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GENETIC DIVERSITY SRG
Excutive Summary 1995

In 1995 the activities of the GD SRG were related and the group thus responded to CIAT strategic research in the context of the dynamic external scenario in genetic resources at global and CGIAR level

1 **Inputs to global and CGIAR genetic resources (GR) initiatives** Participation in two technical meetings of the Biodiversity Convention participation in the Central American/Caribbean and South American preparatory meetings for the fourth FAO Technical Conference on GR CGIAR System wide GR initiatives (i) participation in the system wide information network in GR (SINGER) (ii) preparation for and response to the ICER CIAT gene bank review (iii) preparation of a cosultation workshop on international standards for in vitro and field genebanks with IPGRI and FAO for Jan 1996 at CIAT

2 **Upgrading CIAT genebank** A diagnostic study on the status of CIAT genebanks was carried out and the ways and means for upgrading have been proposed Implementing some of the recommendations started this year

3 **Collaborative activities** With CORPOICA Colombia with A von Humboldt Institute of the Colombian Ministry of Environment CGIAR meeting on molecular screening of GR in Italy visits to collaborators in the Univ of Georgia, USA targeted cassava and bean germplasm explorations in Central America and Colombia

4 **Research Initiatives** One of the main activities of the SRG has been the discussion of new research ideas which cut across CIAT Programs and Units The following project initiatives have been identified and some have been developed into proposals Assessment of agrobiodiversity by integrating spatial analysis and molecular marker technology cassava cryopreservation characterization of the *Manihot* and *Phaseolus* core collections using molecular marker technology identification and use of exotic germplasm in beans and rice comparative genome mapping safe duplication and assessment of genetic coverage in the germplasm collections held in trust at CIAT

GENETIC DIVERSITY - SRG
Annual Report 1995

A Purpose

The objective of the Genetic Diversity Scientific Resource Group (GD SRG) is to coordinate the scientific and technical strategies for and develop initiatives in genetic diversity across center for the conservation and sustainable use of diversity from the gene level to the species and agroecosystems

B Scope

The activities of the GD SRG focus on CIAT mandate crops and agroecosystems These activities are related and the Group thus responds to both CIAT internal research strategies and to the very dynamic external scenario principally as a consequence of global and CGIAR developments in genetic resources and biodiversity in general

C Composition

Current disciplinary composition of the Group From the Genetic Resources Unit Botany Biogeography (1) Germplasm Curators, (3) from the Biotechnology Research Unit *In vitro* culture (2) Molecular mapping/markers (2) Gene transfer (2) from Commodity Programs Genetics (2) Agronomy (2) from Natural Resource Management Programs (1)

D Report of 1995 Activities

This year the Group s activities in the external front included (i) global and CGIAR system wide activities and (ii)collaboration with colombian Latin American and global organizations In the internal front the Group s activities involved (i) the upgrading of CIAT genebank and (ii) developing of new cross center research initiatives in genetic diversity

1 **CIAT s inputs to global and CGIAR system wide activities** These activities involved the Convention on Biological Diversity (CBD) the CGIAR System wide Genetic Resources Program (*SGRP*) and initiatives (SGRI) and the FAO Genetic Resources Global Plan of Action (*GR GPA)*

1 1 Attendance to the experts meeting of the CBD Biosafety in the generation and transfer of genetically modified organisms in Madrid (W Roca) On the other hand Group members contributed to prepare a paper on Technology Transfer upon a request by the

CBD Secretariat (UNEP) (D Debouck and W Roca with G Habich)

1 2 Attendance to the regional preparatory meetings for the Fourth FAO Technical Conference on GR to be held in Leipzig in 1996 Central America and Caribbean (Costa Rica) and South America (Brazil) (W Roca)

1 3 The CGIAR System wide Genetic Resources Program (SGRP)

1 3 1 The GD SRG actively participated in the preparation and conduction of an ICER genebank review as part of the SGRP The review Panel included Prof N L Innes (Chair) S A Eberhart Dr E Arias and Dr M Lobo The Group prepared a Status Report on CIAT Genetic Resources Activities and Management which was used as basis for the review The review was carried out succesfully and involved presentations by GD SRG members interviews and visits The Group has prepared a response the comments and recomendations by the Panel for internal CIAT use

1 3 2 System wide Information Network in Genetic Resources (SINGER) Attendance to a CGIAR meeting in CIMMYT Mexico (J Tohme) A proposal with CIAT plan of work in GR data management and financial requirements has been sent to IPGRI These comprise SQL hardware 3 requirements (hardware and training) information on the germplasm collections held in trust at CIAT taxonomy passport data of FAO designated accessions plan for collecting missions plan for germplasm distribution and characterization data for designated germplasm

1 3 3 Latin American and Caribbean agrobiodiversity initiatives With CIAT and IPGRI leadership a consultation workshop will be held in 1996 to discuss the technological offer by the IARCs (CIAT CIMMYT CIP IPGRI) for implementing regional priorities on GR conservation and utilization

1 3 4 Attendance to a Course Workshop on field genebanks organized by IPGRI in Puerto Rico (A Ortiz)

1 3 5 Attendance to a Workshop on Molecular Technologies for genetic resources conservation and use organized by IPGRI in Rome (M Bonierbale)

1 3 6 Collaboration with IPGRI in the organization of a Consultation Workshop on field and in vitro genebanks management to take place at CIAT in Jan 1996

2 Collaboration with Colombian, Latin American and Developed country organizations

2 1 Research collaboration with CORPOICA A discussion on genetic resources and biotechnology and other topics of mutual interest was held in Bogota (Attended by W Roca and S Beebe) Major topics for collaborative research in genetic diversity include molecular characterization of Colombian passifloras assessment of spatial distribution and diversity of genetic resources using GIS and molecular marker technology

2 2 Visit to the INBIO headquarters Costa Rica (J Tohme)

2 3 CIAT representation to a regional workshop on GR cooperation Costa Rica (D Debouck)

2 4 CIAT representation in a National Biodiversity Workshop Guatemala (D Debouck)

2 5 Present lecture on genetic resources at Releza v Ecuador (D Debouck)

2 6 Discussion with ICA Bogota, about cooperation in germplasm quarantine issues (D Debouck R Hidalgo B Maass)

2 7 Visit to the Biotechnology Labs of Ciba Geigy North Carolina and Dupont Co Delamare and Univ of Georgia, Athens to gather information on latest molecular technologies and data processing/analysis for assessment of genetic diversity and crop improvement (J Tohme M Bonierbale W Roca)

2 8 CIAT representation in the European Community meeting on molecular screening Italy (M Bonierbale)

2 9 GD SRG members have initiated discussions on agrobiodiversity research with the Colombian organizations A von Humboldt, Univ de los Andes Univ del Choco the Sinchi institute Univ del Valle

3 Internal Activities

3 1 Upgrading CIAT genebank operations and facilities

In early 1995 the Group carried out a diagnostic study on the status of CIAT genebank and proposed the ways and means for upgrading its operations and facilities including the funding requirements to improve the status of the collections to international standards A comprehensive document on this topic has been submitted to CIAT management for internal use The upgrading will focus on topics directly related to CIAT mandate/responsibilities such as clearing germplasm backlogs seed healt testing before storage viability assays long term storage

3 2 In April 1995 the GD SRG discussed a possible *merging of the GRU and BRU* into a single Unit The proposal s objective is to bring into genetic resources a leading edge approach by enhancing the use of modern biotechnology tools and GIS in genetic resources conservation and utilization research Rather than the structural merging of the two units the Group believes that the functional aspects of the proposal would reflect a maturing of CIAT s agrobiodiversity research in conservation and utilization and would keep abreast of current trends in biodiversity and GR worldwide The Group recommended actions to CIAT management

3 3 Targeted cassava and bean germplasm collections Central America (D Debouck)

3 4 Development of research initiatives by the GD SRG

3 4 1 Assessment of agrobiodiversity by integrating spatial analysis and molecular marker technology

Project profile being expanded into full proposal for presentation to the GR Technical/Conference Leipzig 1996 Involves collaboration with LAC NARS and FAO and focuses *Phaseolus Manihot* as model and extends to *Arachis* and other species of interest to the NARS

3 4 2 Implementing GIS capabilities in CIAT GRU A proposal for the SGRI for 1996

3 4 3 Development of a pilot cryopreserved cassava collection Based on CIAT s advances in the technique with cassava, the objective is to assess the logistical and technical aspects involved in establishing a base gene through cryopreservation using cassava as a model Collaboration with IPGRI and NARS A proposal for the SGRI (as bridging role for one year) 1996

3 4 4 Characterization of the *Phaseolus* and *Manihot* core collections using molecular markers technology

3 4 5 Identification and utilization of transgressive variation from exotic germplasm using molecular markers *Phaseolus* and *Oryza*
Collaboration with the Germplasm Development SRG Cornell Univ NARS
Proposal for submission to donor

3 4 6 Other projects under consideration

Safe duplication of the beans cassava and tropical forages collections held in trust at CIAT Project for the SGRP

Assessing adequate coverage of diversity in the germplasm collections held trust at CIAT and in countries of origin/diversity Project for the SGRP

Comparative genome mapping for the characterization of diversity in less known species

Agroecosystem re habilitation through the sustainable use of native species Colombian and Andean region hillsides

REPORT FROM THE SRG-GERMPLASM DEVELOPMENT

The role of our SRG is to promote scientific excellence in the area of Germplams Development by stimulating peer interaction and discussion acquiring complementary knowledge nd identifying researchable constraints

The group is quite complex Although the majority of scientists are plant breeders the group also includes plant physiologists biochemist G x E interaction specialists quality specialists biometrician etc It has been suggested that the group should be divided into more functional working areas around research topics

Research Related Developments

The SRG-GD has participated in the development of research components within the project proposal on P acquisition and re-cycling in low-P supplying tropical soils Scientists from our group will be involved in research on improved genetic adaptation for P-acquisition and utilization and on the identification of plant traits and mechanisms related to improved P-acquisition and use

A one-day workshop on recurrent selection was organized to share our experiences within CIAT s commodities with an active participation of Program assistants Recurrent selection is defined as any breeding methodology that includes a cyclic process of evaluation selection and recombination within a given population A pioneer work on the application of recurrent selection for the improvement of self-pollinated crops (bean and rice) has being developed at CIAT for the enhancement of pest and disease resistance along with other agronomic traits In the case of cassava an open-ended recurrent selection process has been practiced for several crop cycles Pros and cons of having a close recurrent selection system were discussed Such selection system is starting to be developed within the Cassava Program The following recommendations were derived from the workshop a) to develop and exchange information on applicabilities of recurrent selection b) to promote field visits for discussion on the applications of recurrent selection and c) to seek the input from other specialists in recurrent selection such as Dr Arnel Hallauer

Development with Partners

The SRG-GD constitutes a valid mechanisms to foster the interaction with similar groups at National Program level From a 2-day meeting with CORPOICA the areas of development of germplasm with tolerance to acid soils and germplasm development for drought prune areas were defined as priority for future interaction and project development between our institutions

Participation in Meetings and Reviews

One of our staff participated in the meeting related to the use of induced mutations and molecular techniques for crop improvement organized by the International Atomic Energy Agency As a result of this meeting a closer contact with IAEA was developed to explore several activities that incorporate the development of rice mutants with resistance to two diseases

(blast and sheath blight) CIAT scientists will be able to use IAEA s facilities as well as those of one of its associated institutions in Colombia (INEA) IAEA is interested in cooperating with CIAT for the development of germplasm and training of national scientists IAEA is particularly interested in using the anther culture protocol applied at CIAT as a model system for training purposes

The SRG-GD was represented by one of its members in the EUCARPIA meeting focussed on adaptation in plant breeding One of the most relevant conclusions from that meeting was that the single most important genetic mechanism in improving adaptation was the assembly of favorable epistatic combinations of alleles of different loci by means of recurring cycles of selection and that purifying selection (elimination of deleterious alleles) played a small role Crosses among the best modern commercial cultivars should lead to further yield gains in most of the crops Our SRG should examine CIAT s crops in terms of factors that determine the breath of adaptation needed and in relation to the types of gene action being exploited the uniformity of target environments and the rate of recombination within and among linkage groups

A member of the SRG-GD took part of the workshop on participatory plant breeding (PPB) approaches presenting the work that has been developed at CIAT CIAT has significant prestige within the international community for its leadership in PPB The possibility for CIAT to promote the development of a System Wide Initiative in the area of farmer participatory research could be well received by TAC and donors Several sister institutions are interested in testing PPB approaches

Consultants Brought to CIAT

A 3-week consultancy from W Bowen was organized by our SRG The purpose of such visit was to strengthen the linkage between modeling efforts at IFDRC and research activities at CIAT Some of the most relevant conclusions and recommendations from this consultancy were a) the value of the systems research approach and simulation tools must be clearly demonstrated and their use adopted at international agricultural research centers if this methodology is to be successfully transferred to national agricultural research systems b) Past field experiments that might have sufficient data for testing any of the crop models were identified Data sought as inputs for running the models included daily weather data soil profile characteristics and management practices Data sought for evaluating model outputs included growth analysis data and measurements of soil water and nitrogen contents made during the growing season c) A more user-friendly system for assembling soil profile data and observed data files needs to be created d) The current system of specifying water management needs to be simplified e) To be able to simulate crop rotations with cassava we need to add the capability to simulate N dynamics into the cassava model Data for developing and testing a cassava N sub-model exists at CIAT

The SRG-GD provided financial support for two of the invited speakers to the International Symposium on Statistics in Agriculture and Environmental Research (Drs E Carbonell and R Machiavelli) Scientific activities covered during the symposium included a) 2 intensive 3-day training courses on spatial variability and statistics in epidemiology b) 22 invited

conferences and discussion sessions and c) specialized consultancy sessions with some of the invited speakers The 3 scientific topics selected for the symposium are highly relevant to the present research agenda of agriculture and environmental research institutions worldwide and in Latin America in particular statistical methods in biotechnology and molecular biology statistical methods in agricultural epidemiology and statistical methods in environmental research The first one is the most relevant for our group

Dr Edie Paul spent one week in CIAT analyzing and discussing alternatives for the development of comprehensive genomic databases for our commodities The following observations and recommendations were made as a result of her visit a) the development of a genetic database system requires access to a broad spectrum of data covering many disciplines The process proceeds most efficiently when the information/computer specialist has immediate access to the author(s) of the data and can work with them to develop appropriate storage and display structures and links to related pieces of information This activity also requires certain human resources specifically skilled computers and information staff b) A project like at CIAT will need the full support of administration so the project leaders feel they can and should devote staff time and resources to this activity c) In CIAT the data on genetic maps and markers breeding insects viruses diseases and germplasm collection characterization and storage are all being generated on-site and most of it is already in some type of electronic format The specialists in this fields can easily consult and exchange ideas There is willingness among working groups to work toward the development of a central data repository d) If a comprehensive project in databases is undertaken there will be a need for someone with a solid background in genetics and genome organization and good knowledge of the crop as Principal Investigator as well as someone skilled in computer science database systems and Internet information resources as the Database Curator e) A crop information system can be a valuable training and dissemination tool for the national programs being served by CIAT and can help ensure that the information being generated in various research programs is reaching the widest audience possible

Pest and Disease Management SRG
Executive Summary

Pest and disease management activities at CIAT involve CIAT s mandated crops beans cassava tropical pastures and rice and those ecosystems in the natural resources initiative hillsides and tropical lowlands CIAT scientists are involved in pest management activities in Africa as well as Latin America Active IPM programs are being implemented in Brazil Colombia and Ecuador primarily on beans and cassava CIAT s expertise in strategic and applied research provides a strong foundation for collaboration with NARS and other institution to develop effective pest control methods

CIAT scientists participated in the formation of the CGIAR Systemwide Program on Integrated Pest Management (SPIPM) in a meeting in the Hague in which 10 IARC s were represented The policy statement that resulted from this meeting affirmed that IPM principals should guide all pest control efforts within the CG system and that the IARC s should strongly support research leading to its wider application The Hague meeting also agreed on guide lines for the selection of intercenter research projects eight projects were selected and CIAT was chosen as lead center for two projects 1) Sustainable integrated management of whiteflies and 2) Participatory methods for IPM implementation in tropical agriculture The whitefly project has been a approved by CIAT s PPMG and is presently being developed in collaboration with other IARC s and regional and national institutions A second cross CIAT programs project on the integrated control of whitegrubs has been approved by the PPMG and is being developed

The P&DM SRG sponsored the participation of two consultants/visiting scientists that presented courses on Statistics in Epidemiology and Molecular data Analysis Methodologies

P&DM SRG scientists collaborated with NARS and regional institutions in the formulation of IPM projects Countries include Colombia Ecuador Cuba and CATIE in Costa Rica A meeting organized with CORPOICA IPM scientists in October identified five potential collaborative projects in basic research and IPM These include IPM research and implementation with whiteflies whitegrubs spittlebugs and hillside agroecosystems as well as basic research including molecular aspects of biological control of plant pathogens and host plant resistance

P&DM scientists participated in numerous international meetings workshops and symposiums presenting research papers in several disciplines including themes such as herbicide resistance genetic structure and virulence of rice pathogens the use of baculoviruses for pest control integrated management of whiteflies and plant viruses

IPM projects in Brazil (Cassava) and the Andean Zone (Beans) are being successfully implemented with the active participation of CIAT scientists

SRG Pest and Disease Management
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1 *Organizational Aspects*

1 1 Purpose The purpose of the Pest Management SRG is to stimulate scientific interaction to promote and foment new ideas and research initiatives within CIAT and represent CIAT in the global IPM activities

1 2 Scope Pest and Disease management activities at CIAT involve CIAT s mandated crops beans rice cassava and tropical pastures as well as those ecosystems of major CIAT activity Hillsides Tropical Lowlands and semi arid regions Although CIAT is a ecoregional center for Latin America it is involved in pest management activities on other continents especially Africa where some of CIAT s mandated crops are of considerable economic importance

1 3 Role and Responsibility These initial two years of the existence of the P&DM SRG have increased communication among crop protection related scientist and this has led to a clearer and better defined role and responsibility of the SRG

1 To promote interdisciplinary approaches to problem solving in pest and disease management
2 To identify and prioritize major biotic constraints affecting CIAT s mandated commodities and crops important in target ecosystems
3 To promote and design interdisciplinary projects look at the intricacies of project management
4 To identify and bring together a critical mass of expertise in a given or need area or project
5 To share scientific competence between researchers to improve peer interaction and the quality of research
6 To identify and prepare cross commodity or commodity/ecosystem projects for special funding
7 To provide a scientific advisory capacity available to management
8 To provide and foment interactions with NARS and other international institutions where there is an IPM component.
9 To provide a forum to discuss important centerwide issues
10 To identify scientific expertise and provide resource expertise across commodity and natural resources programs to achieve research goals

1 4 Scientific Expertise The P&DM SRG is comprised of scientists in the discipline of entomology pathology virology and weed science In addition

the SRG draws upon the expertise in related disciplines especially in crop management and socioeconomics CIAT has added expertise in farmer participatory research which is a key component in any integrated pest management project

This area of competence (P&DM) in CIAT has expanded beyond the traditional role of supporting plant manipulations to also include biological and cultural control practices and IPM

CIAT expertise in strategic and applied research will generate basic knowledge that will result in the development of technology components This provides a strong foundation for collaboration with other institutions to find more effective methods to manage and control the impact of pests diseases and weeds particularly through IPM IPM contribute to increased stable and sustainable production maintenance of biodiversity and conservation of the natural resource base while minimizing human health risks associated with chemical pest and disease control

2 SRG Activities 1995

Periodic meeting were held throughout the year to discuss topics of interest and to formulate and develop projects

2 1 CGIAR Systemwide Program on Integrated Pest Management (SPIPM)

Agenda 21 highlighted the crucial importance of integrated pest management (IPM) as a key component in sustainable agriculture In response to Agenda 21 a planning meeting for the UNCED CGIAR Intercenter IPM Initiative was held at AS Norway in May of 1994 in which eight CGIAR Centers and nine partners organizations participated

On Feb 22 to 24 1995 representatives of ten CGIAR Centers including CIAT met at ISNAR The Hague to formulate a policy statement for adoption by TAC and the CGIAR This policy statement affirmed that IPM principles should guide all pest control efforts within the CG system and that the IARCs should strongly support research leading to its wider application The meeting also called for the formation of a CGIAR Systemwide IPM Programme An inter-center Working Group on IPM will be formed consisting of all Centers and would serve as the steering committee for the Programme and provide a forum for discussion of strategy and activities

The objectives of the System wide IPM Programme (SPIPM) on IPM are to

- strengthen intercenter collaboration

- enhance communication and cooperation between IARC s and partners
- provide a collective voice and focus on IPM issues
- identify IPM opportunities and develop joint projects
- support IPM implementation through research and training and
- promote public awareness of CG Center IPM activities

It was further agreed that the SPIPM should help to

- ensure greater impact of CGIPM activities at the farm level by encouraging farmer participation and the formation of effective collaboration with organizations primarily concerned with IPM implementation (NARS inter governmental organization NGOs)
- focus attention of IPM activities on sustainability (including preservation of biodiversity and other aspects of environmental health) and human well being (health and equity)

The CGIAR Policy Statement Integrated Pest Management (IPM) is here defined as ecologically based pest management that promotes the health of crops and animals and makes full use of natural and cultural control processes and methods including host resistance and biological control It uses chemical pesticides only where the above measures fail to keep pests below damaging levels All interventions are need based and are applied in ways that minimize undesirable side-effects

The Hague meeting most importantly agreed on guidelines for the selection of research projects to be supported under the CGIAR System wide IPM Programme It was further agreed that projects should involve farmer participatory and multidisciplinary research relating to ecological mechanisms improved sustainability and conservation of biodiversity Based on these and other criteria the meeting made an initial selection of eight projects which were subsequently approved by TAC

1 Integrated control of cereal stemborers
2 Integrated management of insect pests of grain legumes
3 Sustainable integrated management of whiteflies as pests and vectors in the tropics
4 Integrated control of Striga and other parasite weeds
5 Rice weed management
6 Integrated management of tsetse-fly and trypanasomiais control under different production systems in Africa
7 Participatory methods for IPM implementation in tropical agriculture
8 Characterization of functional agrobiodiversity in support of sustainable food production systems

Concept notes were prepared for each project CIAT was chosen as lead center for two projects 1) Integrated management of whiteflies and 2) Participatory methods in IPM implementation CIAT will participate in three additional projects 1) Integrated management in grain legumes 2) Rice weed management 3) Characterization of functional biodiversity

Monies have been approved by TAC for 1996 to form Task Forces for each project These Task Forces will identify partners within and outside the CGIAR system and develop more detailed proposal CIAT has already initiated contact with IARCs NARS and other organization for the whitefly projects (see this report)

2 2 Project Development

2 2 1 CIAT is the lead center for the intercenter CGIAR project on Integrated control of whiteflies This has developed into a global project and numerous IARC s NARS and other institutions have showed considerable interest in participating in this project Participating IARC s include CIP IITA ICRISAT AVRDC and ICIPE NARS that have responded positively include CORPOICA INIAP and NARO (Uganda) Regional institutions include CATIE (Costa Rica) and Zamorano (Honduras) Other institutions whom have expressed interest include the University of Florida and the University of Wisconsin

CORPOICA and CIAT IPM scientists have had two meetings on the formation of this project Earlier during 1995 questionnaires were sent to all possibly interested participants The objective of this survey is to help formulate and define the role of participating centers and institutions In addition the survey also provided considerable information on the whitefly global situation especially pertaining to the extent of damage yield losses pesticide use target area crops attacked and viruses transmitted

Response to the questionnaire was very positive and this information is being evaluated and compiled It is planned to bring several participants together at CIAT early in 1996 to formulate a project proposal to submit to donors This project has been submitted to and approved by the CIAT Project Portfolio Management Group (PPMG)

2 2 2 A second cross program project proposal on the integrated control of whitegrubs was also elaborated with P&DM SRG participation and approved by the CIAT PPMG Whitegrubs are an important subterranean pest of major food crops including all of CIAT s

commodity crops Other institutions participating in this project include CATIE CORPOICA EAP El Zamorano and the Colombian NGO s FIDAR and CETEC Funding is being sought for this project

2 2 3 Consultancy The P&DM SRG sponsored the participation of two visiting scientists/Consultants involved in the training of CIAT scientists and support staff

1 The symposium on Statistics in Agriculture and Environmental Research was held at CIAT from June 5 9 1995 P&DM SRG sponsored the participation of Dr Aurelio Pedrosa Epidemiologist and Biometrician from Chapingo University Mexico This international event was organized by the CIAT Biometry Unit and co sponsored by CIAT and several NGO s and governmental institutions There were more than 180 participants from numerous South and Central American countries England and the USA Seventy six CIAT research personnel attended Dr Pedrosa was course instructor for Statistics in Epidemiology

2 In order to strengthen our abilities to analyze our molecular data the CIAT plant pathologists have organized a course on recent molecular data analysis methodologies Dr D Shinner Research Geneticist and Statistician of the USDA has been invited to teach this course and will remain at CIAT for two weeks Course participants will be CIAT SS as well as support staff The objectives of the course are to acquire expertise in various software for data analysis and methods (including numerical taxonomy and multivariate analysis) and analysis of research data an interpretation It is also planned to establish continuous collaboration on data analysis and increase CIAT s ability to analyze complex biological data

2 2 4 Collaboration with national and regional programs CIAT scientists met with entomologists at CATIE during August 1995 to discuss future collaboration between the two institutions in the area of IPM It was agreed that at present there are two areas of mutual interest where we would seek joint funding integrated pest management of whiteflies and whitegrubs Progress was made on elaborating project documents and a clearer understanding on the role of each institution in these projects was achieved

A meeting was organized in October with CORPOICA and representatives of CIAT SRG s and management Agreement was

reached between the CIAT and the IPM Division of CORPOICA on future collaboration in several areas where special project funding would be sought These include

1 IPM of whiteflies
2 Integrated control of whitegrubs
3 Integrated control of spittlebug on pastures
4 Biological control of plant pathogens *Trichoderma* sp
5 IPM on Hillsides agroecosistems
6 Integrated management of blast in rice

2 2 5 International meetings Congresses and Symposiums CIAT scientists with P&DM SRG sponsorship during 1995 participated in the following events

1 CGIAR IPM Intercenter Planning Meeting February 1995
Attended by Anthony C Bellotti and Stephen Lapointe
Purpose Development of CGIAR Intercenter IPM Initiative

2 International meeting Herbicide resistance in weed management
Attended by Albert Fischer April 1995 Cordoba Spain
Paper presented Detection of resistance to propanil in *Echinochloa colona* populations

3 International Symposium on the use of induced mutations and molecular techniques for crop improvement FAO/International Atomic Energy Agency (IAEA) Vienna Austria June 1995
Attended by Fernando Correa Presented paper Genetic structure and virulence diversity of *Pyricularia orisea*

4 Florida Entomology Society/Costa Rica Entomology Society joint meeting San Jose Costa Rica August 1995
Attended by Anthony C Bellotti Invited paper The use of baculoviruses for insect control in Latin America

5 Workshop Augmentative Biological Control CATIE Turrialba Costa Rica August 1995
Attended by César Cardona Anthony C Bellotti Andreas Gaigl
Papers presented on Integrated pest management in beans
Integrated management of whiteflies in cassava Integrated management of whitegrubs

6 International whitefly symposium Uganda June 1995

Attended by Lee Calvert

7 16th International Conference on Weed Control and Soil Management Columa France December 1995
Attended by Albert Fischer

2 2 6 Arthropod Biodiversity Collection (ABC) The CIAT ABC is a service provided for all commodity and Natural Resources Programs Personnel costs are shared between the four commodity programs and additional support for materials surveys and training are provided by the P&DM SRG The collection now contains more than 20 000 specimens these include both crop pests as well as their natural enemies Scientists in national programs that are working with CIAT commodities are encouraged to send specimens to CIAT for storage and identification We have working arrangements with approximately 40 taxonomists that provide identification services

A data base of all entries into the collection is maintained and available to collaborators

Table 1 Data base of CIAT Arthropod Biodiversity Collection of major crops Cassava Beans Tropical Pastures and Rice

Crop	Entries	Countries	Families	Genera	Species	Hosts
Cassava	424	13	72	151	120	
Forages	617	10	45	132	149	77
Beans	528	19	63	149	145	65
Rice	375	14	58	129	108	

Production Systems & Soils Management SRG Annual report 1995

Executive Summary

Operation and activities
The SRG has operated during 1995 mainly as thematic working groups to either develop inter-program projects or to discuss specific inter-program topics of relevance to competence areas of the group

Working groups were established to develop the inter-program phosphorus project which has now reached the concept note phase in preparation for presentation to donors The working group decided to prepare an overall project and three sub-projects The overall project is on phosphorus acquisition and recycling in low-P supplying tropical soils with sub-projects on 1) enhancing phosphorus efficiency in tropical field crops 2) identifying plant traits and mechanisms for improved phosphorus acquisition and utilization and 3) integrating production components for efficient phosphorus utilization and cycling Sub-project 2) is being developed by the Germplasm Development-SRG

A second project entitled "integrated nutrient management" was also prepared and went through the CIAT project prioritization process in May 1995 It is pending further development

A modelling group brought in an external consultant from IFDC in a joint activity co-sponsored with the Germplasm Development-SRG Dr Walter Bowen has made two visits to the center to discuss a work plan and possible joint CIAT-IFDC projects involving crop modelling CIAT's senior management is now discussing mechanisms for increasing collaboration with IFDC in this area The outcome of these meetings was a project profile entitled " Overcoming site specificity in research for sustainable agricultural production and resource management" Currently this project is under further development

Activity in the systemwide initiative on soils, water and nutrient management (SWNM)

During 1995 a total of four documents were produced for the SWNM initiative The first was a report of the Rome consultation meeting with center directors In this report the group requested that CIAT prepare an inventory of SWNM activities amongst all the CG and non-CG centers This second document the inventory was submitted to and used by the TAC task force on "Priorities and strategies for soil and water aspects of natural resources management research in the CGIAR" (July 21, 1995 draft) In addition a third document on the implementation of the SWNM initiative was presented to TAC 66 in Lima Peru in March 1995 Subsequent to this a SWNM consultative meeting was organized

jointly with IBSRAM in Feldafing, Germany in June 1995 to address the comments of TAC and to develop the proposals further The report of the Feldafing meeting was prepared and an implementation plan was re-submitted to TAC in July 1995 TAC subsequently approved the SWNM initiative for funding of $350 000 for 1995 and $900 000 for 1996

The Feldafing report and the inventory were used by the TAC Task Force in their deliberations on NRM research within the system and their document clearly shows the influence of the CIAT-produced documents

Plans are now underway to prepare four full proposals for each of the four consortia in the SWNM initiative during 1995-96 to be submitted to TAC in February 1996 CIAT and the PSSM-SRG will lead the proposal to be submitted under the MAS (managing acid soils) consortium A MAS meeting is currently being planned for December 1995 at CIAT headquarters

Other collaborative activities
The leader of the PSSM-SRG attended the first CORPOICA-CIAT meeting held in Bogota Sept 28-29 1995 to represent the SRG As a result of this meeting it was decided that a project be developed jointly with CORPOICA on the recuperation of degraded lands in the savannas hillsides and forest margins of Colombia Internally this project will be an inter-program project mainly with the natural resource management programs CIAT contact staff are G Gallopin D Pachico and R Thomas

Internal management of the SRG
The PSSM-SRG met in October to review the activities and operation of the SRG during its first two years of existence Views expressed indicate that a change of emphasis to soils management is needed as it was felt that the inclusion of production systems tended to give the impression of a large group competing as a program within the center An emphasis on soils would give the SRG a clearer focus and a clearer signal externally on what the SRG has to offer our partners and collaborators Details of this meeting has been submitted to CIAT's senior management and hopefully will be used in the deliberations over the role of the SRG's