420	<u>Elements of an Integrated Inter- Cropping Research Programme</u>	A F E Palmer & R Kirkby
1420-1445	<u>An Example The Intercropping Research Programme in Mauritius</u>	N Govinden
1445-1515	<u>Breeding for Intercrops</u>	J Davies
1515-1530	<u>Weed control in intercrops</u>	J Ransom
1530-1545	T E A	

1545-1600	<u>Fertilizer research in intercrops</u>	L Ngwira & T Edje
1600-1630	<u>Insect pests in intercrops</u>	C Cardona
1630-1645	<u>Diseases in inter- crops</u>	D Allen
1645-1700	<u>Spatial arrange- ments in inter- crops</u>	M Natarajan
1700-1730	Discussion (Rapporteur )	

Tuesday 24 January

SESSION 4      EXPERIMENTATION  
WITH INTERCROPS

Chairman    I Mariga

0800-0830	<u>The Planning of OFR Intercrop Experi- ments</u>	A Low & S Waddington
0830-0915	<u>Appropriate Exp- erimental designs and treatment structures for intercropping</u>	R Mead
0915-0940	<u>Implementation of Intercrop Experiments</u>	J Woolley

SPECIAL      COUNTRY EXPERIENCE IN  
SESSION      INTERCROPPING RESEARCH

(Chairman            )

0940-1000	(e g <u>Malawi experience</u> )
1000-1020	T E A
1020-1040	(e g <u>Kenya experience</u> )
1040-1100	(Another experience)
1100-1120	(Another experience)
1120-1145	Discussion (Rapporteur        )



SESSION 5      ANALYSIS AND INTERPRETATION  
OF INTERCROP RESEARCH

Chairman R Milikau

- 1145-1205      Measurement of                      M S Reddy  
Biological outputs
- 1205-1220      Measurement of                      A Sutherland  
Socio-economic  
outputs
- 1220-1240      An Example Agronomic              T Edge  
and nutritional  
assessment of a  
Maize/bean intercrop
- 1240-1400      L U N C H
- 1400-1445      Statistical Analysis                  R Mead  
of Intercropping  
Experiments Designed  
to Address Basic  
Research Issues
- 1445-1530      Statistical Analysis                  F Kisiyombe  
of On-farm Research  
Intercropping Trials
- 1530-1545      T E A

SESSION 5      Continued

(Chairman                      )

- 1545-1615      Agronomic Inter-                      J Ransom  
pretation of On-  
farm Research  
Intercropping  
Trials
- 1615-1645      Economic Interp-                      P Ananda & A Low  
retation of Inter-  
crop Trials
- 1645-1715      Discussion  
(Rapporteur                      )

Wednesday 25 January

SESSION 5 Continued

(Chairman )

0800-0845 Models of Inter- P Thornton  
cropping Their  
uses and limitations

SESSION 6 SUSTAINABILITY AND INTERCROPS

(Chairman )

0845-0900 Sustainability C Francis  
issues with  
Intercrops

0900-0940 Sustainability of M Swift  
intercrops in  
relation to manage-  
ment of soil organic  
matter and nutrient  
cycling/nutrient use  
efficiency

0940-1000 Discussion  
(Rapporteur )

1000-1020 T E A

Group Discussion and Development  
of Guidelines

1020-1230 SESSIONS 1 AND 2

1400-1730 Visit Intercrop Trials (Tour Organiser  
at Chitedze Research L Ngwira)  
Station, in farmers  
fields and at Bunda  
College  
(Rapporteur )

Thursday 26 January

Group Discussion and  
Development of Guidelines cont

0800-1230 SESSIONS 3 AND 4

1400-1730 SESSIONS 5 AND 6

1900 - WORKSHOP DINNER

Workshop on Research Methods for Cereal/Legume Intercropping  
22-27 January, 1989, Lilongwe, Malawi

Sponsored by the Government of Malawi, CIMMYT and CIAT

---

Dear International Participant,

We enclose some information to help make your preparations for travel and your arrival at Lilongwe as smooth as possible

Visas for entry into Malawi are required by persons with a passport from the following countries in E&S Africa, Ethiopia, Rwanda, Burundi and Mozambique

Most participants will require a PTA. We plan to send out PTA's during the 3rd week of December. If you cannot trace your PTA by the 6th January, 1989, please telex the CIMMYT Harare office (2462 ZW) immediately for assistance

Malaria is endemic throughout Malawi and the use of a malaria prophylactic is strongly recommended. Persons coming from both West and East Africa should have a current certificate of vaccination against yellow fever and cholera

Reasonable en-route expenses will be reimbursed in foreign currency by the workshop sponsors provided claims are supported by receipts

When arriving at the airport, females should wear a dress or skirt that covers the knee, not trousers. Males should not wear long hair

We plan to register all International participants arriving on Saturday 21 January or Sunday 22 January as they check in at the Lilongwe Hotel. The registration desk will also be open from 0700-0900h Monday 23 January, primarily for the registration of local participants

The equivalent of MK200 (approx US\$75) of new goods per person may be brought into Malawi duty free provided you declare they are for your personal use. Gifts for other persons are liable for duty. Please remember to complete the currency declaration form fully

You will be met at the airport by a representative of the organisers and taken to the Lilongwe hotel. The representative will carry a sign "Intercrop Workshop" so you can recognise him. If you do not see him, event you are not met, and have not altered your flight without informing us, please take a taxi to the Hotel where the taxi driver will be paid

Any necessary changes in your travel plans less than one week before your scheduled arrival time should be communicated to the CIMMYT office in Lilongwe (Telephone Lilongwe 731316, Telex 43055 MI), not to Harare

Contact addresses in Lilongwe

Ms Farida Osman or Dr Malcolm Blackie  
CIMMYT/Rockerfeller Foundation  
P O Box 30727  
Lilongwe 3  
Malawi

Telephone 731316  
Telex. 43055 MI

Lilongwe Hotel  
P O Box 44  
Lilongwe 3  
Malawi

Telephone 721866  
Telex 4321 MI

df

M E M O R A N D U M

Workshop on RESEARCH METHODS FOR CEREAL/LEGUME INTERCROPPING in Eastern and Southern Africa, to be held 22-27 January, 1989 at Lilongwe, Malawi

Sponsored by CIMMYT, CIAT and the Government of Malawi

---

To all Participants

Date 4 November, 1988

1) National Program Staff

Dr M S Reddy	Zambia	
Dr A Sutherland	Zambia	
Dr B K Patel c/o	Zambia	(4 copies)
Dr D Wanchinga	Botswana	
Dr G H Semuguruka c/o	Tanzania	(6 copies)
Dr M Moraes c/o	Mozambique	(3 copies)
Dr J K Rutto c/o	Kenya	(6 copies)
Mr M N Wania	Kenya	
Mrs J J Chumo	Kenya	
Mr M Ogunyin	Kenya	
Mr F M Munthi	Kenya	
Mr R L Milikau	Kenya	
Mr M Nkonko	Rwanda	
Dr E Niyongabo c/o	Burundi	
Mr R Emmanuel	Burundi	
Dr L Gahamanyi c/o	Rwanda	
Dr Seme Debela c/o	Ethiopia	(6 copies)
Dr M Natarajan	Zimbabwe	
Dr Irvine Mariga	Zimbabwe	
Professor M J Swift	Zimbabwe	
Dr P Muchena	Zimbabwe	
Mr E Shumba	Zimbabwe	
Mr I Mharapara	Zimbabwe	
Dr E Whingwiri	Zimbabwe	
Dr Noel Govinden	Mauritius	
Secretary for Personnel & Training c/o	Malawi	(10 copies)

2) Participants from Outside the Region

Dr C Francis	United States of America
Dr P Thornton	United Kingdom
Professor W Stern	Australia
Professor R Mead	United Kingdom

3) IARC Staff (Not all are participants)

Dr C Cardona	Colombia
Dr R Kirkby	Ethiopia
Dr J Woolley	Mexico
Dr A Low	Zimbabwe
Dr B Gelaw	Zimbabwe
Dr J Davies	Rwanda
Dr D Allen	Tanzania
Dr T Edje	Tanzania
Dr F Palmer	Kenya
Dr J Ransom	Kenya
Dr R Arias	Ghana
Dr R Cantrell	Mexico
Dr R Paliwal	Mexico
MAMRS	Zimbabwe

We enclose the latest draft program for the workshop. Please have a look through the program and let us know if you have further suggestions for improving the content of the workshop.

VENUE

We plan to hold the workshop and provide accommodation at the Lilongwe Hotel, close to the Old Town area of Lilongwe, Malawi.

MALAWI CLEARANCE

All non-Malawi participants have to be cleared by the Government of Malawi to attend the workshop. To allow us to obtain clearance, if you have not already done so, please send the following details (by telex if possible) to the CIMMYT Harare office immediately (Our telex number is 2462 CIMMYT ZW).

- 1) Full name
- 2) Current position/designation and discipline
- 3) Nationality of passport
- 4) Passport number and place of issue,
- 5) Passport date of issue and expiry date

Please note that in addition to the above, Nationals of Burundi, Ethiopia and Rwanda require a visa (issued outside of Malawi) to enter Malawi. All persons should be vaccinated against Cholera. Persons coming from West Africa need Yellow Fever

TRAVEL ARRANGEMENTS

Most participants will require PTA's. We plan to send them out towards the end of December, 1988. In order to avoid delays when sending out the PTA's, the airlines require full business and home physical addresses, and telephone numbers where possible. Please send this information to the CIMMYT Harare office. Further details of local arrangements will be sent to you before the end of the year.

## PRESENTATIONS AT THE WORKSHOP

### 1) Invited Topic Presentations

Participants invited to present, or that have offered to present, one or more papers at the workshop should check the program carefully to make sure the subject area or tentative title given on the program fits your proposed presentation. Authors should note that the amount of time allocated on the program for the verbal presentation of your topic is to be taken as a firm guide.

You are encouraged to include more details in your written paper for distribution at the workshop. If you have not already done so, please send the full title of your paper(s) to the CIMMYT office in Harare. We would also appreciate a copy of your draft paper(s) as soon as possible.

To ease the burden on photocopying in Lilongwe we ask you to bring up to 50 copies of your full paper for distribution. Full overhead projector, slide projector and flipchart facilities will be available in the workshop room. If you anticipate any difficulties or have any unusual request concerning presentations, please let us know before you arrive in Lilongwe.

### 2) Country Presentations

Please note that in addition to the invited/offered papers on particular topics, we have set aside four slots of about 20 minutes each for country presentations on Cereal/Legume Intercropping Research. We invite persons nominated to attend from each country within the region to develop a short outline paper (4-6 A4 pages) covering current and past cereal/legume intercropping research in your country, with emphasis on the methods employed and why. Include difficulties encountered and successes achieved. Some ideas on where the author(s) sees intercropping research going in their country in the future should round off the paper.

Because of time constraints we plan that only four of these country experiences will be verbal presentations in the workshop. Nevertheless copies of all papers will be circulated among participants. We have tentatively included Malawi and Kenya on the program because they have already shown interest in developing a presentation.

Should you have questions or suggestions about any aspect of the workshop, please contact any of the persons named overleaf.

On behalf of the organisers, the very best of wishes and we look forward to seeing you or your representatives in Lilongwe in January

Cordially yours,

*Stephen Waddington*

STEPHEN WADDINGTON

For the Organisers - Lovewell Ngwira, Malawi Maize Team  
Chitedze Research Station  
P O Box 158  
Chitedze  
Lilongwe 3  
Malawi

Todo Edge  
SADCC/CIAT  
P O Box 2704  
Arusha  
Tanzania

Stephen Waddington  
CIMMYT  
P O Box MP 154  
Mount Pleasant  
Harare  
Zimbabwe

df



WORKSHOP ON RESEARCH METHODS FOR CEREAL/LEGUME  
INTERCROPPING IN EASTERN AND SOUTHERN AFRICA

Sponsored by the Government of Malawi, CIMMYT and CIAT  
Lilongwe Hotel, Lilongwe, Malawi,  
22-27 January, 1989

Program Draft 2 (1 November, 1988)

---

Sunday 22 January

1400-2000 Registration

1900-2030 Reception

Monday 23 January

0800-0805 Welcome to the Workshop Malawi Organiser  
L Ngwira

0805-0815 Welcome Address By a representative of  
the Government of Malawi

0815-0830 Aims of the Workshop S Waddington

0830-0900 Relevance of the T Edge  
Workshop to Farming  
in E&S Africa

SESSION 1 THE FUTURE OF INTERCROPPING  
RESEARCH AND IMPLICATIONS FOR  
RESEARCH METHODS

Chairman W R Stern

0900-0940 New Innovations in C Francis  
Intercropping  
Research

0940-1000 T E A

1000-1040 Effective Use D Yiwombe  
of Current  
Intercropping  
Technologies

1040-1100 Discussion  
(Rapporteur)

SESSION 2: UNDERSTANDING CURRENT  
INTERCROPPING PATTERNS  
AND DIAGNOSIS OF  
INTERCROPPING  
PROBLEMS IN FARMER S  
FIELDS

(Chairman . )

- 1100-1130 General Procedures P Ananda  
for Diagnosis
- 1130-1210 Specific Diagnostic J Woolley  
Considerations for  
Intercropping
- 1210-1230 Discussion  
(Rapporteur )
- 1230-1400 L U N C H

SESSION 3 DEVELOPMENT OF AN  
INTERCROPPING  
RESEARCH PROGRAMME  
AND COMPONENT RESEARCH

Chairman B Gelaw \_

- 1400-1420 Elements of an A F E Palmer &  
Integrated Inter- R Kirkby  
Cropping Research  
Programme
- 1420-1445 An Example The N Govinden  
Intercropping  
Research Programme  
in Mauritius
- 1445-1515 Breeding for J Davies  
Intercrops
- 1515-1530 Weed control in J Ransom  
intercrops
- 1530-1545 T E A

1545-1600	<u>Fertilizer research in intercrops</u>	L Ngwira & T Edje
1600-1630	<u>Insect pests in intercrops</u>	C Cardona
1630-1645	<u>Diseases in inter- crops</u>	D Allen
1645-1700	<u>Spatial arrange- ments in inter- crops</u>	M Natarajan
1700-1730	Discussion (Rapporteur )	

Tuesday 24 January

SESSION 4      EXPERIMENTATION  
WITH INTERCROPS

Chairman    I Mariga

0800-0830	<u>The Planning of OFR Intercrop Experi- ments</u>	A Low & S Waddington
0830-0915	<u>Appropriate Exp- erimental designs and treatment structures for intercropping</u>	R Mead
0915-0940	<u>Implementation of Intercrop Experiments</u>	J Woolley

SPECIAL      COUNTRY EXPERIENCE IN  
SESSION      INTERCROPPING RESEARCH

(Chairman                      )

0940-1000	(e g <u>Malawi experience</u> )	
1000-1020	T E A	
1020-1040	(e g <u>Kenya experience</u> )	
1040-1100	(Another experience)	
1100-1120	(Another experience)	
1120-1145	Discussion (Rapporteur                      )	

SESSION 5 ANALYSIS AND INTERPRETATION  
OF INTERCROP RESEARCH

Chairman R Milikau

1145-1205 Measurement of M S Reddy  
Biological outputs

1205-1220 Measurement of A Sutherland  
Socio-economic  
outputs

1220-1240 An Example Agronomic T Edge  
and nutritional  
assessment of a  
Maize/bean intercrop

1240-1400 L U N C H

1400-1445 Statistical Analysis R Mead  
of Intercropping  
Experiments Designed  
to Address Basic  
Research Issues

1445-1530 Statistical Analysis F Kisyombe  
of On-farm Research  
Intercropping Trials

1530-1545 T E A

SESSION 5 Continued

(Chairman )

1545-1615 Agronomic Inter- J Ransom  
pretation of On-  
farm Research  
Intercropping  
Trials

1615-1645 Economic Interp- P Ananda & A Low  
retation of Inter-  
crop Trials

1645-1715 Discussion  
(Rapporteur )

Wednesday 25 January

SESSION 5 Continued

(Chairman )

0800-0845 Models of Inter- P Thornton  
cropping Their  
uses and limitations

SESSION 6 SUSTAINABILITY AND INTERCROPS

(Chairman )

0845-0900 Sustainability C Francis  
issues with  
Intercrops

0900-0940 Sustainability of M Swift  
intercrops in  
relation to manage-  
ment of soil organic  
matter and nutrient  
cycling/nutrient use  
efficiency

0940-1000 Discussion  
(Rapporteur )

1000-1020 T E A

Group Discussion and Development  
of Guidelines

1020-1230 SESSIONS 1 AND 2

1400-1730 Visit Intercrop Trials (Tour Organiser  
at Chitedze Research L Ngwira)  
Station, in farmers  
fields and at Bunda  
College  
(Rapporteur )

Thursday 26 January

Group Discussion and  
Development of Guidelines cont

0800-1230 SESSIONS 3 AND 4

1400-1730 SESSIONS 5 AND 6

1900 - WORKSHOP DINNER

Friday 27 January

0800-1230	<u>Presentations to Plenary Session</u> <u>and General Discussion</u>	
1400-1600	Presentations and Discussions cont	
1600-1700	<u>Discussion on Follow-up to the</u> <u>Workshop</u>	
1700	Closure of the workshop	Representative of the Government of Malawi