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Annual 1997

International Plant Genetic Resources Institute

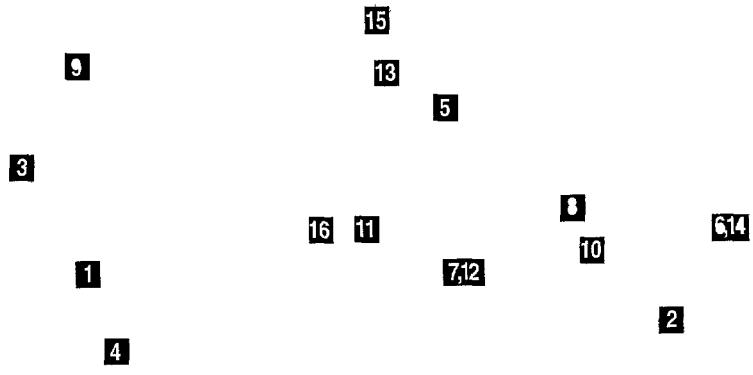
IPGRI

IPGRI is an institute of the Consultative Group on International Agricultural Research

The CGIAR is a decentralized structure made up of 16 international agricultural research centres located in 11 developing and 3 developed countries CGIAR s mission is to promote sustainable agriculture for food security in developing countries Centres work in close collaboration with partners in national research systems, to develop resource efficient technologies that contribute to sustainable improvements in the productivity of agriculture, forestry and fisheries, thereby enhancing the nutrition and well being of the poor They also conduct research into agriculture related policy and assist in capacity building

Fifty seven members provide funds that support the CGIAR, which is jointly sponsored by the World Bank, the Food and Agriculture Organization of the United Nations, the United Nations Development Programme and the United Nations Environment Programme

CGIAR centres - geographical locations



1	CIAT	Centro Internacional de Agricultura Tropical Cali Colombia
2	CIFOR	Center for International Forestry Research Bogor Indonesia
3	CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo, Mexico DF, Mexico
4	CIP	Centro Internacional de la Papa Lima Peru
5	ICARDA	International Center for Agricultural Research in the Dry Areas Aleppo Syria
6	ICLARM	International Center for Living Aquatic Resources Management Metro Manila Philippines
7	ICRAF	International Centre for Research in Agroforestry Nairobi Kenya
8	ICRISAT	International Crops Research Institute for the Semi Arid Tropics Hyderabad India
9	IFPRI	International Food Policy Research Institute Washington DC USA
10	IIMI	International Irrigation Management Institute Colombo Sri Lanka
11	IITA	International Institute of Tropical Agriculture Ibadan Nigeria
12	ILRI	International Livestock Research Institute Nairobi Kenya
13	IPGRI	International Plant Genetic Resources Institute Rome Italy
14	IRRI	International Rice Research Institute Los Baños Philippines
15	ISNAR	International Service for National Agricultural Research The Hague The Netherlands
16	WARDA	West Africa Rice Development Association Bouake Cote d Ivoire

A 1997 report

International Plant Genetic Resources Institute

IPGRI

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The **designations** employed and the presentation of material in this publication and in its maps do not imply the expression of any opinion whatsoever on the part of IPGRI or the CGIAR concerning the legal status of any country territory city or area or its authorities or concerning the delimitation of its frontiers or boundaries

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http //www cgiar org/ipgri/annurep/

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IPGRI structure, mandate and support

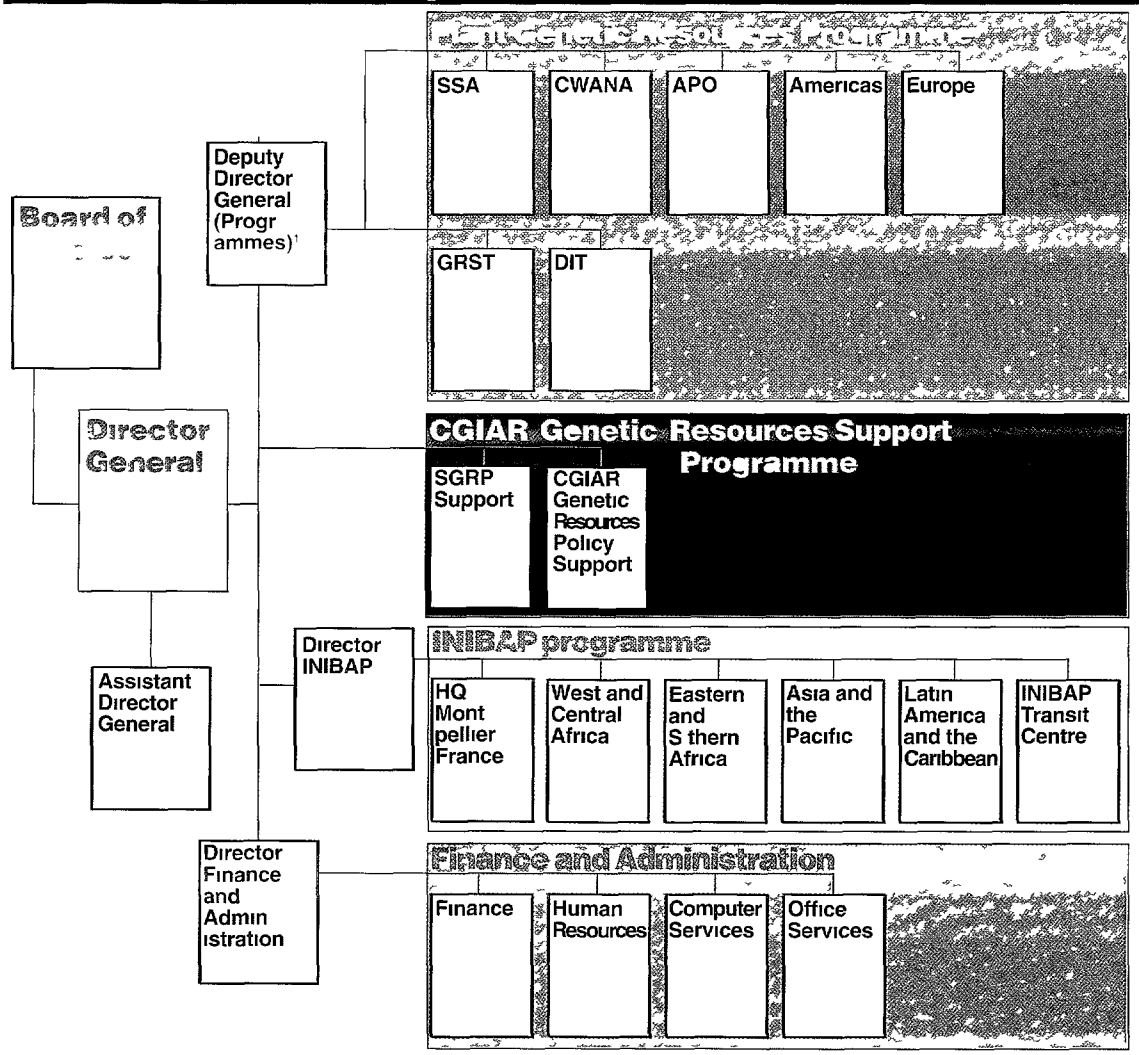
The **International Plant Genetic Resources Institute** is an autonomous international scientific organization operating under the aegis of the Consultative Group on International Agricultural Research

IPGRI has the responsibility for the governance and administration of the International Network for the Improvement of Banana and Plantain which is headquartered in Montpellier France IPGRI is the Convening Centre for the CGIAR System wide Genetic Resources Programme

IPGRI retains the strong programme links of its predecessor the International Board for Plant Genetic Resources with the Food and Agriculture Organization of the United Nations

IPGRI s headquarters are based in Rome Italy with regional offices located strategically around the world (see map page 4) IPGRI s programme is divided into three separate elements (see organigram below) The international status of IPGRI is conferred under an Establishment Agreement which by 31 December 1997 had been signed by 47 countries (see p 5 above) Financial support for the Research Agenda Programme of IPGRI was provided in 1997 by 25 governments and a number of international donors (see p 5 below)

IPGRI's organizational plan



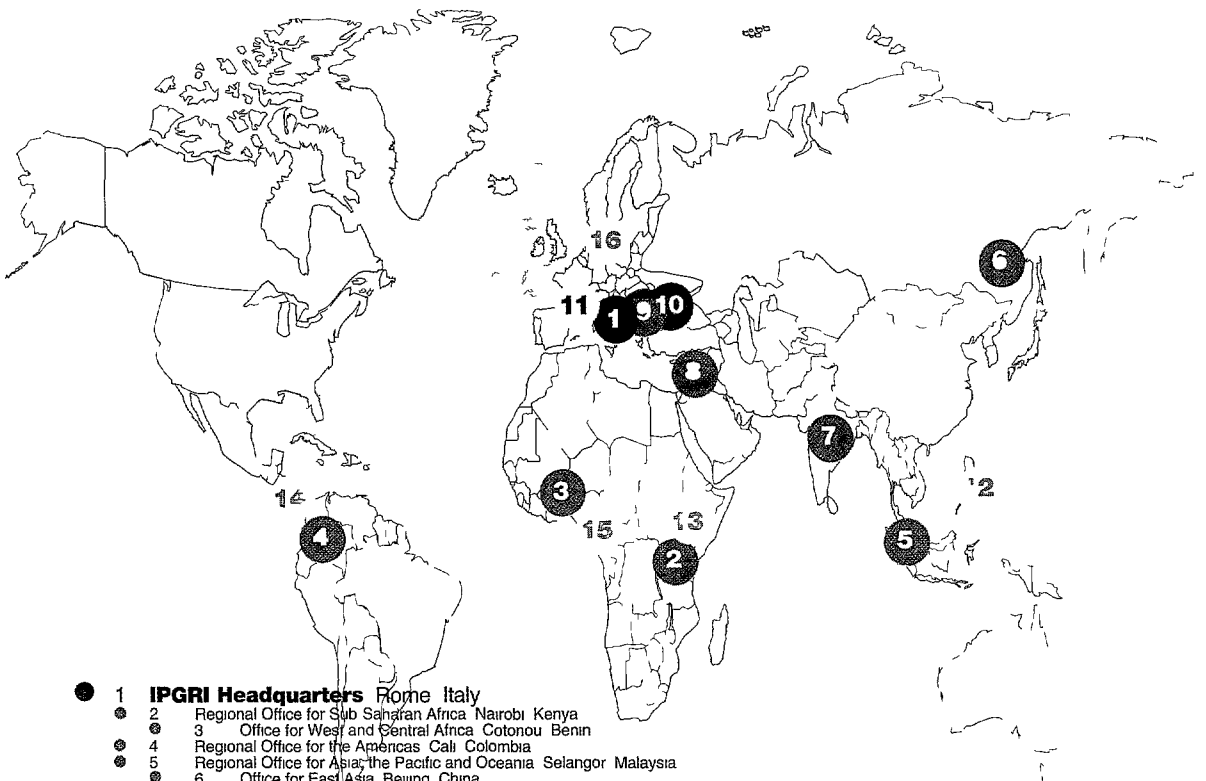
In addition to line responsibility for the Plant Genetic Resources Programme the DDG(P) is also responsible as advisor to the DG for overall programme oversight

IPGRI's mandate and mission

Mandate
to advance the conservation and use of plant genetic resources for the benefit of present and future generations

Mission
to encourage support and engage in activities to strengthen the conservation and use of plant genetic resources worldwide, with special emphasis on the needs of developing countries IPGRI works in partnership with other organizations, undertaking research and training and providing scientific and technical advice and information

IPGRI's locations around the world



1 **IPGRI Headquarters** Rome Italy
2 Regional Office for Sub Saharan Africa Nairobi Kenya
3 Office for West and Central Africa Cotonou Benin
4 Regional Office for the Americas Cali Colombia
5 Regional Office for Asia the Pacific and Oceania Selangor Malaysia
6 Office for East Asia Beijing China
7 Office for South Asia New Delhi India
8 Regional Office for Central & West Asia and North Africa Aleppo Syria
9 Regional Office for Europe Rome Italy
10 SGRP Secretariat Rome Italy
11 INIBAP Headquarters Montpellier France
12 INIBAP Office for Asia and the Pacific Los Banos Philippines
13 INIBAP Office for Eastern and Southern Africa Kampala Uganda
14 INIBAP Office for Latin America and the Caribbean Turrialba Costa Rica
15 INIBAP Office for West and Central Africa Douala Cameroon
16 INIBAP Transit Centre Heverlee Belgium

Establishment Agreement Signatories

Algeria
Australia
Belgium
Benin
Bolivia
Brazil
Burkina Faso
Cameroon
Chile
China
Congo
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Côte d'Ivoire
Cyprus
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Israel
Italy
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Senegal
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Sudan
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Syria
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Ukraine

Donors to the Research Agenda Programme

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the Philippines
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Sweden
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as well as

Asian Development Bank
Technical Centre for Agricultural & Rural Co operation
European Union
Food and Agriculture Organization of the United Nations
Interamerican Development Bank
International Development Research Centre
International Fund for Agricultural Development
United Nations Development Programme
United Nations Environment Programme and
World Bank

Foreword

Every few years, IPGRI pauses and reflects on where we have been as an institute and where we are going. Opportunities for such reflection present themselves most vividly at the time of an External Programme and Management Review (EPMR). Such reviews are conducted approximately every five years by the Technical Advisory Committee (TAC) of the CGIAR. In late 1996, it was IPGRI's turn to be reviewed, strictly speaking for the first time, since prior reviews were concerned with its predecessor institute, IBPGR.

Since our last EPMR in 1991, dramatic developments have revolutionized the science and politics of conserving and using biodiversity. The 1992 Earth Summit, and the adoption of the Convention on Biological Diversity the next year, galvanized a spirit of national and international cooperation and dedication to the conservation and use of genetic resources, a spirit that continues to this day. During this same period, IPGRI became a fully independent CGIAR institute, took on the role as Convening Centre of the System wide Genetic Resources Programme (SGRP) and integrated the International Network for the Improvement of Banana and Plantain (INIBAP) into its programme and structure. Meanwhile, extraordinary advances in the fields of information and biotechnology offer hope of solutions to problems that five years ago seemed insurmountable.

The latest Programme and Management Review of IPGRI could not have come at a better time. The events of 1996 — the so called year of agro biodiversity — have given rise to major challenges for IPGRI, both as an institute and in its capacity as Convening Centre for SGRP. Important meetings of the Conference of the Parties to the Convention on Biological Diversity, the FAO Commission on Genetic Resources for Food and Agriculture, the FAO International Technical Conference on Plant Genetic Resources, and the World Food Summit have instigated programmes of work with important implications for IPGRI's own programmes. In particular, the Global Plan of Action for the Conservation and Use of Plant Genetic Resources — the principal output of the International Technical Conference — explicitly mandates a key role for IPGRI and the CGIAR in its implementation. This will profoundly affect the strategic and programme choices made by the institute in the future.

As eventful and demanding as the last five years have been, both on the international and the institutional levels, for IPGRI, the challenge is just beginning. Assisting our partners to meet their goals and obligations under the Convention and the Global Plan will require IPGRI to be dynamic, focused and at the same time flexible. Perhaps the most critical question posed by the Review Panel was whether IPGRI is equal to the enormous task it faces. We are pleased to report that their answer was very much in the affirmative.

The Review Panel was positive and enthusiastic about IPGRI's achievements, citing in particular its representation of the CGIAR in global

fora and its strong links with a wide range of genetic resources stakeholders The Panel endorsed IPGRI's mode of operation, which emphasizes promoting research by collaborators located in national programmes, advanced research organizations and non governmental organizations Importantly, the Review expressed support for IPGRI s shift in emphasis from 'conservation for use to 'conservation and use' as exemplified in activities relating to banana and plantain (INIBAP), coconut (COGENT), cacao and other crop plants The Panel strongly recommended the formal conclusion of the process of integrating INIBAP as a programme within IPGRI It also underscored the importance of the 9-country research project on the scientific underpinnings of the conservation of crops and crop relatives in farmers' fields and home gardens These and other IPGRI activities are described in detail in the pages that follow

The Review commended IPGRI for its efforts to develop strong and productive partnerships with FAO, particularly citing the institute s contribution to the process leading up to the International Technical Conference It noted the important part that IPGRI and SGRP can play to support the implementation of FAO's strategies for forestry and domestic animal diversity The Panel praised the institute s efforts, through SGRP, to establish a strong and central presence for the CGIAR in global biodiversity efforts and to provide a sharper focus for the genetic resources efforts of the CGIAR Centres It strongly supported the institute s growing capacity to provide support and advice in the areas of genetic resources policy and legal issues, a move recommended by the CGIAR in 1995

New and exciting challenges and opportunities lie ahead for IPGRI as it positions itself to play a decisive role in supporting the further development of a global system for agricultural biodiversity The External Review s strong endorsement of our mission, our programmes and our partnerships indicates that we are indeed on the right track IPGRI s experience in 1997 is evidence that, given continued excellent support from our donors, the institute can play a significant role in constructing an effective global effort for the conservation and use of plant genetic resources

Geoffrey Hawtin
Director General

Marcio de Miranda Santos
Chair Board of Trustees

Introduction

The impact of IPGRI's Programmes

In 1997, IPGRI began seriously to measure its long term effect on its ultimate beneficiaries To do this, it went beyond the review and evaluation mechanism and began to use the techniques of impact assessment During the year the Institute made significant progress towards making impact assessment a routine part of its work

The difficulty of the task

Assessing IPGRI's impact is complex because the Institute functions in a complex environment Development concerns and conservation needs overlap, and cause and effect are often indistinguishable The results of IPGRI's work are not always easy to attribute to a specific, quantifiable input Through its way of operating, the Institute contributes, along with a number of partners, to operating a process rather than developing a product Classical impact assessment methods have a strong economic bias IPGRI's activities do not aim for a specific increase in an output such as tonnes of a specific cereal harvested for market Outputs of IPGRI s work are often delivered to beneficiaries indirectly In addition, it is difficult to attribute credit for impact where partners collaborate by working on complementary aspects of a problem IPGRI s staff work on genetic resources, but often do not work directly with these resources Instead they work as facilitators and coordinators Thus their impact is difficult to quantify IPGRI s work frequently looks to the long term with little short term benefit apparent Because of this, it is an exacting exercise of understanding and analysis, requiring careful selection of indicators and close attention to risk factors

IPGRI's experience

Over a four year period beginning in 1993, IPGRI laid a firm foundation for impact assessment exercises with Italian donor funding Staff compiled a report on the Institute's history, from the years of IBPGR to the recent achievements of IPGRI Exploratory case studies were started, a bibliography compiled, contacts made with experts IPGRI staff participated in a CGIAR SGRP meeting at IFPRI and CGIAR's Impact Assessment and Evaluation Group meetings hosted by ISNAR and FAO Work started on defining impact indicators, adopting the 'SMART' criteria (simple measurable, accurate, reliable and timely) A series of 11 thematic and 12 country case studies provided different and complementary views of the Institute's Plant Genetic Resources and INIBAP Programmes

Strengthening the National Programme in Bolivia

In a 1994 seminar IPGRI helped define national policies and capabilities 80% of accessions in Bolivian national collections are from IPGRI sponsored collecting missions At least 50% of IPGRI trainees are still active in the work and are training others

The outcome to date has shown that IPGRI can demonstrate impact on target beneficiaries in a number of areas

> Strategic approaches are taken in the design and execution of plant genetic resources work
> The scientific basis of the conservation and use of plant genetic resources is strengthened
> Training and capacity-building support the development of national programmes
> Networking with partners optimizes use of resources and breaks down barriers
> Information is gathered, organized and disseminated
> Awareness is raised of the importance of plant genetic resources conservation and use

Studies by CGIAR's Impact Assessment and Evaluation Group

A series of case studies on the adoption of CGIAR innovations is being developed simultaneously by IPGRI and eight other Centres under the coordination of the Impact Assessment and Evaluation Group The studies will provide System wide conclusions regarding the factors affecting adoption – a condition for impact They will also provide a solid base for future case studies using a similar methodology

IPGRI identified two innovations from among the Institute s activities and outputs, and from which the approach and, to a degree, the results can be generalized, namely the crop descriptor lists and the International *Musa* Testing Programme of INIBAP The IPGRI case studies examine common aspects of CGIAR research such as networking activities, information dissemination, training and technical advice The significance of these two studies is the niche that IPGRI fills in conducting or promoting work that would otherwise not be done and the stimulation that this work can have on related activities within national programmes There is little methodology on impact assessment appropriate for the level of complexity of IPGRI's programme Ultimately the results of IPGRI s activities should help fill this gap

Germplasm collecting

Over 200 000 germplasm samples have been collected in over 500 missions partly or fully supported by IPGRI providing a major boost to national and international conservation and use programmes IPGRI has spearheaded standardization of procedures and strengthening of the scientific base for locating valuable genetic diversity and making it available for use IPGRI s collecting activities have resulted in a wide network of contacts in countries throughout the world

Hand in hand with logical framework analysis

Analytical tools adopted by IPGRI in 1997 made impact assessment easier and more efficient The mechanisms derive from logical framework analysis, which places programmes, projects and activities in clearly defined associations and links inputs and activities to outputs and objectives through cause and effect relationships The milestones and indicators required for impact assessment are easily incorporated into this approach Used together, impact assessment and logical framework analysis are excellent mechanisms to measure impact

The effective integration of milestones and impact indicators into project management allows for improved *ex post* impact assessment The design of indicators also looks for keys to attribute shared responsibility for impact and to impact through adding value to the work of others This takes us to the most important and most difficult level of evaluation impact on target beneficiaries The important criterion of impact upon the rural poor will involve defining a more intricate model through which IPGRI achieves its impact This will comprise a chain of component stages from, say, training of a national programme scientist, to an achievement which alone or in concert with other factors brings about a poverty-alleviating change

Training

Over 2000 national programme scientists have been trained by IPGRI IPGRI trainees show high retention and significant multiplier effects through secondary training The Institute s trainees are well represented among national programme coordinators For example 54% of countries in Sub Saharan Africa have national programme leaders who have received training from IPGRI They are also well represented at key international events 31% of developing country delegations to the International Technical Conference in Leipzig in 1996 included IPGRI ex trainees

 See pp 135-136 for Abbreviations

Sub-Saharan Africa

Sub-Saharan Africa is a source of essential agricultural genetic diversity These resources have the potential for increasing agricultural production and economic development of African nations, if they are conserved and used wisely This wealth, once naturally conserved through indigenous agricultural systems, is rapidly disappearing as exotic materials are introduced, local culture eroded, landraces replaced and natural habitats destroyed

Focused around one IPGRI project, the Regional Group works to coordinate the conservation and use of plant genetic resources in Sub Saharan Africa The project also aims at developing human resources through training initiatives and increasing awareness at government level of the importance of genetic resources This aspect of the project s work has become particularly important as increased awareness and sensitivity in the region to various policy concerns has limited access to germplasm and slowed down progress in germplasm exchange

In collaboration with the African Centre for Technological Studies SSA staff compiled a profile of policy, legislative and institutional measures in conserving and using plant genetic resources in Africa Constraints in developing legal frameworks and policies mean that Africa lacks a critical mass of expertise in policy and law on genetic resources Insufficient political attention is given to the area, compounded by institutional rigidity that makes it difficult to mobilize international experience and expertise to formulate policy

Re-introducing germplasm to Somalia

Project Re-introduction of germplasm for the diversification of the genetic base of Somalia s agricultural production system

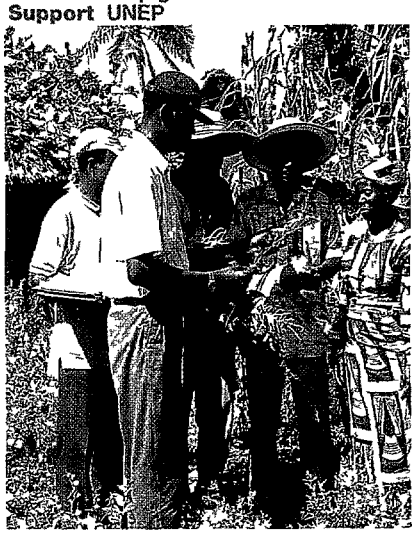
Support European Union

Farmers in Somalia showed a strong interest in this project Since they are the main beneficiaries two approaches were taken Farmers from nine villages in the three districts concerned replicate formal on station activities done at the CINS (an Italian NGO) Centre in Deganley, Balaad The Regional Office in Nairobi airfreighted 500 kg of sorghum and maize seeds, conserved and multiplied by the National

On farm trials of re introduced sorghum germplasm in Deganley Somalia

Genebank of Kenya since 1993, to the Centre At the Centre the seeds were multiplied and characterized for storage and use Farmers then collaborated in on farm trials of 170 maize and sorghum accessions in the nine villages involved The farmers selected 16 agronomically promising landraces which they will evaluate further in subsequent seasons The Regional Office staff collaborated with CINS to establish an *ex situ* conservation facility for medium term seed storage at the Project Centre, which was used to train NGO workers and farmers in conservation techniques Public awareness efforts raised community interest in the work through the mass media World Radio for the Environment interviewed project staff for a broadcast on the BBC World Service, and press interviews led to a number of articles on the project in the local daily newspapers

Project Monitoring genetic diversity through ethnobotanic and genetic erosion studies for effective conservation strategies of crop genetic resources
Support UNEP



Training course participants collected useful information from local farmers

Monitoring genetic diversity

Participants from Ghana Malawi and Uganda developed research methods and chose model crops for this project at a training workshop held by IPGRI and the National Museums of Kenya Bambara groundnut yams cassava and sweet potato were selected to test ways of monitoring the cause, place and timing of genetic erosion National programmes will use the information to plan more effective approaches to conservation All three countries gathered information on the distribution of crops and their diversity The indigenous knowledge of local farmers contributed much to understanding the dynamics of seed exchange and supply systems The surveys that staff made began to reveal changes in cropping patterns and related cultural tendencies though it was less clear whether these changes necessarily result in genetic erosion in all cases Participating countries and institutions include the Plant Genetic Resources Centre of the Crops Research Institute (Ghana), the Malawi Plant Genetic Resources Centre (Malawi) and the National Agricultural Research Organization (Uganda)

National workshops and policy meetings

Regional staff worked to raise the profile of genetic resources activities within the political systems of countries Staff attended national workshops in Mali and Benin which recommended strengthening the countries' national programmes and established a Committee on Plant Genetic Resources in Benin A policy meeting in Uganda recommended creating a National Coordination Board to oversee activities and a National Plant Genetic Resources Centre will be established under the National Agricultural Research Organization Two government Ministers agreed to table the recommendations of the meeting to the Cabinet In Kenya a policy meeting recommended to the government to establish a task force of the main groups involved in biodiversity to review national coordination mechanisms and develop a coherent strategy A visit to the National Centre for Genetic Resources and Biotechnology in Nigeria, as a follow up to a previous policy meeting resulted in increased funding more staff and a biotechnology centre (under construction)

Regional Office staff member D K Kiambi (far left) attending a policy level meeting in Uganda

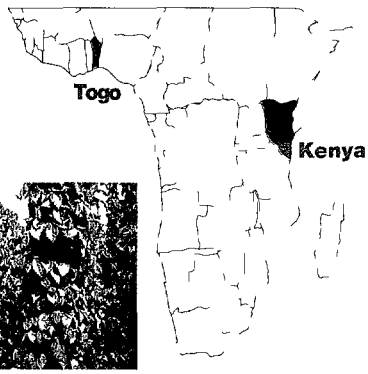
A media workshop in SSA

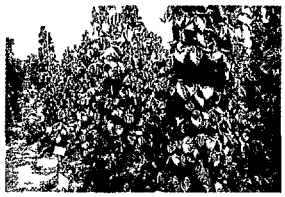
A media workshop on Plant Genetic Resources Management in Africa, organized in Nairobi by regional staff sensitized local media to issues in genetic resources A good rapport was established with the press and ten articles were published in the local dailies One article triggered discussions between GTZ and the Government on additional funding for the National Genebank of Kenya This work led to regional staff collaborating with GTZ to review the work and management of the Genebank Based on these recommendations IPGRI and Genebank staff wrote an interactive work programme to develop new management proce

 See pp 135-136 for Abbreviations

Support to National Programmes

- Togo regeneration and characterization of 533 yam accessions of one of the largest yam collections in the subregion at the Institut National des Cultures Vivrieres (photo below)
- Kenya 1000 accessions of the world base duplicate collection of sesame were multi plied, characterized and evaluated in collaboration with the National Genebank of Kenya, the University of Nairobi (Crop Science Department) and KARI, Siaya Agricultural Research Station Farmers and breeders selected 175 accessions for further trials after attending a field day that attracted 1300 farmers, scientists, schoolchildren and local administrators
- Kenya seed testing procedures for *Clitoria ternatea* in collaboration with the National Genebank of Kenya, seed storage research on *Eleusine coracana* and *Amaranthus hybridus* with the University of Nairobi, biodiversity research on wild *Coffea* species from Mauritius at the University of Birmingham, UK





Maintaining a yam field collection in Togo

dures and improve scientific standards

SSA staff also assisted in a review in Ghana of the Plant Genetic Resources Centre, recommending increased funding, decentralizing activities, a centralized, computerized documentation system and additional conservation facilities

Networking

A meeting in Uganda established the Eastern Af rica Plant Genetic Resources Network under ASARECA, supported by IPGRI, Sida and the Nordic Genebank The network will promote collaboration among countries, facilitate information and germplasm exchange and strengthen national programmes IPGRI will provide the coordination office for the first 2 years and donors have been approved to fund the network

A report on the status of plant genetic resources in the Lusophone countries of Africa indicated that more training is necessary for the National Programme staff, germplasm needs to be collected and conservation facilities should be developed fur ther The report was submitted to IPGRI and it will be used as a reference document during the Lusophone Initiative Consultation to be held in Praia, Cape Verde in March 1998 SSA staff worked with the SADC Board to facilitate the development of a common stand among the countries for the FAO Commission on the issues of germplasm access, exchange and on-farm conservation

Wild rice collecting programme

The programme covers East and Southern Africa, where some countries such as Tanzania, Kenya and Zambia are important reservoirs of diversity for this valuable and significant group of species It is funded by IRRI and facilitated by IPGRI in collaboration with SPGRC So far a total of 281 ac cessions consisting of *Oryza barthii O longistaminata O punctata, O eichigeri, Leersia hexandra L denudata* and *L friesii*, have been col lected The programme also provided the Uganda national programme with conservation equip ment Kenya and Mozambique national pro gramme staff attended a short training course on multiplying and characterizing wild rice at IRRI in the Philippines

Collaboration

An NRI/IPGRI/CPRO Workshop on African Indigenous Vegetables made recommendations that included surveys of genetic erosion and market demand/supply, genetic diversity stud ies, development of breeding programmes and agronomic and post harvest research These were developed into a project concept note that could be submitted to DFID A meeting with the Biodiversity Institute in Ethiopia and the National Genebank of Kenya resulted in a draft memorandum of understanding on germplasm

Ankon Goli IPGRI

A magnificent example of a multiple-purpose tall sorghum landrace in Benin
Sorghum is one of the most popular cereals in the savannah zone of West and Central Africa Many countries have a research programme on the crop often collaborating with international research centres Improved cultivars are available They usually have higher yields and mature early but the plants are short This apparently insignificant detail is of prime importance for African farmers In actual fact they grow sorghum not only for the grain but also for the stalk which is used for many purposes including building shelters making fences weaving mats etc Because of the usefulness of the stalk many African farmers still conserve the local landraces as they can grow up to 7 m tall

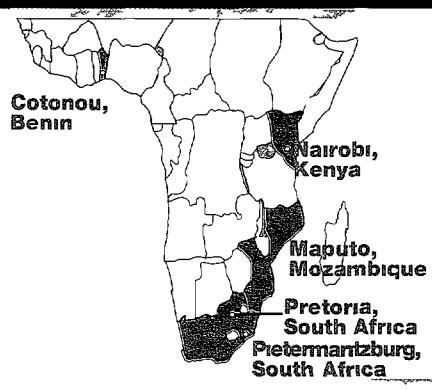
duplication that was submitted to higher government authorities for approval In collaboration with CIP, SGRP and IITA, a regional meeting developed an action plan for conservation and use of cassava, yams and sweet potato recommending the establishment of a West/Central Africa Root Crops Network and core collections in regional genebanks A task force was then formed to develop a project proposal for donor funding New institutional linkages with ICIPE, IUCN, ACTS and Africover led to a number of significant and productive initiatives a joint project proposal with ICIPE for GEF funding, a policy paper with ACTS on the status of plant genetic resources in Africa and collaboration with IUCN to assist National Programmes to formulate national biodiversity strategies

Collaboration in other IPGRI projects

IPGRI s thematic groups run projects with activities in the regions, in close association with regional staff whose contribution is crucial to the success of the work Joint activities in 1997 included implementing the Global Forestry Genetic Resources Strategies Project in Cameroon and Burkina Faso and developing forestry projects specific to Sub Saharan Africa Reports on genetic erosion indicators using finger millet and rice were compiled work on re introduction of rice landraces into the Tana River District Kenya continued a seed sun drying experiment was started in Kenya and targeted collecting activities started in Ethiopia and Tanzania As part of a global *in situ* project, preliminary diagnostic surveys of prospective research sites were made in Burkina Faso and Ethiopia and sites for the *in situ* (on farm) work chosen Socioeconomic and ethnobotanical surveys were made in Kenya and Cameroon as part of a project on conserving the biodiversity of leafy vegetables Ethnobotanical surveys and diversity studies on cocoyam started in Ghana

 See pp 135-136 for Abbreviations

Training activities in the SSA region



Two training courses were organized with funding from the Darwin Initiative

- A training course on *in situ* conservation was held in Pretoria, South Africa with 20 participants representing all the SADC countries
- A training course on conservation and utilization of botanical diversity was held in Cotonou, Benin. 30 participants from West African National Programmes attended the course

An in-country training course on conservation and germplasm collecting using rice as a test crop was held in Maputo, Mozambique

In collaboration with DIT, a meeting was organized for the key persons from three Universities in the region (University of Zambia, University of Nairobi and University of Abidjan) to discuss their training programmes and develop strategies for the way forward The University of Zambia launched a training programme as an elective course of its MSc programme and the University of Nairobi made progress in having plant genetic resources included in the MSc programme

Partial support was provided to a national programme staff member from the National Museums of Kenya to attend a 1-year course on ethnobotanical studies at the University of Cape Town, Pietermaritzburg, South Africa

Aurora Tozza

 See pp. 135-136 for Abbreviations

Central & West Asia and North Africa

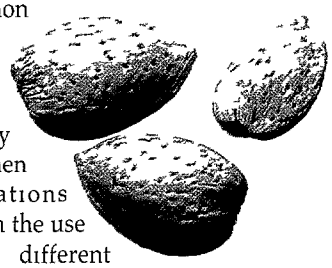
Introduction: challenges and opportunities

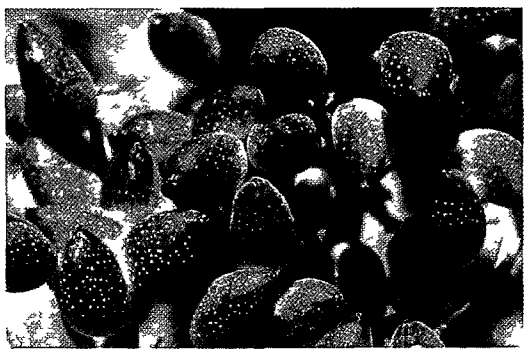
During 1997, the CWANA regional group was at the hub of a number of key initiatives in achieving the efficient conservation and sustainable use of plant genetic resources in the region The Group extended its responsibilities into Central Asia (marked by the re naming of the Group) and a new Regional Director was appointed Several fundamental activities started in Central Asia a Central Asia Network on Plant Genetic Resources was created and a programme of training activities began WANANET made significant progress A major conference yielded new insights into our understanding of the origin, diversity and evolution of crops in the Near East Postgraduates from regional national programmes, supervised by CWANA staff made important contributions to the conservation of *Triticum* and *Prunus* The Regional Office published a number of documents on genetic resources in the region that raised several major issues

- increasing the participation of key stakeholders such as farmer communities and the private sector
- integrating plant genetic resources into a holistic ecosystem and species approach
- enhancing intraregional collaboration in scientific, technical and policy matters

Degree-related studies

CWANA staff supervised several students in their studies for higher degrees One student, from the American University of Beirut, Lebanon, completed his MSc degree with a thesis on the genetic diversity of almond in Lebanon Of the four almond species that are recorded in the flora, two have limited distribution In general, almonds in Lebanon are under stress, and this was reflected in the low levels of genetic diversity that were found This study produced a set of recommendations on the use of different types of almonds Another graduate student at the same university used DNA fingerprinting of land races of wheat to develop methods to evaluate germplasm (see box on next page)





R Makdis

Pistachio is one of WANANET s priority fruit trees and was a focus of research in 1997

Other research supervised by CWANA staff

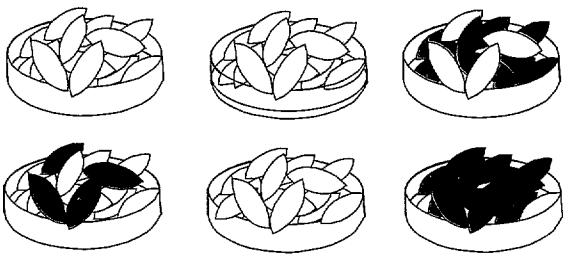
Lebanon	diversity of pistachio and safflower in Lebanon
Syria	diversity of *Nerium oleander* in Syria
Syria	biological diversity of fruit trees and horticulture plants in forests
Lebanon	evaluation and characterization of Lebanese pine (*Pinus pinea P brutie* and *P halepensis*)

Training

Regional Group staff assisted in organizing courses and training more than 50 scientists in the region (see box below) Of great significance was the course in Tashkent, Uzbekistan, which hosted participants from all of the Central Asian countries These countries have an urgent need for skilled technicians and researchers in the study and management of genetic resources Conservation and sustainable use of the extensive breadth of plant genetic resources available in the region is particularly important within the context of the GPA implementation process and CAN/PGR commitments Well-trained staff are needed to undertake urgent field and research activities such as inventorying resources, survey and sampling/collecting missions to arrest genetic erosion and meet the needs of breeders and researchers for targeted germplasm Scientists are also needed to take part immediately in developing action plans and setting priorities for their emerging national programmes and undertaking joint conservation and research on international and regional levels that is already planned for 1998 2000

Evaluating landraces of wheat

Ali Khatib (right) at the University of the Lebanon used DNA fingerprinting to evaluate landraces of wheat Below biochemical characterization of wheat genotypes based on the phenol test The different levels of staining reflect the difference in genetic make up of the seeds



Networking

WANANET

Representatives of national programmes of plant genetic resources in the region met in Aleppo for the annual WANANET meetings

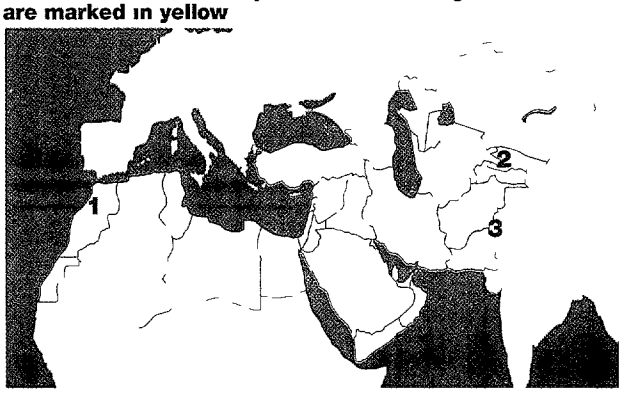
CWANA training activity summary

> 1 A training course Genetic Resources of Grain Legumes was organized jointly with ICARDA and GTZ in 1997 at IAV Hassan II Rabat Morocco where 20 scientists from Algeria Morocco and Tunisia were trained in all aspects of grain legume genetic resources

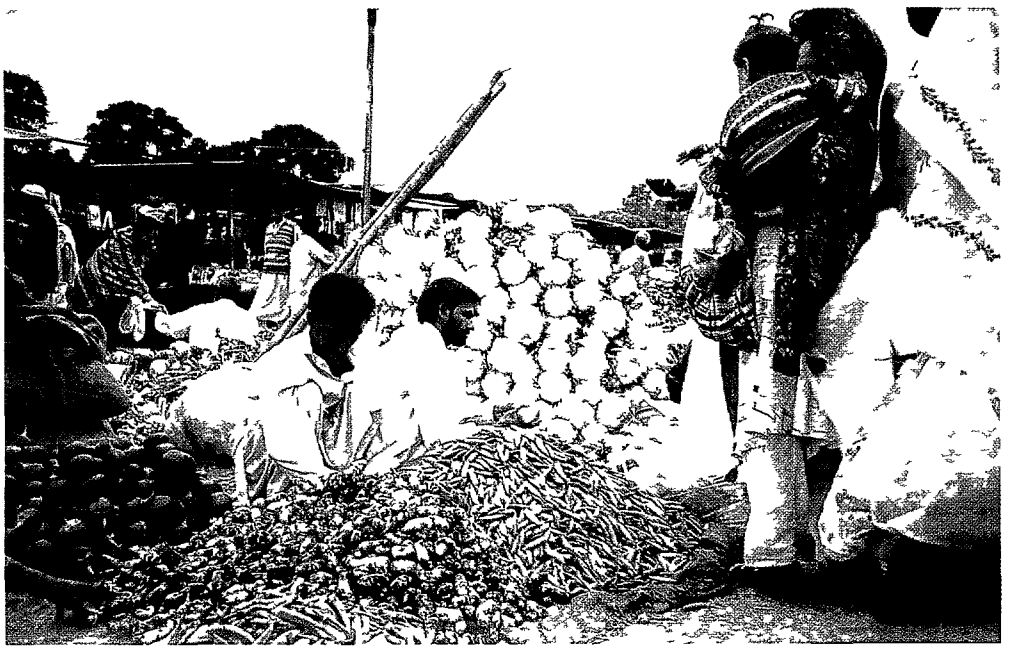
> 2 A training course for Central Asia Countries was held in Tashkent 22 September 3 October 1997 Fifteen participants attended the course from all Central Asia Countries The course was sponsored by ICARDA IPGRI and SGRP

> 3 A training course was organized jointly with FAO ICARDA PGRI/PARC Pakistan and IPGRI at PGRI Islamabad Eighteen scientists (11 from Afghanistan and 7 from Pakistan) were trained on different aspects of plant genetic resources

The countries of the expanded CWANA region are marked in yellow



 See pp. 135-136 for Abbreviations



Joshka Wessels IPGRI

A market scene in Pakistan, showing some of the diversity of vegetable crops available locally

Discussions were lively, very fruitful and motivated the members to continue activities on plant genetic resources in the region, since all the countries face similar problems The members agreed that WANANET should be a tool to enhance cooperation between the countries through which they can combine forces to stop the threat to biodiversity in the region The working groups on Pasture, Forage and Rangeland and on Food Legumes met, followed by a Steering Committee meeting The sections below summarize the working groups discussions

Food Legumes working group

- Draft proposal for a regional food legume project is under development
- More work on evaluation in close collabo ration with breeders aiming at the use of the local germplasm
- Identification of donors and training on characterization and evaluation

Pasture Forage and Rangeland working group

- Need for a regional project on evaluation and use of species in the arid areas
- Publication of proceedings of meetings and directory of members to have high priority
- Each country should identify training needs for long term and short term periods
- Need for greater participation of National Programmes in the Regional Rangeland Seed Information Network

Cereal Crops working group

The Cereal Crops working group of WANANET meeting was convened in conjunction with the 3rd International Triticeae Symposium, to allow members to acquaint themselves with the latest research approaches for the study of cereals The 1997 meeting recommended that Group mem bers

- Identify the gaps in collections
- Gather information on cereal holdings and on constraints in the area of documentation
- Provide an inventory of hot spots for biotic as well as abiotic stress
- Establish a Barley Core Collection

Steering Committee

- Fourteen National Plant Genetic Resources Committees established through IPGRI-provided secretariat in the region

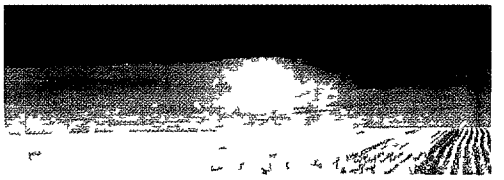
New insights into the origin, diversity and use of crops

Why a Symposium on the Triticeae?

Together with the rice genus *Oryza* and the maize genus *Zea* this tribe is in the grass family Poaceae It is one of the most important and scientifically interest ing plant groups

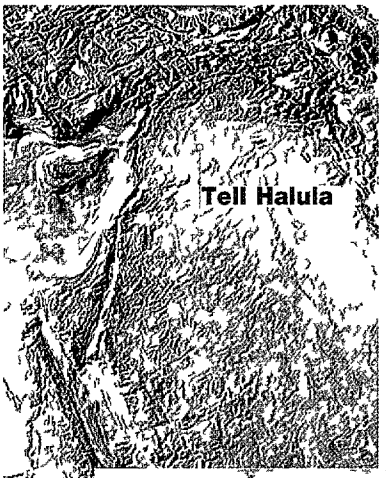
IPGRI in collaboration with its sister centre ICARDA organized in 1997 two international symposia that have shed new light on the origin of agri culture and on the diversity of the tribe Triticeae

The Third International Triticeae Symposium held in ICARDA Aleppo Syria addressed the state of the art of the tribe Triticeae comprises some 350 to 500 species including the temperate cereal crops wheat barley and rye and the artificial' triticale It also includes a number of forage grasses of great importance especially in Central Asia and in North America (such as *Agropyron* species) Apart from the cultivated species the Triticeae also includes a large number of wild species with present or potential importance as gene sources to improve cereals or forages species The members of the tribe have adapted to a very wide range of ecological conditions ranging from sea level to 4500 m asl in the Himalayas and from rich meadows and forests to steppes stony dry or saline environments The papers at the Symposium broadened our knowledge on evolutionary genomic relationships among members of the tribe For instance research work from the USA addressed the successful development of synthetic hybrids between the perennial grass *Timopyrum* sp and bread wheat varieties thanks to a new chromosome pairing technique It also contributed to understanding the patterns of ecogeographic distribution and taxonomy of the genus *Elymus* The scientific community is keen to develop a core collection for this species because of its potential contribution to wheat improvement



Origins of Agriculture

Agriculture is thought to have first originated some 10 000 years ago and scientists have been searching for confirmation of this hypothesis for decades Excavations at the Syrian Neolithic site of **Tell Halula** in the Middle Euphrates uncovered traces of durum wheat bread wheat barley and lentils This site was inhabited continuously for more than two millenia from 8700 to 6300 years before the present providing further confirmation of the early origin of agriculture This finding and questions such as the mechanism that led to the origin of a production economy in agriculture were addressed in a symposium on the origins of agriculture* Plant biologists and archaeologists heard that climatic conditions in the past were much wetter than today This historical information is most significant because the Near East represents the centre of domestication not only of many major cereals and pulses but also of many other useful crops such as leafy vegetables fruit trees oil and medicinal plants Because of the lack of well preserved archaeological remains they have not been studied in as much depth as the cereals and pulses The Near East was one of the most important centres of early Neolithic civilization evolution of crop plants and innovations of agricultural techniques in which more than 50 plant genera have either their greatest diversity or their site of domestication



The Origin of Agriculture and the Domestication of Plants in the Near East 10 14 May Tel Hadya Syria sponsored jointly by the Institut de Prehistoire Orientale (France) the Genetic Resources Conservation Programme of the University of California (Davis USA) IPGRI and ICARDA

Jan Valkoun ICARDA

A pounding stone used to process cereals found at an 8000 year old farming site in Beidha Jordan

 See pp. 135-136 for Abbreviations

- Terms of reference of WANANET executive bodies finalized as recommended by the review committee of the WANA regional group and approved by the BOT
- Priorities for conservation and utilization of plant genetic resources in the region were assessed

Linking WANANET and CAN/PGR

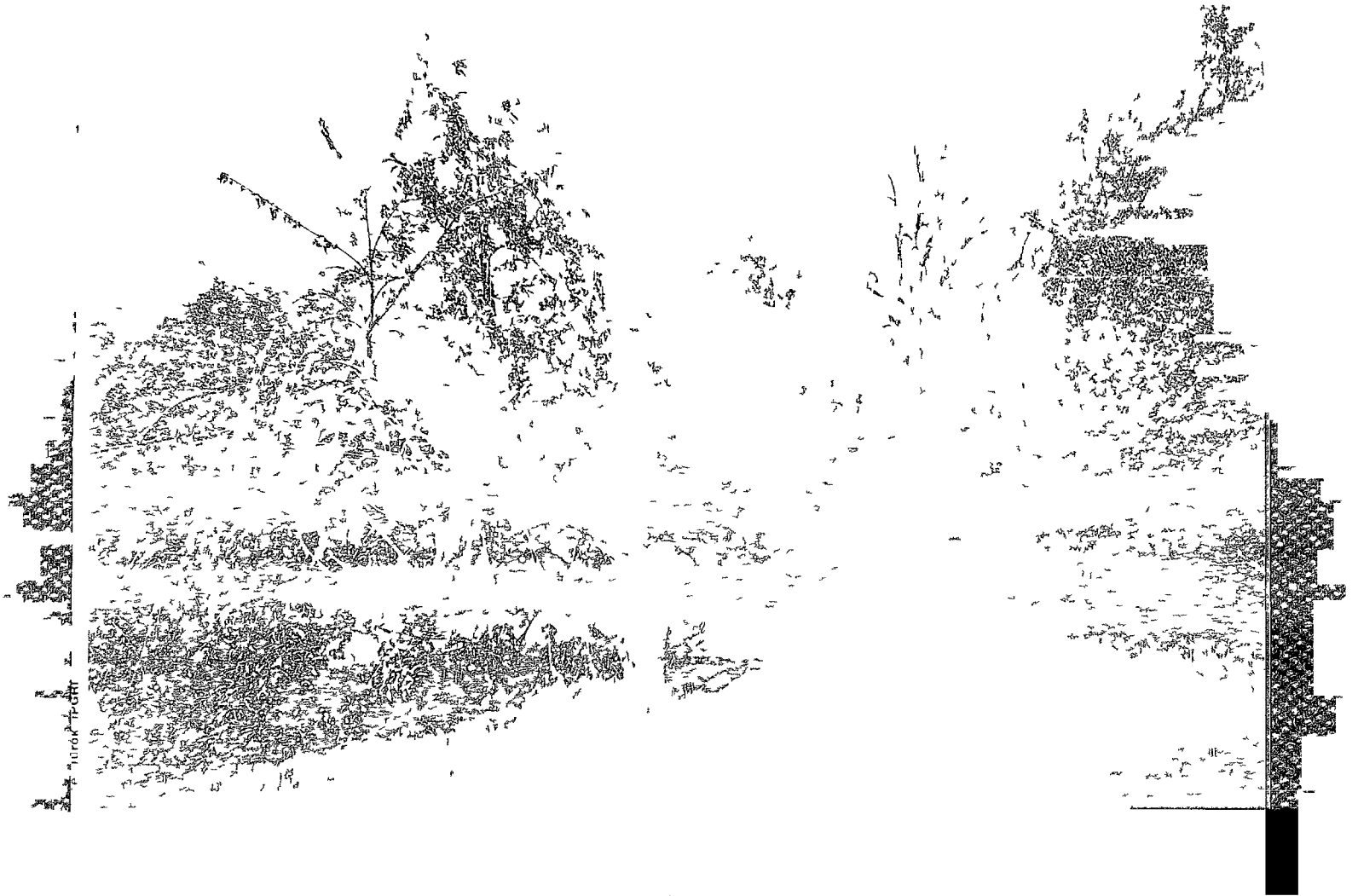
The Central Asian countries have requested assistance in establishing their programmes and national committees to deal with plant genetic resources Linking the Central Asian Network to WANANET would benefit both networks, so the Steering Committee recommended that the Chairs of each network become members of both networks Neighbouring countries (e g Iran, Pakistan and Turkey) with good conservation facilities will share their experience with the Central Asian countries

CAN/PGR

Forest trees working group

In Bishkek, Kyrgyz Republic, representatives of five Central Asian countries participated in the consultative meeting of the CAN/PGR Working Group on Forest Biodiversity and Forest Genetic Resources in August The main objective was to discuss developing the CAN/PGR Working Group and to establish an action plan with practical, shared tasks The working group recognized that fruit and nut forests boast a high biodiversity and constitute a unique genetic fund in terms of populations of trees and shrubs The area they occupy in southern Kyrgyzstan is the largest existing example of such forests in the world The Group was very concerned about conserving and using this valuable resource sustainably They suggested that a scientific facility be developed

Apple trees in Central Asia



Joshka Wessels IPGRI

A coppice forest of *Quercus* in the Al Barouk Mountains in Lebanon in the winter

to contribute to the conservation and use of genetic resources of these forests at an international level

Coordination Committee

The Coordination committee of CAN/PGR met in Tashkent and members of five Central Asian countries participated A scientific committee and a policy committee on plant genetic resources have been established in three out of the five countries The meeting made the following recommendations

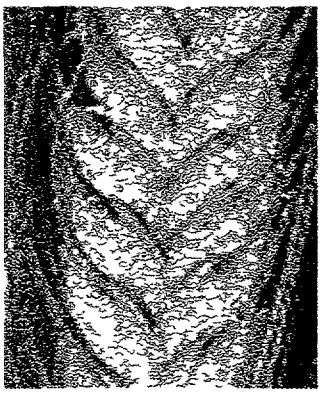
- establish seed storage facilities – highest priority
- organize joint collecting missions on crop species of common interest
- carry out more technical training courses on conservation and use of plant genetic resources in the future
- establish databases on plant and forest genetic resources
- continue joint programme with VIR
- develop links to existing networks
- establish National Programmes as soon as possible

Information and publications

As part of the development of its regional information strategy, the CWANA Group focuses its publication activities on region specific information that is of primary interest to regional communities working on plant genetic resources Part of the strategy is also to publish and disseminate information in key languages of the region, mainly Arabic and Russian Since 1995 IPGRI CWANA has published an Arabic version of its quarterly regional newsletter During 1997 it published, in Arabic, the proceedings entitled First National Workshop on Plant Genetic Resources in Yemen' and jointly with ACSAD a publication entitled 'Preliminary ecogeographical survey on genetic resources of wild almonds in Syria With the integration of Central Asian countries to CWANA, there are plans to translate and publish plant genetic resources information in Russian

 See pp. 135–136 for Abbreviations

Severe genetic erosion found in Morocco



Morocco forms part of the Mediterranean centre of diversity for such globally important crops as wheat barley faba bean lentils and alfalfa This valuable and underexploited diversity resulted from long term adaptation to drought cold and saline conditions Microcentres remain in the mountain areas and in the oases at the edge of the Sahara

A survey made in 1997 revealed that nearly all local varieties of bread wheat (*Triticum aestivum*) appear to have been lost and only 20% of Morocco s durum wheat (*T durum)* grown in the surveyed area is still based on local cultivars Moreover *Triticum monococcum* once common in the Rif Mountains is now rarely seen Staff of INRA and IAV Hassan II in Rabat Morocco and the CWANA Office made the survey in three different agro ecological zones of Morocco (the Atlas mountains the Oases and the Rif Atlas) on cereals legumes and forages to finalize the formulation of an on farm conservation project in the country

 See pp. 135-136 for Abbreviations

Asia, the Pacific and Oceania

Introduction

In January, the APO Regional Office began operation in Serdang, Malaysia Close support from the new host was reinforced with the inauguration in April of the Office by the Minister of Agriculture A subsequent Inauguration Workshop identified priorities common to Malaysia and IPGRI Access and benefit sharing continued as major concerns to partners in the region Later in the year APO hosted IPGRI s Board of Trustees meeting at the newly established Office The Board strongly endorsed a positive Internally Commissioned External Review that commended the scope and quality of IPGRI's activities in the region

In the New Delhi Office the joint ICAR IPGRI workplan was reviewed to the satisfaction of both partners The Beijing Office began preparations to move to quarters located close to the offices of other CGIAR centres within the CAAS campus A CGIAR China meeting helped develop a common set of priorities to help China sustainably meet its food production needs Priorities included *in situ* conservation, and evaluation of germplasm for marginal conditions A new initiative was started during the year to develop public awareness kits for school children in Malaysia

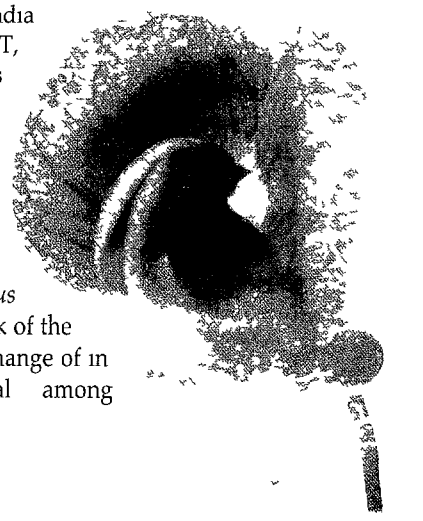
Paul Quek IPGRI

The Malaysian Minister for Agriculture unveiling the plaque that marked the opening of the new APO Regional Office in Serdang, Malaysia

Conservation and use of the *Lathyrus* genepool

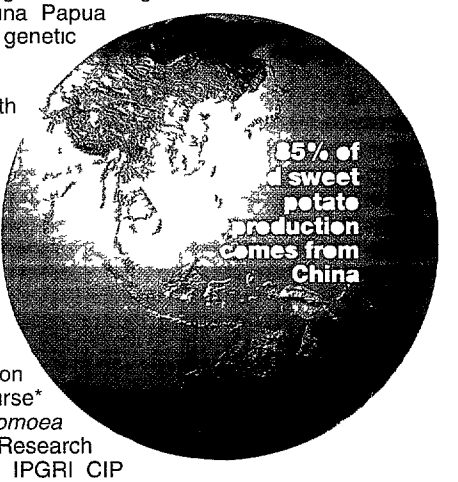
The genus *Lathyrus* contains a number of species that are very useful in the region *L sativus* is a hardy species that farmers in stress prone areas grow as a grain legume and a fodder crop across South and West Asia and Ethiopia Plant breeding identified the low toxin types and interest is now focused on increasing their productivity and use Improved conservation and use of the *Lathyrus* genepool is a topic of priority in the region

The Regional *Lathyrus* Genetic Resources Working Group includes representatives from Bangladesh, India Nepal ICARDA, ICRISAT, Australia and Belgium as well as from IPGRI s APO and WANA offices The Working Group met in 1997 and outlined a *Lathyrus* Genetic Resources Network to conserve and enhance *Lathyrus* genetic resources The work of the Network will increase exchange of information and material among



The Asian Network on Sweet Potato Genetic Resources

Sweet potato the world s seventh largest food crop is one of the two most important root and tuber crops in the APO region It is a stable food source particularly for low income resource poor farmers and it is also a high energy source of feed for livestock Most of the present world production of sweet potato is in the APO region China is the largest producer followed by Indonesia Vietnam and the Philippines Sweet potato is thought to have the largest potential for yield improvement of any crop in Asia Sweet potato was domesticated in Central and South America and introduced into Asia by European explorers during the 16th century Since then a large amount of genetic diversity has developed and evolved in Asia the geographic area comprising China Papua New Guinea and Indonesia are now considered the secondary centre of sweet potato genetic diversity



In the APO region there are a number of sweet potato genebanks of varying sizes with over 16 000 accessions maintained in national programmes across Asia and the Pacific Most are maintained in field genebanks with a small percentage maintained *in vitro* or as seed Conservation of sweet potato genetic diversity in field genebanks is risky expensive and labour intensive and puts a heavy burden on national programmes Hence there is an urgent need in the region for strategies that can strengthen the long term maintenance of Asian sweet potato genetic diversity increase its use and reduce maintenance costs CIP with global responsibility within CGIAR for sweet potato and IPGRI worked with National Programmes to conserve and use Asian diversity to complement the collections maintained at CIP

A workshop organized by CIP and IPGRI in 1996 started ANSWER the Asian Network on Sweet Potato Genetic Resources which in 1997 undertook several joint activities A course* trained National Programme staff to maintain characterize and identify duplicates in *Ipomoea batatas* collections This was jointly organized by CIP IPGRI and Philippine Root Crop Research and Training Center Visayas State College of Agriculture in Baybay Leyte Philippines IPGRI CIP and ANSWER members also worked on the conservation of Asian sweet potatoes to devise complementary conservation strategies emphasizing the use of botanical seeds rationalizing collections in field genebanks looking at population patterns within regional germplasm and identifying genotypes using morphological and molecular methods Preliminary results of these studies indicate that botanical seed conservation can be a highly applicable method to complement Asian sweet potato field genebanks especially in localities where natural flowering of sweet potato occurs reliably within the major part of the local germplasm and where the crop has evolved through frequent sexual reproduction cycles

It was also observed in a model case study on duplicate identification that the collection consists of a remarkable number of morphological duplicates indicating the fact observed earlier with field genebanks in South America – a primary centre of sweet potato diversity – that duplicate identification should be the first step in improving the cost effectiveness of sweet potato conservation in field genebanks

*Characterization of sweetpotato storage roots ANSWER Training Course on Maintenance Characterization and Duplicate Indentification of *Ipomoea batatas* Collections Philippine Root Crop Research and Training Center VISCA Baybay Philippines 1 6 September 1997

members Members immediately started to plan how to use the available diversity to develop low toxin cultivars with improved nutritional composition and resistance to stress conditions The major emphasis will be on *L sativus* with some attention to the important related species, *L cicera* and *L ochrus* Collections of other *Lathyrus* relatives will be documented and used as needed ICARDA will start nurseries of potential grain and fodder varieties to make material available to network members Activities started on farmers' participatory breeding and testing germplasm accessions for multiple uses including as cover crop for fodder and erosion control

National workshops

Joint planning for national workshops brings together the concerned organizations in the country and identifies important issues In 1997, national workshops were organized in Cambodia and Bangladesh, using the Country Reports of the GPA as starting points for discussion and planning

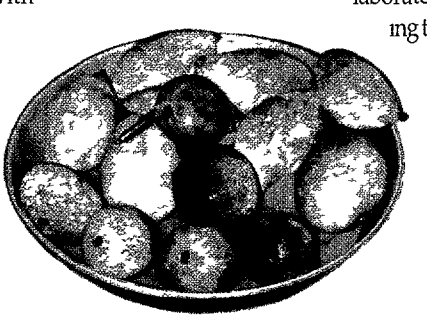
 See pp. 135-136 for Abbreviations

In Cambodia the workshop focused on crop/genepool priorities for collecting, conservation and utilization, plans for a national programme in Cambodia and future priorities In a very successful outcome, the workshop agreed to seek official approval in establishing a national committee on plant genetic resources, involving the Ministries of Agriculture, Fisheries and Forestry, of Health and of Rural Development The meeting also recommended to the government that legislation on genetic resources should be drafted, and certain locations rich in plant genetic resources be declared protected areas The meeting also decided to increase regional involvement by collaborating with the RECSEA PGR networks IPGRI was asked to increase support by collaborating in human resources development, information and documentation activites

The same level of collaboration emerged from a meeting in Bangladesh, attended by over 60 participants from various institutions in the newly formed National Committee on Plant Genetic Resources, consisting of government representatives and NGOs The meeting decided to establish a national genebank system to protect already conserved material, and to develop a national policy on genetic resources Links will be made among stakeholders, NGOs, farmers and IPGRI together with other countries in the region, to increase information flow and stimulate collaboration

Regional collaboration

A RECSEA PGR meeting held in Vietnam agreed on a carefully focused set of priorities in information exchange, training and technology transfer and public awareness that closely match those of IPGRI Regional staff presented IPGRI s role in facilitating regional and crop networks to an Expert Consultation and Executive Committee Meeting of APAARI The group appreciated very much the idea of these low transaction cost networks As a result, APAARI agreed on closer linkage with IPGRI in support of plant genetic resources networks in the region This will increase the impact of network activity and give them a greater voice in influencing work in the region



E Nissila IPGRI

Diversity of mango cultivars (Bangalore, India)

Human resource development

Training in the region is focused at two levels short courses on practical aspects of plant genetic resources and MSc programmes

Short courses

Topics for practical training are established at national and regional workshops 17 trainees from 13 countries attended a very successful laboratory and field oriented course on the conservation and use of tropical fruits at the Indian Institute of Horticultural Research in Bangalore, India This course was supported and organized by IPGRI in collaboration with UTFANET and ICAR IPGRI also provided training course modules Five IPGRI staff (including one from HQ) acted as resource persons for topics related to diversity assessment, collecting and conservation strategies

Practical courses on germplasm documentation are in high demand in the region They are often taught at the national level, to tailor the course to the capabilities that exist in one country In Nepal, a one week documentation training course was conducted with IPGRI support and trainers at NARC in Kathmandu, with 11 participants from research stations across the country Participants were very positive about the course and found GMS version 1 2 easy to learn A similar course conducted in Mongolia drew a positive response from the 17 trainees Although IPGRI provides trainers and training materials for such courses, they are developed in close consultation with partners to meet local and regional needs The majority of course instructors come from the region or host institute Other organizations including FAO and UTFANET collaborated in organizing and supporting these courses

E Nissila IPGRI

Trainees characterizing sweet potato storage roots in the Philippines

MSc programmes

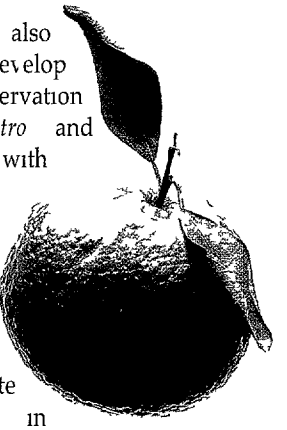
An IPGRI sponsored survey of training needs revealed a strong interest in increased MSc level training in the re

in increased MSc level training in the region Three new MSc programmes on plant genetic resources were under development, or started in 1997 Regional staff served as members of the MSc course development committee at the Universiti Kebangsaan Malaysia, Malaysia, participated in two weekend workshops to develop courses in documentation and genetic diversity for the University of Philippines at Los Baños and provided IPGRI teaching modules to a new course organized by the Indian Agricultural Research Institute and NBPGR, India Rome based DIT staff worked closely with APO staff in these efforts

Collaboration on citrus genetic resources

South and Southeast Asia have the greatest citrus diversity in the world Long term conservation of citrus in field genebanks is particularly difficult because of high levels of pests and diseases such as citrus leaf miner, citrus greening, Tristeza virus, bacterial canker and *Phytophthora*

IPGRI and ACIAR sponsored a workshop in 1997 to discuss conservation and use of citrus germplasm with a focus on citrus rootstocks Representatives from 10 major citrus growing countries in Asia and Oceania agreed that field genebanks must remain as the primary method of conservation of citrus Increased collaboration among countries will ensure that the components of the citrus genepool are conserved and used in the region, and that germplasm is exchanged safely The meeting also agreed on the urgent need to develop complementary methods of conservation for citrus, including *in vitro* and cryopreservation Planning began with the University Kebangsaan Malaysia and the University of Malaya to develop cryopreservation procedures for the accessions in the regional citrus collection which is now in the field genebank at the University of Malaya A duplicate back up collection held in cryopreservation will ensure the safety of this important collection



Effective use of information

Countries in the region possess a wide range of computer and information hardware and software To promote the sharing of genebank accession information, APO staff and partners developed a Data Interchange Protocol (DIP) to exchange data among existing systems without the need to change the existing software or re enter data

During the year a browser for DIP was developed which successfully demonstrated the feasibility of the protocol In India, NBPGR used DIP software to develop electronic germplasm catalogues for 10 important crops CAAS in Beijing also began using it Data exchanged by DIP can be used in statistical software or in other applications such as geographical information systems

E Nissila IPGRI

A Cambodian trainee examining *Citrus* germplasm in the field genebank Bangalore India

 See pp. 135–136 for Abbreviations

COGENT in 1997

The International Coconut Genetic Resources Network COGENT is a global network operated under IPGRI and coordinated from the APO Regional Office in Serdang Its objective is to improve coconut production on a sustainable basis and to strengthen the capacity of national programmes to conserve and utilize coconut genetic resources

Building the training capacity of coconut researchers

COGENT developed a manual on standardized research techniques in coconut breeding which was upgraded in 1997 COGENT and regional staff used the manual to increase the skills of trainers in germplasm documentation and evaluation in two workshops in Cote d Ivoire for Africa and the Indian Ocean and in Jamaica for Latin America and the Caribbean Financial assis tance came from the Common Fund for Commodities COGENT and IPGRI and increased the number of trainers on the subject to 50 worldwide

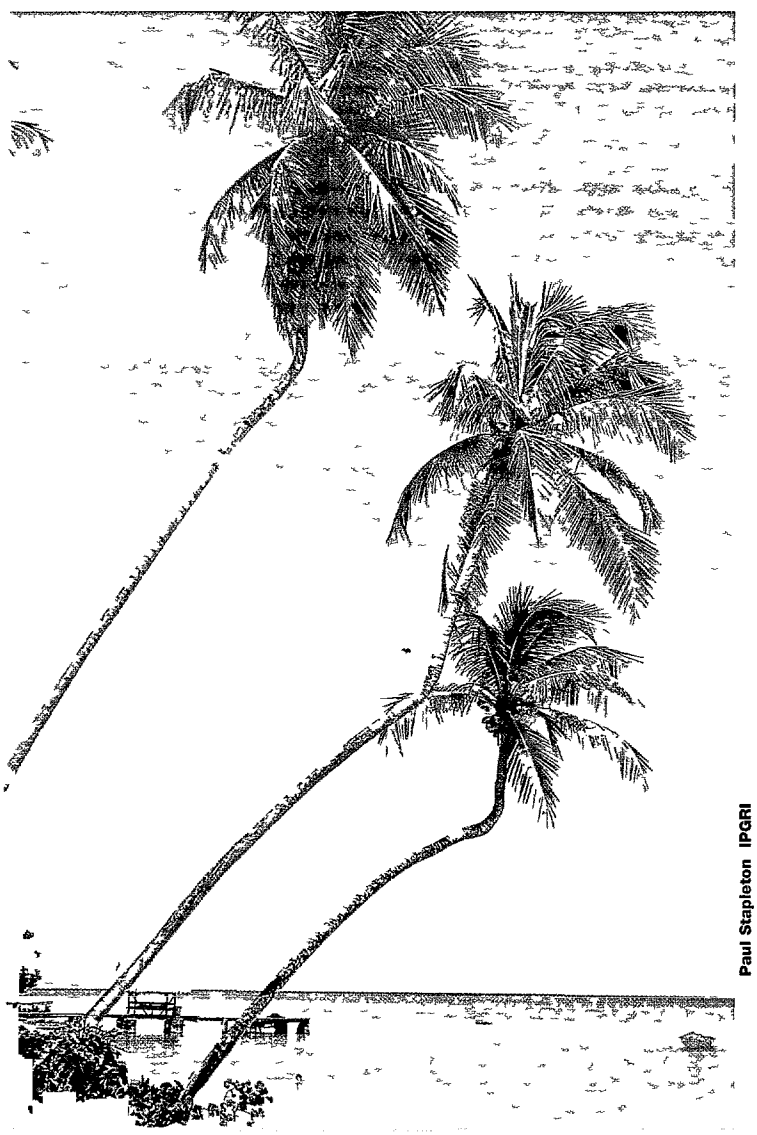
Pons Batugal IPGRI

Trainers course on techniques in coconut breeding research in Manado Indonesia

Research collaboration in biotechnology and embryo culture

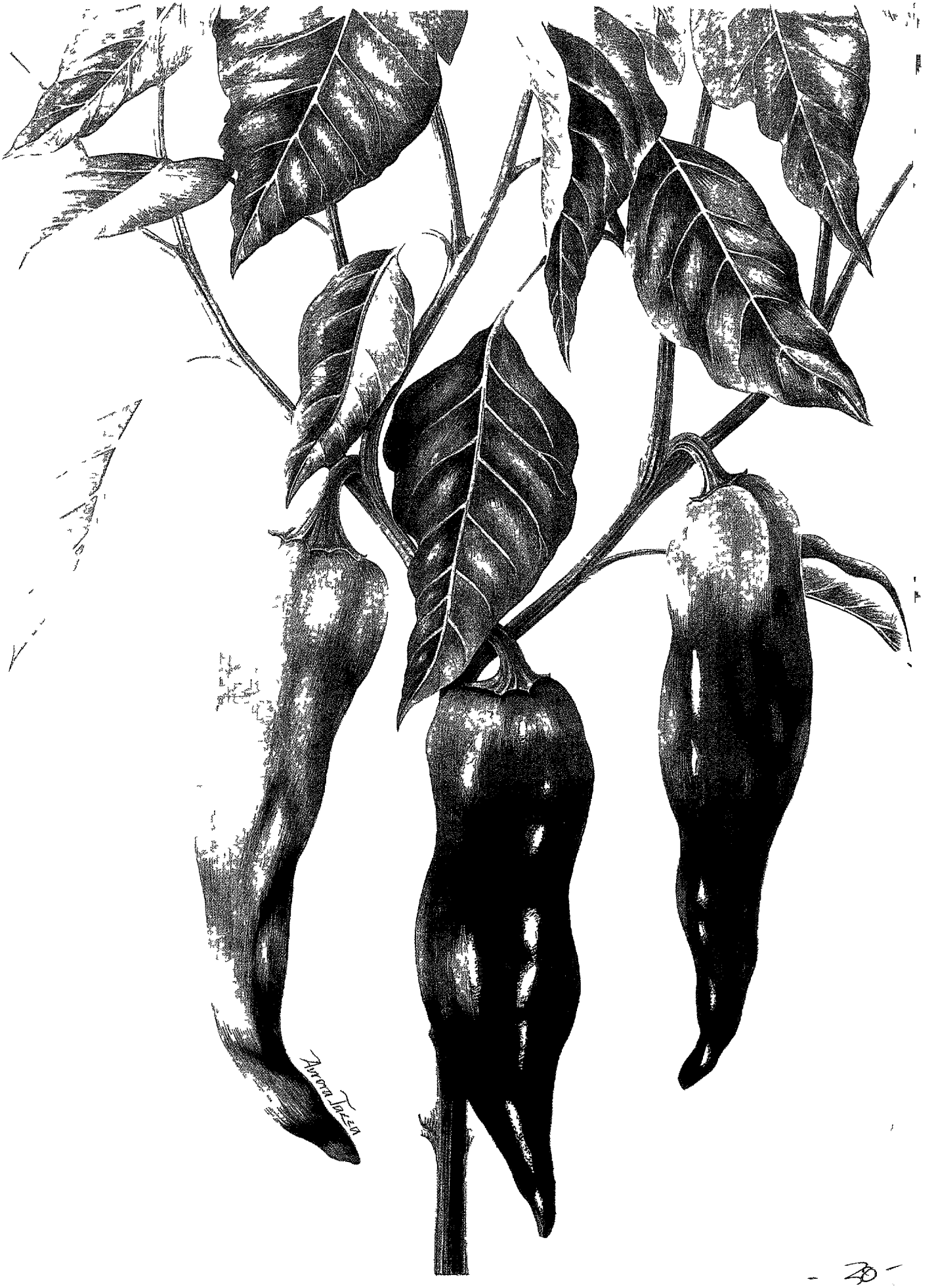
Collaborative work on developing AFLP and microsatellite markers to reveal genetic diversity in coconuts was carried out with Long Ashton Research Station UK Polymorphic microsatellite markers were developed and tested with different clones AFLP analysis was made of the same material This methodology is now available to study genetic diversity in coconut This work was supported by DFID UK

A workshop assessed the status of coconut embryo culture research Participants were able to develop an upgraded and standard ized embryo culture technology and also formulated some collaborative projects to validate the technology These will be undertaken in 1998 The workshop was funded by the CFC organized and held at the Albay Research Centre Philippine Coconut Authority in the Philippines Fourteen leading embryo culture practitio ners from 8 countries of Asia Pacific Africa Europe and Latin America participated



Paul Stapleton IPGRI

To strengthen collaboration in coconut research and development COGENT and IPGRI organized in 1997 five regional coconut genetic resources subnetwork meetings in Southeast Asia South Asia South Pacific Africa/Indian Ocean and Latin America/Caribbean With the assistance of the ADB COGENT continued to assist 13 Asia Pacific countries to collect and conserve coconut germplasm Material collected in 1996 was planted out in nurseries in 1997 In 1997 COGENT supported germplasm collecting by CPCRI in Mauritius Madagas car and the Seychelles in collaboration with the concerned Ministry in the respective country Support was also provided for collecting by the CRI Sri Lanka and by the Oil Plant Institute of Vietnam To promote germplasm conservation and exchange COGENT started a multi site International Coconut Genebank in Indonesia for Southeast Asia India for South Asia Papua New Guinea for the South Pacific and Cote d Ivoire for Africa/Indian Ocean


Aurora Tazza

Americas

Highlights of project activities

TROPIGEN

Project workers in Brazil discovered new sources of resistance to fusariosis in pineapple in a project that started in February Fusariosis is a major fungal disease that reduces yield by up to 80% in Brazil, Paraguay and Bolivia The EU supports the project, which aims to recover or breed resistant varieties of pineapple and improve production systems in Brazil, Venezuela, France and Portugal The first three countries hold the most important collections of pineapple germplasm in the world Staff inventoried the collections in Martinique (CIRAD FLHOR) Brazil (CNPMF EMBRAPA) and Venezuela (UCV) to detect duplicates and coordinate germplasm exchange The Venezuelan collection had lost some valuable accessions but 80 duplicate accessions were sent from Martinique to replace the material Project participants began describing the agromorphology of the material and evaluating it, after revising the list of descriptors for pineapple Three Venezuelan scientists were trained at CIRAD-FLHOR – two in Martinique to manage and evaluate collections and one in Montpellier to evaluate resistance to nematodes Molecular characterization and gene mapping made good progress in Montpellier and at the University of Algarve in Portugal

Germplasm acquisition

Regional staff members participated in the first mission ever conducted in Guatemala to collect peanut landraces This was a particularly interest

All photos by Geo Coppens IPGRI

(Main photo right) *Ananas comosus* an Amazonian landrace that yields enormous fruits (Far right from the top) *Ananas ananassoides* in the wild *Ananas bracteatus* an ornamental species *Ananas comosus* inflorescence of cultivar Española Roja

International collaboration in geographic information systems

Staff in the Americas Group together with CIAT and national partners explored new ways of using GIS to locate genetic diversity In particular they worked to develop a model that will predict the distribution of genetic diversity of cultivated species and also indicate areas where there is a high risk of genetic erosion Unlike wild plant species cultivated crop diversity depends largely on farmer prefer ences climatic and soil suitability For this reason socioeconomic and cultural data are crucial to the model which is expected to become a valuable tool for locating conserv ing and managing cultivated plant diversity in developing countries

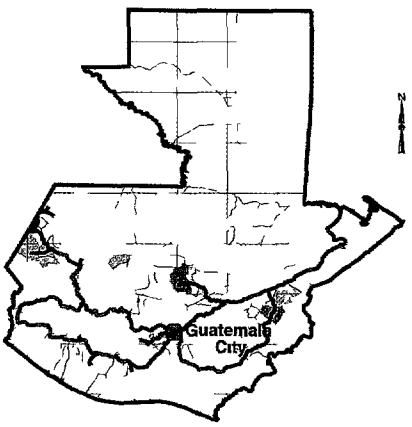
A Guatemalan farmer (on the right) provides extra data to collectors as he helps them prepare germplasm samples

Karen A Williams

Using cultivated peanut landraces as a test case genetic diversity information from plant explorations in Ecuador and Guatemala was correlated with digital information on climate elevation communications land use and socioeconomic indicators Statistical analysis reveals the variables showing the greatest correlation with the distribution of peanut diversity This allows an empirical model to be developed to generate maps of genetic diversity hotspots as well as areas at high risk of genetic erosion The model will then be tested using other crops and countries until a final version is produced that can be used in almost any country to predict the distribution of genetic diversity for almost any crop

Americas Group staff worked closely with scientists from CIAT s GIS Laboratory and from USDA s National Germplasm Resources Laboratory Two GIS users one from Ecuador and one from Guatemala joined the effort to assist in elaborating the GIS model contributing environmental and census data from their countries in digitized formats In turn they developed skills in genetic diversity applications for GIS (see page 33)

The GIS technology immediately affected the ways in which plant collecting trips were planned and conducted USDA supported three field campaigns two in Ecuador and one in Guatemala (see collecting activities) to collect data on peanut diversity To ensure statistically significant sampling a 50 km square grid was superimposed on a map of the target country and the known available diversity from each cell (see map this page) This methodology imposes a more rigorous and systematic approach onto the collecting strategy The resulting model will be a valuable tool for planning both collecting missions and *in situ* conservation efforts It will also identify environments most suitable to introduce new varieties and to multiply and characterize existing collections



Map courtesy of CIAT GIS Laboratory

See pp. 135–136 for Abbreviations

ing trip as peanut is a widespread crop that has been grown there for centuries by native and traditional farmers Team members expected to find high levels of native genetic diversity in the country using a systematic collecting strategy that would also provide data to develop a GIS model for locating genetic diversity of cultivated plants (see opposite) The 33 varieties the team collected indeed showed extensive genetic diversity, even though only half the country was sampled because of the mountainous terrain (see map opposite) The grid based sampling strategy with its very thorough coverage, also reduced the amount of ground surface that needed to be covered

The work laid the basis for a comprehensive national collection of peanut landraces and filled an important gap in our limited knowledge of peanut diversity in Central America The germplasm was stored in Guatemala at USAC s Agronomy Department, with duplicate samples deposited in the USA and Argentine collections These highly adapted landraces are particularly significant as they could contribute much to breeding improved varieties for both Guatemalan and foreign consumers The trip was part of continuing collaboration with USDA and CIAT s GIS laboratory Funded by USDA and IPGRI, the collecting team included scientists from USDA, the National University of San Carlos and IPGRI

Karen A Williams

(Above) Recently harvested peanuts separated by landrace, spread out to dry in a Maya village in Guatemala
(Left) A traditional peanut producing village in highland Guatemala where Maya farmers still maintain highly adapted landraces

Developing materials to assist training

In collaboration with Spanish and Latin American scientists, staff in the regional office developed training modules in Spanish on seed physiology, utilization and basic concepts of plant genetic resources The modules contain lecture notes slides a list of references and a glossary aimed at classroom use as well as self study via IPGRI s Web site (see p 72) Work also started on lecture notes on *in situ* and *ex situ* conservation Extremely useful in developing capacities of National Programme staff, this work is part of an INIA (Spain) IPGRI project on Training Trainers and Developing Training Support Materials in Spanish for Plant Genetic Resources

Participants at a workshop in Bolivia with CIF/AECI found the modules interesting and useful, and made valuable suggestions to improve the material Trainers and trainees alike said that the modular approach was very convenient for presenting and understanding fundamental concepts The workshop tested modules on seed physiology and basic concepts of plant genetic resources in a highly participatory atmosphere, using lectures, discussions and practical sessions

David E Williams IPGRI

Students at a Spanish language training workshop on seed physiology in Bolivia participating in a laboratory exercise

pcGRIN – documentation software for developing countries

The lack of suitable software to document germplasm is a serious obstacle to managing genebanks in developing countries Regional Office staff have been working since 1995 with the Database Management Unit of the Genetic Resources Information Network at the USDA to help develop a new version of the GRIN software that can be readily adopted by National Programmes USDA is an ideal partner for this venture as it is the original developer of pcGRIN and so has long term experience in producing software to manage germplasm It also has the institutional infrastructure to provide its users with updated versions and technical support in the future

Karen A Williams

Jim Mowder, GRIN Database Manager and Frances Bekele of the University of the West Indies in Trinidad and Tobago evaluating the suitability of the new pcGRIN Maintenance software for use in genebanks in developing countries

Known as pcGRIN Maintenance the software is user friendly and has the capacity to store passport taxonomic evaluation inventory and other data Available in Spanish or English it can also make customized searches process orders and generate reports Genebank managers and documentation specialists from four countries in Latin America and the Caribbean were very enthusiastic about the software at an evaluation workshop co sponsored by IPGRI and USDA Participants made valuable recommendations that will improve pcGRIN s usefulness to smaller national plant genetic resources programmes

Documentation

Diagnostic study of collections of Andean roots and tubers

In 1997 Regional Group staff assessed the documentation and status of a complex and important collection of Andean roots and tubers This work was part of the Group s continuing efforts to assist genebanks in the region to improve their documentation practices The Biodiversity Program on Andean Root and Tuber Crops (RTA Program) based at CIP involves a network of 14 *ex situ* genebanks spread across Peru, Bolivia and Ecuador These genebanks conserve germplasm of nine species of root and tuber crops The Program s Steering Committee requested IPGRI s assistance in evaluating genebank procedures descriptors data organization and standardization, hardware and software tools used to document the collections The Group also identified training needs and areas for improvement

Staff visited nine genebanks and also used questionnaires to gather data from all conservation sites in Ecuador Peru and Bolivia Recommendations for priority action included standardization of descriptors centralization of passport and characterization data in a single integrated documentation system training genebank staff in documentation procedures and acquiring appropriate documentation software and hardware

Communication

Improved communication within the plant genetic resources community is one of the principal goals of IPGRI Towards this objective, the Americas Group integrated its library into CIAT s catalog database (CATAL) to

Andean roots and tubers

Patrizia Tazza IPGRI

See pp. 135–136 for Abbreviations

Geo Coppens IPGRI

Passiflora alata
sweet maracuja

make it more accessible to partners in the region and worldwide 1700 records including grey literature were entered and can be accessed by contacting CIAT's Information Unit's Services website

IPGRI publications were strategically distributed to target audiences in the region Seventy one libraries that can serve as plant genetic resources information nodes were identified in the region They were targeted as depositories of IPGRI publications

36.

 See pp. 135–136 for Abbreviations

Europe

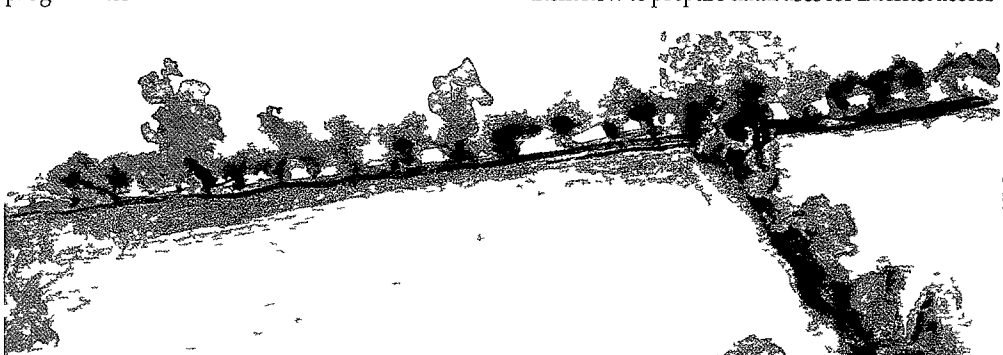
Introduction

An increasing number of countries in the region now have institutional structures established by governments committed to conserving plant genetic resources in the long term Many countries suffered funding difficulties in 1997, particularly those in east and southeast Europe Insufficient facilities, personnel and funds held back emerging programmes, especially in many of the Newly Independent States of the former USSR In addition, plant genetic resources programmes throughout Europe were affected by general cuts in funding to agricultural and forestry research This situation made work towards sustainable and interdisciplinary national programmes an important activity for the Regional Group

During 1997, the two networking programmes ECP/GR and EUFORGEN became increasingly important in implementing international agreements for the conservation of crop and forest genetic resources These programmes also played a key role in having non EU country institutions participate in EU funded genetic resources programmes

European Cooperative Programme for Crop Genetic Resources Networks

Recommendations made at a 1996 meeting on documentation of germplasm collections significantly influenced ECP/GR activity in 1997 In collaboration with various partners in Europe, IPGRI developed the European Information Platform for Crop Genetic Resources on the Web (**http // www cgiar org/ecpgr/platform**) This innovation serves the information needs of European National Programmes and offers on line access to ECP/GR Central Crop Databases By the end of 1997 *Agrostis*, *Avena*, barley, *Brassica*, *Glycine*, *Phalaris*, *Phleum*, *Poa* and *Trifolium* were available, as well as other regional and international databases such as *Beta* and *Vitis* The site immediately became an important resource, providing, in addition to the databases, information such as the Directory of European Collections and the IPGRI/FAO multicrop passport descriptors A workshop organized by ECP/GR and ZADI trained crop database managers to participate by showing them how to prepare databases for Internet access



Edward F Stapleton

European Cooperative Programme for Crop Genetic Resources Networks

This Programme now involves 32 countries including Estonia and Slovenia, which joined during 1997

Member countries are

Austria	Lithuania
Belgium	Malta
Bulgaria	Netherlands
Croatia	Norway
Cyprus	Poland
Czech Republic	Portugal
Denmark	Romania
Estonia	Slovakia
Finland	Slovenia
France	Spain
Germany	Sweden
Greece	Switzerland
Hungary	Turkey
Iceland	UK
Ireland	Yugoslavia
Israel	(Fed Rep)
Italy	

ECP/GR

ECP/GR Working Groups developed and upgraded databases for some agricultural species in collaboration with EU funded projects ECP/GR assisted by ensuring full collaboration with existing ECP/GR Working Groups and by supporting non EU partners to participate in these EU projects

Working groups on barley, forages, *Malus/Pyrus* and *Prunus* made further progress in defining the concept of European collections In these collections indigenous accessions become the primary focus of conservation efforts for the country of origin which accepts the responsibility for conserving the material on behalf of the ECP/GR countries This arrangement is advantageous to both the country of origin and the other countries involved since it ensures better access to germplasm within the region, promotes more intensive cooperation and allows a country to make its long term conservation more efficient by focusing primarily on indigenous material

Several groups discussed the crucial matter of safety duplication in protecting stored genetic resources Meetings stressed the importance of establishing formal bilateral agreements that define the responsibilities of the contracting parties for the long term conservation of the safety duplicates NGB reached agreements with Latvian and Lithuanian institutes, providing models for agreements with other countries Several genebanks offered space for the long term conservation of safety duplicates

An outstanding collaborative effort within the Forages Working Group resulted in a detailed set of guidelines to regenerate accessions in seed collections of the main perennial forage grasses and legumes of temperate grasslands The regeneration protocol required a compromise between maximizing the number of accessions that can be regenerated each year within available resources and maximizing the genetic integrity of the accessions Preferred and acceptable standards were defined to prevent contamination of accessions with alien genes and for the characteristics of the location used for regeneration

Threats of losing the *Malus* collection at the Maikop station of VIR, Russia due to the age and perilous state of the trees, prompted ECP/GR to fund an emergency mission to promote the recovery of endangered accessions Graft wood from trees of the most threatened species and accessions was taken to the Genebank Obst Dresden Pillnitz in Germany where it will be kept temporarily and repatriated to Russia in the future In the meantime, plans are underway to transfer the whole collection to another site within the Maikop station

See pp. 135–136 for Abbreviations

European Forest Genetic Resources Programme

EUFORGEN

Although EUFORGEN has a mandate of implementing a ministerial resolution on the conservation of forest genetic resources in Europe in 1997 efforts were also invested in establishing links through the Networks with countries in other regions This included the further development of collaborative activities between the *Quercus suber* Network and North African countries Links outside of Europe were also sought by the *Populus nigra* Network with West Asian and North African countries These countries contributed to both the core collection of clones and the database comprising more than 2000 entries maintained by the Network, since it is important to capture the diversity of a species over its entire distribution area This database and other outputs of the Networks were made available on the Internet and played an important role in raising awareness of forest genetic conservation

The main focus of the *Populus nigra* Network shifted from coordinating 'standard' *ex situ* activities towards *in situ* conservation of genetic diversity in riparian ecosystems Well preserved black poplar stands can still be found in some countries such as Hungary, Romania and the Ukraine The Network needs to ensure that measures are taken for the long term *in situ* conservation and reproduction of this diversity To facilitate this process, members of the Network developed criteria for designating *in situ* gene conservation stands The scope of the Network was broadened to include *Populus alba* which is an associate species in riparian ecosystems where the genetic diversity of *P nigra* will be better conserved *in situ* A list of minimum descriptors will allow easier inventories of stands

Members of the *Quercus suber* Network continued their efforts in the provenance experiment as part of a concerted action funded by the EU The collecting of acorns was completed with 34 provenances and 610 mother trees represented in the evaluation All progenies were sown in a nursery hosted by Portugal from where they were distributed to the trials in different countries at the end of the 1997

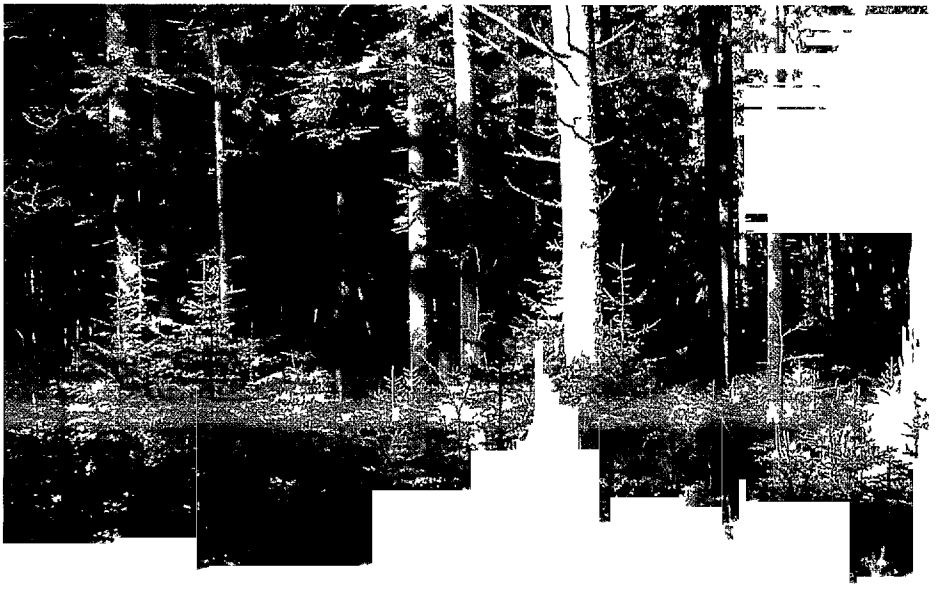
EUFORGEN

During 1997, Luxembourg and [illegible] joined the Programme, bringing [illegible] number of participating countries [illegible]

Austria
Belarus
Belgium
Croatia
Czech Republic
Denmark
Finland
France
[illegible]
Lithuania
Luxembourg
Malta
Moldova
Monaco
Netherlands
Norway
Poland
Portugal
Russia
Switzerland
Ukraine.

Jozef Turok IPGRI

After some intensive information exchange among the Norway Spruce Network members, Technical Guidelines for management of gene conservation stands were produced These give practical advice on both *in situ* and *ex situ* conservation The Guidelines describe general requirements for the origin, size and basic silvicultural principles in gene reserve forests The improved management of these stands will ensure the conservation of diversity in this economically important but locally threatened conifer



Jozef Turok IPGRI

Norway spruce is an economically important species in Northern and Central Europe

Facilitating genetic conservation

Throughout Europe broadleaved tree species have been receiving a lot of attention in national programmes on forest genetic resources because of their ecological stability quality and natural diversity

Some species predominate in forest ecosystems providing habitats for other scarce trees and shrubs Many broadleaved species are distributed across the continent Others are limited to small isolated areas European broadleaves are threatened by improper silvicultural management excessive logging atmospheric pollution and repeated droughts These factors combined with pest and disease attack have led to the decline of stands formed by ash beech elm lime maple and a number of oak species The natural genetic diversity contained within these forests is fundamental in meeting the demands of local economies for high quality timber and other valuable forest products and benefits Despite extensive research on broadleaved species in Europe in recent years conservation strategies are often being implemented with insufficient knowledge of the underlying genetic diversity However the increased attention these species are now receiving through four of the five EUFORGEN Networks and other regional efforts is beginning to resolve this problem Activities facilitated by regional networks emphasize an integrated approach encompassing management and protection of wild populations *in situ* and tree improvement activities *ex situ*

The new **Network on Social Broadleaves** was established because the participating countries felt that the specific gene conservation approach required for temperate oak and beech species was not receiving adequate attention at the regional level The first meeting of the Network was held at the Forestry Research Station INRA Bordeaux Cestas France where the common needs of the 23 countries represented were identified and a joint workplan developed The Network will

- contribute to a better information flow among countries
- promote the establishment and appropriate management of the gene reserve forests in each country
- develop common methodologies
- harmonize research priorities and disseminate available results
- raise public awareness

Broadleaves are receiving much attention in European genetic conservation programmes

In situ conservation of broadleaves

A further effort to promote the conservation and sustainable use of genetic diversity in European broadleaves is the launch of a 3-year project on the genetic diversity of native broadleaves in Bulgaria, Moldova and Romania. This project specifically addresses the complementarity between *ex situ* and *in situ* conservation, strengthens capacities and develops modern techniques for *in vitro* propagation of broadleaved species, using expertise available from IPGRI. The project was developed by the Regional Office for Europe with the financial assistance of Luxembourg, which also actively participates in its implementation through the Environment and Biotechnology Research Unit of the University Centre.

Jozef Turok IPGRI

Broadleaved species included in EUFORGEN Networks

Noble Hardwoods		Social Broadleaves
Alnus cordata	*P pyraster*	*Quercus robur*
A glutinosa	*Sorbus aria*	*Q petraea*
Acer campestre	*S aucuparia*	*Q pubescens*
A lobelii	*S domestica*	*Fagus sylvatica*
A platanoides	*S torminalis*	*F orientalis*
A pseudoplatanus	*Tilia cordata*	
Betula pendula	*T platyphyllos*	
Carpinus betulus	*Ulmus canescens*	*Quercus suber*
Castanea sativa	*U glabra*	*Q ilex*
Fraxinus angustifolia	*U laevis*	*Q coccifera*
F excelsior	*U minor*	*Q alnifolia*
Juglans regia	*U procera*	
Malus sylvestris		*P alba*
Prunus avium		
Pyrus amygdaliformis		

 See pp. 135–136 for Abbreviations

The Noble Hardwoods Network developed strategies to conserve several genera and species in Europe These strategies were particularly valuable as they form the basis for national policies but also outline action at the European level that will allow the genetic diversity of these species to be managed sustainably, used more efficiently and conserved in the long term A major constraint to this is the current exclusion of Noble Hardwoods from existing regulations on the movement of forest reproductive material Therefore, afforestation is often carried out using material with unknown properties and sometimes of undesirable origin To counteract this situation, the Network has developed recommendations to improve the quality of genetic material used

Underutilized Mediterranean Species

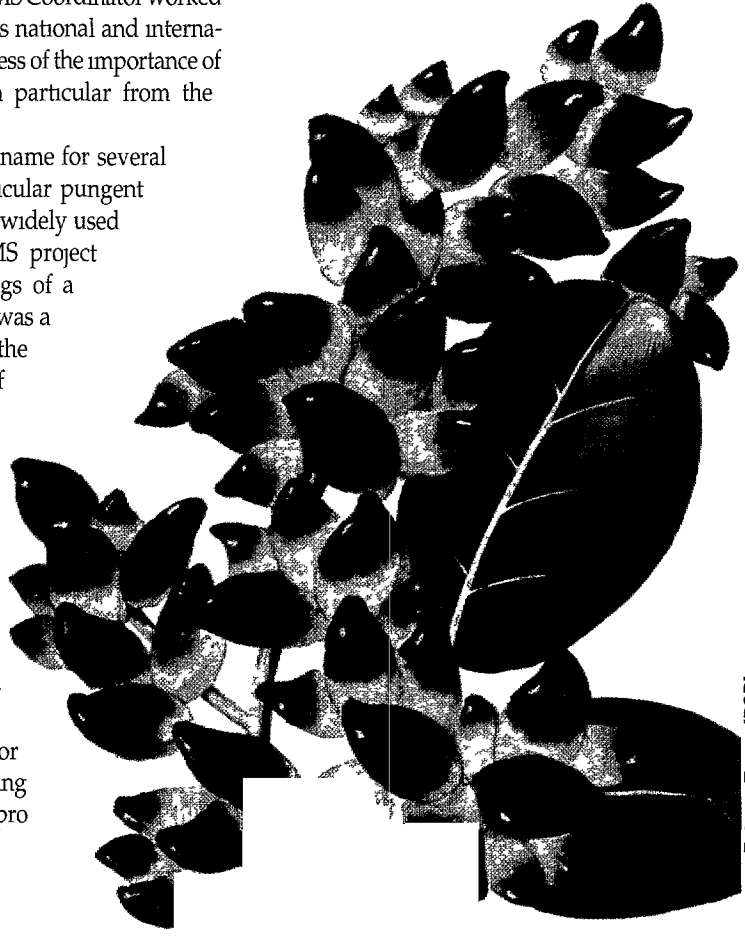
Only a small fraction of the 7000 edible plant species found in the world are widely used Greater attention to the use of the thousands of other, neglected species would represent an important step towards agricultural and diet diversification Network members and the UMS Coordinator worked during the year at various national and international fora to raise awareness of the importance of underutilized species, in particular from the Mediterranean

'Rocket', a collective name for several Brassicaceae with a particular pungent flavour in the leaves, is a widely used speciality food The UMS project published the proceedings of a workshop on rocket that was a major contribution to the knowledge of this group of plants These proceedings included details of state of the art cultivation techniques for both *Eruca* and *Diplotaxis* species as a result of a survey undertaken by the Network in the Veneto region, which is the largest Italian producer of this crop

The Descriptor List for *Pistacia* was released during the year This publication promotes the better conservation and use of this economically important nut crop as it makes joint evaluation work and data sharing more straightforward and effective *Pistacia* Network members reviewed the molecular and morphological characterization of *Pistacia* and compiled evaluation data on national varieties These initiatives make the eventual use of conserved material much easier for researchers and breeders

Sustainable plant genetic resources programmes in eastern Europe

Regional Office staff took part in a number of government-level workshops aimed at implementing international agreements such as the CBD and the GPA The workshops established national coordination structures to formulate needs, opportunities and action plans Wide consultation within a country is essential because an underlying principle of the CBD and the GPA is that the conservation and use of plant genetic resources should be approached in a *complementary way* that is, by making the best use of all the



Patrizia Tazza IPGRI

Cover illustration for *Descriptors for* Pistacia published during 1997

available *in situ* and *ex situ* conservation methods Taking this complementary approach into countries where the responsibilities for environmental protection and the maintenance and use of germplasm collections traditionally fall under different governmental sectors is very challenging Thus formal coordinating mechanisms can make the process much more effective

The Caucasus Region is part of one of the global centres of crop diversity It is the home of numerous wild relatives of cultivated crops such as *Triticum araraticum*, *Triticum urartu*, *Triticum boeoticum* and many species of the genus *Aegilops* which are ancestors of today s cultivated wheat, wild relatives of cultivated fruit and nut crops such as almonds, apple, apricot, cherries, grape, pear, and many more In remote areas farmers still cultivate a wide diversity of crops, old varieties and landraces which have evolved with their environment and may contain valuable traits for plant breeding and future food security The forests of the region include some of the most diverse and distinctive temperate conifers and broadleaved forests in Eurasia These forests play an essential role in the environment and in the socioeconomic development of the region, but are severely threatened due to excessive fellings, insufficient regeneration and other factors related to the management of genetic diversity

A workshop on the genetic resources of the Caucasus Region held in Tbilisi, Georgia brought together representatives of various institutions involved in the conservation or utilization of crop and forest genetic resources in Armenia, Azerbaijan, Georgia and the Russian Federation, as well as representatives of IPGRI and ICARDA Donors are already being approached for a number of issues requiring urgent attention

- low awareness among decision makers and the general public of the importance of plant genetic resources
- capacity building and coordination at a national level
- *ex situ* conservation facilities and equipment
- the condition of several field conditions such as *Vitis* in Georgia
- the low level of cooperation with foreign, and especially western countries
- insufficient attention given to on farm conservation of old cultivars and landraces
- insufficient attention given to the conservation of wild relatives of crops
- national coordination and capacity building towards effective conservation of forest genetic resources
- scientific and legal foundation for conservation

Training activities

1 Many of the participants of a 3 week course hosted by the Hungarian national programme in Szarvas play an important role in their national programmes and will be responsible for training others in these fields The second in a series of three this course provided 30 trainees from 20 countries of central and eastern Europe and the former USSR with practical training on the various methods of conserving plant biodiversity supported by extensive theory sessions

Funding IPGRI Training programme NGB and the UK Darwin Initiative Fund in association with the University of Birmingham UK

2 Six participants from Europe learned molecular techniques for genotype identification verification and molecular characterization This knowledge will allow genebanks in the region to make better use of these new technologies for assessing genetic diversity The course was held in the facilities of the Gene Bank of the Slovak Republic in Piešťany

Funding Slovak Ministry of Agriculture and IPGRI

See pp. 135–136 for Abbreviations

Mediterranean oaks

Jozef Turok IPGRI

 See pp. 135-136 for Abbreviations

Genetic Resources Science and Technology

GRST - a multidisciplinary research group

1997 was the first year of operation of the new Genetic Resources Science and Technology (GRST) Group the outcome of a merger of the groups *Germplasm Maintenance and Use* and *Genetic Diversity* This consolidation reaffirms the Institute s holistic and multidisciplinary research strategy This new thematic Group spans both the technological, as well as the strategic, policy and organizational aspects of genetic resources work and integrates human, biological, legal and policy concerns in the three main domains of its research

- locating and measuring plant genetic diversity
- maintaining plant genetic resources
- deploying plant genetic resources

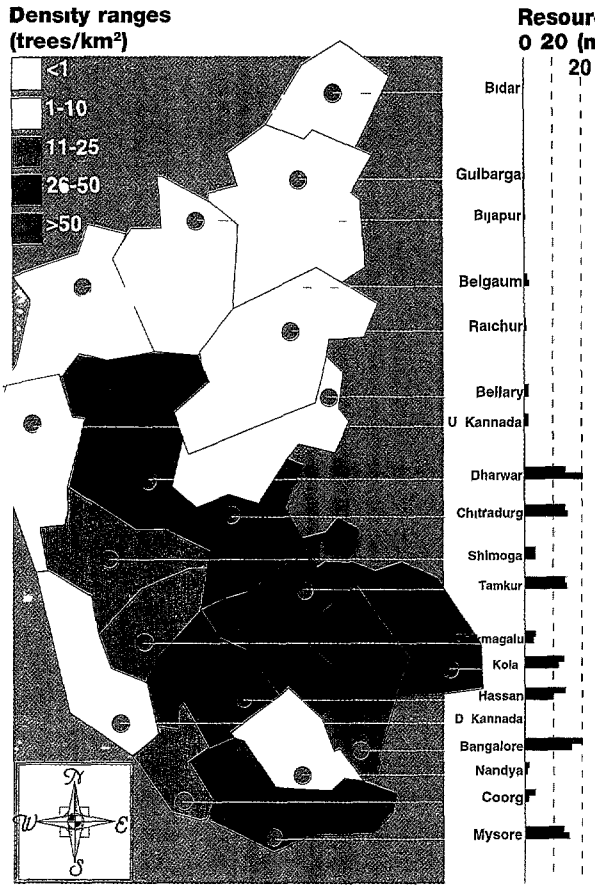
The scientific and technical research components of GRST s projects focus on developing and implementing widely applicable methodologies to locate and monitor as well as conserve and use plant genetic diversity This is complemented by the Group s research on strategic policy and institutional issues that aim to promote the conservation and use of genetic diversity

Forest genetic resources

Patterns of genetic diversity in tropical forests

With mapping of forest genetic resources and use of sophisticated analytical techniques, hot spots of genetic diversity in sandalwood in India were identified The results of this project are helping to assess the conservation status of important trees and point to strategies to conserve them GRST staff collaborated with the University of Agricultural Sciences, Bangalore, India to study *Santalum album* in the Western Ghats, India Maps depicting the district wide status over time of sandal wood were developed (see, for example, the figure overleaf) These temporal maps showed changes in the resource base in specific areas of the forests Project workers then used isozyme analysis to assess polymorphism Samples segregated into 10 distinct groups, suggesting that all the phenotypic provenances collected from different sites belonged to probably 10 genetic provenances Further analysis showed a more structured grouping that will assist in efforts to develop an effective conservation strategy

Sandalwood *(Santalum album)* is an endemic species of South India It is a most important non timber tree species whose heartwood is harvested for its scented oil The oil is widely used in soap and cosmetics and also in certain pharmaceutical preparations



Distribution of sandalwood resources by district in Karnataka State India

Patterns of genetic variation in degraded populations of tropical forest trees

This project aims at estimating genetic erosion in relation to levels of forest disturbance in three commercially valuable species, *Dalbergia oliveri Pterocarpus macrocarpus* and *Xylia kerrii*, in northeastern Thailand Sponsored by IPGRI AFTSC and UNEP the work had the hypothesis that the degree of loss in genetic diversity is related to the number of genotypes remaining in populations The relationship of measurements of diversity, such as number of alleles per locus or effective number of alleles was not related to the disturbance index This indicated that the trend in the loss of genetic variability did not relate directly to the number of individuals remaining in the populations The result also indicated that loss of genetic diversity due to forest disturbance can only be used for indicator species of some forest types It does not hold true for species that normally co exist in a number of forest types unless a subset of various disturbance levels remains in a single large population This information is essential for future study of loss in genetic variability

Pterocarpus macrocarpa in Thailand, at the Asean Forest Tree Centre Muak Lek, Thailand

Chaisusri Kowit

Genetic resource areas as conservation tools

This work investigated the effectiveness of genetic resource areas (GRA) as sites for *in situ* conservation Research centred on locating patterns of genetic variation of *Cotelylobium melanoxylon* in Thung Khai GRA in southern Thailand The level and structure of genetic variation as shown by allozyme genetic markers in *C melanoxylon* were compared with those of three natural populations in Thailand

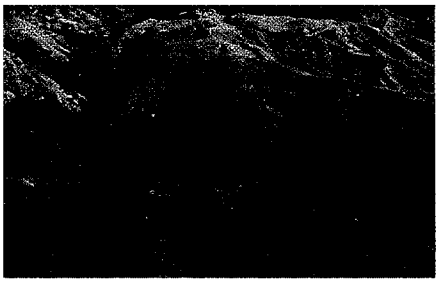
Analysis of isozyme markers revealed that the trees in the GRA harboured far higher levels of genetic variation than those in three other natural populations The study thus indicated that establishing the GRA had been an effective conservation method This work also defined parameters for identifying appropriate population size for *in situ* work and gave insights into the breeding systems of *C melanoxylon* populations It will also allow workers to monitor changes in genetic variability over time in *C melanoxylon* individuals in the GRA

In situ conservation of tropical forest ecosystems

Work on *in situ* conservation focused on the impact of human activities on genetic resources such as deforestation forest fragmentation selective logging of timber extraction of non timber forest products and other disturbances in tropical forests

Human activities in forests tend to divide a once continuous area of trees into individual fragments Work in Costa Rica examined whether this fragmentation had any effect on the flow of genes among isolated populations of selectively logged Royal Mahogany (*Carapa guianensis*) Indicators of

 See pp. 135–136 for Abbreviations



K S Bawa UMB

Deforestation and forest fragmentation in Costa Rica

genetic make up showed greater differentiation among saplings growing in fragmented areas than in adult trees that had developed before fragmentation In some cases the genetic distances were over three times higher than normal This increased divergence is clear evidence that geneflow has been reduced, with implications for the long term diversity of the populations in the area The project is carried out by IPGRI scientists in collaboration with staff of the University of Massachusetts, Boston, USA

Work on the tropical dry forest trees *Pithecellobium saman* and *Enterolobium cyclocarpum* in Central America gave similar results Project staff at the University of Costa Rica found that *P saman* trees in continuous forests produced more seeds than isolated trees The rate of seed abortion was also higher for isolated trees

Human impact on tropical forests

A joint CIFOR/IPGRI/SGRP project investigated how human activities affect the genetic resources of forest plant species Sites were selected in India Malaysia and Thailand to cover as many different types of human activities as possible, while also allowing comparisons to be made across countries In Malaysia the main type of human activity is logging in Thailand as well as timber harvesting the forests are also used for grazing and collecting non timber forest products and in India the main activities are collecting forest products and grazing

In India in general it is the poorer households that rely on collecting non timber forest products which are seasonal with unreliable yields Market forces then encourage unsustainable harvesting This may even be done by the indigenous communities that have traditionally relied on these products for their livelihoods Regeneration of species such as *Phyllanthus emblica* and *Terminalia chebula* is almost completely absent in areas of highly intensive harvesting, and the genetic diversity is consequently severely eroded

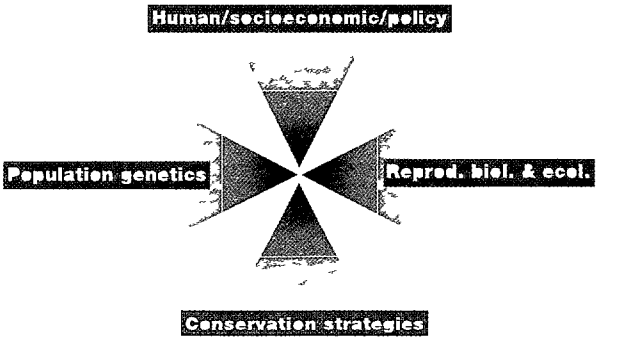
Collecting *Phyllanthus emblica* in the Western Ghats in India

In Malaysia, logging reduced genetic diversity, but not as seriously as expected Similarly, harvesting only high levels of wood for building and fuel in Thailand had a significant effect on diversity The intensity of the impact depended on the reproductive ecology of the species Those species pollinated by weakly flying insects show increased levels of inbreeding as the density of reproductive individuals decreases, while species affected by more strongly flying insects are less affected

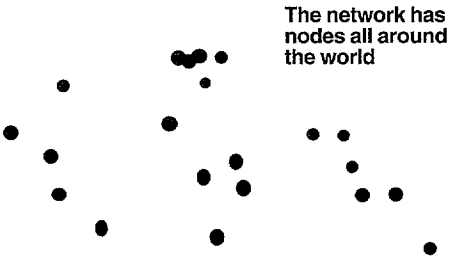
Seeds of recalcitrant and intermediate tropical forest trees

During the year, over 20 institutes established an informal international network to research forest tree seed Together they developed two protocols as standardized procedures for research Project staff then used the protocols to work on priority species, patterns of seed desiccation and storage behaviour for 25 species Work was also done on aspects of seed development (see the table above) Activities in the

Multidisciplinary framework for *in situ* conservation



International network on forest tree seeds



Studies on seed phenology, seed desiccation and storage in tropical forest trees

Species	Family	Partner Institute	Trial/ expt *	Results on desication tolerance and/or storage
Azadirachta indica	Meliaceae	AFTSC Thailand		
		FRIM Myanmar	DT	intermediate seed behaviour
Hopea odorata	Dipterocarpaceae	AFTSC Thailand		
		FRIM Myanmar	DT	recalcitrant seed behaviour best stored at 16°C
Pometia pinnata	Sapindaceae	LIPI Indonesia		
		AFTSC, Thailand	DT ST	recalcitrant seed behaviour best stored at 14 16°C
Vitellaria paradoxa	Sapotaceae	CNSF Burkina Faso		
		RBG Kew UK	DT ST	recalcitrant seed behaviour (not to be stored at low temperature)
Sclerocarya birrea	Anacardinaceae	ICRAF Kenya		
		CNSF Burkina Faso		
		RBG, Kew	ST	intermediate or orthodox (partial results)
Lannea microcarpa	Anacardiaceae	CNSF, Burkina Faso		
		CPRO Netherlands	DT ST	desiccation tolerant
Khaya senagalensis	Meliaceae	CNSF, Burkina Faso	DT ST	desiccation tolerant
Khaya antholeca	Meliaceae	NTSP Tanzania	DT, ST	desiccation tolerant
Syzigium cumini	Myrataceae	NTSP Tanzania		
		Univ Natal S Africa		
		RGB, Kew UK	DT, ST	highly recalcitrant
Warbugia salutaris	Canelaceae	KEFRI Kenya		
		RBG Kew, UK		
		UN SA	DT ST	non recalcitrant seed behaviour best conserved at 16°C
Vochysia guatemalensis	Vochysiaceae	Prosefor CATIE Costa Rica		
		RVAU Denmark	DT ST	very desiccation tolerant

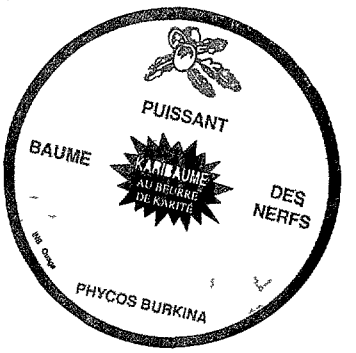
DT desiccation trial ST storage trial

project were carried out in partnership with national programmes within the framework of the IPGRI DFSC project funded by DANIDA

Forest genetic resources network established in Central Asia

In close collaboration with staff of the regional offices for Europe and CWANA, the first consultative meeting of the CAN/PGR Working Group on Forest Trees was organized in Bishkek, Kyrgyz Republic in 1997 (see also p 21 in the CWANA section) The Working Group discussed the basic elements of a national programme and a list of priority species were established for regional collaboration

Juniperus seravsehanica J semiglobosa and *J turkestanica*
Picea schrenkiana (and local populations of other coniferous species from the genera *Picea Abies* and *Pinus)*
Haloxylon aphyllum H persicum and *H ammodendron*
Juglans regia
Pistacia vera Amygdalus spp
Malus sieversii Pyrus communis Prunus spp *Armeniaca vulgaris*
Populus pruinosa P nigra P alba and *P diversifolia*
Acer spp *Fraxinus* spp
Shrubs *Calligonum Tamarix Berberis Rosa Hippophae rhamnoides Salsola richteri* and *S paletzkiana*



A medicinal balm made in Burkina Faso from an extract of Shea butter tree (*Vitellaria paradoxa*)

 See pp. 135-136 for Abbreviations

Bamboo and rattan

The Japanese Government has supported IPGRI s work on bamboo and rattan since it started a num ber of years ago The work has made significant progress, particularly in the areas of locating pat terns of species and genetic variation This work is fundamental to planning conservation and col lecting measures

Genetic resources

Surveys of rattan and bamboo resources of north east India located more than 22 rattan species and gathered details of their occurrence, frequency and infraspecific variations Work in the eastern and western parts of China, Hainan and Taiwan revealed significant patterns of species diversity Surveys of rattan distribution in north, central and south Vietnam pinpointed areas of five economi- cally important rattan species This was followed up by a study that identified superior plants and populations for *in situ* and *ex situ* conservation from those zones The end result will be an eftec tive supply of quality fruits to enrich the planta tion programmes

Genetic variation

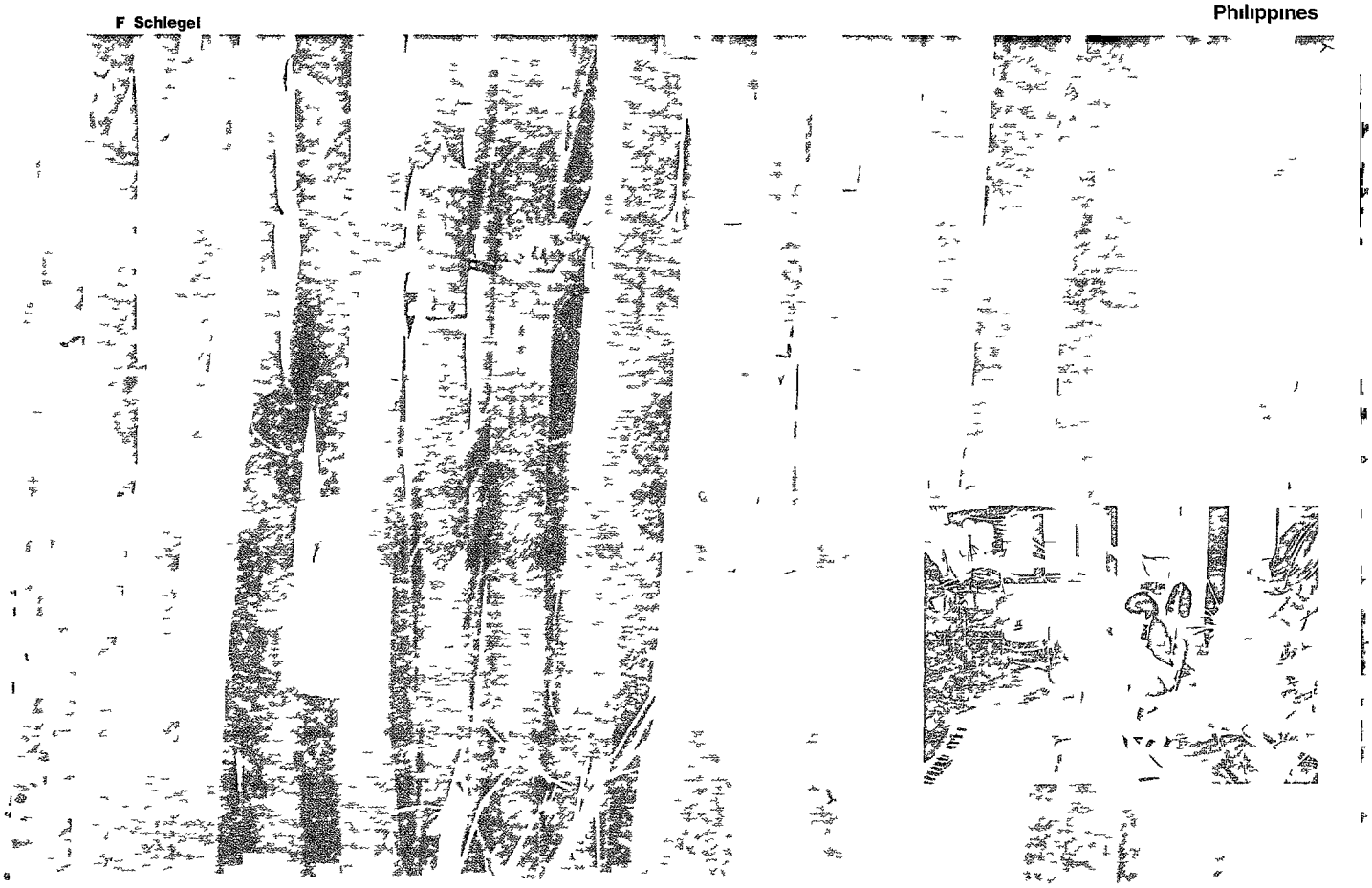
Collaborative work with FRIM in Malaysia as sessed the genetic diversity of *Calamus manan C caesius* and *C palustris* Mature plants and seeds were sampled from four different sites The germination of all three species was generally high except in cases where the seeds were not fully mature Even though more males than females may be present in natural populations, the level of heterozygosity is higher in females than in males This indicates a natural compensating mechanism for the deficit of females to ensure fitness of progenies produced

Disturbance and diversity

The distribution of *Calamus palustris* was surveyed in disturbed and undisturbed areas of southern Thailand Work comparing RAPD and isozyme methods of identifying diversity revealed highly polymorphic isozyme gene loci in this species This meant that isoenzyme analysis alone is suffi cient to evaluate genetic diversity of *C palustris*, al- lowing the researchers to investigate genetic struc ture, differentiation and diversity in greater numbers of populations

A bamboo stand in the Philippines

F Schlegel



Locating and measuring genetic diversity

The difficulty faced by germplasm collectors and prospective *in situ* conservationists is how to locate populations with high and/or useful genetic diversity and sample this diversity efficiently GRST staff made significant progress in applying methods for locating and studying genetic diversity in 1997 particularly through molecular and ethnobotanical approaches

Measuring genetic diversity in coconut

This project adapted novel molecular techniques to explore genetic diversity in coconut (*Cocos nucifera*) The objective was to develop methods for targeting specific populations for conservation based on their diversity and distinctiveness First, standard protocols were developed using a small number of accessions in preparation for a more extensive analysis of diversity in coconut field genebanks and eco-geographically distinct populations AFLP technology could be applied immediately to coconut so efforts focused on developing microsatellite markers A small DNA library containing a high proportion of microsatellite sequences was developed at Long Ashton and 158 clones from this library were then sequenced manually Of these, 93 were suitable for the design of primer sets for amplification of the microsatellite Some 52 primer sets were tested on a limited range of germplasm

The most promising microsatellites were used to test a sample of 50 different coconut clones for their suitability for further testing and development Not all primer sets tested yielded amplification products in the first PCR attempted These were tested further using different conditions Some 11 primer sets gave amplification products on limited sets of coconut germplasm The number of alleles detected ranged from one (i e the microsatellite was monomorphic) to seven among the 20 clones tested All the primer sets were tested and the most polymorphic microsatellites identified to screen the 50 clones

The project was supported by ODA (now known as DFID) UK in collaboration with the Institute of Arable Crops Research Long Ashton UK and COGENT member institutes

 See pp. 135-136 for Abbreviations

Demography, reproductive ecology and genetic diversity in wild lima beans in Costa Rica

This project studies the factors determining the extent and structure of genetic diversity in wild lima beans (*Phaseolus lunatus*) in the Central Valley of Costa Rica Some 400 wild *P lunatus* populations were recorded in open and disturbed areas including coffee plantations within the target area which covers 2100 km of premontane and lower montane humid forests

The project developed allozyme systems to estimate genetic parameters for 29 populations using 24 loci Data from five natural populations and seven polymorphic loci were used to design an optimal sampling strategy for *ex situ* conservation *P lunatus* shows high levels of self fertilization in the study area The results showed that a sampling strategy in which 1 4 seeds are collected from 160 400 plants would recover alleles with frequencies as low as 0 007 Sampling 1 2 seeds from 10 80 plants would recover alleles at frequencies greater than 0 05

Another component of the study is a demographic and phenological investigation of five populations ranging from 500 to over 3000 m^2 and from about 300 to almost 1500 individuals The populations are characterized by demographic instability in disturbed habitats The number of reproductive individuals in a given population fluctuates markedly from year to year Each individual in a population was assigned to one of a series of life stages (e g seed seedling mature flowering) The probability of an individual moving from one life stage to another was then calculated and matrices of these transition probabilites developed for each population These data were used to develop a computer simulation of wild lima bean populations Various population parameters calculated for the simulated populations agreed with observation of actual wild populations

The results from the project were used to develop an *in situ* conservation strategy for *P lunatus* in the Central Valley of Costa Rica GIS were used to identify a number of distinct combinations of environmental conditions where wild Lima bean populations are located Each of these zones was visited with a view to identifying potential *in situ* conservation areas, in particular relatively isolated sites far from the possibility of human interference Some 30 such micro reserves were identified and characterized

Shifting cultivation encroaching on established forest

This BADC supported project is a collaboration between IPGRI, the Faculte Universitaire des Sciences Agronomiques, Gembloux, Belgium and the Escuela de Biologia, Universidad de Costa Rica

Germplasm collecting

The table overleaf summarizes information on collecting missions that IPGRI supported in funds or staff time in 1997 All accessions are conserved in national programme facilities of the country of origin, with duplicates stored at participating institutes

Fruits of the uncommon African locust bean from West Africa

Tony Simons ICRAF

IPGRI-supported collecting missions in 1997

Country	Partners	Material collected		Conservation sites
Guatemala	Plant Exchange Office NPGS ARS USDA FAUSAC	*Arachis hypogea* *Capsicum annuum*	33 6	FAUSAC NPGS Inst Bot Nordeste Argentina ICRISAT CENARGEN Brazil
China Yunnan	KIB CAAS	*Colocasia esculenta*	30	KIB Inst Veg Flowers CAAS
China Liangshan Pref Sichuan		*Fagopyrum* spp	40	Liangshan Pref Sichuan
India West Bengal State	DOR Rajendranagar India	*Carthamus tinctorius*	27	DOR NBPGR
Mauritius	CPCRI India MAFNR Mauritius	*Cocos nucifera*	6	MAFNR Mauritius CPCRI
Madagascar	CPCRI India IRAT Madagascar	*C nucifera*	4	IRAT CPCRI
Seychelles	CPCRI India IRAT Madagascar	**C nucifera*	5	Min Ag Seychelles CPCRI
Sri Lanka	CRI Sri Lanka	**C nucifera*	13	CRI
Vietnam	OPI	*C nucifera*	3	OPI
Malawi	NPGRC Malawi IRRI SPGRC	*Oryza barthii* *O longistaminata* *O punctata*	32 19 3	NPGRC Malawi SPGRC IRRI
Mozambique	NPGRC Mozambique IRRI SPGRC	*O longistaminata* *O punctata* *O sativa* *Leersia hexandra*	14 14 14 5	NPGRC Malawi SPGRC IRRI
Namibia	NBRI IRRI SPGRC	*O longistaminata* *L friessii*	10 2	NBRI SPGRC IRRI
Swaziland	NPGRC Swaziland NBRI SPGRC	*L hexandra*	8	NPGRC Mozambique IRRI SPGRC
Tanzania	NPGRC Tanzania IRRI SPGRC	*O longistaminata* *O barthii* *O punctata* *O echigeri* *Leersia* spp	4 4 7 1 12	NPGRC Tanzania SPGRC IRRI
Zanzibar	Commis Research Min Ag Zanzibar IRRI SPGRC	*O longistaminata* *O punctata* *O echigeri* *O glaberrima* *L hexandra*	8 14 1 5 12	Min Ag Zanzibar IRRI SPGRC
Zambia	NPGRC Zambia IRRI SPGRC	*O longistaminata* *O barthii* *O punctata* *O brachyantha* *Leersia* spp	6 3 7 6 3	NPGRC Zambia IRRI SPGRC
Kenya	GBK IRRI	*L hexandra* *L denudata*	59 3	IRRI GBK
Uganda	NARO IRRI	*O eichigeri* *O longistaminata* *L hexandra*	4 3 8	NARO IRRI

 See pp. 135-136 for Abbreviations

Ex situ conservation technologies and strategies

Ex situ storage technologies

Optimizing seed water content and storage temperature

The results of this global experiment (with the cooperation of NSSL, CAAS and ICRISAT) show that lettuce seeds stored at 35°C and <2% water content aged more rapidly than seeds containing slightly more water This indicates that there is an optimum water content for storage and a potential risk if seeds are dried too much While the data are preliminary, results so far suggest that the optimum water content for storage varies with storage temperature from about 2% for 50°C, 3% for 35°C and 4% for 20°C These water content/temperature combinations correspond to an RH of 15% at the respective storage temperatures The research clearly shows that the RH at which seeds are ***stored*** must be distinguished from the RH at which seeds are ***dried*** To achieve the optimum RH of 15% for storage, seeds must be dried at different relative humidities depending on the intended storage temperature These experiments will allow workers to determine the water content at which seeds achieve their maximum longevity when stored at ambient or sub ambient temperatures This information will be critical for genebanks where refrigeration is not reliable or available

In vitro conservation research

A DFID funded project with NBPGR India aimed at developing cryopreservation techniques for vegetatively propagated and recalcitrant tropical species In 1997 project staff succeeded in freezing vam apices using both vitrification and the encapsulation dehydration techniques By contrast sweet potato proved to be extremely sensitive to sucrose and no survival could be achieved using the encapsulation dehydration technique However a modified vitrification protocol gave very encouraging preliminary results Litchi zygotic embryos could withstand cryopreservation but regrowth of whole plants had not been achieved

Collaborators at the University of Natal Durban South Africa continued screening seeds of non orthodox tropical tree species for resistance to desiccation and cryopreservation Whole seeds and embryonic axes of *Croton sylvaticus* withstood cryopreservation after partial desiccation, as did embryonic axes of *Sclerocarya birrea* In the case of *Trichilia emetica*, successful cryopreservation required cryoprotection of axes before their desiccation and freezing Axes of *Ekebergia capensis* and *Quercus robur* could survive cryopreservation only after moderate dehydration followed by ultra-rapid freezing, achieved by immersion in isopentane held in a liquid nitrogen reservoir Seeds of *Garcinia livingstonia* consist of a hypertrophied, underdeveloped axis, which makes them impossible to cryopreserve Adventitious buds were thus induced from cambial tissues and successfully frozen after partial desiccation

Research at the Changli Pomology Research Institute, Hebei, China, successfully applied various cryopreservation techniques to apple shoot tips sampled on both *in vitro* and *in vivo* material A cryopreserved collection of apple germplasm is progressively being established and experiments on grape cryopreservation started

Vitrification and encapsulation/dehydration

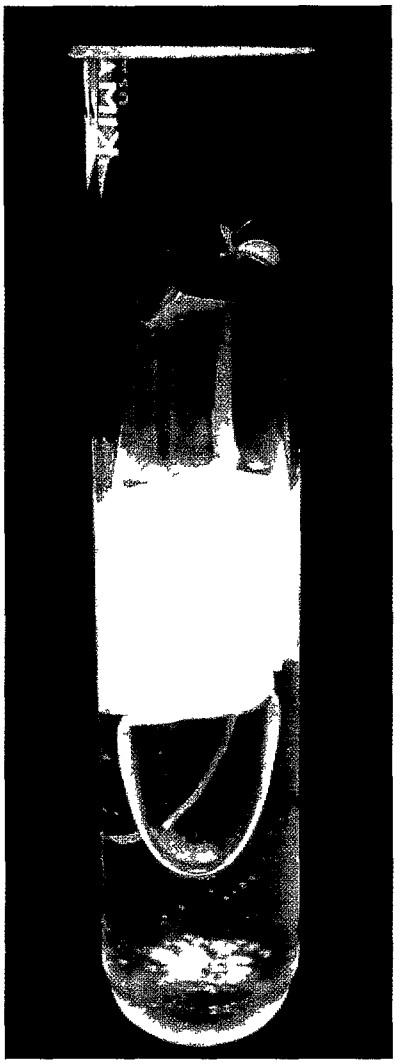
When water freezes it expands There are two aspects to the problem of dehydration in cryopreservation One concern is to remove enough water from the tissues of the sample to avoid damage to the cells caused by ice crystals forming during the freezing process The other side of the problem is to avoid removing too much water which is detrimental to the sample

New approaches seek to remove all free water from the material before freezing The internal solutes will then vitrify upon freezing i e turn directly from liquid into an amorphous phase or glass thus avoiding damaging ice formation In the technique called ***vitrification*** water is removed osmotically by putting the samples into a highly concentrated solution before freezing In the ***encapsulation-dehydration*** process samples are enclosed in a bead of calcium alginate cultivated for several days in liquid medium with high sucrose concentration partially dried in air then frozen in liquid nitrogen The advantage of this new approach is that large samples of differentiated tissue can be cryopreserved

Yongjie Wu Changli Pomology Institute Hebei China

An apple shoot tip healthy and growing 80 days after treatment

Citrus cryopreservation

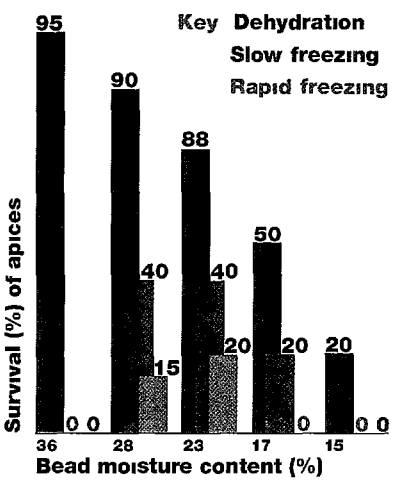


(Above) Somatic embryo developed on an ovule of grapefruit cryopreserved using the encapsulation dehydration technique

(Left) Apex of an adult clementine plant regrowing after cryopreservation

M T Gonzalez Arnao CNIC Cuba and N Duran Vila IVIA Spain

A collaborative project with CNIC IIC (Cuba) and IVIA (Spain) succeeded in freezing apices sampled on *in vitro* plantlets of the rootstock *Poncirus trifoliata* and on adult clementine plants as well as ovules of grapefruit and sour orange using the encapsulation dehydration technique (see Box) In another project with CNIC and UNICA (Cuba), pineapple apices could withstand freezing using the vitrification technique

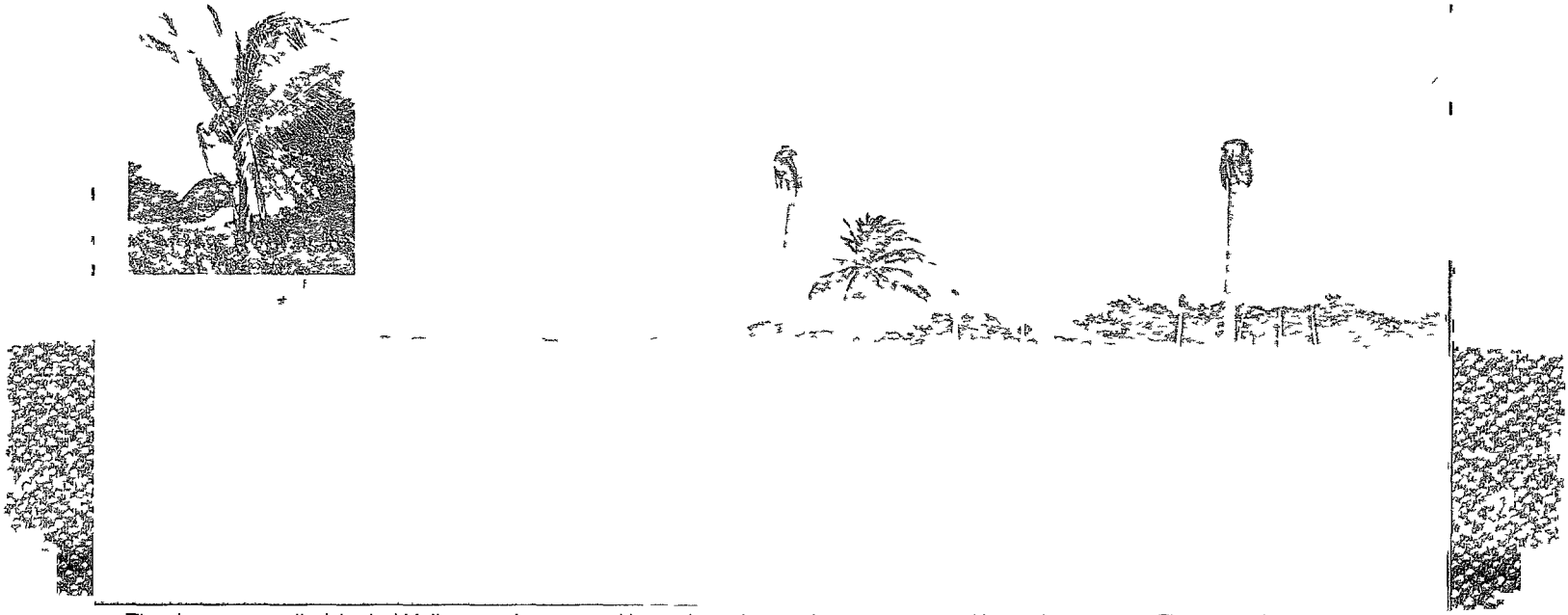


Poncirus trifoliata is an important *Citrus* rootstock The figure here shows the effect of bead moisture content on the survival of apices after dehydration, or slow or rapid freezing Apices were submitted to a progressive increase in sucrose concentration during preculture (0 3M/24h + 0 5M/24h + 0 75M/24h) before dehydration

Germplasm health

The technical guidelines for the safe movement of *Allium* spp germplasm were published as No 18 in the joint FAO/IPGRI series The recommendations section of the guidelines for the safe movement of *Eucalyptus* spp were published in French and Spanish, as this is such an important species economically A meeting funded by ACIAR and organized by IPGRI/COGENT in Kuala Lumpur discussed viroids and viroid like sequences of coconut and decided that there is no evidence that viroid like sequences are pathogenic Therefore they should not be considered of quarantine significance An addendum to the Guidelines was published and distributed to inform the research community Guidelines for pome fruits were developed at a meeting in Bethesda MD USA organized by IPGRI and the USDA ARS National Germplasm Resources Laboratory

GATT brought changes in plant quarantine and its administration Lists of quarantine pests and general prohibition are no longer accepted instead pest risk analysis is conducted on a case by case basis The IPPC Secretariat located within the Plant Protection Service at FAO Rome, established a standard for the conduct of pest risk analysis The underlying principle is that of managed risk meaning that some risk of moving pests with plants and plant material always exists The process of pest risk analysis allows workers to assess the risk and to identify management options These principles are applied to all plant material including germplasm, and changes in plant quarantine decision making may affect the movement of germplasm Pest risk analysis was used for example for the movement of coconut germplasm considering viroid like sequences in general and



The disease is called Lethal Yellowing It is caused by a phytoplasma that is transmitted by a planthopper The inset shows the start of the disease The main photo illustrates the total devastation the disease can cause It occurs in the Caribbean and has destroyed a large number of palms in the Yucatan peninsula of Mexico Late in 1997 the disease was reported for the first time on the Pacific coast of Mexico which caused great concern The disease then spread to Belize so neighbouring countries were very alert to prevent its introduction Similar but not identical phytoplasmas cause similar diseases in East and West Africa The presence of the disease may affect the planned Regional Coconut Field Genebank in Côte d Ivoire

Summary of the steps in pest-risk analysis relevant to the movement of germplasm

Step 1
Identify the potential pests associated with the plant species you want to move and answer the following questions for each of them

(1) Is the pest reported in the country of origin? — **No** → STOP the PRA as no risk is perceived
Yes
(2) Is the pest reported in the receiving country? — **Yes** → STOP the PRA as no risk is perceived
No
(3) Does the pest have a pathway with the commodity? — **No** → STOP the PRA as no risk is perceived
Yes
(4) Is the pest of potential economic importance? — **No** → STOP the PRA as no risk is perceived
Yes
(5) Is there potential for establishment in the PRA area? — **No** → STOP the PRA as no risk is perceived
Yes
(6) Evaluate management options according to perceived risk (low medium high)

Step 2
Implement the appropriate management options to minimize the risk of spreading pests (e g obtain the germplasm from an area free of the pest obtain germplasm from a pathogen tested collection move the material as *in vitro* cultures rather than seed apply therapy measures)

the movement of germplasm to the locations of field genebanks The process is summarized on the left

A pathway is defined as any means that allows the entry or spread of a pest with pest including plants (weeds) animals or pathogenic agents injurious to plants or plant products The process can be explained by example the movement of coconut germplasm from the Philippines to the new coconut field genebank in Indonesia A potential pest of coconut is cadang cadang viroid, which causes the lethal cadang cadang disease The viroid is reported in parts of the Philippines, but not in Indonesia There are reports of transmission by seed and pollen so the pathway is seeds and pollen in addition to plants which is always the case with a systemic pathogen The economic importance of the disease in the Philippines is clear and although a vector for the viroid has not been identified it must be assumed that there is a potential for establishment in countries like Indonesia Cadang cadang viroid is therefore identified as a quarantinable pest in coconut plants, seeds and pollen from the parts of the Philippines where the pathogen occurs A suitable management option would be collecting nuts from indexed plants

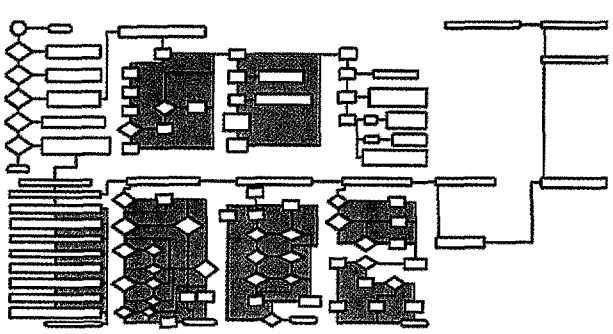
Germplasm management

Seed regeneration

A project on improving methods to regenerate germplasm continued in 1997 with ICGR, China The objective of this project is to develop improved regeneration methods for both self pollinating and outcrossing crop species such as buckwheat, sesame, Jobs tears and Chinese cabbage The work of monitoring the genetic structure and variability in four sample sizes of ten populations each of mungbean (*Vigna radiata* [L] Wilczek), okra (*Abelmoschus esculentus* [L] Moench), and bittergourd (*Momordica charantia* L) over four cycles of regeneration using morphometric and electrophoretic techniques continued at NPGRL, IPB The second cycle of regeneration and characterization (morphometric as well as isozyme) was done during 1996 97 Final analyses at the end of the project will provide guidelines on the minimum acceptable sample sizes required for regeneration

Technical Guidelines to *Regeneration of Accessions in Seed Collections A Decision Guide'* were prepared, published and distributed These will facilitate developing optimal procedures for the regeneration of seed germplasm They also deal with the timely identification of accessions of inadequate quality or quantity of seed The Guide addresses aspects related to the cost effective production of seed of maximum quality and optimum quantity with minimum loss of genetic integrity

Regeneration of accessions in seed collections



A complete outline of the contents of *Regeneration of Accessions in Seed Collections A Decision Guide* was produced as a poster for distribution with the publication

Field genebank research

In 1997, field genebank research started with a focus on the use of botanical seed in genetic conservation of sweet potato

Studies started in collaboration with VISCA the Philippines to reveal the potential limits of production of botanical seeds in sweet potato field genebanks The work will also produce a realistic estimate of the number of seeds needed to conserve allelic richness if a clone is converted to seeds Molecular genetic studies started in UPM to investigate the genetic diversity and genetic distance within and between sweet potato germplasm locally adapted in different subregions of Southeast Asia

Germplasm documentation methodologies and applications

In collaboration with FAO a list of multicrop passport descriptors was developed and released The list provides an initial set of passport descriptors that are consistent and can be used for all crops Several crop networks in Europe immediately used the list as the basis for their Central Crop Databases It was also incorporated into new versions of IPGRI Crop Descriptor lists The list of IPGRI/FAO multicrop passport descriptors can be obtained by contacting any of the IPGRI Offices It is also available for downloading in portable document format from IPGRI s Web site

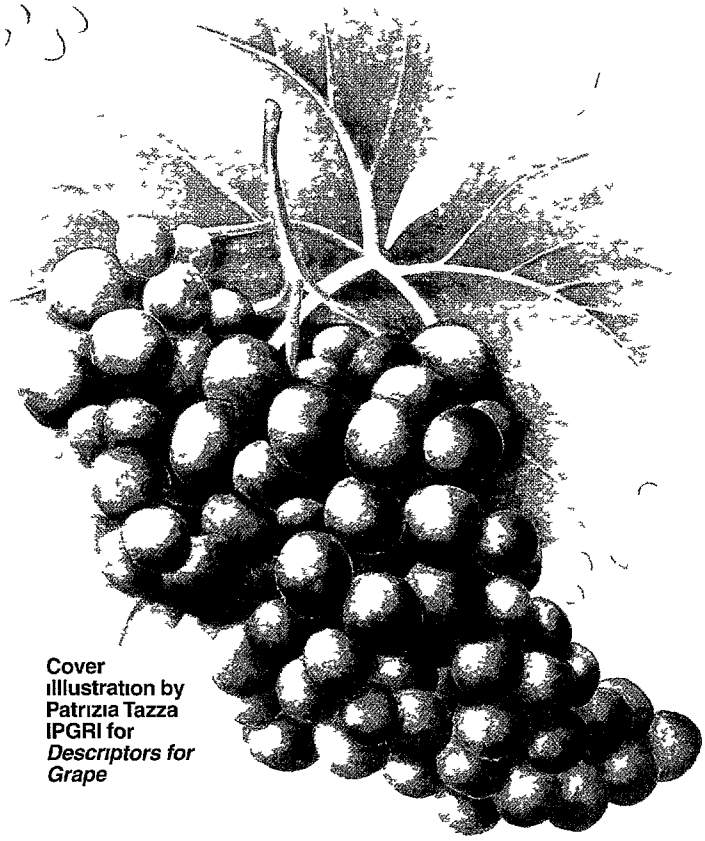
The production of crop descriptor lists exceeded its targets set for 1997, producing four descriptor lists

- *Pistacia*, in collaboration with IPGRI s project on the Conservation and use of neglected and underutilized species
- Grape in collaboration with UPOV/OIV
- Tea
- Yam in collaboration with IITA

All the lists were published in various language editions resulting in a total of 11 separate titles (see pp 76–77 Publications list) Versions of these descriptors are also available for downloading in portable document format from IPGRI s Web site

As one of the ways to assess the national programmes documentation needs the task team actively collaborated with IPGRI s impact assessment project in developing in depth case studies on crop descriptor lists for banana maize and coconut

 See pp. 135-136 for Abbreviations



Cover illustration by Patrizia Tazza IPGRI for *Descriptors for Grape*

These impact studies will provide valuable information on the use of descriptor lists and provide indications on possible areas for improvement

In April 1997, the Genebank Management System software (version 1 2) was finalized and made available to IPGRI Regional Offices for release to partners in national programmes The next (and final) version of GMS (2 0) was currently under development The major emphasis in GMS version 2 0 will be to strengthen the management component and enhance data export facilities

In situ conservation of crop species and their wild relatives

Conservation of local crop cultivars on-farm

In 1997, the global IPGRI project Strengthening the Scientific Basis of *In Situ* Conservation of Agricultural Biodiversity' made significant progress in the planning of this major enterprise A founding meeting in Rome brought together partners from Burkina Faso, Ethiopia, Hungary, Mexico, Morocco, Nepal, Peru, Turkey and Vietnam, technical experts, donors and IPGRI regional and Headquarters staff Papers read at the meeting provided information towards understanding the effects on the genetic diversity of local cultivar populations over time of farmer decision making, agro ecosystem dynamics and plant population structure and breeding systems (see the box below)

The project is expected to generate a matrix of environmental, socioeconomic ethnobotanic, agromorphological and genetic data that can be analyzed to help determine key or limiting factors to changes in genetic diversity over time Information and farmer perceptions will be collected by gender, age and ethnic group in six main areas

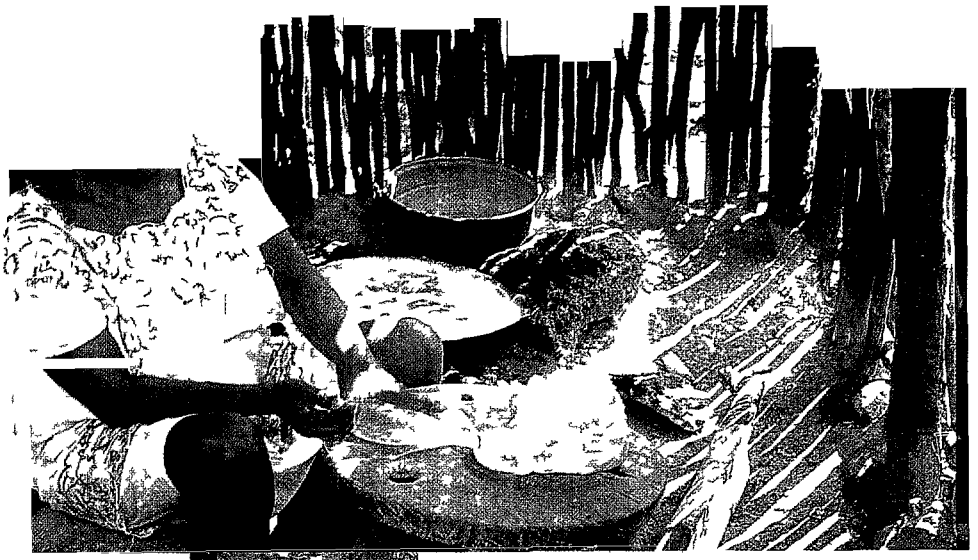
- socioeconomic, cultural and biological influences
- population structure of local cultivars
- farmer selection of agromorphological characters
- environmental selection by agro ecosystems
- seed/germplasm supply systems
- adding value

Regional and global strengthening and country implementation of *in situ* conservation

National partners in Burkina Faso conducted preliminary surveys of research sites Sites were chosen from each of the three main agro ecological zones in Burkina Faso, the centre and centre north, the west and the southeast Crops identified for study included sorghum, cowpea, pearl millet,

Strengthing the scientific basis of *in situ* conservation of agricultural biodiversity - the basic data set

- Farmers knowledge and agricultural sustainability in Ethiopia
- Socioeconomic and cultural influences on farmer decision making in the Yucatan
- Population dynamics and on farm conservation in Burkina Faso
- Agro ecological and environmental influences and genetic diversity in Ethiopia
- Farmer agromorphological character selection and genetic diversity in Burkina Faso
- Varietal and germplasm supply systems in Peru
- Participatory plant breeding in Nepal
- Gender and data collection and analysis on farm
- Formation of multidisciplinary and multi institutional groups in Morocco Burkina Faso and Nepal
- Experiences in data collecting and analysis from other *in situ* conservation from Mexico Vietnam Turkey Hungary the Philippines
- Preliminary data collecting forms and questionnaires for a possible start on assembling a basic data matrix for the global project



Making tortillas in Yucatan Mexico using flour from a corn variety that keeps the tortillas soft

(Left to right) Husking sorghum in Burkina Faso Showing pride in local taro in Nepal Cutting alfalfa in Morocco for animal feed, highlighting the fact that the native varieties exist within a wider agro ecosystem

okra and *Solestonum* Multidisciplinary and multi institutional teams were formed to prepare for research activities, and a letter of agreement between IPGRI and INERA, which is the main co ordinating institution in Burkina Faso, was signed so that work could start

The project site for the Mexico component was located in the Yucatan in a slash and burn agricultural system of Mayan culture Maize, lima bean, squash, and chilli were selected as priority crops for the project These crops still have a broad range of genetic diversity in the Yucatan, which is now threatened by increased production costs, technological change, decrease in labour and a reduction in length of the traditional fallow period

In Morocco, three agro ecological zones were selected in the high Atlas, the oasis area, and in the mountains Priority crops were agreed as barley, durum wheat, faba bean, alfalfa and bread wheat

In Nepal, the Nepalese Agricultural Research Council assisted in selecting three physiographic regions representing high, middle and low altitude crop-production ecosystems The project will focus on major crops including rice, finger millet, indigenous vegetables, and a series of minor crops such as buckwheat, foxtail millet, blackgram, horsegram, niger and sesame However the final selection of crops will be done with the farmers

In Vietnam identification of agro ecological regions began with initial site surveys in the Red river delta Central and South Vietnam A number of crops were proposed including mungbean soyabean rice and taro Multidisciplinary teams were formed for project implementation these include staff from institutes in both north and south Vietnam Proposed sites for the global *in situ* project in Hungary were visited by trainees from Eastern Europe attending the 1997 Darwin Initiative funded *in situ* conservation training course in Szarvas

Preliminary work began in Ethiopia Hungary Turkey and Peru including site consideration team development and target crop identification

Linking conservation and use

Plant genetic resources are conserved so that they can be used This utilitarian perspective is fundamental to IPGRI's work on conserving plant genetic resources In 1997, IPGRI began a project with the objective of maximizing the effective utilization of plant genetic resources The project includes work on implementing complementary conservation strategies, determining current patterns of use, maintaining diversity through use (particularly for neglected and underutilized crop species) and, methods that can be employed to improve the use of *ex situ* conserved germplasm It also includes a substantial new programme of work on cocoa genetic resources

Complementary conservation strategies

The most effective conservation strategy for a crop and its wild relatives involves *ex situ* (seed *in vitro*, DNA storage and cryopreservation) and *in situ* methods combined in complementary ways GRST staff organized a workshop on this area that developed a strategy for conservation technologies and complementary conservation, identified focal points on conservation methodologies and strategies in the regions and agreed on key areas for future work

 See pp. 135–136 for Abbreviations

Identifying patterns of use

There is an increasing concern to quantify the use of plant genetic resources and identify their impact The contribution that plant genetic resources make in a wide range of agricultural research activities is likely to be substantial but has not been quantified in any way Use in research includes their introduction and testing in cropping systems, detecting new useful characters and incorporating them in new varieties, genetic studies and studies of crop response to pathogens, pests and environmental stresses

A preliminary survey of some key crop genetics and crop improvement journals was carried out to determine the percentage of papers published in 1996 that reported on work involving the use of plant genetic resources in research For this survey plant genetic resources were defined as material originating from genebanks or from germplasm collecting and described as such in the papers surveyed The results showed that it was possible to obtain information on plant genetic resources use from such a survey and that 17 30% of the papers in four journals surveyed (*Euphytica Theoretical and Applied Genetics, Crop Science* and *Plant Breeding*) involved the use of these types of plant genetic resources

Neglected and underutilized species

Neglected and underutilized crop species tend to receive little attention from those concerned with either *ex situ* or *in situ* conservation IPGRI brought its work in this area together which culminated in the production of a series of monographs on neglected and underutilized crop species This project began in 1993 with financial support from BMZ/GTZ, Germany, and by the end of 1997 had published 21 titles

Underutilized and neglected crops

1	Physic nut	1996
2	Yam bean	1996
3	Coriander	1996
4	Hulled wheats	1996
5	Niger	1996
6	Pili nut	1996
7	Safflower	1996
8	Chayote	1996
9	Bambara groundnut	1997
10	Breadfruit	1997
11	Cat s whiskers	1997
12	Tef	1997
13	Sago palm	1997
14	Oregano	1997
15	Black nightshades	1997
16	Trad African vegetables	1997
17	Carob tree	1997
18	Grass pea	1997
19	Buckwheat	1997
20	Peach palm	1997
21	Andean roots and tubers	1997

Peach palm

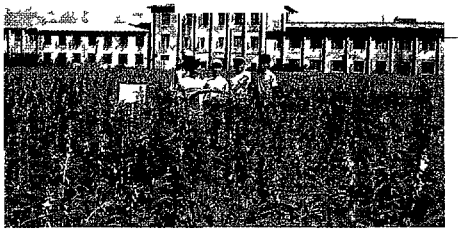
Sesame core collections

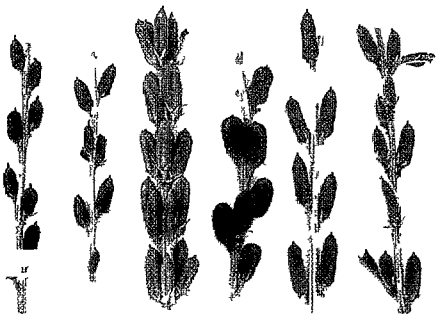
Core collections are limited sets of accessions of a crop drawn from a larger genebank collection (or from the collections of a number of genebanks) which include the maximum genetic diversity available in the whole collection As recognized in the Global Plan of Action, core collections are an effective way of improving the accessibility of genebank collections for plant breeders and other users

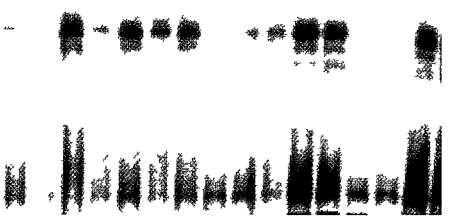
During 1997 a collaborative project to develop a sesame core collection with the Oil Crops Institute, Wuhan, China was completed and a project with NBPGR, India to develop an Indian core collection for sesame continued These projects provide a way of testing the procedures that can be used most effectively by national programmes in developing countries to establish such collections as well as providing such collections for potential users Both partners have very substantial collections of over 4000 accessions which represent a significant proportion of the global holdings of the crop

In China the variation in the preselected core of 884 was further analyzed and a set of some 400 accessions designated as the core collection (see also Annual Report, 1996) An ecogeographic stratification procedure combined with multivariate

Part of the sesame collection stored over calcium carbonate, at the Oil Crops Institute Wuhan, China







(Above) Evaluating sesame in China (Centre) variability in sesame capsule characteristics (Below) the extensive variation in the sesame accessions is revealed by isozyme gels

analysis of morpho agronomic characters appears to provide a core with good coverage of the total diversity of useful characters Isozyme variation was also tested on a few accessions to determine the extent of variation for esterase, peroxidase, amylase and other key enzymes Little variation was detected and isozyme variation probably will not be useful for establishing the core or validating the selections made

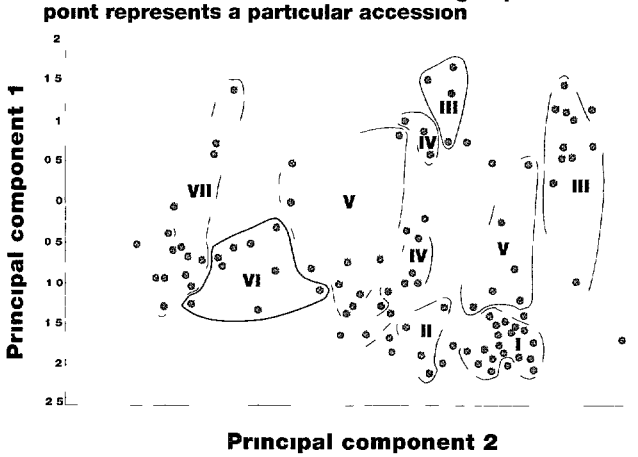
Interestingly, in India a simple ecogeographic classification did not appear entirely appropriate for developing the core collection Data were analyzed for 19 distinct morpho agronomic characters on over 3000 accessions from 7 ecogeographic production areas After testing a number of different procedures on a sample set of 100 accessions, 20 groups were identified using a combination of morpho agronomic and passport data The entire set of tested accessions was then assigned to the 20 groups Various procedures for selecting core accessions from each of the 20 groups were tested Logarithmic weighted diversity allocation with weights proportional to the diversity within the group was found to be the most efficient sampling strategy and 344 accessions were selected for the core collection through stratified random sampling without replacement

Locating useful accessions in large collections

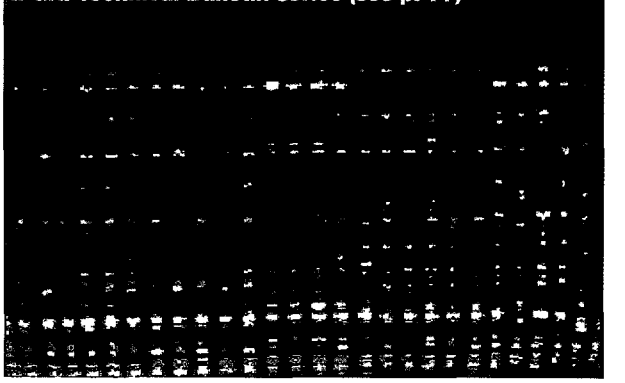
Identifying an accession that has characteristics useful to plant breeders or other users in large *ex situ* collections presents genebank managers with a substantial problem Molecular methods will prove useful for some aspects of this process particularly when the DNA sequences associated with specific characters are known There are a number of molecular techniques that can be used to assess diversity During 1997 IPGRI published a Technical Bulletin dealing with the uses of these techniques The Bulletin aims to help users to identify techniques most appropriate for the specific problems they face (see pp 76–77, Publications list)

It is clear that molecular techniques can be useful for plant genetic resources management However, there have been doubts that the techniques can be used in a practical way on *ex situ* collections where large numbers of accessions are involved During the year, GRST staff collaborated in starting a project to demonstrate how molecular techniques could be used in genebanks The CGN lettuce collection of 2000 accessions will be entirely characterized using a variety of molecular methods including AFLPs and SSRs The ways in which these techniques support regeneration, duplication studies, detection of useful genes and genetic diversity studies will then become apparent Collaborators include (with funding from the European Union (DGXII)) IPGRI, CGN, CPRO DLO, Netherlands, Botanisk Institut Denmark, Keygene, Netherlands, IARC LARS, UK, Perkin Elmer, Netherlands

Principal component analysis allowed the Indian material to be associated into a series of clear groups Each orange point represents a particular accession



DNA sequencing is one of the molecular methods that can be used to identify useful characteristics in large *ex situ* collections of germplasm. Illustration from IPGRI Technical Bulletin series (see p. 77)



 See pp. 135-136 for Abbreviations

Conservation and use of cocoa genetic resources

After a year of intensive consultations with the 13 partners in the project Cocoa Germplasm Utilization and Conservation a Global Approach (for details see the section on cocoa on p 58 of the 1996 IPGRI Annual Report) the project agreement was formally signed by CFC, ICCO and IPGRI on 9 December 1997 Through visits and interactions with cocoa breeders and pathologists in Brazil, Ecuador, Venezuela, Trinidad and Tobago, Cameroon, Nigeria, Ghana, Ivory Coast, UK and France detailed workplans and budgets were developed and scientific advice was given on ongoing and future breeding and conservation efforts In several countries initial activities had already started and ongoing national research activities were suggested to become part of the project In all instances significant counterpart contributions could be secured and critically important co financing, largely from the private sector, was obtained It is anticipated that the project will become effective early 1998 when a technical planning workshop is scheduled to establish standardized working procedures with all partners

Human and policy aspects of conservation and use

Ethnobotany and genetic diversity

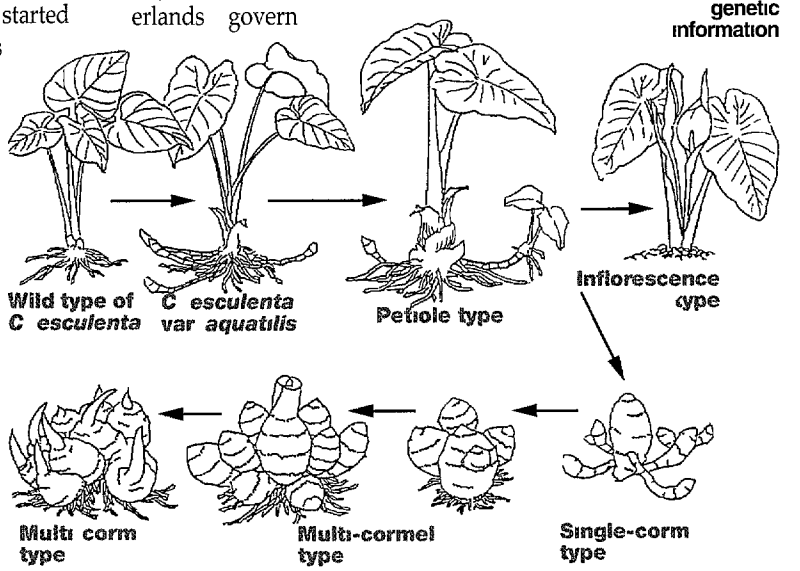
During the year, field research on how people shape, use and conserve genetic diversity continued, in collaboration with national programmes in Africa Asia and Latin America The focus was on plants that are important to national food security and to the nutrition and incomes of the rural poor

Ethnobotanists from the Kunming Institute of Ethnobotany went to the field with geneticists and biotechnologists from the Institutes of Biotechnology, and of Flower and Vegetables of the Chinese Academy of Agricultural Science in Beijing Accompanied by IPGRI staff, the team visited farmers in central Yunnan to learn more about the evolution and diversity of taro that the farmers use and maintain Molecular and isozyme studies of the major taro morphotypes identified by farmers confirmed that they contain significant genetic diversity By combining the farmers' knowledge with the genetic information, the team identified taro cultivars at risk of genetic erosion The team was also able to confirm the role of communities, cultural diversity and multiple uses in maintaining taro diversity The end result will be a conservation and use strategy for taro in China, the world's largest producer

African leafy vegetables

Scientists and community organizations in Senegal, Cameroon, Kenya, Zimbabwe and Botswana continued their work on African leafy vegetable species with the support of the Netherlands govern

Evaluation tree of taro (*Colocasia*) developed by combining farmers knowledge with genetic information

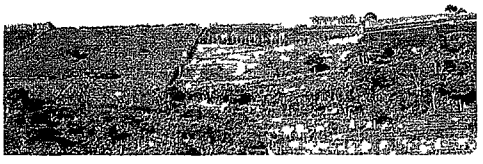


ment At a workshop organized by NRI, project staff defined priorities and development potential of the more important and widespread of the African leafy vegetable species

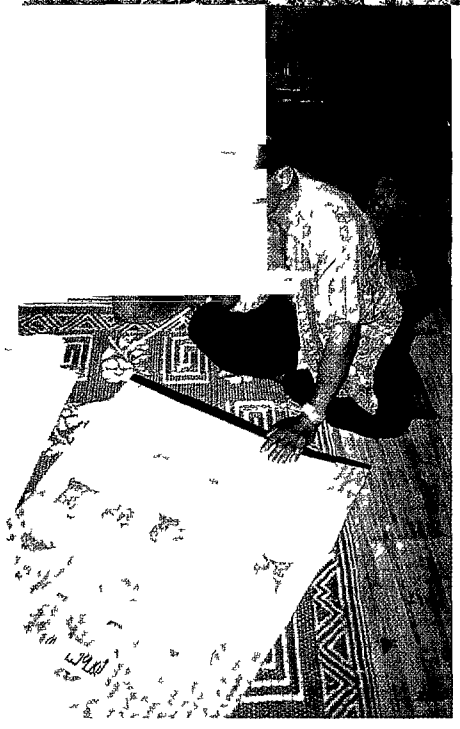
- African spinach (*Amaranthus*)
- Sorrel / roselle (*Hibiscus sabdariffa*)
- Black nightshade (*Solanum nigrum*)
- Bitter leaf (*Vernonia amygdalina*)
- Cowpea leaves (*Vigna unguiculata*)
- African kale (*Brassica carinata*)
- Spider flower (*Cleome gynandra*)

Field studies document the range of diversity, and the distribution and uses of these species This will contribute to the priorities and development plans to raise incomes and improve nutrition of the rural poor and urban migrants by making greater use of this indigenous diversity

Human and policy aspects of the conservation and use of plant genetic resources
1 A researcher inspecting a harvest of Andean tubers with a farmer in Cochabamba Bolivia Selecting seed tubers for next year s crop is a crucial time for sustaining productivity and maintaining diversity



2 An intensively cultivated site in Venezuela represents for the project a site heavily influenced by human and natural factors Microenvironments like home gardens in such landscapes may shelter particular species or highly diverse populations



3 Classifying crop varieties with members of a farming community in a village in northern Thailand

and knowledge The priority leafy vegetable species are primarily grown and sold by women farmers Research confirmed that the constraints to their use and competitiveness with other species are often in the seed supply and processing systems The focus on gender factors at the outset of the study proved very effective in obtaining a more complete understanding of diversity within the priority species and their uses Women producers and traders have valuable knowledge and their continued participation in future stages of this work should result in a conservation through use strategy that is gender sensitive

Home gardens in Vietnam

Ethnobotanists from IPGRI s regional office for APO completed a pilot survey of plant genetic resources in Vietnamese home gardens Researchers from the University of Agriculture and Forestry in Thuduc, Cantho University and the Vietnamese Agricultural Sciences Institute collaborated in the study with support from the Swiss Development Corporation One hundred home gardens were surveyed in six sites covering three ecosystems the Annam Highlands the upland plains and Mekong Delta or flood plain In total 646 species were grown and used in the gardens These were further classified by uses ranging from food medicine ornamental, spices and aromatic to environmental The number of species per home garden ranged from 86 to 42 and the researchers were able to identify the most widely distributed and economically important species From these a set of key species was selected, which represent the structure and function of home gardens, from root crops to tall multipurpose trees

Project staff assessed the significance of key species One element which was quite striking was the importance of these species to household income In some sites over half the annual household income came from home garden crops Economic factors also determine composition and diversity in home gardens One implication of this work is that home gardens may be a means of introducing new diversity into agro ecosystems provided they add to household income There were few factors within the household that could be identified as promoting continuing maintenance of diversity However cultural difference

between communities was important in identifying diversity in varieties and species

Intellectual property rights

The legal and policy aspects of plant genetic resources received increasing world attention in 1997 IPGRI addressed the primary issue of an appropriate legal system to cover property rights in plant genetic resources GRST staff coordinated the production of a paper (Issues Paper No 6 see p 77 Publications list) describing the issues, the TRIPs requirements and possible elements of a *sui generis* (unique) system of intellectual property rights to protect plant material Discussions also began on a system to provide guidance to national governments in constructing their own tailor made *sui generis* legislation

Relaunch of the Crucible Group

A *sui generis* system of intellectual property rights is only one part of the policy environment Many different groups and organizations at the international level have their own objectives Various genetic resource related policies also conflict In addition, many of the obligations that member states have as a result of membership in these fora are still being negotiated The confusion regarding the relationship between the various genetic resource related policies being developed hampers law-based initiatives to lend coherence to the implementation of multiple objectives IPGRI began work with IDRC to relaunch the Crucible Group which worked to assist countries in understanding the nature, relationship and consequences of the obligations arising from their membership in various fora Plans include a conference to contribute to the debate concerning the legal regulation of genetic resources by distilling discreet policy options out of continuing developments and conflicting opinions Work began to analyze developments in the control and management of genetic resources since the publication of the Crucible sponsored People Plants and Patents

Economic value

Sharing the benefits of plant genetic resources will depend on knowing what those benefits are and what they are worth Economic models may seem esoteric to those carrying out the daily tasks of conservation, but determining the value and benefits of the resources is a difficult problem GRST commissioned economists in Cambridge University and University College London, UK to test models that can give an economic value to crop genetic resources, depending on how and where they are maintained and used One method was finalized for testing in the case of *in situ* conservation Other methods considered the market values of genetic resources in use and under conservation

Indigenous knowledge and traditional resource rights

Indigenous knowledge on plant genetic resources is essential to our understanding of useful diversity As a way of motivating researchers to solicit and value local farmer knowledge of crop genetic resources, IPGRI staff worked with agricultural research institutes in Yunnan Province in China to test the concept of an Indigenous Knowledge Journal This could provide a mechanism into which scientists and farmers place their respective knowledge in a common resource on an equal footing Multimedia methods, including visual, graphic, audio, and written communication, are included in the journal Trials began in Malaysia, and the initial impression was that the work began to forge a closer partnership between researchers and farm communities

Participatory approaches and gender issues

IPGRI and FAO produced the first in the series of Gender and Genetic Resources Management These documents are building a fund of practical knowledge and experience on this topic This joint series is a key means to generate and disseminate knowledge to bring gender perspectives further into the mainstream of agrobiodiversity conservation and use

 See pp. 135–136 for Abbreviations

Documentation, Information and Training

Introduction

Two important activities that cut across the wide responsibilities of the DIT Group during the year were the evolution of the IPGRI Web site, and collaboration with other IPGRI Groups to build on the institute wide Information Meeting held in 1996 (see Annual Report 1996, p 66) Through the Web Management Team, the DIT Group is responsible for coordinating IPGRI's web site, which provides access to information on IPGRI and its three programmes The site also includes the institutional strategy, a home page' for each Group and information such as training materials, publications and bibliographic resources

DIT staff visited the CWANA office to assist in examining regional information needs and opportunities The meeting provided valuable experience as the first in a rolling programme to tailor the IPGRI Information Strategy to each region

As in past years IPGRI s publications received peer recognition through the Agricultural Communicators in Education Awards In the 1997 Awards, gold medals were awarded to a five poster series created for the International Technical Conference on Plant Genetic Resources, the 1996 IPGRI Season s Greetings Card and the 1997 IPGRI Calendar the 1996 Annual Report was highly commended

Germplasm documentation

Genetic resources information services

IPGRI maintains a number of databases to support the information services that the Institute provides to the international community During the year new and updated information was included in the databases and about 100 enquiries from partners were answered To improve access to these databases, IPGRI is developing an interface that will allow direct querying via the Internet

Information on IPGRI s germplasm collecting missions was submitted to the central SINGER databases which contain basic data on all collections held by CGIAR Centres These databases have been made available by SGRP via the Internet and on CD ROM

Germplasm documentation training

In April 1997 a new version of the Genebank Management System (GMS version 1 2) was released This software, which is available free from IPGRI, is often used as a hands-on training tool in germplasm documentation courses It can also be customized to a high degree, allowing it to be used as an entry level documentation system for genebanks Work on developing GMS version 2 0 focused on improving the germplasm management module and enhancing facilities to export the data to other platforms

Standards for germplasm documentation

In 1997 descriptor lists for grapevine (in collaboration with UPOV and OIV), yam (in collaboration with IITA) and tea were produced in English, French and Spanish With IPGRI's programme on Underutilized Mediterranean Species, a list for pistachio was produced in English and French All of these descriptor lists are available for downloading in portable document format from IPGRI's Web site

During the year the final version of the list of multicrop passport descriptors (see Annual Report 1996, p 67) was released This list developed jointly with FAO, provides consistent coding schemes for a number of passport descriptors that can be used for all crops At the same time it highlights a number of additional descriptors that are used in FAO s World Information and Early Warning System on Plant Genetic Resources The multicrop passport descriptors* have already been adopted by a number of European Crop Networks as the basis for developing their central crop databases

An agreement was reached with ISO allowing IPGRI to distribute the 3 letter country codes (ISO 3166) in printed and non-revisable electronic form, to partners for use in genetic resources information systems The agreement will allow IPGRI to actively promote the use of this essential standard in germplasm documentation**

*The multicrop passport descriptor list can be obtained from any of IPGRI s offices and is also available for downloading in portable document format from IPGRI s Web site

**The most up to date list can be obtained from the Germplasm Documentation Officer at IPGRI Headquarters or through any of IPGRI s offices

The illustration of a tea flower, that was used on the cover of IPGRI s trilingual *Descriptors for Tea* which appeared in 1997

Patrizia Tazza IPGRI

 See pp. 135–136 for Abbreviations

Library and Information Services

IPGRI programme staff continued to make heavy demands on the IPGRI Library and Information Services One indicator of the level of service provided is the number of document requests These maintained levels similar to previous years, in 1997, 1049 document requests from inside and outside IPGRI were satisfied As well as providing regular library services, LIS staff were also heavily involved in other DIT project activities such as managing IPGRI's Web site and supporting information activities of the regional offices

Eight editions of the Library Bulletin were produced during the year This current awareness tool contains information on new books, reports and journal articles and is delivered to staff via the Intranet or email The same production process produces Web pages for the external audience

Assistance to the plant genetic resources community

IPGRI continued to sponsor subscriptions for national programme libraries to *Plant Genetic Resources Abstracts*, a quarterly abstracts journal that has been produced in collaboration with CAB International since 1992

IPGRI is a member of AGRIS, the International Information System for the Agricultural Sciences and Technology In 1997, LIS submitted 97 records for input into the AGRIS databases An LIS area containing information on IPGRI reports and on references to current literature can be found on IPGRI's Web site

Editorial and Publications

In 1997, the three Programmes of IPGRI produced almost 150 publications (see pp 76–77) Feedback received during the year showed that the Institute's publications continued to have a significant impact within the genetic resources community Almost all the 1997 titles were published in English Several were also published in Arabic, Chinese, French and Spanish, reflecting the increasing importance that IPGRI places on producing material in languages other than English The CWANA Regional Office also published the proceedings of several workshops in Arabic only Partners themselves translated some IPGRI material into other languages For example, the FAO/IPGRI *Genebank Standards* were translated into Hungarian and published by the National Programme because of local demand

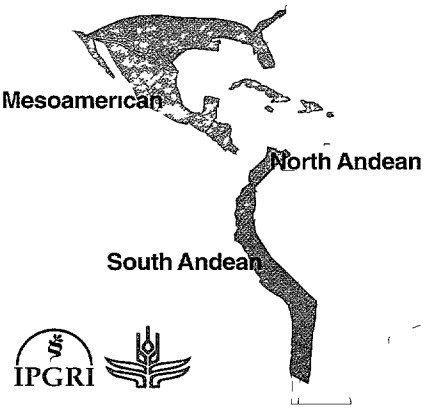
Editorial and Publications Unit

The Editorial and Publications Unit, based in Rome, produced more than 100 individual items in 1997, such as publications, posters, reports, leaflets and displays Of these, 72 were substantial publications, derived from the increasing output of IPGRI's project activities Using a comprehensively revised mailing list, the Unit distributed almost 130 000 copies of new publications and over 7000 copies of previously published titles The number of requests for publications generated through IPGRI s Web site increased steadily from the start of the year to the end, indicating an increasing awareness of the electronic service

Biodiversity in Trust

In 1997 EPU staff supervised for CGIAR and SGRP the production of the book *Biodiversity in Trust conservation and use of plant genetic resources in CGIAR centres** Contributed by CGIAR centre staff each chapter describes the status of the key CGIAR collections of genetic resources forming an invaluable reference source for all those concerned with monitoring maintaining and utilizing the biodiversity of the staple crop species of the world

The map on the right (from Chapter 11 *Phaseolus* Bean R Hidalgo and S Beebe) shows the geographical distribution of *Phaseolus* in its three primary centres of diversity *Phaseolus* beans are a cheap source of high value dietary protein in developing countries



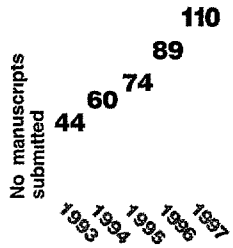
Biodiversity in Trust (1997) edited by D Fuccillo L Sears and P Stapleton Cambridge University Press UK ISBN 0 521 59365-4

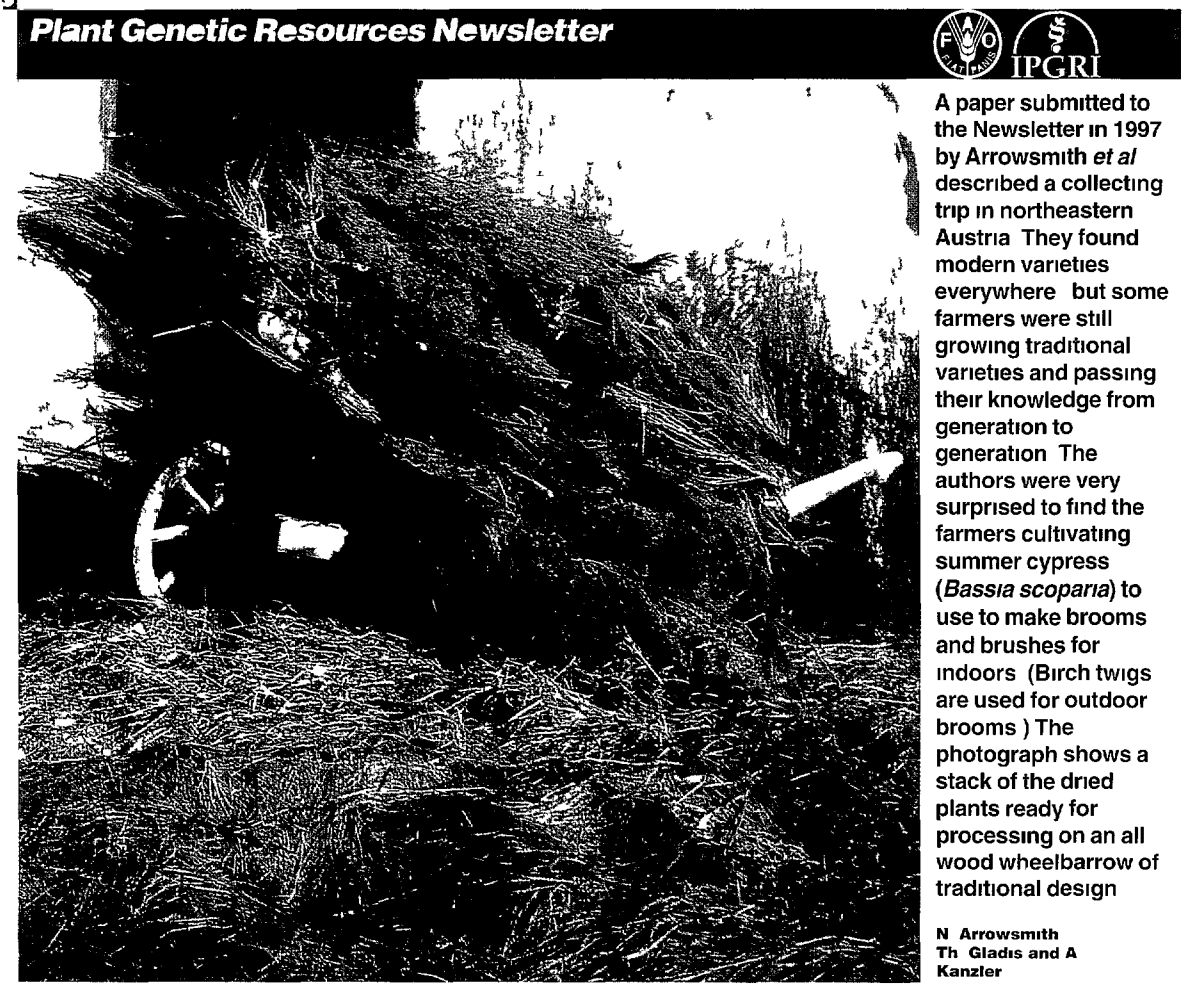
The continued high level of output provoked discussion within the Institute on alternatives to conventional dissemination A simple procedure for converting publications to make them available on the Web was developed to apply to all titles Software was evaluated for intensive EPU application to develop and produce elements of Web pages, particularly text-heavy documents, graphics and tabular material For the first time, immediately on formal publication, an electronic version of the Annual Report was made available via the IPGRI Web pages A process of 'back publication also began, with the Descriptors for Banana, Coffee and Tomato appearing in downloadable form on the Internet Sections of the *1996 Annual Report* and the Descriptors were among the most frequently downloaded files from IPGRI's Web site These innovations will eventually reduce the number of paper copies that have to be printed

By the end of the year, work was finished in developing a policy and intellectual property section in the Web pages of GRST This widened the audience and increased the accessibility of an important publication

Plant Genetic Resources Newsletter

A joint FAO/IPGRI production, the Newsletter continued to attract good quality material of broad interest, which is distributed to a wide audience throughout the world It continued to publish peer reviewed reports of collecting missions, conservation activities and studies on the characterization and evaluation of plant genetic resources of direct relevance to workers in the field Reflecting trends in the area, 1997 issues of the Newsletter extended coverage to include





A paper submitted to the Newsletter in 1997 by Arrowsmith *et al* described a collecting trip in northeastern Austria They found modern varieties everywhere but some farmers were still growing traditional varieties and passing their knowledge from generation to generation The authors were very surprised to find the farmers cultivating summer cypress (*Bassia scoparia*) to use to make brooms and brushes for indoors (Birch twigs are used for outdoor brooms) The photograph shows a stack of the dried plants ready for processing on an all wood wheelbarrow of traditional design

N Arrowsmith Th Gladis and A Kanzler

 See pp. 135–136 for Abbreviations

papers on ethnobotany, *in situ* conservation and legal and policy subjects It also encouraged publication of more substantial research work, particularly review articles of recent developments These are especially useful to developing country readers, who might not have good access to the world literature

Collaboration and capacity-building

Publications staff visited INIBAP, the APO offices in Malaysia and China, and the CWANA Regional Office to train regional staff to assist them to produce publications themselves This resulted in an increase in the skills and efficiency of regional staff and a steady growth in the quality and number of regional titles

Training

IPGRI continued a dual approach to training during 1997, combining individual training opportunities, short courses and workshops to help meet immediate needs, with training capacity building and training materials development to help meet longer-term needs Reformulating IPGRI's project portfolio linked training activities more closely with wider efforts to build capacity within national programmes

Individual training

IPGRI's Italian funded Individual Training Scheme entered its fifth year, with five developing country scientists training in Italian institutions Mr Mohammad Shatnawi from Jordan completed a Research Fellowship on cryopreservation of plant genetic resources at the Fruit Tree Research Station, Ciampino, Rome He successfully applied encapsulation dehydration and vitrification methods to callus and cell suspension cultures in almond apple and kiwi His training will strengthen the germplasm programme at the Jordan University of Science and Technology Mr Zhu Shen Long from China completed a Research Fellowship at the University of Naples on using molecular markers He found that the frequency of polymorphism in *Glycine soya* (wild sovabean) is higher than in *G max* He also examined genetic variation among different clones of the apple variety Annurca and identified markers for resistance to rice blast (*Pyricularia grisea*) Ms Khouildi Sondos from Tunisia began a Research Fellowship to study genetic studies in caper (*Capparis spinosa*) at the University of Tuscia, Viterbo

During 1997, Special Skills Trainee, Ms Myint Than Tay from Myanmar, completed her training on germplasm collecting, characterization and evaluation at the Germplasm Institute, Bari A second Special Skills Trainee, Ms Tiblez Zeccarias from Ethiopia, began studies in Bari on conserving and evaluating plant genetic resources Other individual training activities took place in various regional locations as detailed in the respective Regional Group reports and on p 70

Vavilov-Frankel Fellowships

One of the two 1996 Fellows, Dr Sneh Lata of India, completed a comparative study in India and Nepal on the diversity, ethnobotany and conservation of *Grewia optiva*, a multipurpose tree The

***Grewia optiva*, a multipurpose crop of India and Nepal that was studied by Dr Sneh Lata, one of the 1996 Vavilov Frankel Fellows Clockwise cattle eating the leaves woman with flexible branches used for basket weaving man spinning fibre**

All photos by Sneh Lata

Training Summary - 1997

In general applications to IPGRI for training support are considered in the first instance by IPGRI s Regional Groups please refer to contact addresses on back page of this report

Vavilov-Frankel Fellowships

Year	Home country	Subject	Training location
1996	Cameroon	compatibility of goverment policy and indigenous culture in forest management	Netherlands
1996	India	diversity ethnobotany and conservation of *Grewia optiva*	India/Nepal
1997	China	AFLP study of large naked oat for *in situ* conservation	USA
1997	Russia	genetic diversity and ecological aspects in *Dactylis glomerata*	USA
1997	Yugoslavia (F R)	evaluation and utilization of vineyard peach populations of former Yugoslavia	UK

Individual Training

Home country	Subject	Training location
Benin	conservation and use of plant genetic resources	UK
China	molecular markers of germplasm evaluation	Italy
Cuba	cryopreservation of citrus germplasm	Spain
Cuba	cryopreservation of pineapple	Cuba
Ecuador	development of empirical model for genetic diversity of peanut landraces in Ecuador	Colombia
Ethiopia	preservation and evaluation of plant genetic resources	Italy
Germany	cost assessment of germplasm conservation	Germany/Kenya
Germany	cost assessment of germplasm conservation	Germany/Ethiopia
Germany	legal issues of plant genetic resources	IPGRI Rome
Germany	tree seed pathology	Germany
Germany	cost assessment of germplasm conservation	Germany/Peru
Guatemala	develop empirical model for genetic diversity of peanut landraces in Guatemala	Colombia
Jordan	cryopreservation of plant genetic resources	Italy
Kenya	conservation of *Trichilia dregeana*	South Africa
Kenya	seed technology	Kenya
Kenya	ethnoeconomic botany	South Africa
Lebanon	genetic diversity of almonds in Lebanon	Lebanon/Syria
Lebanon	genetic diversity of wild pistachio in Lebanon	Lebanon/Syria
Lebanon	methods of germplasm evaluation in wheat	Lebanon/Syria
Lebanon	evaluation and characterization of safflower	Lebanon/Syria
Lebanon	genetic diversity of almonds in Lebanon	Lebanon/Syria
Mauritius	genetic diversity of coffee	UK/Mauritius
Myanmar	germplasm collecting characterization and evaluation	Italy
Poland	cryopreservation techniques	Italy
Romania	genebank management and evaluation of germplasm	Germany/Netherlands
Russia	herbarium training	USA
Syria	biodiversity and genetic diversity of *Nerium oleander*	Syria
Syria	fruit/forest tree genetic diversity	Syria
Tunisia	diversity studies of *Capparis spinosa* in Tunisia	Italy
USA	public awareness	IPGRI Rome
USA	ethnobotany and socioeconomic aspects of plant genetic resources	IPGRI Rome
Venezuela	evaluation and characterization of pineapple	Martinique
Venezuela	evaluation and characterization of pineapple	Martinique
Venezuela	evaluation of nematode resistance in pineapple	France
Zambia	seed longevity and health of maize and cowpea	Germany/Zambia

 See pp. 135–136 for Abbreviations

Short courses and training workshops

1 Benin
IPGRI/National University of Benin/University of Birmingham/Darwin Initiative/UNEP Training Course in Plant Conservation and Sustained Utilization (for West Africa)
33 participants from Benin (7) Burkina Faso (1) Cameroon (2) Central Africa (2) Cote d Ivoire (3) Gambia (1) Ghana (2) Guinea (2) Senegal (2) Tchad (2) Togo (3) Mali (2) Niger (2) Nigeria (2)

2 Bolivia
IPGRI/INIA Spain/AECI Training Materials Workshop Taller de Formacion de Profesionales en RFG y de Evaluacion de Materiales de Ensenanza en Fisiologia de Semillas
17 participants from Argentina (2) Bolivia (6) Colombia (3) Ecuador (2) Paraguay (1) Peru (1) Venezuela (2)

3 Chile
INIA Chile/JICA/PROCISUR/IPGRI Tercer Curso Internacional sobre Recursos Fitogeneticos Conservacion de los Recursos Fitogeneticos (Third International Course on Plant Genetic Resources Conservation of Plant Genetic Resources)
13 participants from Argentina (1) Brazil (1) Colombia (1) Chile (1) Ecuador (1) El Salvador (1) Guatemala (1) Nicaragua (1) Panama (1) Paraguay (1) Peru (1) Uruguay (1) Venezuela (1)

4 Côte d'Ivoire
IPGRI COGENT/IDEFOR/CFC STANTECH Regional Trainers Course for Africa and Indian Ocean
9 participants from Benin (1) Ghana (1) Guinea (1) Jamaica (1) Kenya (1) Mozambique (1) Nigeria (1) Tanzania (1) Togo (1)

5 Germany
ECP/GR ZADI Training Workshop on Central Crop On Line Databases
8 participants from Austria (1) Germany (2) Hungary (1) Poland (2) United Kingdom (2)

6 Hungary
University of Birmingham/IPGRI/Institute of Agrobotany/Nordic Gene Bank Darwin Initiative Training Course in Plant Conservation Complementary Conservation Strategies
30 participants from Armenia (2) Azerbaijan (1) Belarus (2) Bulgaria (1) Czech Rep (2) Estonia (1) Georgia (1) Hungary (3) Kazakhstan (2) Latvia (1) Lithuania (2) Macedonia (1) Moldova (1) Poland (2) Romania (1) Russia (3) Slovak Rep (1) Slovenia (1) Ukraine (1) Yugoslavia (Fed Rep) (1)

7 India
IPGRI/IIHR ICAR/UTFANET Regional Training Course on Germplasm Conservation and Use of Tropical Fruit Species in Asia
17 participants from Bangladesh (2) Cambodia (1) China (1) India (2) Indonesia (1) Laos (1) Malaysia (1) Myanmar (1) Nepal (2) Philippines (1) Sri Lanka (2) Thailand (1) Vietnam (1)

8 Jamaica
IPGRI COGENT/CIB/CFC STANTECH Regional Trainers Course for Latin America and the Caribbean
6 participants from Brazil (1) Cuba (1) El Salvador (1) Haiti (1) Mexico (1) Trinidad and Tobago (1)

9 Kenya
NMK/Darwin Initiative/RBG/IPGRI Plant Conservation Techniques Course Specialist Workshop Recent Advances in Seed Conservation
13 participants from Kenya

10 Malaysia
IPGRI/MARDI Genebank Management Systems Training Course
14 participants from Malaysia

11 Mongolia
IPGRI/MNAU National Training Course on Plant Genetic Resources Documentation and the Use of Genebank Management System (GMS) Software in Mongolia
17 participants from Mongolia

12 Morocco
IAV Hassan II/GTZ/ICARDA/IPGRI International Training Course on Genetic Resources of Grain Legumes/Cours Approfondi Ressources Genetiques des Legumineuses a Graines
20 participants from Algeria (7) Morocco (11) Tunisia (2)

13 Mozambique
Mozambique National Plant Genetic Resources Programme/IPGRI/IRRI/Commonwealth Secretariat In Country Training Course on Germplasm Collecting
29 participants from Mozambique

14 Nepal
NARC/IPGRI National Training Course on Plant Genetic Resources Documentation and the Use of Genebank Management System (GMS) Software
11 participants from Nepal

15 Pakistan
IPGRI/FAO/ICARDA/PGRI PARC Training Course on Collection and Conservation of Plant Genetic Resources in Afghanistan
18 participants from Afghanistan (11) Pakistan (7)

16 Philippines
IPGRI COGENT/PCA ZRC/CFC International Coconut Germplasm Collecting and Conservation Training Course
11 participants from Fiji Islands (1) Indonesia (2) Malaysia (2) Philippines (3) Sri Lanka (1) Vanuatu (1) Vietnam (1)

17 Philippines
CIP/IPGRI/PRCRTC ViSCA ANSWER Training Course on Maintenance Characterization and Duplicate Identification of *Ipomoea batatas* Collections
10 participants from Indonesia (3) Malaysia (2) Philippines (3) Thailand (1) Vietnam (1)

18 Slovakia
IPGRI/RIPP Biochemical and Molecular Methods of Plant Genetic Resources Characterization
6 participants from Latvia (1) Poland (1) Romania (1) Ukraine (1) United Kingdom (1) Yugoslavia (Fed Rep) (1)

19 South Africa
University of Birmingham/IPGRI/SPGRC/ARC PGRU/Darwin Initiative *In Situ* Conservation in Southern Africa
18 participants from Angola (1) Botswana (1) Kenya (1) Lesotho (1) Malawi (2) Mozambique (1) Namibia (1) South Africa (3) Swaziland (3) Tanzania (1) Zambia (2) Zimbabwe (1)

20 Thailand
IPGRI/CIFOR/FAO/AFTSC/Royal Forestry Dept Thailand/DANIDA Forestry Planning and Training Workshop on Genetic Erosion Methodologies
10 participants from Laos (2) Myanmar (2) Thailand (4) Vietnam (2)

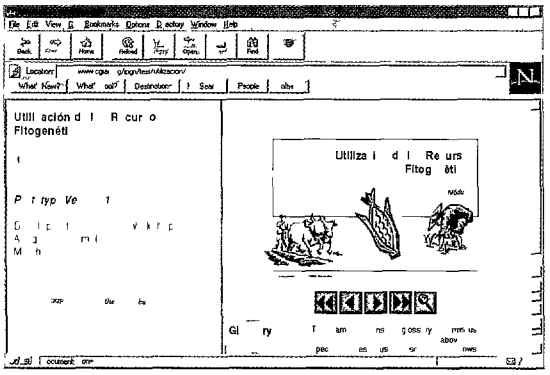
21 Uzbekistan
IPGRI/ICARDA/Uzbekistan Academy of Sciences Training Course on Conservation and Use of Plant Genetic Resources in Central Asia
15 participants from Kazahkstan (2) Kirghizstan (2) Tajikistan (2) Turkmenistan (2) Uzbekistan (7)

Trainee on the a short course in South Africa on *in situ* conservation

Anke van den Hurk IPGRI

The Internet opens up new horizons in training

The Internet and the Web have driven down the costs of communicating while increasing the amount of information that can be exchanged The revolution is influencing dramatically the way in which training is carried out from its planning and organization to its delivery and support For universities and other trainers faced with increasingly large and diverse student populations and large numbers of distance learning students the Internet is a powerful medium with the potential to be a truly learner centred environment Lecture summaries slides video clips demonstrations and tests are just one click of a mouse button away wherever the student may be located



IPGRI is developing a flexible curriculum on the conservation and use of plant genetic resources using electronic media especially the Internet as part of its strategy to reach wide and diverse audiences while meeting user needs and preferences The potential for outreach is considerable as borne out by recent statistics IPGRI s training module on molecular markers was the most popular download from IPGRI s Web site in 1997 The portable Internet formats suitable for diskette CD ROM as well as the World Wide Web can be read on a wide variety of computer platforms and are straightforward to update They do not require access to the Internet to work an important consideration in countries where connections are slow or non existent However the increasing capacity and speed of telecommunications and the growth of the Internet in developing countries mean that these materials will be reaching an ever wider and more diverse audience opening up new possibilities to help build capacity in the subject

study added greatly to existing knowledge on this little known economic species Seed samples were sent to several institutes in India for propagation and conservation During the year, 1996 Fellow Mr Augustin Chi Muam of Cameroon completed his research on the compatibility of government policy with indigenous culture in forest management in Cameroon He concluded that a joint approach to management based on a contract between the government and village communities would benefit sustainable forest management

Vavilov-Frankel Fellowships 1997

Three new Fellowships were awarded in 1997 Mrs Ksenija Gasic' of the Institute for Fruitgrowing and Viticulture, Yugoslavia (Fed Rep) began her research on 'Evaluation and utilization of vineyard peach populations of former Yugoslavia' at HRI, UK Ms Marina A Gritsenko of the N I Vavilov Institute of Plant Industry, Russia travelled to Washington State University, USA to begin a study entitled 'Assessing patterns of genetic diversity and ecological adaptation at inter-regional and intra regional scales in *Dactylis glomerata*' Mr Baohong Guo of the Institute of Crop Germplasm Resources, CAAS, China began his fellowship, again in the USA at North Carolina State University He is studying AFLP evaluation of the geographical divergence of large naked oat (*Avena sativa* var Nuda) for developing *in situ* conservation

MSc programmes

Fruitful collaborations continued with the University of the Philippines in Los Baños in support of their MSc programme on plant genetic resources (see also p 28) IPGRI staff contributed to course development workshops and to the preparation of publicity material for the programme Discussions were held with IARI in India and UKM in Malaysia on planned masters programmes and inputs were provided to curriculum development

A workshop involving IPGRI's partners in masters programme development in Sub Saharan Africa discussed the administrative, scientific and didactic aspects of establishing advanced teaching programmes This information gave IPGRI staff a better understanding of the optimal inputs that the Institute can provide in support of the universities' efforts (see also p 15)

 See pp. 135–136 for Abbreviations

Short courses

IPGRI collaborated in organizing 21 short courses or training workshops during 1997 (for further details including locations, see map on p 70) In all, 325 scientists from 93 countries were trained This continues the steady increase over recent years in the number of national programme scientists and countries that IPGRI has been able to target through such technical training opportunities These courses benefited from sponsorship and collaborative inputs from a wide range of partners Details are given on p 71 and in the Regional Group Reports IPGRI again contributed lectures and materials to training courses organized by other institutes and assisted in matching trainees to training opportunities elsewhere A particularly fruitful interaction with DSE in Germany involved IPGRI staff contributing lectures to several DSE courses and discussions on intensifying collaborative on training and capacity building in the future

Ten Algerian trainees from various stations of the Insitut Technique des Grandes Cultures from all over Algeria visited IPGRI as part of a 5 month training course on seed production at the Istituto Agronomico per l'Oltremare in Florence, Italy

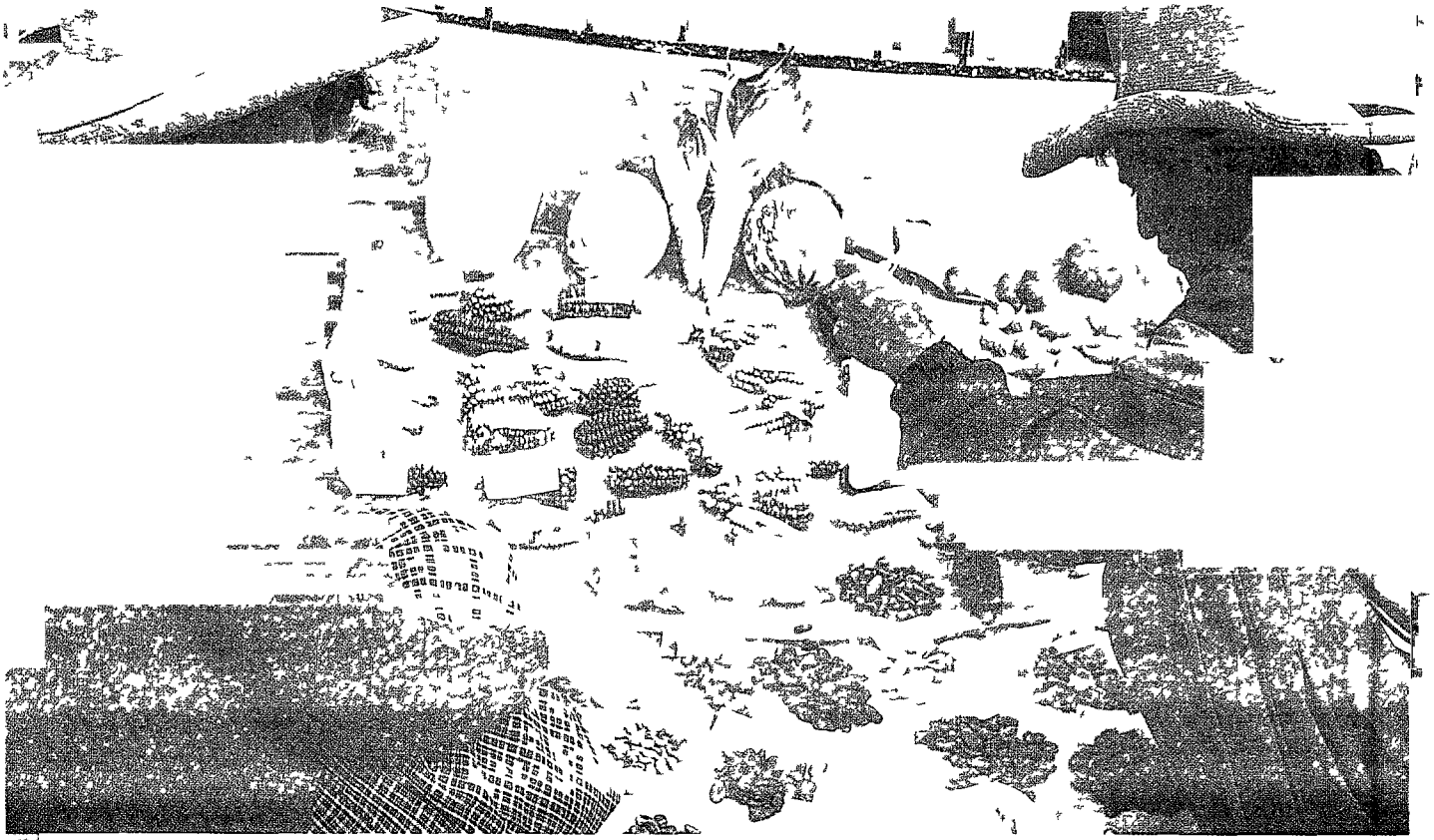
National programme development

In a collaborative activity with the GRST Group and in consultation with FAO, two papers were drafted to describe the issues and options for strategic planning and structural organization of national plant genetic resources programmes They describe the complex policy environment within which national programmes operate and set out the structural and technical issues and options that must be taken into consideration The papers are complemented by a set of 10 "fact sheets" that provide, in concise form, information to help raise awareness of the need for coordinated development of national plant genetic resources programmes and secure the necessary moral and financial support These drafts will be used as resource materials at forthcoming national and regional workshops, where inputs will be gathered from national programme partners to aid their finalization

Public Awareness

In 1997, IPGRI produced issues of the institute s flagship public awareness publication, *Geneflow*, in English, French and Chinese This year, *Geneflow* focused on the activities of SGRP as part of IPGRI's commitment to raise awareness of SGRP It included coverage of fish and livestock genetic resources, new areas for *Geneflow*, which has hitherto been concerned with plants The 1998 calendar described IPGRI s work on 'minor crops, which are often neglected by science Many of these crops are well suited to marginal areas Radio and print interviews featuring IPGRI, SGRP and national programme staff were sponsored by the Institute and disseminated throughout Europe and Sub Saharan Africa

UN Secretary General Kofi Annan visiting the CGIAR booth at the United Nations General Assembly Special Session on Sustainable Development IN 1997



South American farmers at a genetic resources fair This image is taken from a scene in one of the episodes of a 4 part documentary series entitled Last Plant Standing that is being coordinated by IPGRI

Eric Milner Acacia Productions

A short video trailer was developed to promote the four part documentary film series, provisionally entitled *Last Plant Standing* , which will be broadcast on NHK television in Japan in 1998 The series will then be available to TV stations throughout the world An IPGRI initiative, the series is being produced by Acacia Productions for Television Trust for the Environment, an international non-governmental organization which uses broadcast television and other audio visual resources to raise environmental awareness worldwide Japan has provided principal funding for the project Further support comes from Canada's IDRC, the UK's DFID, and the Danish Ministry of Foreign Affairs

The CGIAR Public Awareness and Resources Committee requested IPGRI to coordinate a number of public awareness events on behalf of the system during 1997 IPGRI developed a CGIAR display and organized press meetings in conjunction with Italy's annual 'Science Week', sponsored by the Italian National Academy of Science The United Nations General Assembly Special Session on Sustainable Development set the scene for another major CGIAR display The purpose of the Special Session was to examine the state of global efforts to stem the tide of environmental degradation in the five years since the UNCED meeting in Rio de Janeiro Some 65 Heads of State attended and most other countries were represented at the Ministerial level The CGIAR was one of only 25 exhibitors invited to mount displays at the UN and the only agricultural organization IPGRI coordinated the development of display panels for the IX World Forestry Congress in Turkey with input from CIFOR and ICRAF Another IPGRI coordinated activity was held in concert with the Japan Day of International Cooperation, which took place in a public park in Tokyo A display was prepared by IPGRI, which described the CGIAR's role in sustainable development and highlighted specific examples of CGIAR Japan cooperation

An assessment of the impact of IPGRI s awareness raising efforts carried out in 1997 found that knowledge of the Institute and of genetic resources issues generally has grown significantly in recent years Partnerships with and among national programmes and NGOs have been strengthened

 See pp. 135–136 for Abbreviations

Impact assessment

The complexity of the environment within which IPGRI works makes its impact very difficult to measure as discussed in the introduction to this Annual Report (see pp 8–9) Thus, IPGRI has directed its efforts towards elucidation of the impact of the Institute and, at the same time, development of expertise in appropriate methodology

Stimulated by participation in a workshop on case study methodology organized by the Impact Assessment and Evaluation Group of the CGIAR, IPGRI began two studies of impact, one looking at the factors affecting the adoption of crop descriptors published over the last 20 years and the other the International *Musa* Testing Programme of INIBAP (see below) With the assistance of expertise provided by EGAD from the University of Arizona, the case studies will provide a basis for the wider application of case study methodology to other aspects of the IPGRI programme

Identifying meaningful indicators is a crucial component of project design, monitoring, evaluation and impact assessment During 1997, IPGRI gave particular attention to this by initiating a staff development programme on Logical Framework Analysis, and the development of 'logframes' for the IPGRI programme and projects

Collecting impact assessment data in Guadaloupe

As part of a case study on the adoption of IPGRI descriptor lists the newly revised and published *Descriptors for Banana* (IPGRI INIBAP/CIRAD) were tested on the field collection of CIRAD–FLHOR in Neufchateau in Guadaloupe during the first training workshop for the *Musa* Germplasm Information System developed by INIBAP Curators of the major *Musa* collections found the descriptors very useful as a part of the MGIS management system They also provided important feedback on the use of the descriptor lists information which will be very useful for the case study

Brigitte Laliberte IPGRI

List of publications produced in 1997

APO

Regional Newsletter for APO Nos 22 24 (English and Chinese)

Michael J Brown Durio A Bibliography Review ISBN 92 9043 318 3

Americas

Regional Newsletter for the Americas Vol 3 No 1 English July

CWANA

WANA Newsletter Issue No 15 September

Newsletter for Central & West Asia and North Africa Issue No 16 December

IPGRI/WANA and ACSAD Preliminary ecogeographical survey on genetic resources of wild almonds in Syria (in Arabic) ISBN 92 9043 316 7

A Bari and A A Jaradat compilers Summary Proceedings of the Third International Triticeae Symposium ISBN 92 9043 326 4

A A Jaradat editor Proceedings of the First National Workshop on Plant Genetic Resources in Yemen ISBN 92 9043 312 4

Bibliographic

Plant Genetic Resources Abstracts Vol 6 Nos 1 4 CAB International Wallingford Oxon UK

Descriptors

Descriptors for Pistachio ISBN 92 9043 332 9

Descripteurs du pistachier ISBN 92 9043 333 7

Descriptores para la vid ISBN 92 9043 357-4

Descriptors for Grapevine Published in cooperation with UPOV and OIV ISBN 92 9043 352 3

Descripteurs de la vigne ISBN 92 9043 356 6

Descriptores para el te ISBN 92 9043 343 4

Descriptors for Tea ISBN 92 9043 244 6

Descripteurs pour le theier ISBN 92 9043 344-2

Descriptores para el name ISBN 92 9043 354 X

Descriptors for Yam Published in cooperation with IITA ISBN 92 9043 353 1

Descripteurs de l igname ISBN 92 9043 355 8

Europe

Regional Newsletter for Europe Nos 10 12

ECP/GR (European Cooperative Programme for Crop Genetic Resources Networks)

T Gass M Ambrose I Faberova A Le Blanc and J Weibull compilers Report of a Workshop on Wheat Genetic Resources 21 23 March 1996 Paris France Published in collaboration with the Bureau des Ressources Genetiques (BRG) ISBN 92 9043 313 2

E Lipman M W M Jongen Th J L van Hintum T Gass and L Maggioni compilers Central Crop Databases Tools for Plant Genetic Resources Management Report of a workshop 13 16 October 1996 Budapest Hungary Published in collaboration with the Centre for Plant Breeding and Reproduction Research (CPRO DLO) and Centre for Geentic Resources the Netherlands (CGN) ISBN 92 9043 320 5

E Lipman R H Ellis and T Gass compilers Maize Genetic Resources in Europe Report of a workshop 28 29 May 1996 Rome Italy ISBN 92 9043 306 X

L Maggioni D Astley M Gustafsson T Gass and E Lipman compilers Report of a Working Group on *Brassica* Third meeting 27 29 November 1996 Rome Italy ISBN 92 9043 340 X

EUFORGEN (European Forest Genetic Resources Programme)

J Turok F Lefevre S de Vries and B Toth compilers *Populus nigra* Network Report of the third meeting 5 7 October 1996 Sarvar Hungary ISBN 92 904325-6

J Turok and V Koski compilers *Picea abies* Network Report of the second meeting 5 7 September 1996 Hyytiala Finland ISBN 92 9043 330 2

V Koski T Skrøppa L Paule H Wolf and J Turok editors Technical Guidelines for genetic conservation of Norway spruce (*Picea abies* (l) Karst) ISBN 92 9043 331 0

J Turok M C Varela and C Hansen compilers *Quercus suber* Network Report of the third and fourth meetings 9 12 June 1996 Sassari Sardinia Italy 20 22 February 1997 Almoraima Spain ISBN 92 9043 336-1

Underutilized Mediterranean Species

S Padulosi and D Pignone editors Rocket a Mediterranean crop for the world Report of a workshop 13 14 December 1996 Legnaro (Padova) Italy ISBN 92 9043 337 X

General

Plant Genetic Resources Newsletter Nos 109 112

IPGRI Annual Report 1996 ISBN 92 9043 324 8

IPGRI Calendar 1998

IPGRI Christmas Card 1997

Donor Fact Sheets China Cote d Ivoire Egypt Ivory Coast Luxembourg Pakistan Peru English Peru Spanish South Africa

Scientist Plants and Politics A history of the plant genetic resources movement Robin Pistorius (Vavilov Frankel Fellow 1993) ISBN 92 9043 308 6

Five continents by N I Vavilov ISBN 92 9043 302 7

Paul Richards and Guido Ruivenkamp Seeds and survival crop genetic resources in war and reconstruction in Africa ISBN 92 9043 349 3

Forgen News December 1997

Issues in Genetic Resources

Intellectual Property Rights and Plant Genetic Resources Options for a *Sui Generis* System Dan Leskien and Michael Flitner Issues in Genetic Resources No 6 June 1997 ISBN 92 9043 329 9

Promoting the Conservation and Use of Underutilized Species

J Heller F Begemann and J Mushonga editors Bambara Groundnut Vigna subterranea (L) Verdc ISBN 92 9043 299 3

Diane Ragone Breadfruit *Artocarpus altilis* (Parkinson) Fosberg ISBN 92 9043 300 X

James A Chweya and Nameus A Mnzava Cat s whiskers *Cleome gynandra* L ISBN 92 9043 303 5

Seyfu Ketema Tef *Eragrostis tef* (Zucc) Trotter ISBN 92 9043 304 3

Michael Flach Sago Palm *Metroxylon sagu* Rottb ISBN 92 9043 314-X

S Padulosi Oregano ISBN 92 9043 317 5

Jennifer M Edmonds and James A Chweya Black nightshades *Solanum nigrum* L and related species ISBN 92 9043 321 3

L Guarino editor Traditional African Vegetables Proceedings of the IPGRI International Workshop on Genetic Resources of Traditional Vegetables in Africa Conservation and Use 29 31 August 1995 ICRAF HQ Nairobi Kenya ISBN 92 9043 332 1

I Battle and J Tous Carob tree *Ceratonia siliqua* L ISBN 92 9043 328 X
Clayton G Campbell Grass pea *Lathyrus sativus* L ISBN 92 9043 341 8
Clayton G Campbell Buckwheat *Fagopyrum esculentus* Moench ISBN 92 9043 345 0
Jorge Mora Urpi John C Weber and Charles R Clement Peach palm *Bactris gasipaeas* Kunth ISBN 92 9043 347 7
M Hermann and J Heller editors Andean roots and tubers Ahipa arracacha maca and yacon ISBN 92 9043 351 5

Public Awareness
Geneflow 1997
IPGRI Calendar 1998

Safe Movement of Germplasm
Recommendations pour l echange securitaire du materiel genetique Eucalyptus Directives techniques pour l echange et la circulation securitaire du materiel genetique ISBN 92 9043 334-5
Recomendaciones para la transferencia segura de germoplasma Eucalyptus Directrices tecnicas para la transferencia segura de germoplasma ya publicadas ISBN 92 9043 335 3
M Diekmann editor FAO/IPGRI Technical Guidelines for the Safe Movement of Germplasm No 18 *Allium* spp Food and Agriculture Organization of the United Nations Rome/IPGRI Rome ISBN 92 9043 346 9

SGRP
Report of the Internally Commissioned External Review of the CGIAR Genebank Operations Annex Centres Responses to the External Review ISBN 92 9043 327 2
Annual Report 1996 ISBN 92 9043 342 6
Fact sheets SINGER CD ROM

Technical Publications
M Diekmann editor Viroid like Sequences of Coconut Proceedings of a meeting 21 23 April 1997 Kajang (Kuala Lumpur) Malaysia ISBN 92 9043 348 5
W G Ayad T Hodgkin A Jaradat and V R Rao editors Molecular genetic techniques for plant genetic resources Report of an IPGRI Workshop 9 11 October 1995 Rome Italy ISBN 92 9043 315 9
A Karp S Kresovich K V Bhat W G Ayad and T Hodgkin Molecular tools in plant genetic resources conservation a guide to the technologies (IPGRI Technical Bulletin No 2) 92 9043 323 X
Sarah E Ashmore Status report on the development and application of *in vitro* techniques for the conservation and use of plant genetic resources ISBN 92 9043 339 6
N R Sackville Hamilton and K H Chorlton Regeneration of accession in seed collections a decision guide (Handbooks for Genebanks No 5) ISBN 92 9043 319 1

CGIAR
Ethics and Equity in conservation and use of genetics resources for sustainable food security Proceedings of a workshop to develop guidelines for the CGIAR 21 25 April 1997 Foz do Iguaçu Brazil Published for the CGIAR by IPGRI ISBN 92 9043 338 8

INIBAP

General Publications
E Arnaud and J P Horry editors *Musa*logue a Catalogue of *Musa* Germplasm Papua New Guinea collecting missions 1988 1989 International Network for the Improvement of Banana and Plantain Montpellier France
E A Frison G Orjeda and S Sharrock editors PRO*MUSA* A Global Programme for *Musa* Improvement Proceedings of a meeting 5 9 March 1997 Gosier Guadeloupe INIBAP Montpellier France / The World Bank Washington DC USA ISBN 2 910810 19 4
Networking Banana and Plantain INIBAP Annual Report 1996 ISBN 2 910810 15 1
INIBAP/CTA/FHIA/NRI/ODA B K Dadzie and J E Orchard Post harvest Routine Screening of Banana and Plantain Hybrids Criteria and Methods INIBAP Technical Guidelines 2
INIBAP/CTA/FHIA/NRI/ODA B K Dadzie et J E Orchard Evaluation post recolte des hybrides de bananiers et bananiers plantain Criteres et methodes Guides techniques INIBAP 2
INIBAP/CTA/FHIA/NRI/ODA B K Dadzie y J E Orchard Evaluacion rutinaria postcosecha de híbridos de bananos y platanos Criterios y metodos Guias tecnicas INIBAP 2
INIBAP/CTA P R Speijer and D De Waele Screening of *Musa* Germplasm for Resistance and Tolerance to Nematodes INIBAP Technical Guidelines 1 ISBN 2 910810 16 X
INIBAP/CTA P R Speijer et D De Waele Evaluation du materiel genetique de *Musa* pour la resistance aux nematodes Guides techniques INIBAP 1
INIBAP P Speijer y D De Waele Tamizado de germoplasma de *Musa* para resistencia y tolerancia a nematodos Guias Tecnicas INIBAP 1
INIBAP E Arnaud editor Bananas and Plantains Directory of Researchers
INIBAP E Arnaud editor Bananiers et plantains Repertoire des chercheurs
INIBAP E Arnaud editor Bananos y Platanos Directorio de Investigadores
Posters INIBAP HQs INIBAP Regional Office for Eastern and Southern Africa INIBAP Regional Office forLatin America and the Caribbean INIBAP Regional Office for Asia and the Pacific INIBAP Regional Office for West and Central Africa

Regional Publications
V N Roa and R V Valmayor editors Minutes Sixth meeting of INIBAP/ASPNET Regional Advisory Committee (RAC) 26 28 September 1996 Tiruchirapalli India hosted by National Research Center on Banana (ICAR)

Fact sheets
J Bridge R Fogain and P Speijer *Musa* Pest Fact Sheet No 2 The Root Lesion Nematodes of Banana *Pratylenchus coffeae* (Zimmermann 1898) Filip & Shih Stek 1941 *Pratylenchus goodeyi* Sher & Allen 1953
J Bridge R Fogain et P Speijer Parasites et ravageurs des *Musa* fiche technique No 2 Les nematodes parasites des bananiers *Pratylenchus coffeae* (Zimmermann 1898) Filip & Shih. Stek 1941 *Pratylenchus goodeyi* Sher & Allen 1953
J Bridge R Fogain y P Speijer Plagas de *Musa* hoja divulgativa No 2 Nematodos lesionadores de los bananos *Pratylenchus coffeae* (Zimmermann 1898) Filip & Shih Stek 1941 *Pratylenchus goodeyi* Sher & Allen 1953
X Mourichon J Carlier and E Foure in collaboration with the PRO*MUSA* Sigatoka working group *Musa* Disease Fact Sheet No 8 Sigatoka Leaf Spot Diseases
X Mourichon J Carlier et E Foure en collaboration avec le groupe de travail sur les cercosporioses de PRO*MUSA* Maladie des *Musa* fiche technique No 8 Les cercosporioses
X Mourichon J Carlier y E Foure en colaboracion con el grupo de trabajo sobre Sigatoka de PRO*MUSA* Enfermedades de *Musa* hoja divulgativa No 8 Enfermedades de Sigatoka

Trilingual Serials
Musarama Vol 10 Nos 1 2 (English French and Spanish)
Musarama Annual indexes (English French and Spanish)
INFO*MUSA* Vol 6 Nos 1 2 (English French and Spanish)

International Network for the Improvement of Banana and Plantain

Introduction

INIBAP's focus on Africa in 1996 brought rewards in 1997 The newly recruited Regional Coordinators were instrumental in activating two banana research networks, bringing together some 21 countries as well as regional and international institutes These networks will facilitate cooperation in banana research as well as allow increased opportunities for information and technology exchange in the region

Another major achievement for INIBAP in 1997 was the launching of PRO*MUSA*, the Global Programme for *Musa* Improvement This joint INIBAP/World Bank initiative was the culmination of a long period of consultation with all the major groups in *Musa* improvement

The first version of the software for the *Musa* Germplasm Information System was completed and distributed on CD-ROM The System facilitates the management of data on accessions in genebanks It is a tool that will increase information exchange and encourage the use of material held in collections

INIBAP s support to strategic research resulted in significant progress towards the production of transgenic bananas Plants were transformed with an anti fungal gene, which was expressed in the regenerated plants, including in the fruit The gene continued to be expressed in subsequent generations, indicating stable integration of the foreign genes into the chromosomal structure

Highlights of project activities

Managing *Musa* germplasm

Musa germplasm collecting

Collecting activities in 1997 continued in South China and Indonesia, where 53 new accessions were gathered Accessions collected in China during 1996 were established in the field collection of the South China Agricultural University in Guangzhou and characterization began After identifying distinct species and cultivars, and eliminating synonyms and duplicates SCAU will start sharing this material with INIBAP In Indonesia collecting in Molluccu was completed in 1997 The material was established in a field genebank in Solok and arrangements made to transfer the agreed material to INIBAP The eastern Malaysian States of Sabah and Sarawak were identified as priority areas for future *Musa* germplasm collecting Collecting in this area will complement the efforts of Indonesia to collect characterize and conserve the *Musa* germplasm of Kalimantan, the Indonesian part of Borneo, where forest fires annually destroy large areas of biodiversity, including *Musa* germplasm

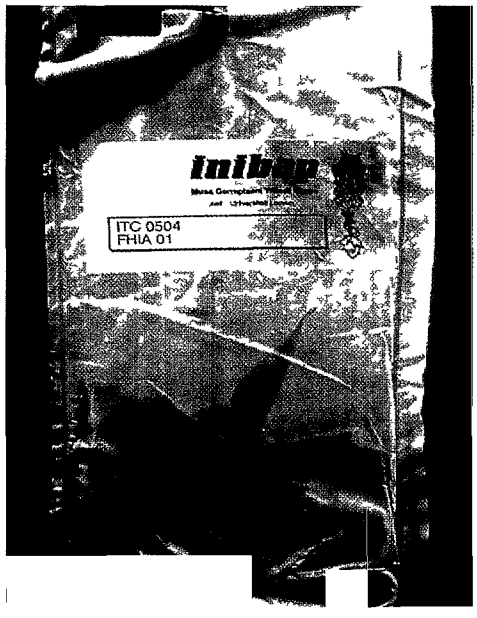
Musa germplasm conservation

Twenty six new accessions, mainly originating from the 1994-95 collecting missions in Vietnam, were introduced into the germplasm collection at the INIBAP Transit Centre during 1997, bringing the total number of accessions to 1114 By the end of the year, over 500 accessions had been screened for endogenous microbial contaminants Bacteria were isolated from 4 5% of the tested clones and eradicated by culturing small explants (meristems) or by antibiotic treatment

Research on developing a simple method of cryopreservation revealed that the existing protocol did not give acceptable regeneration rates for all *Musa* genotypes Despite modifications to the recovery conditions viability rates remained variable ABB and AAA dessert banana genotypes responded well, but recovery of AAB plantains was low and AAA highland bananas did not survive at all Transit Centre staff collaborated with researchers from the Japanese International Research Centre for Agricultural Sciences who have developed a successful cryopreservation technique for banana meristems excised from *in vitro* rooted plantlets based on complete vitrification A revised protocol using the vitrification method on proliferating meristem clumps rather than on shoot tips has resulted in improved post thaw viability rates for the genotypes under investigation

Musa germplasm distribution

ITC distributed 1740 samples of 163 accessions during the year representing a utilization rate of 30% of the available accessions in the collection Further regional multiplication centres are being established to facilitate the distribution of germplasm Agreements were signed with CATIE Costa Rica and NBPGR India to act as centres for Latin America and the Caribbean and India The ITC provides these centres with virus indexed *in vitro* cultures of the varieties most in demand in the particular region The centre then has the responsibility for further multiplying and distributing material throughout the region

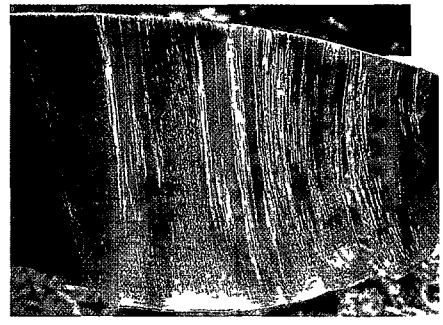


A banana plantlet in a specially developed cultusak that INIBAP uses to distribute germplasm

Research on *Musa* viruses

Methods to detect banana streak virus in *Musa*

INIBAP, with UNDP funding, is supporting research at the University of Minnesota on banana streak virus This virus has several unique features not found in most other plant viruses The *Musa* genome contains integrated badnavirus sequences that, in certain *Musa* genotypes, may be able to be activated to produce a new BSV infection Results obtained in 1997 indicated that tissue culture might be one of possibly several stresses that activate the integrated viral sequences Research is now focused on developing methods to detect these activateable sequences in different *Musa* genotypes This would be particularly useful information for breeding programmes in determining the suitability of germplasm for use



Symptoms of banana streak virus on a leaf

Techniques to eliminate virus diseases from *Musa*

The University of Gembloux in Belgium made various innovative approaches to virus therapy as part of an INIBAP research project funded by BADC Plants infected with BSV were subjected to various tissue culture treatments including standard tissue culture proliferation cell suspensions, cryopreservation of cell suspensions and cryopreservation of meristems Some of the regenerated plantlets did not have the virus, but others still had it in their tissues

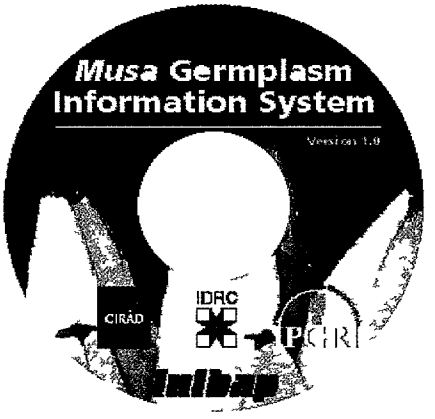
Diagnostic tests for viruses

Work on tests to screen germplasm for viruses made good progress in 1997, laying the basis for diagnostics for banana bract mosaic virus, Abaca mosaic virus and a new, flexuous rod virus of banana This new virus is likely to be classified as a Potex virus The virus has not been associated with any specific symptoms and is therefore not considered to be a major threat An IC PCR test that detects BBrMV, BBTV and cucumber mosaic virus in one single test was also developed by the project, which is funded by UNDP and involves partners in Australia (QDPI), France (CIRAD FLHOR) and the Philippines (BPI)

Musa Germplasm Information System

INIBAP successfully pressed its first CD ROM during 1997 This contains the *Musa* Germplasm Information System software, developed in collaboration with CIRAD, which was finalized and delivered to INIBAP during 1997 The MGIS database already contains almost 2000 records of accessions held in three collections ITC, CIRAD, Guadeloupe and CRBP, Cameroon Users can access a full set of data on each accession covering identification (passport) and characterization/evaluation information In some cases, a photograph of the accession is also available

INIBAP and CIRAD organized a workshop on MGIS methodology once the software was completed The feedback obtained was very positive All participants were enthusiastic about the system and keen to start using it for their own collections Funded by IDRC, the training took place at the CIRAD FLHOR research station in Neufchateau, Guadeloupe, attended by ten curators of major *Musa* collections



Musa Germplasm Improvement

A major achievement for INIBAP during 1997 was the launching of PRO*MUSA* the Global Programme for *Musa* Improvement PRO*MUSA* was developed as a joint INIBAP/World Bank initiative It is a broad based programme that brings together all the major groups involved in *Musa* improvement research, working as partners, each playing a contributory and complimentary role The programme operates as a series of interlinked thematic working groups coordinated by an Executive Secretariat provided by INIBAP Working groups cover the major global research needs, which include genetic improvement, Fusarium wilt Sigatoka diseases, nematodes and viruses (see also box on next page)

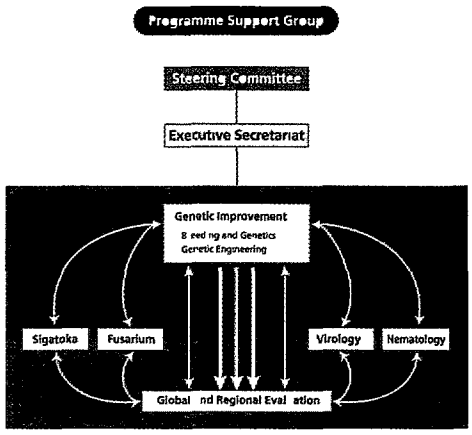
International *Musa* Testing Programme

Preliminary results from the IMTP Phase II trials showed that the hybrids produced by the FHIA breeding programme in Honduras performed well across a range of environments and disease pressures UNDP funds IMTP, which operates within the framework of PRO*MUSA* and provides a mechanism to evaluate germplasm within the programme

An increasing number of breeding programmes and NARS wanted to participate in the programme indicating its success not only in providing breeding programmes with a wide range of testing sites but also as a mechanism to distribute improved germplasm to National Programmes This expansion and the needs of the participants, led to a revised structure for future phases of IMTP, with two levels of evaluation In-depth evaluations will be made at a limited number of sites, providing information primarily of interest to breeders and pathologists At the remaining sites, more simplified evaluations will focus on the agronomic performance of the varieties under local conditions Countries hosting

Global Programme for *Musa* Improvement - PRO*MUSA*

PRO*MUSA* was developed as a broad based programme that involves all the major research groups in *Musa* improvement.



PRO*MUSA*

- provides a mechanism to further maximize the outputs and accelerate the impact of the overall *Musa* improvement effort
- aims to create innovative new partnerships bringing together research carried out by ARIs IARCs and NARS in both developing and developed countries

Guiding principles

- the programme focus is specifically on *Musa* genetic improvement and supportive research
- it operates as a consortium and relies on a range of funding mechanisms
- participation is voluntary and is based on the capacity to contribute through a high scientific capability in *Musa* research and on comparative advantage
- decision making follows a bottom up approach

Objectives

- increase the productivity of bananas and plantains produced for home consumption and local and export markets in an environmentally sustainable manner
- foster the development of improved *Musa* varieties with a wide genetic base and consumer acceptability and to disseminate these varieties to farmers through participating NARS
- facilitate and stimulate partnerships among NARS advanced research institutes and IARCs to increase the efficiency and cost effectiveness of global *Musa* improvement efforts

Benefits of participation

- global prioritization of research needs
- improved possibilities for funding
- close interactions with and knowledge of other research teams
- opportunities for interdependent research projects
- improved access to information and resources
- participation in programme meetings and conferences

such sites will be able to select the material they wish to test according to their needs and preferences, thus introducing greater flexibility into the programme

Nematode evaluation

An INIBAP research associate supported by VVOB started work at the Vietnam Agricultural Science Institute evaluating a range of *Musa* accessions, including some IMTP clones for resistance and tolerance to nematodes in both field and pot experiments Similar screening trials carried out in Honduras identified new sources of resistance to two nematode species, *Radopholus similis* and *Pratylenchus coffeae* These may be useful in future *Musa* breeding schemes

Support to the FHIA breeding Programme

The FHIA breeding programme works with diploid hybrids that have exceptional agronomic or disease resistance features Some of these diploids were used in crosses to produce FHIA 25 (SH 3775), the most interesting triploid hybrid identified during 1997 FHIA 25 shows considerable promise for production in the East African highland region It has fruit, bunch and flesh characteristics very similar to the cultivars traditionally grown in this region It is highly resistant to black Sigatoka and resistant to both Fusarium wilt and nematodes Produced in bunches up to 47 kg, the green fruit are easy to peel and have an excellent texture when boiled or fried

Genetic transformation

Researchers at the Laboratory of Crop Improvement in KUL Belgium focused on transforming bananas and plantains with anti fungal genes A gene encoding an antimicrobial peptide known to exert a strong fungistatic effect was introduced into both an AAB plantain variety and the AAA dessert banana variety, Williams In 1997 a plant of the transformed Williams variety produced a 14 hand bunch, with the anti fungal gene expressed in the fruit Introduced genes were also expressed in the leaves of three generations of suckers, indicating stable integration of the foreign genes

The most successful technique so far developed for transforming bananas has been particle bombardment Nearly 600 independent

transgenic lines were screened with PCR Almost 94% were positive for introduced genes This demonstrates that the method is efficient and reliable In addition, PCR tests showed that simultaneous introduction and possible stable integration of up to six foreign genes was possible in the banana genome

Impact of new varieties

The potential impact that new *Musa* hybrids may have on banana and plantain production in the future was evident in Cuba By the end of 1997 at least 8000 ha had been planted with a number of different FHIA hybrids This represents some 7 6% of the total banana production area These resistant cultivars increasingly replace susceptible banana and plantain clones on the island Farmers enthusiastically accept the new varieties because of their high yields and substantial savings on fungicides

Regional activities

Asia and the Pacific

Three new network members, Pakistan, Bangladesh and Sri Lanka, joined the 1997 INIBAP ASPNET Regional Advisory Committee Meeting in Vietnam, which also brought together Vietnamese banana researchers to discuss research constraints and priorities amongst themselves, as well as with specialists from other countries in the region The regional network assisted Sri Lanka and Papua New Guinea to establish national evaluation programmes during 1997 and organized a banana disease management workshop with BPI, Philippines and NRI, UK

The Regional Information System for Banana and Plantain Asia and the Pacific was very active during 1997 Seven countries in the region received copies of the INIBAP databases and training/demonstrations of the databases were given in each country

Latin America and the Caribbean

Support provided through the IDB project *Musa* research and technology transfer Network to three of the main LAC *Musa* breeding programmes (FHIA in Honduras, EMBRAPA in Brazil and the Banana Board in Jamaica) assured a continued output of improved germplasm for

Why is genetic transformation of bananas needed?

Banana and plantain production worldwide is under increasing threat from a number of important pathogens that cause severe yield losses Some of the major diseases, like Black Sigatoka, can be controlled by chemicals, others cannot Most small-scale producers cannot afford the chemicals, which also pose a severe threat to the environment Genetically resistant varieties are the basis of sustainable improved production A very wide range of varieties of bananas and plantains is grown worldwide each adapted to a specific ecoregion and selected for specific eating or cooking qualities So a similarly wide range of improved varieties is required

Breeding bananas and plantains is difficult Almost all cultivated varieties are sterile and do not produce seeds, making conventional hybridization programmes extremely complex Sources of resistance to the major pests and diseases are known, but these are generally in wild species When these are used in crosses many unwanted traits are transferred with the desirable resistance genes

Genetic transformation provides an opportunity for single genes or gene combinations (such as those associated with disease resistance) to be extracted from the genome of the source plants and transferred directly into the desired variety This allows the variety to retain all its normal characteristics, with the simple addition of the desired resistance Furthermore, since banana cultivars do not produce seeds, crosses with other varieties or species cannot occur. Therefore the introduced gene remains confined to the variety in which it has been introduced

In the case of banana, where conventional breeding is difficult, and a very large range of improved varieties is required genetic transformation holds great potential for the future It is for this reason that INIBAP, with funding from BADC is supporting strategic research in transformation techniques Research that is already producing promising results (see text).

The first bunch of transformed Cavendish bananas with useful genes

A market scene in the Philippines

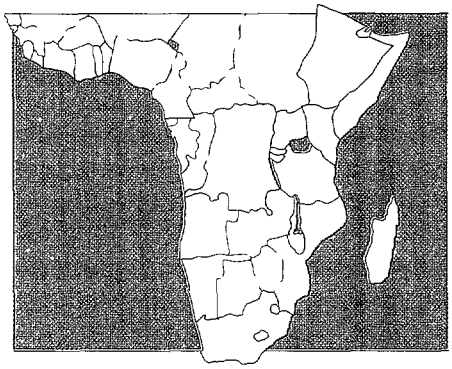
further selection and testing at field level The EMBRAPA programme evaluated and selected diploids (AA) for resistance to *Pseudomonas solanacearum* (Moko disease race 2) This is presently the only breeding programme in the world with such a focus Productive and resistant diploid hybrids will be used in breeding triploid and tetraploid banana varieties suitable for both the export market and local consumption

The destructive spread of black Sigatoka continued in the LAC region in 1997 Three new countries reported the arrival of this dreaded fungal disease in banana and plantain crops Peru, Bolivia and the Dominican Republic INIBAP staff assisted the countries by supplying information about the disease and remedial measures LACNET organized a workshop with CORBANA in Costa Rica on the epidemiology and control of black Sigatoka disease to train technicians and scientists from countries recently affected or threatened by the disease IDB provided the funds

INIBAP signed an agreement with CATIE to create a Regional Multiplication and Distribution Centre for improved cultivars, particularly those resistant to black Sigatoka Demand continued to increase within the region for such material produced in a safe but efficient way The Centre will distribute virus tested rooted plantlets in batches large enough to start field-propagated seed bed plots' for further distribution to small farmers in countries affected by Sigatoka

Membership of BARNESA

Official members are marked in yellow on the map *Ex officio* members are ICIPE IITA INIBAP and IRAZ



Sub-Saharan Africa

INIBAP's programme made particular progress in Africa during 1997 Regional Coordinators for both West and Central Africa and East and Southern Africa were recruited and regional offices were established in Cameroon and Uganda The Coordinators in both subregions immediately assumed key roles in activating banana research networks and mobilizing resources for banana research in the region as a whole

East and Southern Africa

INIBAP's regional office was opened in Kampala, Uganda during 1997, and a Regional Coordinator recruited At the request of BARNESA s Steering

Committee, the INIBAP Regional Office provides the Secretariat for the network while the Regional Coordinator plays the role of Network Coordinator The Coordinator immediately organized a Steering Committee meeting to discuss strategy and activities The meeting agreed that BARNESA would focus on increasing regional collaboration, particularly by providing a forum for the rapid exchange of information, expertise and technologies and by facilitating *Musa* research and capacity building activities in the region s NARS

West and Central Africa

A meeting of a number of NARS representatives and IARCs agreed to create a *Musa* network for Central and Western Africa to be known as the Reseau *Musa* pour l Afrique Centrale et Occidentale, or *MUSA*CO The network operates under the auspices of CORAF and the INIBAP regional office provides the secretariat to the network The goal of the network is to contribute to sustainable increased production of, and productivity in, banana and plantain in West and Central Africa for increased income and food security

Communications

Regional activities

INIBAP's Regional Information/Documentation networks were particularly active during 1997 An information workshop in Costa Rica reactivated the Regional Information and Documentation System on Banana and Plantain for Latin America and the Caribbean (SIDBAP) As a result, 450 bibliographic references were provided for inclusion into *MUSA*LIT (see below) Similarly, the regional network for Asia/Pacific (RISBAP) was active in gathering regional information, providing *MUSA*LIT with almost 200 references from the region

Publications

In 1997, INIBAP launched two new series The *Musa*logue , a catalogue of *Musa* germplasm Its first issue, on PNG germplasm, was published with the financial assistance of ACIAR. The second series, the trilingual "INIBAP Technical Guidelines was supported by CTA The first issue focused on the screening of *Musa* germplasm for nematode resistance The third issue of the Directory of Researchers working on banana and plantain was published, including data on 691 *Musa* researchers Two factsheets were published, one presenting updated information on black and yellow Sigatoka diseases and the other focusing on the nematode species *Pratylenchus* spp Trilingual serials such as INFO*MUSA* and *Musarama* continued to be published as usual with support from CTA

Public awareness

Public awareness continued to grow in importance and INIBAP recognized the need to inform a wide audience not only of its own programme and activities, but also to promote bananas and plantains in general INIBAP developed a Public Awareness strategy in close collaboration with IPGRI The INIBAP Home page was updated and a Web page on PRO*MUSA* developed

Improved banana varieties in Cuba

Bananas and plantains are a very important food crop for many people in Cuba More than 100 000 ha of the crop are grown and the entire production is consumed locally Black Sigatoka was first identified in Cuba at the end of 1990 In the space of 5 years it dramatically reduced the total planted area and yields of the many highly susceptible local clones Chemicals to control the disease were generally not available and if they were available were beyond the means of the majority of small scale producers

The black Sigatoka resistant variety from FHIA growing well in Cuba in 1997

Black Sigatoka resistant banana and plantain hybrids from the FHIA breeding programme in Honduras were first introduced into Cuba between 1991 and 1993 A massive propagation programme followed and in less than 5 years Cuban biofactories had produced enough planting material to cover 5000 ha The hybrids have proved popular with local farmers and consumers alike and they are increasingly replacing local susceptible cultivars FHIA 03 (a cooking banana) is fast becoming a basic in the diet of people in marginal production areas where other varieties cannot be grown

Multiplication and distribution of improved hybrids from FHIA is continuing at an impressive rate Some 25 million plantlets were scheduled to be produced by the biofactories during 1997 thus providing the possibility for the area under these hybrids to be expanded by a further 12 000 ha

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 See pp. 135–136 for Abbreviations

CGIAR System-wide Genetic Resources Programme

Introduction

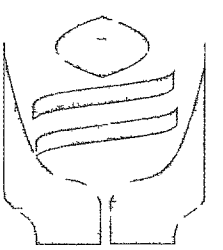
In 1997, the coordination of SGRP and its collaborative activities were supported by grants from Australia, the EU, Japan, the Netherlands and the World Bank This support enabled the SGRP to harness the efforts of individual Centres and their partner institutions in undertaking a number of activities in areas of strategic importance to the development of global systems for the management of biodiversity and genetic resources The *SGRP Annual Report* provides a full account of the Programme s development and work during the year including the activities of the individual member Centres These pages highlight some major developments and achievements

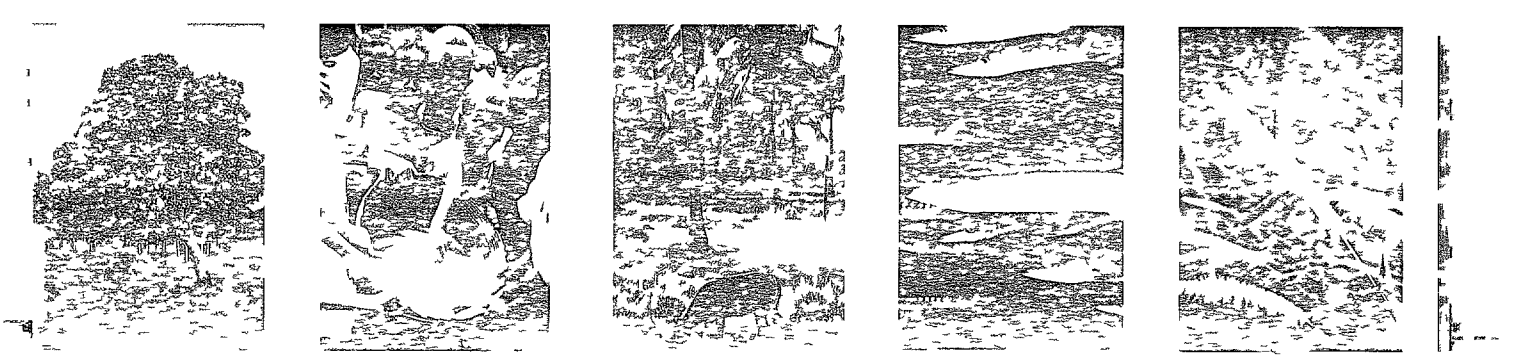
7th ICWG-GR annual meeting

CIFOR hosted the annual ICWG GR Steering Committee meeting where the major topic was

CGIAR System-wide Genetic Resources Programme

The System wide Genetic Resources Programme was created in 1994 to strengthen the CGIAR s contribution to the global effort on the conservation and sustainable use of biological diversity It encompasses the independently managed and funded Centre programmes on crop forestry livestock and aquatic biodiversity and related activities on genetic resources policy and capacity development Mechanisms within the total Programme for coordination and specific collaborative activities that are supported by donor funds to the SGRP promote coherence effectiveness and efficiency of the overall effort The Inter Centre Working Group on Genetic Resources (ICWG GR) with members from all participating Centres and the FAO acts as the Programme s Steering Committee and oversees the planning and implementation of SGRP s collaborative activities It is supported by a small coordinating Secretariat hosted by IPGRI which as the Convening Centre for the SGRP has overall responsibility for the facilitation coordination and representation of the Programme





CGIAR Centres hold half a million accessions of germplasm in trust

the refinement of the strategy, priorities and mode of operation Strategic planning focused on four areas critical to the development of global systems for the conservation and use of genetic resources, namely biodiversity and genetic resources management and research, information management and sharing, policy research and capacity strengthening The Programme's criteria for priority setting were refined accordingly, and applied to determine activities at System and multi Centre level that would build on individual Centre activities

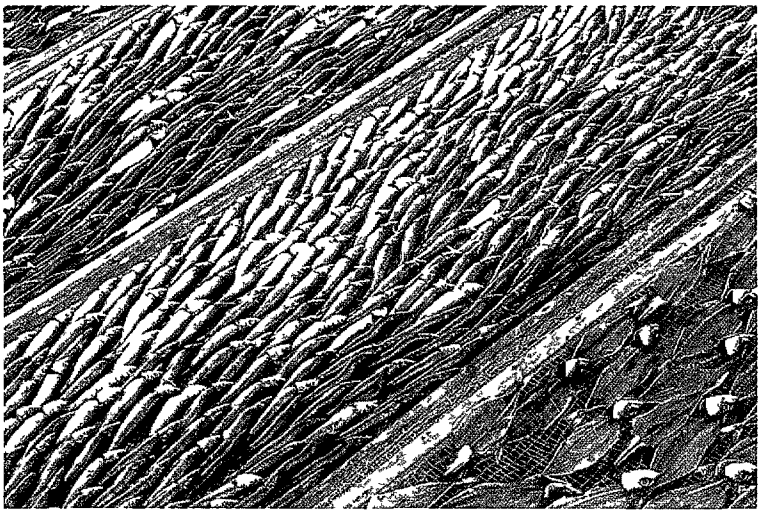
Involvement in international events

During the year, the CGIAR was represented at the 3rd meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity, the 7th regular and 4th extraordinary Sessions of the FAO Commission on Genetic Resources for Food and Agriculture, and meetings of the FAO Committees on forestry and agriculture SGRP contributed through reports of ongoing activities and specific scientific and technical inputs, to the plans for the further development of the CBD work programmes on agricultural, forestry and aquatic biodiversity, the Global Strategy for Farm Animal Genetic Resources, regional action plans for forestry genetic resources, and the implementation of the Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture

Communications and publications

The Annex to the Report of the Internally Commissioned External Review of CGIAR Genebank Operations was published The review was commissioned by the SGRP to evaluate the standards of genebank operations within the System, and assess their conformity with the requirements of the FAO Agreements (see p 90) The Annex contained the review panel's summary comments and specific recommendations for each genebank reviewed, together with the respective Centre's responses

The Programme sponsored a special section in the 1997 edition of the IPGRI publication *Geneflow*, with articles illustrating the range of research conducted by CGIAR Centres and partner organizations on crop, livestock, forest and aquatic genetic resources This publication is aimed at a general audience and has a wide distribution Wren-Agfax was contracted to provide radio and print media services to Asia and Africa Material on CGIAR and national programme collaborative research on genetic resources was gathered through interviews and



 See pp. 135-136 for Abbreviations

on site visits and made available to local radio and news outlets to support local awareness raising efforts on biodiversity and genetic resources conservation and use

System-wide Information Network for Genetic Resources

The project to establish SINGER ended in May This project, which was made possible by generous support from Sweden and Switzerland, has linked the genebank information systems of CGIAR Centres around the world and allows the databases on the genetic resources collections held, to be accessed and searched collectively SINGER contains key data on the source, characteristics and distribution of the individual accessions in Centre collections It is available on the Internet (www cgiar org/singer) and in May a first CD ROM version was produced

By May, most Centres had completed their links to the Network and successfully transferred data into the system By the end of the year, all Centre genebanks were linked and SINGER held more than 500 000 accession records The large majority of records are of the crop and forage genetic resources held in trust by the Centres under the auspices of the FAO SINGER also contains data on a small research collection of fish genetic resources held by ICLARM

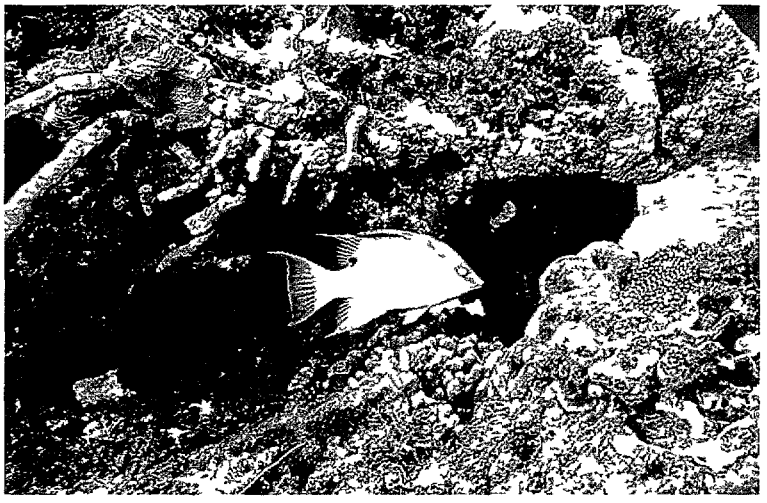
The CD ROM was produced to make SINGER available to national programmes without Internet connection It contains the data that were available in the Network as of April 1997 The CD ROM provides similar searching capabilities to the on line version and includes the same user interface Throughout the year, Centres continued to improve the quality of their datasets in SINGER by copying their data directly to the central database

The SINGER project has led to improvements in data management within the Centres and greatly facilitated information sharing within the CGIAR, and most importantly with national programmes and other collaborators Several NARS have expressed interest in SINGER as a model to adopt or as a network to participate in It was cited as an example of an information network for a multilateral system of germplasm exchange during the meeting of the FAO Commission on Genetic Resources for Food and Agriculture, in May, and demonstrated to delegates

The strategy of SGRP accords high priority to the further development of SINGER and other CGIAR biodiversity data sources and databases, and to their inter linking and linkage with national and international information systems During the year, plans were made and funding secured to launch a second phase of SINGER s development in 1998

The International Crop Information System

SGRP endorsed further development of ICIS and its link to SINGER as an important initiative for improving the management of genetic resources information The system is establishing a set of crop specific databases which show the genetic re



lationships of the materials Unique identifiers of the components remove barriers to associating data generated at different locations and by different studies ICIS is a potentially powerful tool for crop improvement It will allow breeders and genetic resources scientists to gain access to a global body of information on the pedigrees, characterization and evaluation of germplasm

The development of ICIS is an inter Centre initiative, led by CIMMYT SGRP funding support has supplemented the resources of the collaborating Centres, to enable the implementation of ICIS to extend to a range of major crops within the CGIAR mandate By the end of 1997, seven Centres were participating in the project, with the system under development for wheat, triticale, rice, barley, sorghum, cowpea, *Phaseolus* bean, potato and sweet potato The software to manage and analyze pedigree data was modified from its precursor version for wheat, to be generic and accommodate a wide variety of crops Several Centres have loaded genealogical data into the system and others are in the process of compiling pedigrees National crop improvement programmes are involved in this work

Management of *ex situ* collections of plant genetic resources

The primary concern of the genetic resources programmes of many of the Centres of the SGRP is the long term conservation of the collections of plant germplasm that they hold in trust for the international community, and the distribution of these materials for use in crop improvement around the world As required by the Agreements with the FAO governing the in trust status of these collections, the Centres updated their lists of designated accessions and added a further 50 000 accessions, bringing the number held in trust in CGIAR genebanks to 500 000

During the year, the Centres continued their individual efforts to undertake any necessary improvements to their facilities and procedures as recommended by the Genebank Review (see p 88) In addition, IFPRI was asked to undertake an economic analysis of *ex situ* conservation, including the development of guidelines and criteria for costing genebank operations, as recommended by the review The study was conducted on wheat and maize in the CIMMYT genebank in cooperation with staff of the Centre's genetic resources and economics programmes The study produced a conceptual basis for considering costing issues from both an economic and policy perspective, and identified the cost elements and data collection procedures that could be applied by other genebanks

Microbial collections

A number of the Centres hold research collections of microbial organisms A major component is nitrogen-fixing organisms associated with the leguminous crop and forage species held in Centre genebanks The need to address the status of these collections was cited in the Genebank Review In response, the SGRP asked ICARDA to inventory the System s collections to provide a basis for assessing their scope, uniqueness and state of preservation and for decisions on their future conservation status ICARDA, IITA, ILRI, IRRI and CIAT are involved in this project Following the compilation of data on the collections at the individual Centres, the scientists responsible for their maintenance gathered at ICARDA to review the management of the collections and set standard descriptors for their documentation The participants established the structure of a database that would accommodate information on all the collections of nitrogen fixing organisms held within the CGIAR By the end of the year, ICARDA specialists had completed the technological development of the database and commenced with the transformation and entry of Centres' data

Office of the Director General

Genetic resources policy

In the years since the Earth Summit, the policy dimensions of genetic resources conservation and use have grown in both complexity and importance Increasingly, technical and policy matters concerning genetic resources are becoming entwined with the result that no technical programme can afford to ignore political realities In 1997, IPGRI appointed a Senior Advisor, under the Honorary Fellows scheme, to provide advice and assistance to the Director General's Office on a broad range of policy and related technical matters The move was based on a recommendation of the CGIAR at International Centres' Week in 1996 and received the full endorsement of IPGRI's External Programme and Management Review

The Senior Advisor serves on the Secretariat to the CGIAR Genetic Resources Policy Committee In 1997, he assisted in the development of draft Ethical Guidelines that were submitted to ICW-97 for consideration by the Group He also drafted the paper submitted by the Committee to the CGIAR External Review

Also in 1997, IPGRI staff developed a series of policy studies at the request of the FAO Commission, which is currently renegotiating the International Undertaking in harmony with the Convention on Biological Diversity One task of the Commission is to develop an agreement on access to genetic resources The agreement could provide the framework for a global exchange system

At the request of the Commission on Genetic Resources for Food and Agriculture, IPGRI contributed to the process of renegotiating the International Undertaking with a series of policy studies developed in collaboration with FAO The studies examine the options related to scope and terms of access that might be considered in the development of a global exchange agreement within the context of the International Undertaking

Collaboration with FAO

Collaboration between FAO and IPGRI is regulated by a Memorandum of Understanding on Programme Cooperation, signed in 1990 between FAO and IBPGR, but remaining valid despite administrative separation from FAO and by two additional MOUs, one concerning the joint publication of the *Plant Genetic Resources Newsletter* and one concerning IPGRI's role in support of the *International Conference and Programme on Plant Genetic Resources* Numerous examples of IPGRI s extensive collaboration with FAO are cited throughout this report

Scientific interactions

FAO and IPGRI continued their joint activities in the production and publication of joint guidelines for the safe movement of germplasm Guidelines developed in 1997 included those on *Acacia Eucalyptus*, pine pome fruits and small grains FAO and IPGRI also continued the production of the joint *Plant Genetic Resources Newsletter* and four is-

sues were produced in 1997 Other areas of cooperation include joint training and the joint organization of a workshop on broadening the genetic base of crops

The Global Plan of Action

In the 1996 Annual Report, a summary report was provided on the outcome of the International Technical Conference on Plant Genetic Resources, held in Leipzig, Germany, June 1996 The resulting Global Plan of Action has been a major subject of interaction between FAO and IPGRI and during 1997 plans were made for the implementation of the GPA This involves various regional workshops held in 1998

The FAO Commission

IPGRI also continued its technical and scientific support to the FAO Commission on Genetic Resources At the specific request of the Commission, during 1997 IPGRI (with the financial support of ACIAR and Japan) prepared an analysis of options regarding scope and access to plant genetic resources which was presented to the Commission in May 1997

Board

IPGRI/INIBAP Trustees Drs Malcolm Hazelman (Samoa, residing in Fiji), Gene Namkoong (USA, residing in Canada) and Theresa Sengooba (Uganda) joined the Board on 1 March 1997, At the same time the Board said farewell to Drs Nazmi Demir and Lauritz Holm-Nielsen Two more Trustees joined the Board on 1 April 1997, namely Drs Ivan Nielsen (Denmark) and Nohra Pombo de Junguito (Colombia) In September 1997, Dr Mohammed Zehni, the FAO Representative on the Board, stepped down because of his retirement from FAO

Dr Wanda Collins remained Board Chair until 31 October 1997, at which time she resigned from the Board to take up an assignment as Deputy Director General with CIP Dr Marcio de Miranda Santos took over as Board Chair on 1 November 1997 He had been Board Vice Chair until 28 February 1997 Professor Gelia Castillo served as Board Vice-Chair from 1 March 1997 through to 31 March 1998

The IPGRI Board and the various Task Groups met in Rome, 24-28 February 1997 and the Board met again in Serdang Malaysia, 1 5 October 1997 The INIBAP Board (which has the same composition as the IPGRI Board) met in Rome on 28 February 1997

IPGRI's Establishment Agreement

During 1997, representatives of the Governments of Algeria and Brazil signed the IPGRI Establishment Agreement bringing the total number of signatory countries to 47 (see map, p 5)

EPMR

The next pages report the results of the CGIAR External Programme and Management Review of IPGRI The Review was carried out in late 1996 and early 1997 by a team comprising Dr C Qualset (Chair), Mr J Griffith, Dr S Jutzi, Dr J Hardon and Dr A Tan The process was concluded at the 1997 Mid Term Meeting The report of the CGIAR s response to EPMR report is also given in the following pages

Summary and recommendations of the External Programme and Management Review of IPGRI

Evolution

IPGRI was established as an independent Institute of the CGIAR in 1991 following its separation from FAO where its predecessor IBPGR also a CGIAR Centre had been administratively and physically located in Rome Italy since its inception in 1974 IPGRI became an independent legal entity in Italy in 1994 IPGRI has located its Headquarters in Rome and manages its regional programmes from offices located in Cali Colombia (for the Americas) in Kuala Lumpur Malaysia (for Asia Pacific and Oceania) in Nairobi Kenya (for Sub Saharan Africa) in Aleppo Syria (for Central and West Asia and North Africa) and in Rome Italy (for Europe)

IPGRI has experienced rapid evolution in programme staff numbers (60 to 137) and in budget (US$10 6 million to US$21 6 million) during the period 1991 to 1997 In 1994 CGIAR placed the International Network for the Improvement of Banana and Plantain under IPGRI s management INIBAP retains its principal management office in Montpellier France moved into a new building in late 1996 and operates regional offices in Costa Rica and the Philippines with new offices to be established in Uganda and Cameroon during 1997

Following CGIAR decisions in May 1994 the System wide Genetic Resources Pro gramme was established with the Inter Centre Working Group on Genetic Resources as Steering Committee and leadership assigned to IPGRI on behalf of all of the CGIAR Centres that maintain genetic resources or work on agro or aquatic biodiversity The SGRP Programme Leader is the Director General of IPGRI and the SGRP Secretariat is located within IPGRI With its rapid growth IPGRI s headquarters facilities are now a limiting factor and the Institute is evaluating alternative office space arrangements in the Rome area

Strategy

IPGRI is truly a global Institute within the CGIAR System IPGRI s mandate is to advance the conservation and use of plant genetic resources for the benefit of present and future generations Its strategy has evolved around its mission addressed through four objectives It is the only Centre in the CGIAR System that is primarily concerned with biological conservation mainly of plant genetic resources for use in agriculture As a research based service organization IPGRI operates in a catalytic mode as a convenor facilitator and collaborator It does not operate research laboratories and with the exception of banana and plantain does not curate genetic resources It is a primary and leading developer of informational materials on genetic resources

The CGIAR with its more recent empha sis on natural resource management for sustainable productivity and by the formation of SGRP has acknowledged a broader scope in biological resource management IPGRI maintains its own programmes on plant genetic resources but in response to this broader CGIAR scope and as convenor of the SGRP has extended its interests to those of other Centres, such as ILRI for domestic farm animals and ICLARM for aquatic genetic resources

IPGRI has recently reorganized its operations into three broad programme areas Plant Genetic Resources CGIAR Genetic Resources Support and INIBAP The Plant Genetic Resources Programme has two Thematic Groups Genetic Re sources Science and Technology and Documentation Information and Training (each headed by a Programme Director) and five Regional Groups (each headed by a Regional Director) INIBAP has Programme Leaders in its four programme areas and Coordinators for each regional office The Institute is supported by an efficient Finance and Administration Unit at Headquarters in Rome that provides administrative budgetary and personnel service support to all Rome based staff and regional offices

IPGRI s strategy for plant genetic resource conservation is motivated by the need to protect genetic resources for future use It directs its attention to national programme needs through its regional groups and to a great extent through a large number of international networks focused on specific crops thematic emphases or regional collaborations It

facilitates research on conservation and use through its technical thematic staff at Headquarters and through its collaborators located in national programmes specialized research organizations and non govern mental organizations

Accomplishments

The Panel has observed that the Institute is shifting more emphasis from conservation for use to conservation and use as illustrated by its leadership roles in networks or activities in banana and plantain improvement (with INIBAP) coconut (with COGENT) and in cacao and other crop plants as discussed in this Report During the past two years it has organized an activity planned for nine countries on local or *in situ* conservation of crops and crop relatives in farmers fields and home gardens It continues its efforts to organize and support the collecting and conservation of seeds and plant materials in those countries where the threats of genetic erosion are great and conservation facilities may be limited The Panel was pleased to note that more than 100 expeditions were conducted during the period of this review and training activities for more than 830 scientists and technicians in genetic resources management were completed thus contributing significantly to human resource capability for conservation

Since 1994 IPGRI has also developed an innovative new activity in forest genetic resources with collaboration established with other CGIAR Centres including ICRAF and CIFOR and several national pro grammes and universities This work relates to conservation monitoring and restoration of useful biodiversity in forest ecosystems The Panel is enthusiastic about this activity as a strong supporting component of the CGIAR effort on natural resources management

In its coordinating role for the CGIAR and its partners IPGRI has taken initiatives to address the interpretation of and research on policies related to conserva tion ownership access sharing health and quarantine and uses in plant breeding and biotechnology of plant genetic resources This follows a significant role played by IPGRI in the 1996 Leipzig Conference on Plant Genetic Resources for Food and Agriculture which produced a Global Plan of Action for Sustainable Use of Plant Genetic Resources for Food and Agriculture This action plan is being used by IPGRI as it aligns its work programme to its strategy and long term plans The Panel was very pleased with this activity and urges IPGRI to continue to contribute in this arena especially in partnership with FAO with whom it has forged excellent relation ships Also for the greater needs of the CGIAR the System wide Genetic Re sources Programme is now beginning to emerge as a truly System wide effort through IPGRI s leadership and coordination The Panel recognizes this effort as an opportunity for the CGIAR to assume a substantially greater presence in global biological resources management for increasing and sustaining productivity and urges greater System support for the activities of the ICWG GR

The Panel found IPGRI to be a vital dynamic and growing Institute that is well managed with highly qualified and dedicated scientific and support staff The Institute is commended for the development of its operational policies and procedures as it emerged as an indepen dent institute The Panel was extremely pleased about the productive partnership between IPGRI and FAO in many activi ties since this complementarity is ex tremely important for protection and use of global genetic resources of plants As FAO addresses its global strategies for forestry and for domestic animal diversity and conservation IPGRI and SGRP can play an important role in the implementation of those strategies

Future of IPGRI

The Panel is enthusiastic about IPGRI s programme directions and emphases as noted above It is very pleased with the breadth and quality of INIBAP s work and that its integration into IPGRI had been accomplished smoothly The Panel con cluded that INIBAP was good for IPGRI and vice versa and therefore strongly recom mended that the formal integration process now be concluded

The Panel has made a series of recommendations that it believes deserves consideration as IPGRI continues to evolve These recommendations concern (1) strengthening the linkages between strategic programme planning and the

resulting operational aspects, especially for the rapidly expanding regional group activities (2) cautioning IPGRI in assuming new leadership roles in networks with respect to resources required (3) strengthening collaborative linkages with CGIAR Centres especially with IITA in relation to INIBAP (4) building capacity for management of technical genetic information and for training of genetic resources specialists and (5) continuing to provide strong leadership in the System wide genetic resources efforts

Finally IPGRI must be mindful of its mission in protecting global genetic resources indefinitely this can only be done through strong partnerships with the holders of those valuable resources Its programmes must be focused on and reflective of this guiding principle for IPGRI s legacy will be the genetic resources that it helps to conserve for humankind

List of recommendations

CHAPTER 3 THEMATIC ACTIVITIES

1 The Panel recommends that GRST undertake a systematic programme of appropriate diversity surveys in crops or groups of crops by country and region as a baseline activity

2 The Panel recommends that projects directed at developing and testing method ologies in genetic resources should be more than case studies and should be linked directly to priority problems of actual conservation management in national and/ or international programmes

3 The Panel recommends that IPGRI strengthen its documentation unit and establish with SGRP a Documentation Advisory/Support Group comprised of documentation specialists from various advanced institutions The terms of reference for this Group should be to provide programmatic guidance to IPGRI advise on standardization of codes formats and data sets facilitate documentation in support of surveys GIS and farmers data assist in facilitating training opportunities and incorporate the latest developments in information technology in the advice given

4 The Panel recommends the appointment of a training specialist officer in DIT responsible for all aspects of PGR training

CHAPTER 4 REGIONAL ACTIVITIES AND NETWORKS

5 The Panel recommends that IPGRI, and hence the CGIAR should reconsider its facilitation role for COGENT unless greater emphasis is placed upon improvement of coconut productivity for smallholders

6 The Panel recommends that IPGRI define more precisely the role and responsibilities of the Regional Groups in their interaction with the headquarters based Thematic Groups in order to contribute to more efficient and effective operation of the Regional Groups and to more closely integrate Rome based and regional activities

7 The Panel recommends that IPGRI shift its strategic priorities and support for PGR conservation and use towards Objective 2 (regional collaboration) while its Objective 1 (national programme support) would also be achieved through this regional dimensions

8 The Panel recommends that the draft regional strategies be further clarified so that IPGRI s priorities are clearly articulated such that when faced with an opportunity to work in a region the proposal can be measured against the agreed strategy and ranked in order of importance and its claim on re sources

CHAPTER 5 INIBAP PGR

9 The Panel recommends that

1 INIBAP be fully integrated into IPGRI as an identifiable Programme

2 The INIBAP Support Group endorse this recommendation and exercise its right to terminate the MOU between the Support Group INIBAP and IPGRI [dated 22 May 1994 under the provisions of Article VII (Final Provisions) Section 2] forthwith

3 The Support Group remain as an advisory Group to the INIBAP programme within IPGRI and

4 IPGRI should seek to conclude any necessary agreements with the Govern ment of France to protect the privileges and immunities of the institution and its staff

10 The Panel recommends that INIBAP/ IPGRI and IITA carry out a joint strategic planning activity at the earliest possible date for defining the IITA INIBAP input into the *Musa* Improvement Programme and to agree upon a revised MOU

CHAPTER 6 IPGRI's ROLE IN GENETIC RESOURCES IN THE CGIAR

11 The Panel recommends that IPGRI engage with the ICWG GR in exploring measures to ensure that Centre representa tives have authority to speak for their institute on strategic decisions and joint plans of action and further to appoint one or more external advisers to assist it to focus on long term System wide programmes and strategies

12 The Panel recommends that IPGRI initiate a consultation process among the Boards and Directors General of the CGIAR Centres with the objective of reassessing the System s genetic resources conservation responsibilities in the post UNCED environ ment and to readdress structural options for better programmatic integration of the entire CGIAR efforts

CHAPTER 7 GOVERNANCE

13 With respect to the Board of Trustees Panel recommends that the Executive Committee consist of five positions the Board Chairperson the Director General (*ex-officio)* two members who have been tasked with multi year leadership responsibility for the Audit & Operations and Programme oversight functions respectively and the FAO Repre sentative (as required by the terms of the MOU on Programme Cooperation with FAO)

14 The Panel recommends that an *ad hoc* Committee of Board members and staff be formed to translate the broad statement of the *Diversity for Development* document and other more recent draft strategy papers into a set of operational statements that will guide the resource allocation and priority setting decisions that must underpin the implementa tion of the MTP (1998 2000) and PPRC programme deliberations The work of the *ad hoc* Committee could be completed by end 1997 and its report presented by Manage ment to the full Board for its review and approval

CHAPTER 8 - PROGRAMME ORGANIZATION AND MANAGEMENT

15 The Panel recommends that Manage ment strengthen its programme planning and review process to articulate further the linkages between the institutional thematic and regional strategy documents and the programme priorities that guide the implementation of the MTP (1998 2000) and the associated budgetary allocation processes

CHAPTER 10 INSTITUTIONAL RELATIONSHIPS

16 The Panel recommends that IPGRI develop a mode of subcontracting a part of its research programme through the issuance of calls for proposals for designated research topics and after a peer review select the most suitable proposals for funding

Commentary by the CGIAR on IPGRI's EPMR report (Cairo, 26-30 May 1997)

The external review of IPGRI was discussed in Parallel Session II under the chairmanship of Mr William Dar (the Philippines) Review Panel Chair Calvin Qualset presented the findings and recommendations of the panel The EPMR reaffirmed IPGRI s role in genetic resources in the CGIAR Its assessment of the achievements made by the centre during the review period was very positive conclud ing that IPGRI had been well led in its work The panel made a number of recommenda-tions for consideration by the board and management

IPGRI Board Chair Wanda Collins and IPGRI Director General Geoffrey Hawtin expressed appreciation to the panel for its recommendations and indicated the actions that are being planned or which have already been undertaken as part of the centre s response to the recommendations TAC member Ralph Riley presented TAC s commentary on the panel s report highlight ing TAC s specific observations on the key issues covered

Members were pleased with the findings on the state of affairs at IPGRI and

commended the centre for the good progress it has made during the review period A number of members commented on issues raised including the following

- IPGRI s important role as a catalyst and facilitator was fully endorsed however the centre should complement its outsourced research with in house research
- IPGRI should develop a capacity for genetic resources policy research and should develop legal expertise to tackle complex genetic resources policy issues
- Given the centre s mandate which covers a potentially wide spectrum of activities its rapid growth in recent years and the further growth anticipated in the medium-term IPGRI should pay careful attention to maintaining its focus on priority areas of work

The EPMR reaffirmed the benefits of integrating INIBAP with IPGRI Members endorsed the full integration of the INIBAP program and the continuation of the INIBAP support group as an advisory group The session chair concluded by pointing out the need to further discuss the issues raised

Conclusion

Following its review of the EPMR report and the response from the board and management of the centre the Group endorsed the recommendations of IPGRI s EPMR and those in the TAC commentary and expressed confidence in the capacity of the centre to continue playing an important role in the global effort to conserve and utilize plant genetic resources The Group welcomed the follow up actions planned by IPGRI s board and management on the issues raised during the review

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Joined during 1997
Left during 1997
Moved during 1997

Financial report

Audited financial statements for the year ended 31 December 1997 providing further information are available from the Office of the Director General IPGRI

Statement of grant revenue

For the year ended 31 December 1997, in US Dollars ('000)

Research Agenda Programme – Unrestricted	
Australia	449
Austria	50
Belgium	223
Canada	522
China	90
Denmark	1003
Brazil	*
European Union	1400
France	217
Germany	286
India	75
Italy	622
Japan	1527
Mexico	30
Netherlands	1033
Norway	336
Pakistan	100
Republic of Korea	50
South Africa	20
Spain	50
Sweden	457
Switzerland	641
Thailand	50
UK	798
USA	600
World Bank	2000
Subtotal	**12 629**

1997 contribution expected in 1998

Research Agenda Programme – Restricted	
Australia	73
ADB	28
Belgium	1695
CFC	159
CIFOR	6
CIRAD	99
CTA	30
Denmark	134
European Union	54
FAO	57
Finland	104
France	317
Germany	142
ICARDA	20
IDB	427
IDRC	195
IFAD	61
IRRI	29
Italy	353
Japan	239
Luxembourg	66
Netherland	185
Norway	81
Philippines	20
Spain	51
Sweden	91
Switzerland	627
TBRI	7
UK	146
UNDP	427
UNEP	60
USA	25
World Bank	72
Subtotal	**6080**

Non-Agenda Programme	
European countries	411
European countries	230
Italy	155
NGB	6
PARC of the CGIAR	27
UK	38
USA	12
Subtotal	**879**

Total grants 19588

Schedule of Restricted Research Agenda and Non-Agenda Projects

For the year ended 31 December 1997, in US Dollars ('000)

Restricted Research Agenda

Donor Grant Commitments	Income
Australia	
Viroid like Sequences of Coconut Workshop	19
Study for the FAO Commission on Genetic Resources	15
IMTP Trial Sites	19
Musalogue	20
	73
Asian Development Bank	
Coconut Genetic Resources Network	28
Belgium	
INIBAP Transit Centre	227
Collaborative *Musa* Research	238
Gembloux *Musa* Virus Diseases	181
Musa Coordination in Africa	246
Studies on Breeding Systems (*Phaseolus lunatus*)	140
Study of Diversity (*Colletotrichum* and *Stylosanthes*) Phase II	663
	1695
CFC	
Coconut Germplasm Utilization and Conservation	94
Cocoa Germplasm Utilization and Conservation	65
	159
CIFOR	
Project on Forest Genetic Resources	6
CIRAD	
Musa Nematology Project	34
Musa Biographic Information Processing	33
Musa Publications	32
	99
CTA	
Information Services/Publications	30
Denmark	
Effective Conservation and Use of Intermediate and Recalcitrant Tropical Forest Tree Seed	9
Danish Junior Professional Officer Colombia	74
Danish Junior Professional Officer Benin	51
	134
EU/STD3	
Network Collaboration	5
European Union	
Evaluation of Cocoa Research Unit Project	4
Re introduction of Germplasm in Somalia	45
	49
FAO	
Guidelines for the Safe Movement of Eucalyptus Germplasm	2
Guidelines for the Safe Movement of Small Grain Germplasm	3
Guidelines for the Safe Movement of Pome Fruit Germplasm	11
International Conference and Programme for PGR	13
Plant Genetic Resources Newsletter	28
	57
Finland	
Associate Expert Malaysia	104

Donor Grant Commitments	Income
France	
Coconut Genetic Resources Network	70
Associate Expert LACNET Coordination Costa Rica	83
VIC MPL Virus Indexing Centre	42
Musa Germplasm Information System	5
INIBAP West Africa Regional Coordinator	117
	317
Germany	
BMZ/GTZ Wild Forages Project	31
BMZ/GTZ Neglected Crops Project	101
GTZ Towards a *Sui Generis* System	10
	142
ICARDA	
Support to WANANET	20
IDB	
LAC *Musa* Project	331
Tropical Fruit Project	96
	427
IDRC	
Community Level Management of PGR	7
In situ Conservation of Agricultural Biodiversity	86
Musa Germplasm Information System	100
LAC *Musa* Small Grants Phase II	2
	195
IFAD	
Sustainable Use of Coconut Genetic Resources in the Asia Pacific Region	46
In situ Conservation and Utilization of PGR in Desert prone Areas of Africa	15
	61
IRRI	
Germplasm Collecting in Uganda and Kenya	29
Italy	
APO National Programmes	3
Image Processing	4
Genetic Resources of Underutilized Mediterranean Species Conservation and Use	191
Individual Training in Plant Genetic Resources	141
Maccarese Science Park	14
	353
Japan	
Germplasm Evaluation	2
Germplasm Collecting in Vietnam	4
Collecting in CIS and Vietnam	6
Bamboo and Rattan Project	189
Genetic Resources Policy	38
	239
Luxembourg	
Genetic Resources of Broadleaved Forest Tree Species in Southeastern Europe	66

Biodiversity of Neglected Leafy Green Vegetable Crops	40
In situ Conservation in Burkina Faso and Nepal	145
	185
Norway	
Genetic Resources Policy	81
Philippines	
Philippines *Musa* Collection	20
Spain	
Training Programme	28
Canary Island Project (*Musa*)	23
	51
Sweden	
Genetic Resources Policy	12
Workshop on Ethics and Equity in Conservation and Use of Genetic Resources for Sustainable Food Security	17
Eastern Africa Regional Meeting	62
	91
Switzerland	
Genetic Resources Policy	31
In situ Conservation of Agricultural Biodiversity	368
Workshop on Ethics and Equity in Conservation and Use of Genetic Resources for Sustainable Food Security	110
Associate Experts Malaysia	
	118
	627

Donor & Programme/Project	Income
TBRI	
RISBAP	7
UNDP	
IMTP Phase II	427
UNEP	
Monitoring Genetic Diversity	60
UK/Darwin Initiative	
Darwin Initiative South Africa	18
Darwin Initiative Benin	48
	66
UK/DFID	
Coconut Genetic Resources Network	13
Holdback Project R6412 (*Cocos nucifera*)	32
Holdback Project R6110H (Cryopreservation Techniques for Plant Species in India)	7
South China Collecting Mission	22
Asian Collection Rescue	6
	80
USA	
Genetic Resources Policy	25
World Bank	
CGIAR Genetic Resources Policy	72
Total Restricted Research Agenda Grants	**6080**

Non-Agenda Projects

In addition to funding for the Research Agenda Programme (previously termed core), a number of Non Agenda activities within the IPGRI Project Set are supported through special project funding (previously termed complementary) This section lists in alphabetical order by donor the Non Agenda Programme activities for which funds were received and used in 1997

Donor & Programme/Project	Income
European Countries	
ECP/GR Phase V	411
EUFORGEN	230
	641
Italy	
INTAGRES	155
Nordic Gene Bank	
Darwin Initiative Training Course	6
Public Awareness and Resources Committee of the CGIAR	
PARC	27

Donor & Programme/Project	Income
UK/Darwin Initiative	
Darwin Initiative Training Course	38
USA	
Eastern Europe Initiative/Vavilov Project	12
Total Non Agenda Grants	**879**

GRAND TOTAL	**6959**

Staff publications and presentations

Publications

Arnaud E and J P Horry (eds) 1997 *Musa*logue a Catalogue of *Musa* Germplasm Papua New Guinea collecting missions 1988 1989 INIBAP Montpellier France

Arora R K 1997 Biodiversity Convention Global Plan of Action and the National Programmes National Workshop on Plant Genetic Resources 26 29 August 1997 Bangladesh Agricultural Research Council (BARC) Dhaka Bangladesh P 31 (abstract)

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Staff participation in the international peer review process

Marlene Diekmann
Reviewer for *Seed Science and Technology*

Florent Engelmann
Editorial Board member of *Cryo Letters* referee for *Plant Cell Tissue and Organ Culture Plant Science Annals of Botany* and *Seed Science and Technology*

Jan Engels
Editorial Consultant CAB International Reviewer for *Genetic Resources and Crop Evolution*

Emile Frison
Reviewer for *Genetic Resources and Crop Evolution*

Thomas Gass
International Correspondent to the Scientific Board of the *Journal of Agronomy and Crop Sciences*

Geoffrey Hawtin
Corresponding Member of the French Academy of Agricultural Science

Toby Hodgkin
Editorial Board member of *Genetic Resources and Crop Evolution*

Stefano Padulosi
Reviewer for *Genetic Resources and Crop Evolution*

Jozef Turok
Reviewer for *Forest Genetics*

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Highlights of 1997

Sub-Saharan Africa

The SSA Group helped catalyze the development of national programmes in eight countries in the region stimulated the initiation of networks in West/Central and East Africa and contributed to increasing the research capacity in several countries Almost 80 national programme scientists were trained and the programme worked with several African academic institutions to help strengthen their capacity to conduct courses on plant genetic resources Staff worked to raise the profile of genetic resources activities within the political systems of countries A media workshop on managing genetic resources made significant progress in raising awareness Reintroducing 165 accessions of traditional maize and sorghum varieties into Somalia through an EU funded project was well received by the farmers In collaboration with the African Centre for Technological Studies, SSA staff compiled a profile of policy legislative and institutional measures in conserving and using plant genetic resources in Africa

Central & West Asia and North Africa

During 1997 the CWANA regional group was at the hub of a number of key initiatives aimed at achieving the efficient conservation and sustainable use of plant genetic resources in the region The Group s responsibilities were extended to cover Central Asia (marked by the re naming of the Group) a new Regional Director was appointed and the Group reorganized Several fundamental activities started in Central Asia a Central Asia Network on Plant Genetic Resources was created and a programme of training activities began The West Asia and North Africa Network made significant progress A major conference yielded new insights into the understanding of the origin diversity and evolution of crops in the Near East Postgraduates from national programmes in the region supervised by CWANA staff made important contributions to the conservation of *Triticum* and *Prunus* The Regional Office published a number of documents on genetic resources in the region that raised several major issues increasing the participation of key stakeholders such as farmer communities and the private sector, integrating plant genetic resources into a holistic ecosystem and species approach and enhancing intra regional collaboration in scientific, technical and policy matters

Asia, the Pacific and Oceania

In January, the APO Regional Office began operation in Serdang, Malaysia Close support from the new hosts was reinforced with the inauguration of the office by the Minister of Agriculture followed by an Inauguration Workshop when common priorities were identified A joint Indian Council for Agricultural Research–IPGRI workplan was reviewed to the satisfaction of both partners A CGIAR–China meeting developed a common set of priorities to help China sustainably meet its food production needs Priorities included *in situ* conservation and evaluation of germplasm for marginal conditions An Internally Commissioned External Review was very positive about the scope and quality of IPGRI s activities in the region Access and benefit sharing issues continued to be of high concern to our partners with IPGRI staff addressing these issues with partners at meetings in the Pacific

Southeast Asia and India A new initiative was started during the year to develop PGR public awareness kits for school children in Malaysia

Americas

A new Regional Director was appointed and project activities to strengthen the networks consolidated and increased the Group s involvement and expertise in neotropical fruit research The Andean Network on Plant Genetic Resources and the Mesoamerican Network on Plant Genetic Resources successfully completed a project on native fruits The European Union funded project on pineapple conducted within the Amazonian Plant Genetic Resources Network initiated activities A geographical information system model to predict the distribution of genetic diversity of cultivated species and indicate areas at risk of genetic erosion was developed with a number of partners A survey was conducted of the documentation of the genebanks participating in the Andean Roots and Tubers Programme In collaboration with the United States Department of Agriculture, the new pcGRIN germplasm documentation software was evaluated for use in developing country genebanks Work continued on five training modules in Spanish, two of which were tested by trainers trained during 1996 Over 1700 records of the Americas Group library were made available through the on line catalogue of the Centro Internacional de Agricultura Tropical

Europe

Support to develop and strengthen national programmes remained an important activity in the region To assist in developing sustainable plant genetic resources programmes in eastern Europe, staff of the Regional Office actively participated in a number of workshops to affirm national coordination structures and enable them to take more concrete action in formulating needs opportunities and national plans Emphasis also moved towards developing the forest genetic resources sector A new Network on Social Broadleaved trees was established to facilitate a specific gene conservation approach for temperate oak and beech species The European Information Platform for Crop Genetic Resources was developed on the Internet to serve the information needs of the European National Programmes The European Forest Genetic Resources Programme expanded to include 28 countries The importance of underutilized Mediterranean species was emphasized by the release of several publications

Genetic Resources Science and Technology

A new list of multicrop passport descriptors was issued in collaboration with FAO and subsequently adopted by several European crop network databases Crop descriptor lists were published for grape tea and yam The planning meeting of the global *in situ* project brought together project partners from the nine countries involved as well as technical experts and donors The meeting identified the type of information required for the research project which includes a matrix of environmental socioeconomic, ethnobotanic, agromorphological and genetic data Project sites and priority species were identified in Burkina Faso, Mexico Morocco and Nepal Site selection species prioritization and project team development began in Vietnam Hungary, Ethiopia and Peru A project focusing on the link between conservation and use of genetic resources was initiated An institutional workshop developed a strategy for ensuring complementarity between conservation methods and use and identified key areas for future work to advance this approach as a practical means for promoting the cost effectiveness, safety and sustainability of conservation efforts 13 monographs were published in the series on neglected and underutilized species A collaborative project to develop a core collection of sesame in China was completed A technical bulletin outlining the various molecular techniques which can be used for assessing genetic diversity was published and distributed A global Cocoa Germplasm Utilization and Conservation project was signed and activities initiated in several countries Under the project on the human aspects of genetic resources conservation and use, ethnobotanical research including molecular and isozyme studies of major taro morphotypes in Yunnan China confirmed that farmers manage and select considerable genetic diversity Cultivars at risk of genetic erosion were also identified Research in Africa on local leafy vegetables which are primarily grown and sold by women, pointed to inadequacies in seed supply and processing systems as major constraints in the use and competitiveness of the species studied Within these species local cultivars with good potential for increased production were identified A pilot survey of plant genetic resources in Vietnamese home gardens was completed A legal expert joined during the year to oversee the Institute s work in policy and legal aspects of plant genetic resources A paper describing possible elements of a *sui generis* system of intellectual property to cover plant varieties was published Work began in collaboration with International Development Research Centre in Canada

to relaunch the Crucible Group which aims to assist countries in understanding the nature, relationship and implications of their commitments to various international policy fora In China, a prototype *Indigenous Knowledge Journal* based on the use of multimedia tools was tested as a mechanism for farmers and scientists to document and share their respective knowledge The first publication in a series on Gender and Genetic Resources Management was produced with the Food and Agriculture Organization

Documentation, Information and Training

DIT staff visited the CWANA office for the first of a series of meetings to tailor the IPGRI Information Strategy to regional needs Visits were also made to INIBAP and several regional offices to train staff in publications procedures and develop public awareness strategies IPGRI's genetic resources databases were updated and used to satisfy enquiries from partners A new version of the Genebank Management System software was released Descriptor lists for grapevine yam and tea in English Spanish and French and for pistachio in English and French are available in print and on the Internet The IPGRI Library satisfied 1049 document requests Current awareness services were provided through the Library Bulletin *Plant Genetic Resources Abstracts* and the Internet IPGRI produced almost 150 publications, including titles in Arabic, Chinese, French and Spanish as well as English Four publications won awards from the Agricultural Communicators in Education IPGRI collaborated in organizing 21 short courses and training workshops 325 scientists from 93 countries were trained *Geneflow* was published in English, French and Chinese Public awareness materials were produced for several international events including the CGIAR Mid Term Meeting in Cairo, The United Nations General Assembly Special Session on Sustainable Development and the IX World Forestry Congress in Turkey A trailer was developed to promote a four part documentary film series A review of IPGRI s activities threw light on their positive impact and also identified risk factors Two in depth case studies are continuing on the impact of Crop Descriptors and the International *Musa* Testing Programme A series of staff development workshops were organized on Logical Framework Analysis

International Network for the Improvement of Banana and Plantain

In March, the Global Programme for *Musa* Improvement (PRO*MUSA*) was launched This programme was a joint initiative of INIBAP and the World Bank and aims to bring together all the major players in *Musa* improvement worldwide in order to identify and address the main research needs at the global level INIBAP provides the Executive Secretariat for PRO*MUSA* At the regional level INIBAP recruited two Regional Coordinators for Africa and established Regional Offices in Uganda and Cameroon The Coordinators in both subregions are already playing a key role in activating banana research networks and mobilizing resources for banana research in the region as a whole INIBAP s support for strategic research has resulted in further progress towards the production of transgenic bananas Transgenic plants containing introduced genes coding for anti fungal proteins have been produced and are expressing the anti fungal gene The *Musa* Germplasm Information System (MGIS) software has been completed and a number of genebank curators trained in its use The MGIS provides curators with an important tool for germplasm management It will facilitate the rationalization of collections and allow for increased information exchange between interested parties

CGIAR System-wide Genetic Resources Programme

The SGRP provided inputs to the work of global biodiversity and genetic resources programmes and participated in meetings of the FAO and CBD Publications included the 1996 SGRP Annual Report and the Annex to the Report of the External Review of CGIAR genebank operations conducted in 1995 Geneflow included a special section on the SGRP and its activities, and information on Centre activities in Asia and Africa were distributed through Wren Agtax radio and press media services The System wide Information Network for Genetic Resources (SINGER) became fully operational on the Internet and a CD ROM version was produced SINGER enables data on the genetic resources collections held in CGIAR Centres to be accessed and searched collectively By the end of 1997 it held over 500 000 records The development of the International Crop Information System was extended to major crops within the CGIAR mandate to allow breeders to gain access to information on the pedigrees and performance of germplasm lines integrated from diverse sources A database was developed to document the research collections of nitrogen fixing organisms held at different CGIAR Centres

اتفاقات دولية في الصين تم اختيار دورية علمية عن المعرفة المحلية مستخدما" أساليب تقنية حديثة للاعلام كأليه لتوثيق وتبادل المعلومات بين المزارعين والعلماء تم اصدار اول طبعة من سلسلة النوع (الجنس) بالاشتراك مع الفاو

التوثيق والمعلومات والتدريب

قام موظفو المجموعة بزيارة منطقة CWANA بواحدة من اول سلسلة من الزيارات سيقوم بها المجموعة لتعديل استراتيجية المعهد ليكون ملائمة لظروف واحتياجات كل منطقة تم القيام بزيارات ل INIBAP وعدة مكاتب اقليمية اخرى لتدريب موظفي هذه المكاتب على أساليب اصدار المطبوعات وكيفية التوصل لأستراتيجيات الوعي العام تم تحديث قواعد البيانات للموارد الوراثية في المعهد واستخدمت لاستيفاء طلبات المعلومات من شركاء المعهد يتم الآن تطوير تطبيقات لادخال قواعد بيانات اخرى في الشبكة العالمية INTERNET تم توزيع نسخة جديدة من نظام الزمجة لادارة بنوك الجينات تم نشر واصدار قوائم المواصفات لمحاصيل الشاي وبطاطا اليام والعنب والفستق باللغات الفرنسية والاسبانية و الانكليزية وهي ايضا" متاحة عن طريق شبكة INTERNET أستوفت المكتبة حوالي ٤٩ ١ طلب للحصول على وثائق ومعلومات تحتية تقدم خدمات الوعي من خلال النشرة المكتبية Abstract Plant Genetic Resources وأيضا" من خلال INTERNET أصدر IPGRI حوالي مائة وخمسون مطبوعة بما فيها مطبوعات باللغة العربية والصينية والفرنسية والاسبانية بالاضافة الى الانكليزية ساهم المعهد في تدريس واحدا وعشرون دورةتدريبية قصيرة تدرب ٣٢٥ عالما" من ٩٣ دولة من خلال هذا البرنامج تم نشر مجلة Geneflow بالانكليزية والفرنسية والصينية اصدرت وثائق التوعية العامة لتناسب العديد من المؤتمرات الدولية الهامة ومنها المؤتمر العالمي التاسع للغابات في تركيا، الندوة الخاصة للجمعية العامة للامم المتحدة للتنمية المستدامة والاجتماع النصف سنوي لل CGIAR تم تطوير فيلم للتوعية لاستكمال سلسلة من أربعة أفلام وثائقية اقرت علمية المراجعة الخارجية لعمل المجموعة عن الاثار الاتجاهية لعمل المجموعة وكذا التعرف على عوامل المخاطرة استمرت دراسات تفصيلية في مجال اثر مواصفات المحاصيل وبرنامج اختبار MUSA تم عقد سلسلة من ورشات عمل للتحليل المتطفي للتطعيم لتطوير أداء الموظفين

INIBAP

تم البدء في مشروع تحسين الموز PROMUSA اعتبارا من آذار (مارس)، وهو برنامج مشترك مع البنك الدولي ويهدف الى جمع جهود كل العاملين الرئيسين في تحسين الوراثي لتحديد الحاجات البحثية الرئيسية على المستوى العالمي أما على المستوى الاقليمي فقد تم تعيين منسقين اقليميين لأفريقيا وتاسيس مكاتب اقليمية في الكاميرون واوغندا مهمتها تنسيق بحوث السكان الاقليمية للموز وحشد مصادر الدعم لهذه البحوث ادى دعم برنامج INIBAP للبحوث الإستراتيجية الى تقدم متطرد بعرض انتاج موز Transgenic فقد تم انتاج نباتات Transgenic تحتوي على جينات لبروتينات مضادة للفطريات وبذلك انتج أول محصول موز تجاري مدخلة فعالة تم استكمال برامج نظام معلومات الموز وتم تدريب عدد من مسئولي حفظ الموز في البرامج الوطنية على كيفية استخدامه سوف تسهل هذا من تبادل المعلومات بين الأطراف المشاركة في البحوث والتحسين كذلك لترشيد المجموعات المحفوظة

برنامج المجموعة الاستشارية للاصول الوراثية SGRP

شارك SGRP في عدة اجتماعات دولية وساهم في عمل النوع النولوجي الدولي من خلال العام استملت المطبوعات على التقرير السنوي والملحق لتقرير المراجعة الخارجي في عام ١٩٩٥ كما اجتيت مجلة Geneflow على باب خاص عن البرنامج ونشاطاته الخاصة وتم توزيع معلومات عن انشطة المراكز من آسيا وأفريقيا عن طريق Wren Agfax radio and press media services تم وضع برنامج SINGER على شبكة الانترنت ووزعت نسخ منه في شكل CD-ROM ونسخ SINGER للمستخدم الحصول على بيانات عن مجموعات الأصول الوراثية الموجودة بالمراكز الدولية وتحتوي هذه البيانات على معلومات عن اكثر من نصف مليون عينة تستمر تعقيد المرحلة الثانية من SINGER في خلال ١٩٩٨ حسب خطة عمل تم وضعها في عام ١٩٩٧ تم تطوير نظام ISISللمعلومات لتغطية كل المحاصيل الرئيسية لل CGIAR وتسمح هذا النظام للمرئيس للحصول على معلومات عن تسمية ومواصفات السلالات الوراثية المختلفة تم وضع قواعد معلومات لتوثيق المجموعات البحثية للكائنات المتسببة للسرطان (آروب) والموجودة في المراكز الدولية

دراسه التوصل الى نموذج استخدام نظـــام GIS فى السو بالتوزيع الوراثي للانواع المزروعه وتحديد مناطق الإحراف الوراثى فى اطار تعاون مشترك بين CIAT USDA وعده برامج وطنيه تم اجراء دراسه تعريفيه للمعلومات والبيانات المتوفره بشوك الحبات المشاهمه فى برامج الجذور والدرنات فى الأندين بالإشتراك مـــع USDA ، تم تقسيم برنامج التوثيق الجديد pcGRIN حتى يمكن اســتخدامه فى شــوك الحبـــات للـــدول النامية واستمر العمل فى وضع ٥ وثـــائق للتدريـــب باللغه الإسبانيه تم اتاحه ما يزيد عن ١٧ مصـــدر للحبوب المتسوره الخاصه بمكتبه المكتـــب الاقليمـــى للتاجين من البرامج الوطنيه عن طريق قاعده بيانـــات CIAT تم تعيين مديرا" اقليميا" جديدا"

أوروبا

تصدر أنشطه المنطقه هذا العام بدعم وتقويه الـــبرامج الوطنيه تعرض تنشيط وتنميه البرامج الوطنيه فى أوروبـــا الشرقيه شارك موظفو المكتب فى أعمال عده ورشات عمل تعرض تأكيد الدور المحورى لمؤسسات التنســـيق الوطنيه حتى تمكنها أداء دورهـــا فى تحديـــد ماهيـــه الاحتياجات الفنيه وفرص العمل الاقليمـــي والـــدولى والمشاركه الفعليه فى التوصل الى خطط العمل الوطنيـــه تحول التركيز فى العمل الاقليمى الى تطوير التنسيق الخاص بالموارد الوراثيه الحراجيه (للغابات) تم انشاء شبكه اقليميه خاصه بالأنواع الحراجيه ذات الأوراق العريضـــه لتسهيل استراتيجيه وراثيه محدده لحفظ انـــواع أشـــجار البلوط والزان

تم انشاء المجموعه الأوربيه للمعلومات الخاص بـــالموارد الوراثيه النباتيه على الشبكه العالميه Internet لاستيفاء حاجات البرامج الوطنيه الأوروبيه للمعلومات أمتدت دائره عمل البرنامج الأوروبى للمصادر الوراثيه لأنـــواع الغابات لتشمل على ٢٨ دوله تم التركيز على أهميـــه الأنواع النباتيه بالبحر الأبيض المتوسط المهمله وقليلـــه الاستخدام عن طريق عده مطبوعات علميه حديثه

مجموعه علم ونبات المصادر الوراثيه

تم اصدار قائمه جديده لمواصفات متعـــدده المحـــاصيل بالاشتراك مع الفاو وقد تم استخدامها بواسطه عـــده شبكات أوربيه للمحاصيل وقواعد البيانات تم اصـــدار قوائم مواصفات لمحاصيل القمـــح والكـــرم والشـــاى وبطاطا النام استمل المؤتمر التخطيطي لمشروع الحفـــظ بالموقع In situ العالمى على الخبراء القمـــح وممثلـــى الدول والبرامج المانحه جنبا" الى جنب مـــع الشـــركاء الوطنيين للمشروع من الدول التســـع التـــى تضمـــها المشروع وقد تعرف المؤتمر على نوعيه المعلومات المطلوبه لهذا المشروع البحثى وهـــذه تشـــمل علـــى جـــدول المصفوفات للنباتات الوراثيـــه والبيئـــه والإقتصاديـــه والإجتماعيه والعرفيه تم تحديد اولويات النوعيه ومواقـــع المشروع فى دول بوركينا فاسو، المكســـيك والمغـــرب ونيبال والتروع فى انتخاب الأنواع واختيـــار المواقـــع وتشكيل فرق العمل بالمشروع فى دول قيتـــام والمجـــر والجنيه والتروع، كما تم البدء فى مشروع من شانه تدعيم الربط بين الحفظ والاستخدام للمصادر الوراثيه النباتيـــه فقد عقدت ورشه عمل على مستوى المعهد للتوصـــل الى استراتيجيه متكامله للحفظ والاستخدام وحددت أوجـــه رئيسيه للعمل فى المستقبل تعرض دفع هـــذه الطريقـــه كأسلوب عملي لتحقيق أغراض استدامه مجهودات الحفظ والإستخدام ، الأمان وتفعيل النفقات

تم اصدار ثلاثه عشر دراسه نوعيه للمحاصيل فى سلســـله الإصدارات عن الأنواع المهمله والقليله الاســـتخدام وتم استكمال مشروع تعاونى لتطويـــر المجموعـــه المركزيـــه لمحصول السمسم فى الصين وتم اصادر وتوزيع نشره فنيه عن نبات الوراثيه الخرشيه التى يمكن استخدامها لتقســـيم النوع توراثي تم التوقيع رسميا على المشروع العـــالمي لاستخدام وحفظ الكاكاو ويحقق تقـــدم ملمـــوس فى المشروع الخاص بالنواحى الانسانيه لحفـــظ واســـتخدام الموارد الوراثيه اشـــتمل علـــى دراســـات الاثتمـــات والخريطه الوراثيه للانماط المحليه لمحصول الفلفلس الـــتى انتقى عليها المزارعون فى مقاطعه بوتان بـــالصين وقـــد أكدت هذه الدراسات على ان هذه الأنماط المحليه تشـــمل تنوع وراثى على درجه عاليه وقد تم ايضا التعرف على الأصناف المحليه المعرضه بدرجه كبيره للتعريه الوراثيـــه توصل مشروع اخر فى افريقيا الى نتائج هامه منـــها أن الأصناف المحليه للخضراوات الورقيه تزرع وتباع اساسا بواسطه النساء وأشار البحث ايضا' الى أن عدم كفايـــه نظم توفير واعداد التعاون من المعوقات الرئيسيه المتـــوله عن اهمال وعدم الاستخدام الكافى لهذه الأنواع مقارنـــه بمحاصيل أخرى تم استكمال دراسه استرشاديه حـــول الخدائق المنزليه للمزارعين فى قيتنام

البحث بالمجموعه فى خلال العام خـــيرا فى النواحـــى القانونيه والتنظيميه للاشراف على عمل المعهد فى هـــذا المجال تم تشير بحث عن عناصر نظـــام حمايـــه الملكيـــه الفكريه Sui Generis الخاصه بالأصناف النباتيه بـــدأ العمل بالاشتراك مع IDRC فى اعاده اطلاق مشـــروع CRUCIBLE الذى يهدف الى مساعده الـــدول فى فهم طبيعه وعلاقه والاثار المترتبه على التراماتها لعـــده

See pp. 135–136 for Abbreviations

أبرز معالم ١٩٩٧

افريقيا جنوب الصحراء

عملت مجموعة جنوب الصحراء-أفريقيا على دفع تنمية البرامج الوطنية في ثماني دول افريقية والحث على البدء في تأسيس شبكات اقليمية في شرق وغرب ووسط افريقيا وازدياد القدرات البحثية في عدة دول فقد تم تدريب حوالي ثمانون عالما" وباحثا' من البرامج الوطنية وبناء القدرات والطاقات البحثية الأكاديمية للمعاهد البحثية الوطنية حتى تمكنها الإضطلاع دائما بعمليات التدريب والتركيز على ابراز أهمية السلطات المعنية بحفظ واستخدام الأصول الوراثية النباتية في أطر التنمية الوطنية فقد أدى عقد ورشة عمل اعلامية في افريقيا الى رفع مستوى الاهتمام العام بقضية الأصول الوراثية فقد لقت اعادة استزراع ١٦٥ عينة من السلالات المحلية للذرة والذرة الرفيعة في الصومال (مشروع مدعم من الاتحاد الأوروبي) ترحيبا" كبيرا" من المزارعين تم بالاشتراك مع المركز الافريقي للدراسات التكنولوجية جمع وتصنيف المعلومات الادارية الخاصة بالإجراءات الإدارية والقانونية والتشريعية التي اتخذتها دول افريقيا لحفظ واستخدام المصادر الوراثية النباتية

وسط وغرب آسيا وشمال أفريقيا

كانت المجموعة الاقليمية (CWANA) مركزا" لعدة مبادرات رئيسية من شأنها تحقيق هدف الاستخدام والحفظ الأمثل للمصادر الوراثية النباتية بالمنطقة فقد امتدت مسئوليات المجموعة لتشمل دول منطقة اواسط اسيا (وبالتالي فقد اعيد تسمية اسم المجموعة)، وتم تعيين مديرا' جديدا للمكتب الاقليمي وكذلك اعيد تنظيم المجموعة الاقليمية

ففي وسط أسيا، تم البدء في عدة أنشطة جوهرية بأسست شبكة وسط أسيا للمصادر الوراثية النباتية وتم تحقيق برنامجا" متكاملا" للتدريب في المنطقة أما شبكة العمل WANANET فقد حققت تقدما' مضطردا' أدى عقد مؤتمرا' دوليا" في المنطقة الى التوصل الى نتائج جديدة بالنسبة الى اصول وتنوع وتطور المحاصيل الزراعية في الشرق الأدنى كما ادت بحوث طلبة الدراسات العليا تحت اشراف موظفو المكتب، الى اضافات علمية هامة للاستراتيجيات المتكاملة لمحاصيل القمح واللوز وقام المكتب الاقليمي باصدار عدة وثائق عن الأصول الوراثية في المنطقة مما ادى الى التعرف على عدة قضايا هامة بالنسبة لحفظ الأصول الوراثية وهي الحاجة الى زيادة اسهام جماعات المزارعين والقطاع الخاص، دمج المصادر الوراثية النباتية في الاطار الشامل للنظم البيئية والأنواع النباتية، وتكثيف التعاون الدولي بين المناطق الجغرافية المختلفة في الشئون العلمية والتقنية والسياسية الزراعية

أسيا والمحيط الهادي وأفانوسيا

في يناير من هذا العام ، شرع المكتب الاقليمي APO في الاضطلاع باعماله من سيدنايي، ماليزيا وأدى افتتاح المكتب بواسطة وزير الزراعة وعقد ورشة العمل التابعة لها الى تحديد أولويات العمل المشترك مع المعاهد الوطنية في سيدنايي والتوصل الى تعاون مثمر في هذا المجال واعادة دراسة برنامج العمل IPGRI-ICAR مما يحقق ما تصبو اليه الطرفين أما في الصين، فتستمر نقل مكتب اخرى الى جوار مكاتب المراكز الدولية البحثية الأخرى مثلما تنتج عن عقد مؤتمر الصين-CGIAR التوصل الى أولويات مشتركة لمساعدة الصين في مواجهة احتياجاتها للانتاج الغذائي على أسس التنمية المستدامة وتمثلت هذه الأولويات على الحفظ بالموقع وتقسيم لمجموعات الوراثية لظروف البيئات الحديثة وتم مراجعة عمل المجموعة الاقليمية خلال العام وكانت نتائج فريق المراجعة ايجابية للغاية فيما يتعلق بأغراض ونوعية انشطة اخرى في المنطقة وقد دعم مجلس الأمناء هذه التوصيات من فريق المراجعة

أما عن قضايا اقتسام المنفعة والحصول على الموارد الوراثية فقد استمرت تلك القضايا في الاستحوذ على اهتمام خاصة بالنسبة للبرامج الوطنية وقد شارك موظفو المكتب في مناقشة هذه القضايا في مؤتمرات واجتماعات عدة عقدت في الهند وجنوب شرق آسيا والباسفيك تم الاضطلاع بمبادرة جديدة من اجل اصدار مطبوعات ووثائق من شأنها زيادة الوعي الاعلامي عن طريق الموارد الوراثية النباتية لطلبة المدارس في ماليزيا

الأمريكتين

ركز المكتب على دعم شبكات العمل الاقليمية مما ادى الى زيادة الميزة المقارنة بالنسبة لبحوث الفواكه في المناطق الإستوائية الحيوية فقد اتمت شبكات REDARFIT وREMERFI مشروعا" اقليميا لحفظ الفواكه المحلية وتم تقديم طلبا" للدعم المالي الى IDB لإستكمال المشروع بدء مشروعا مدعما من الاتحاد الأوروبي للاصول الوراثية للانتاج في اطار برنامج TROPIGEN في نشاطاته البحثية وتم الان

1997 年活动概述

非洲撒哈拉以南地区

非洲撒哈拉以南地区组促进了该地区八个国家的国家项目发展 启动了西部 中部和东部非洲的协作网 提高了一些国家的研究能力 培训了约 80 名国家项目的科学家 并帮助非洲一些科学机构提高开展培训工作的能力 地区工作人员为制定不同国家政治体制下的遗传资源活动框架而努力工作 召开的有关遗传资源管理的新闻媒体研讨会极大地提高了公众意识水平 通过欧洲联盟资助的项目将 165 份传统的玉米和高粱品种引回索马里受到了农民的欢迎 与非洲技术研究中心合作 非洲撒哈拉以南地区组工作人员编写了非洲植物遗传资源保存和利用的政策 法规和组织措施方面的基本资料

中亚西亚和北非地区

1997 年 中亚西亚和北非地区组在该地区取得植物遗传资源有效保存和可持续利用中起到了重要作用 该项目组的职责范围扩展到了中亚（以该项目组的重新命名为标志） 指定了新的地区组组长 并对地区组人员进行了重组 在中亚开始了几项重要的活动 建立中亚植物遗传资源协作网和开始了一个培训项目 西亚北非遗传资源协作网取得了重要进展 在一次重要的会议上对近东地区的作物起源 多样性和进化提出了新的见解 在该组工作人员的指导下 来自该地区国家项目的研究生在小麦属和李属资源的保存技术研究中做出了重要的贡献。该地区办事处出版了一些关于本地区遗传资源的文献 提出了几个重要问题 即增加一些重要的相关组织如农民社团和私人机构的参与工作 把植物遗传资源与整个生态系统和物种研究途径结合起来 促进地区内在科学 技术和政策方面的合作

亚洲太平洋和大洋洲地区

亚太大洋洲地区办事处于一月份在马来西亚的沙巴开始运行 通过农业部长为办事处揭幕剪彩和随后召开的一个研讨会并确定了共同感兴趣的领域 使新邻居对办事处工作的支持进一步加强 印度农业研究委员会和 IPGRI 一起评估了联合工作计划 双方均感到满意 CGIAR - 中国论坛 协助制定了共同的优先重点 将有助于中国可持续地满足其粮食生产的需要 这些优先重点包括原生境保存 以及评价适合边远地区生产条件的种质资源 IPGRI 组织对该地区组的外部评估 充分肯定 IPGRI 在该地区的工作内容和成绩 交换和利益共享仍然是合作伙伴最关心的问题 该地区组的工作人员在太平洋 东南亚和印度召开的会议上与合作伙伴讨论了这些问题 该年度开始了一项新的活动 即为马来西亚学校的孩子们编写植物遗传资源公众意识宣传图集

美洲地区

任命了新的地区组组长 有关促进协作网的项目活动巩固和增强了该地区组在新热带区果树研究中的优势 安第斯山脉地区植物遗传资源协作网和中美洲植物遗传资源协作网成功地完成了一个关于本地果树的项目 由欧洲联盟资助 亚马逊河流域植物遗传资源协作

网实施的菠萝项目开始了有关活动 与有关单位合作 正在开发用于预测栽培植物遗传多样性的分布 预示遗传耗失危险区域的地理信息系统模型 对参加安第斯山脉块根块茎作物项目的基因库进行了一项信息汇编问题研究 与美国农业部合作 对新版 pcGRIN 种质资源信息管理软件在发展中国家的基因库的利用情况进行了评估 继续进行 5 个用西班牙语进行培训的模式研究 其中的两个由 1996 年培训过的教师进行了检验 通过国际热带农业研究中心的在线目录数据库 使该办事处的 1700 多种图书对外提供查询服务

欧洲地区

支持建立和加强国家项目是该地区的一项重要活动。为协助东欧发展可持续植物遗传资源项目 该地区办事处的工作人员积极参加一些研讨会 确定了各个国家的协调机构 使各国能够制定更加具体的需要 机会和国家行动计划 工作重点转向了发展森林遗传资源方面 为促进温带橡树和山毛榉树种的特殊基因保存 成立了一个新的 社会阔叶树协作网 。在因特网上开发了欧洲作物遗传资源信息平台 为欧洲各国家项目提供所需要的信息服务 欧洲森林遗传资源项目进一步扩大 包括了 28 个国家 在发行的一些出版物中强调地中海地区未被充分利用物种的重要性

遗传资源科学与技术

与联合国粮农组织合作 制定了新的多种作物通用的基本资料描述符 随后在欧洲作物协作网的一些数据库中被采用 出版了葡萄芋和薯蓣等作物的描述符 全球原生境保存项目的计划会议召集了九个国家的项目合作伙伴 包括技术专家和捐助者。会议确定了原生境保存研究项目所需要的信息类型 包括环境 社会经济 民族植物学 农艺形态学和遗传方面的信息 在布基纳法索 墨西哥 摩洛哥和尼泊尔确定了项目点和重点物种 在越南 匈牙利 埃塞俄比亚和秘鲁开始了项目点 重点物种和课题人员的选择工作 开始了一个重点研究遗传资源保存与利用相连接的项目。在本所的一次研讨会上 制定了保存和利用互补战略 并确定了今后的工作重点 以进一步完善该战略 作为促进经济有效和可持续性保存的一种实际手段 被忽视和未被充分利用作物系列丛书又出版 13 种作物的专著 在中国建立芝麻核心收集品的合作项目已经完成。出版和分发了用于评价遗传多样性的各种分子技术的报告 全球可可种质资源利用和保护项目已正式签署 并在几个参加国开始了有关活动 在中国云南开展的遗传资源保存和利用中人类学方面的研究项目 包括对由农民鉴定的主要芋头形态类型进行的分子和同工酶研究 证明农民在管理和选择中保留了丰富的遗传多样性 发现了处于遗传耗失威胁中的栽培品种 在非洲开展的一个项目发现 当地叶用蔬菜主要由妇女种植和销售 研究表明种子供应不足和加工体系不完善是这些物种在利用和市场竞争中的主要制约因素 从这些蔬菜之中 发现了具有好的增产潜力的地方品种 在越南庭园植物遗传资源研究的一个小型项目已完成 本年度 一位法律专家加入本研究所 负责植物遗传资源政策和法律方面的工作 在植物遗传资源问题系列报告中 发表了一篇描述特殊的包括植物品种在内的知识产权系统的可能组成部分的文章 与加拿大国际发展研究中心合作再次发起了植物遗传资源 育种和知识产权小组活动 目的是协助各国了解它们对不同的国际社会所做承诺的性质 关系和含义 在中国 尝试出版图文并茂的土著知识杂志 以此作为农民与科学家汇编和共享各自知识的一种途径 与联合国粮农组织合作 出版了第一本关于妇女与遗传资源管理的系列丛书

文献汇编、信息和培训

文献汇编、信息和培训组工作人员访问了中亚西亚和北非办事处，在那里参加了第一个旨在制定满足地区需要的IPGRI信息战略的系列会议，还访问了国际香蕉大蕉改良协作网和几个地区办事处，为这些办事处的工作人员进行了出版程序培训和制定公关策略。IPGRI遗传资源数据库已进行了更新，用于满足合作伙伴的信息要求。已发行了新版基因库管理系统软件，印制并在因特网上发行了英语、西班牙语和法语版的葡萄、薯蓣和苓性状描述符，以及英语和法语版的阿月浑子性状描述符。IPGRI图书馆满足了1049条信息需求，通过图书馆公报、植物遗传资源文摘和因特网提供当前的公共宣传服务。IPGRI发行了近150种出版物，包括阿拉伯语、汉语、法语、西班牙语和英语版本。其中四种出版物获得了国际农业教育宣传机构的奖励。IPGRI参与合作组织了21个短训班和培训研讨班，来自93个国家的325名科学家接受了培训。出版了《基因流动》杂志英语、法语和汉语的版本，为一些国际活动准备了公关宣传材料，包括开罗的国际农业研究磋商小组的中期会议、联合国大会可持续发展特别会议、以及土耳其的第十一届世界食品大会。拍摄了一部关于四集记录片的电影预告片。IPGRI的一项评估肯定了这些活动的积极影响，也发现了危险因素。以作物描述符和国际芭蕉属试验项目的影响为例的两项深入研究正在进行。为促进工作人员的自身发展，组织了一系列关于《逻辑框架分析》的研讨会。

国际香蕉和大蕉改良协作网

1997年3月全球芭蕉属改良项目(PROMUSA)开始启动。这是INIBAP与世界银行的合作项目，目的是把世界的芭蕉属改良工作者组织起来，确定和提出全球水平上的主要研究需要。INIBAP还为PROMUSA提供了执行秘书处服务。在地区水平上，INIBAP在乌干达和喀麦隆建立了地区办事处，招聘了两名地区协调员，他们在促进整个地区香蕉研究协作网的活动、等集香蕉研究经费方面起到了重要作用。INIBAP支持的具有战略意义的香蕉转基因研究又向生产迈进了一步，已经获得了带有外引抗真菌蛋白基因编码的转基因植株，抗真菌基因得到表达。已完成了芭蕉属种质资源信息系统软件的开发，并对一些基因库管理人员使用该软件进行了培训。该软件为基因库人员提供了一个管理种质资源的重要工具，它将有助于收集品的有效管理，并满足有关各方不断增加的信息交换的需要。

CGIAR全系统遗传资源项目

本年度CGIAR全系统遗传资源项目(SGRP)在全球生物多样性和遗传资源项目中做了大量的工作，并参加了联合国粮农组织和生物多样性公约方面的会议。发行的出版物包括1996年全系统遗传资源项目年报，以及1995年进行的CGIAR基因库运转外部评估报告的附录。《基因流动》杂志包括了一个关于全系统遗传资源项目及其活动的特殊栏目。通过Wren-Agfax无线电台和新闻媒体传播了亚洲和非洲各中心的有关信息。CGIAR全系统遗传资源信息系统(SINGER)已在因特网全面运行，同时出版了只读光盘。通过该系统能够使CGIAR中心拥有的遗传资源收集品的数据集中获取和查询。截至1997年底，该信息系统收集了50万份材料的数据。国际作物信息系统(ICIS)的发展已延伸到CGIAR职责范围内的主要作物上。该信息系统集中了多方面的信息来源，能够使育种家获得种质品系的系谱和特性方面的信息。建立了一个汇编CGIAR各中心拥有的固氮生物研究收集品的数据库。

Faits saillants de 1997

Afrique Subsaharienne

Le groupe SSA a aide a catalyser le developpement des programmes nationaux dans huit pays de la region, stimule le demarrage de reseaux en Afrique de l Ouest Centrale et de l Est et a contribue a augmenter les capacites de recherche dans plusieurs pays Pres de 80 scientifiques de programmes nationaux ont reçu une formation et le programme a fonctionne avec plusieurs institu tions academiques africaines pour les aider a renforcer leurs capacites a conduire des cours sur les ressources phytogenetiques Le Groupe a travaille pour ameliorer le profil des activites sur les ressources genetiques au sein des systemes politiques nationaux Un atelier avec les media sur la gestion des ressources genetiques a fortement contribue a augmenter le niveau de sensibilisation du public La reintroduction de 165 accessions de varietes traditionnelles de mais et de sorgho en Somalie dans le cadre d un projet finance par l UE, a ete bien reçu par les paysans En collaboration avec le Centre africain d etudes technologiques, le Groupe a etabli un profil des mesures politiques legislatives et institutionnelles pour la conservation et l utilisation des ressources phytogenetiques en Afrique

Asie Centrale et Occidentale et Afrique du Nord

En 1997, le Groupe a ete au centre d'un nombre d initiatives cles visant a permettre la conservation efficace et durable des ressources phytogenetiques dans la region Les responsabilites ont ete etendues pour couvrir l Asie Centrale (fait concretise par le changement de l'intitule du Groupe) un nouveau Directeur Regional a ete recrute et le Groupe a ete reorganise Plusieurs activites fondamentales ont demarre en Asie Centrale un reseau de ressources phytogenetiques pour l Asie Centrale a ete cree et un programme d activites de formation a debute WANANET a fait des progres importants Une conference d importance majeure a apporte des elements nouveaux pour comprendre l origine, la diversite et l'evolution des especes cultivees au Proche Orient Des etudiants de second cycle des programmes nationaux de la region, encadres par des chercheurs du Groupe, ont apporte des contri butions importantes a la conservation complementaire chez *Triticum* et *Prunus* Le Bureau Regional lui meme a publie un grand nombre de documents sur les ressources genetiques dans la region, qui abordent plusieurs questions essentielles augmentation de la participation des principales parties concernees, telles que les communautes paysannes et le secteur prive, integration des ressources phytogenetiques dans une approche holistique des ecosystemes et des especes et renforcement des collaborations intra regionales sur les aspects scientifiques techniques et politiques

Asie, Pacifique et Océanie

En janvier, le Bureau Regional APO a commence a operer depuis Serdang en Malaisie Le soutien de la part de nos nouveaux voisins a ete renforce par l inauguration du Bureau par le Ministre de l Agriculture, suivie par un Atelier Inaugural au cours duquel des priorites communes ont ete identifiees Le plan de travail commun entre l ICAR et l IPGRI a ete reexamine a la satisfaction des deux

partenaires Le bureau de Beijing va demenager dans des locaux adjacents, situes pres des bureaux des autres centres du GCRAI, alors qu une reunion GCRAI Chine a permis de developper un ensemble de priorites communes pour aider la Chine a assurer de maniere durable ses besoins dans le domaine de la production alimentaire Ces priorites incluaient la conservation *in situ* et l evaluation du germoplasme pour des conditions marginales Une revue externe (mandatee par l institut lui meme) a donne un avis tres positif sur l etendue et la qualite des activites de l IPGRI dans la region Les questions d'acces et de partage des benefices continuent d etre au centre des preoccupations de nos partenaires et ces questions ont ete discutees avec eux au cours de reunions dans le Pacifique, en Asie du Sud Est et en Inde Une nouvelle initiative a ete demarree en cours d annee pour elaborer des kits de sensibilisation aux ressources phytogenetiques destines aux ecoliers en Malaisie

Amériques

Un nouveau Directeur Regionale a ete recrute et les activites conduites pour renforcer les reseaux ont consolide et accru l'implication et l'expertise du Groupe dans la recherche sur les fruits tropicaux du nouveau monde Les reseaux REDARFIT et REMERFI ont mene a bien avec succes un projet sur les fruits indigenes Une demande d extension du projet a ete faite a la BID Le projet sur l ananas, finance par l'UE et mene dans le cadre de TROPIGEN, a commence ses activites Un modele de GIS pour predire la distribution de la diversite genetique chez les plantes cultivees et indiquer les zones ou existent des risques d'erosion genetique est en cours de developpement avec le CIAT, l'USDA et des partenaires nationaux Une etude de la documentation des banques de genes participant au programme sur les racines et tubercules andains a ete realisee En collaboration avec l USDA, le nouveau logiciel pcGRIN de documentation du germoplasme a ete evalue pour son utilisation dans des banques de genes de pays en developpement Le travail a continue sur cinq modules de formation en espagnol dont deux ont ete testes par des formateurs formes en 1996 Plus de 1700 references de la bibliotheque du Groupe Ameriques ont ete mises a la disposition des utilisateurs sur la banque de donnees bibliographique en ligne du CIAT Un nouveau Directeur Regional a ete recrute

Europe

L assistance pour la mise en place et le renforcement de programmes nationaux demeure une activite importante dans la region Pour aider au developpement de programmes durables pour les ressources phytogenetiques en Europe de l Est le personnel du Bureau Regional a participe activement a de nombreux ateliers pour epauler les structures nationales de coordination et leur permettre d agir plus concretement dans la formulation de leurs besoins perspectives et plans d action nationaux L accent a ete mis sur le developpement du secteur des ressources genetiques forestieres Un nouveau reseau sur les feuillus sociaux a ete etabli pour faciliter une approche specifique de conservation des genes pour les especes temperees de chene et de hetre La plate forme europeenne d information sur les ressources genetiques des plantes cultivees a ete developpee sur Internet pour repondre aux besoins d'information des programmes nationaux europeens Le Programme europeen pour les ressources genetiques forestieres s est elargi et compte maintenant 28 pays L importance des especes mediterraneennes sous utilisees a ete soulignee par la sortie de plusieurs publications dont la liste des Descripteurs pour le Pistachier (*Pistacia vera* L) publiee en anglais et en français

Science et Technologie des Ressources Génétiques

Une nouvelle liste de descripteurs multi plantes a ete produite en collaboration avec la FAO et adoptee ensuite par plusieurs banques de donnees des reseaux europeens Des listes de descripteurs ont ete publiees pour le pistachier la vigne le theier et l'igname La reunion de planification du projet global *in situ* a permis de reunir les partenaires des neuf pays participants ainsi que des experts techniques et des representants des bailleurs de fonds La reunion a permis d identifier le type d informations requis pour le projet de recherche, qui comprend une matrice de donnees environnementales, socioeconomiques ethnobotaniques, agromorphologiques et genetiques Les sites du projet et les especes prioritaires ont ete identifiees au Burkina Faso au Mexique, au Maroc et au Nepal La selection des sites la definition des especes prioritaires et la constitution des equipes du projet ont commence au Vietnam, en Hongrie, en Ethiopie et au Perou Un projet centre sur les liens entre la conservation et l utilisation des ressources genetiques a ete initie Un atelier interne a conduit a l elaboration d une strategie pour assurer la complementarite entre les methodes de conservation et l utilisation, et a identifie les points cruciaux a aborder dans le futur pour developper cette approche comme un moyen pratique de promouvoir la rentabilite la securite et la durabilite des efforts de conservation Treize monographies supplementaires ont ete publiees

dans la serie sur les especes negligees et sous utilisees Un projet sur le developpement d une collection noyau de sesame en Chine a ete acheve Un bulletin technique decrivant les differentes techniques moleculaires qui peuvent etre utilisees pour evaluer la diversite genetique a ete publie et distribue Le projet global 'Utilisation et conservation des ressources genetiques du cacaoyer' a ete signe officiellement et les activites ont demarre dans plusieurs des pays participants Les progres realises dans le cadre du projet sur les aspects humains de la conservation et de l'utilisation des ressources genetiques comprennent des travaux menes dans le Yunnan en Chine, des etudes moleculaires et enzymatiques des morphotypes majeurs de taro identifies par les fermiers ont confirme qu ils renferment une diversite genetique significative Les cultivars risquant l erosion genetique ont egalement ete identifies Un projet en Afrique a montre que les legumes feuilles indigenes sont principalement cultives et vendus par les femmes cette etude a permis d'identifier les insuffisances dans la fourniture des semences et dans les systemes de traitement comme contraintes majeures dans l utilisation et la competitivite des especes etudiees Des cultivars locaux presentant un bas potentiel pour augmenter la production ont ete identifies au sein de ces especes Un inventaire pilote des ressources phytogenetiques dans les jardins de case vietnamiens a ete finalise Un expert juridique a rejoint le Groupe en cours d'annee pour prendre en charge le travail de l'institut sur les aspects politiques et legaux des ressources genetiques vegetales Un article decrivant les elements possibles d un systeme *sui generis* de propriete intellectuelle pour couvrir les varietes vegetales a ete publie dans la serie Questions sur les ressources genetiques (*Issues in Genetic Resources*) En collaboration avec l'IDRC, le Crucible Group, qui a pour but d aider les pays a comprendre la nature les relations et implications de leur engagement dans differents fora politiques a ete reactive En Chine le prototype d un Journal du savoir indigene base sur l utilisation d outils multimedia a ete teste comme mecanisme permettant aux fermiers et aux scientifiques de documenter et de partager leur savoir respectif La premiere publication d une serie sur le genre et la gestion des ressources genetiques a ete produite en collaboration avec la FAO

Documentation, information et formation

Des membres du Groupe DIT on visite le Bureau Regional CWANA pour la premiere d une serie de reunions visant a adapter la strategie d information de l IPGRI aux besoins regionaux L INIBAP et plusieurs Bureaux Regionaux ont egalement ete visites pour former le personnel aux procedures de publication et pour developper des strategies de sensibilisation du public Les banques de donnees de l'IPGRI sur les ressources genetiques ont ete mises a jour et utilisees pour repondre aux questions de nos partenaires Une interface Internet pour les banques de donnees est en cours de developpement Une nouvelle version du logiciel intitule Systeme de gestion des banques de genes" a ete produite Des listes de descripteurs sont disponibles en version papier et sur Internet en anglais français et espagnol pour la vigne l igname et le theier, en anglais et en français pour le pistachier La bibliotheque de l IPGRI a satisfait 1049 demandes de documents Des services de signalement courant ont ete fournis par le Bulletin de la Bibliotheque les *Plant Genetic Resources Abstracts* et sur Internet L IPGRI a produit pres de 150 publications, dont certaines en arabe, chinois français et espagnol en plus de l anglais Quatre publications ont ete primees par les Communicateurs sur l education en agriculture L IPGRI a collabore a l organisation de 21 cours et ateliers de formation 325 scientifiques de 93 pays ont reçu une formation *Geneflow* a ete publie en chinois français et anglais Du materiel de sensibilisation a ete produit pour plusieurs evenements internationaux dont la reunion a moven terme (Mid Term Meeting) du GCRAI au Caire la Session Speciale de l Assemblee Generale des Nations Unies sur le Developpement Durable et le 9eme Congres Mondial de Foresterie en Turquie Une bande annonce a ete produite pour promouvoir une serie documentaire en quatre parties Une revue des activites de l IPGRI a mis en lumiere leurs effets positifs et egalement permis d identifier les facteurs de risque Deux etudes de cas approfondies continuent sur l impact des descripteurs et du Programme international d evaluation des *Musa* Une serie d ateliers de formation du personnel a ete organisee sur l analyse en structure logique

INIBAP

En mars, le Programme mondial pour l amelioration des *Musa* (PRO*MUSA*) a ete lance Ce programme qui est une initiative conjointe de l INIBAP et de la Banque Mondiale, vise a reunir les principaux acteurs du domaine de l amelioration des bananiers et plantains du monde entier pour identifier et chercher a satisfaire les besoins essentiels de la recherche au niveau mondial L INIBAP fournit le Secretariat Executif de PRO*MUSA* Au niveau regional, l INIBAP a recrute

deux coordinateurs regionaux pour l'Afrique et a etabli des bureaux regionaux en Ouganda et au Cameroun Les coordinateurs dans les deux sous regions jouent deja un role cle en activant les reseaux de recherche sur les bananiers et plantains et en mobilisant les ressources pour la recherche sur ces plantes sur l ensemble de la region L appui de l INIBAP a la recherche strategique a conduit a de nouveaux progres dans la production de bananiers transgeniques Des plants transgeniques dans lesquels des genes codant pour des proteines antifongiques ont ete introduits et expriment le gene antifongique Le logiciel Systeme d information sur le materiel genetique de *Musa* a ete achev e et un certain nombre de curateurs de banques de genes a ete forme a son utilisation Le logiciel offre aux curateurs un outil important pour la gestion des ressources genetiques Il facilitera la rationalisation des collections et permettra un echange accru d'informations entre les parties interessees

Programme global du GCRAI sur les ressources génétiques

Le Programme global du GCRAI sur les ressources genetiques a contribue au travail des programmes mondiaux sur la biodiversite et les ressources genetiques et a participe aux reunions de la FAO et de la CDB au cours de l annee Les publications comprennent le Rapport Annuel 1996 du Programme et l Annexe au Rapport de la Revue Externe sur le fonctionnement des banques de genes du GCRAI menee en 1995 *Geneflow* a inclus une section speciale sur le Programme et ses activites et des informations sur les activites des Centres en Asie et en Afrique ont ete distribuees par les services de radio et de presse de Wren Agfax SINGER est devenu completement operationnel sur Internet et une version sur CD ROM a ete produite SINGER permet de consulter et d'interroger l'ensemble des donnees sur les collec tions de ressources genetiques maintenues dans le monde entier par les Centres du GCRAI A l heure actuelle SINGER contient des donnees sur plus de 500 000 accessions Le demarrage d une deuxieme phase pour le developpement de SINGER a ete prevue pour 1998 Le developpement d ICIS a ete etendu aux plantes majeures sous mandat du GCRAI Ce systeme d'information permettra aux selectionneurs d acceder a des informations sur le pedigree et les performances de lignees de germoplasme integrees a partir de diverses sources Une base de donnees a ete developpee pour documenter les collections de recherche des organismes fixateurs d azote maintenues par differents Centres du GCRAI

Acontecimientos de 1997

Africa Subsahariana

El grupo del Africa subsahariana ayudo a impulsar el desarrollo de programas nacionales en ocho paises de la region, favorecio el establecimiento de redes en Africa Occidental Central y Oriental y contribuyo a aumentar las capacidades de investigacion en varios paises Cerca de 80 cientificos de los programas nacionales recibieron capacitacion y el programa trabajo con varias instituciones academicas africanas a fin de contribuir al fortalecimiento de sus capacidades para la realizacion de cursos sobre recursos fitogeneticos El personal trabajo para mejorar el perfil de las actividades de recursos geneticos dentro de los sistemas politicos de los paises Un seminario para los medios de informacion sobre gestion de los recursos geneticos contribuyo de manera importante a sensibilizar a la opinion publica La reintroduccion de 165 accesiones de variedades tradicionales de maiz y sorgo en Somalia, mediante un proyecto financiado por la UE fue acogida con beneplacito por los agricultores El personal del grupo SSA, en colaboracion con el Centro Africano de Estudios Tecnologicos, elaboro un perfil de las medidas normativas, legislativas e institucionales para la conservacion y utilizacion de recursos fitogeneticos en Africa

Asia Central y Occidental y Africa del Norte

En 1997, el grupo regional del CWANA fue el centro de una serie de iniciativas fundamentales encaminadas a lograr la conservacion eficaz y la utilizacion sostenible de los recursos fitogeneticos en la region El ambito de accion del grupo se extendio para incluir al Asia Central (hecho puesto de manifiesto por el nuevo nombre), se nombro a un nuevo director regional y se reorganizo el grupo En Asia Central se emprendieron varias actividades fundamentales se creo la Red de Recursos Fitogeneticos de Asia Central y se emprendieron actividades de capacitacion La Red de Asia Occidental y Africa del Norte realizo notables progresos Un conferencia importante aporto nuevas ideas para la comprension del origen, la diversidad y la evolucion de los cultivos en el Cercano Oriente Posgraduados de los programas nacionales de la region, bajo la supervision del personal del CWANA, hicieron importantes contribuciones para la conservacion del *Triticum* y *Prunus* La oficina regional publico varios documentos sobre los recursos geneticos de la region en los que se plantearon algunas cuestiones importantes promover la participacion de las principales partes interesadas como las comunidades de agricultores y el sector privado integrar los recursos fitogeneticos en un ecosistema holistico y en un enfoque por especies, y potenciar la colaboracion intrarregional en asuntos cientificos, tecnicos y normativos

Asia, el Pacífico y Oceanía

En enero la oficina regional APO comenzo sus operaciones en Serdang, Malasia La inauguracion de la oficina por el Ministro de Agricultura, seguida por un taller de inauguracion una vez que se identificaron las prioridades comunes, reforzo el apoyo estrecho de nuestros nuevos anfitriones El programa de trabajo conjunto del Consejo de Investigaciones Agricolas de la India y el IPGRI se examino a satisfaccion de las dos partes La oficina de Beijing se mudara a una nueva sede situada cerca

de las oficinas de otros centros del GCIAI, mientras que una reunion del GCIAI China contribuyo a la elaboracion de un conjunto comun de prioridades para avudar a China a hacer frente de manera sostenible a sus necesidades de produccion de alimentos Entre las prioridades se incluyeron la conservacion *in situ* v la evaluacion del germoplasma en condiciones marginales Un examen externo, realizado a pedido del Instituto, se mostro sumamente positivo con respecto al alcance v la calidad de las actividades del IPGRI en la region Las cuestiones relativas al acceso v los beneficios compartidos siguen suscitando gran interes en nuestros colaboradores y el personal del IPGRI examino estas cuestiones con los colaboradores en reuniones celebradas en el Pacifico, Asia Sudoriental e India Durante el año se puso en marcha una nueva iniciativa para elaborar material de sensibilizacion hacia los recursos fitogeneticos para los escolares en Malasia

Las Américas

Se nombro a un nuevo director regional v las actividades de los proyectos destinadas al fortalecimiento de las redes consolidaron y aumentaron la participacion v los conocimientos especializados del grupo en investigaciones sobre frutos neotropicales La Red Andina de Recursos Fitogeneticos y la Red Mesoamericana de Recursos Fitogeneticos terminaron un proyecto sobre frutos nativos con muy buenos resultados Se presento una propuesta al BID para la ejecucion de un proyecto complementario El proyecto sobre el ananas financiado por la UE y dirigido por la Red Amazonica de Recursos Fitogeneticos, comenzo sus actividades Conjuntamente con varios colaboradores se elaboro un modelo de sistema de informacion geografica para predecir la distribucion de la diversidad genetica de las especies cultivadas v señalar las zonas expuestas a la erosion genetica Se realizo un encuesta sobre la documentacion de los bancos de germoplasma que participan en el Programa de Raices y Tuberculos Andinos En colaboracion con el Departamento de Agricultura de los Estados Unidos se evaluo el nuevo programa informatico pcGRIN para la documentacion del germoplasma destinado a utilizarse en los bancos de germoplasma de los paises en desarrollo Prosiguieron los trabajos de perfeccionamiento de cinco modulos de capacitacion en español, dos de los cuales se sometieron a prueba por los instructores capacitados en 1996 Mas de 1 700 registros de la biblioteca de las Americas se pusieron al alcance de los interesados mediante el catalogo en linea del Centro Internacional de Agricultura Tropical

Europa

El apovo al desarrollo y fortalecimiento de los programas nacionales siguio siendo una importante actividad en la region A fin de prestar asistencia al desarrollo de programas sostenibles de recursos fitogeneticos en Europa oriental, el personal de la oficina regional participo activamente en varios talleres para consolidar las estructuras nacionales de coordinacion y permitirles adoptar medidas mas concretas en la formulacion de necesidades oportunidades v planes nacionales La atencion tambien se desplazo hacia el desarrollo del sector de los recursos geneticos forestales Se establecio una nueva Red de Frondosas de Utilidad Social para facilitar un enfoque especifico para la conservacion de genes de las especies de roble y haya de climas templados Se establecio la Plataforma Europea de Informacion sobre Recursos Geneticos Agricolas en Internet para atender las necesidades de informacion de los programas nacionales europeos El Programa Europeo de Recursos Geneticos Forestales se extendio a 28 paises Varias publicaciones destacaron la importancia de las especies mediterraneas subutilizadas

Ciencia y Tecnología de los Recursos Genéticos

En colaboracion con la FAO se publico un nueva lista de descriptores de cultivos multiples, que posteriormente fue adoptada por varias bases de datos de las redes de cultivo europeas Se publicaron listas de descriptores de cultivos para la vid el te v el ñame La reunion de planificacion del provecto global *in situ* reunio a los colaboradores de los nueve paises participantes asi como a expertos tecnicos y donantes En la reunion se identifico el tipo de informacion necesaria para el proyecto de investigacion, que incluye una matriz de datos ambientales socioeconomicos etnobotanicos agromorfologicos y geneticos En Burkina Faso Mexico Marruecos v Nepal se identificaron los lugares de ejecucion de los provectos v las especies prioritarias En Viet Nam Hungria, Etiopia v Peru se comenzo a seleccionar los lugares de ejecucion atribuir un orden de prioridades a las especies y organizar los equipos de los proyectos Se inicio un proyecto centrado en el enlace entre la conservacion v la utilizacion de recursos geneticos En un taller institucional se elaboro una estrategia para garantizar la complementariedad entre los metodos de conservacion y la utilizacion y se identificaron ambitos claves para el trabajo futuro a fin de proponer este enfoque como un medio practico para promover la rentabilidad seguridad y sostenibilidad de los esfuerzos de conservacion Se publicaron 13 monografias sobre cultivos en la coleccion dedicada

a las especies olvidadas o subutilizadas Se termino un proyecto de colaboracion para formar una coleccion basica de sesamo en China Se publico y distribuyo un boletin tecnico en que se resumia las diferentes tecnicas moleculares que pueden utilizarse para evaluar la diversidad genetica Se suscribio oficialmente el proyecto mundial de Utilizacion y Conservacion del Germoplasma del Cacao y en varios paises comenzaron las actividades En el marco del proyecto sobre los aspectos humanos de la conservacion y utilizacion de recursos geneticos, la investigacion etnobotanica, que incluia estudios moleculares e isoenzimaticos de los principales tipos morfologicos de taro en Yunan, China, confirmaron que los agricultores controlan y seleccionan una considerable diversidad genetica Tambien se identificaron cultivares expuestos a erosion genetica En Africa una investigacion sobre las hortalizas de hoja locales, cultivadas y vendidas principalmente por las mujeres, señalo que las deficiencias en el suministro de semillas y el sistema de procesamiento eran los principales obstaculos que limitaban la utilizacion y la competitividad de las especies estudiadas Dentro de estas especies se identificaron cultivares locales con buenas potencialidades para aumentar la produccion Se termino una encuesta experimental sobre los recursos fitogeneticos de las huertas vietnamitas Un experto legal se unio al grupo para supervisar la labor del Instituto en lo referente a los aspectos normativos y legales relativos a los recursos fitogeneticos Se publico un documento en que se describia los posibles elementos de un sistema *sui generis* de propiedad intelectual que abarcara a las variedades vegetales En colaboracion con el Centro Internacional de Investigacion para el Desarrollo en Canada se comenzaron a desplegar esfuerzos para dar un nuevo impulso al Crucible Group cuya finalidad es ayudar a los paises a comprender la naturaleza las relaciones y las consecuencias de sus compromisos con varios foros de politica internacionales En China se ensayo un prototipo del *Indigenous Knowledge Journal* basado en la utilizacion de instrumentos multimediales como un mecanismo para que los agricultores y cientificos documentasen y compartiesen sus conocimientos En colaboracion con la FAO, se publico el primer numero de la coleccion sobre Genero y Gestion de los Recursos Geneticos

Documentación, Información y Capacitación

Algunos miembros del DIT visitaron la oficina del CWANA en la primera de una serie de reuniones destinadas a adaptar la estrategia de informacion del IPGRI a las necesidades regionales Tambien se realizaron visitas a la INIBAP y varias oficinas regionales para capacitar al personal en procedimientos de publicacion y para elaborar estrategias de sensibilizacion de la opinion publica Las bases de datos del IPGRI en materia de recursos geneticos se han actualizado y utilizado para atender a las preguntas de los colaboradores Se ha puesto en circulacion una nueva version del programa informatico del Sistema de gestion de bancos de germoplasma Se pueden acceder a las listas de descriptores de la vid, el ñame y el te en ingles, español y frances y del pistacho en ingles y frances, ya sea a traves de documentos impresos o de Internet La biblioteca del IPGRI atendio 1049 pedidos de documentos Mediante el boletin de la biblioteca, *Resumenes sobre Recursos Fitogeneticos* e Internet se facilitaron servicios de informacion actualizada El IPGRI produjo casi 150 publicaciones con inclusion de obras en arabe, chino español frances e ingles Cuatro publicaciones recibieron premios de la Agricultural Communicators in Education El IPGRI colaboro en la organizacion de 21 cursos de breve duracion y talleres de capacitacion Se capacitaron a 325 cientificos de 93 paises *Geneflow* se publico en ingles frances y chino Se elaboraron materiales de sensibilizacion de la opinion publica para varias reuniones internacionales, entre ellas la reunion de mitad de periodo del GCIAI celebrada en El Cairo, el periodo extraordinario de sesiones de la Asamblea General de las Naciones Unidas sobre Desarrollo Sostenible y el IX Congreso Forestal Mundial celebrado en Turquia Se elaboro un avance para promover una serie dividida en cuatro partes de peliculas documentales Un examen de las operaciones del IPGRI mostro las consecuencias positivas de las actividades realizadas, e identifico los factores de riesgo Dos estudios pormenorizados de casos relativos al impacto de los descriptores de cultivos y del Programa Internacional de Evaluacion de *Musa* prosiguieron sus actividades Se organizaron una serie de seminarios de formacion del personal en analisis de estructura logica

INIBAP

En marzo se lanzo el Programa Mundial para el Mejoramiento de *Musa* (PRO*MUSA*) Se trata de una iniciativa conjunta del INIBAP y el Banco Mundial que se propone reunir a todas las partes directamente interesadas en la mejora de la *Musa* para identificar y abordar las principales necesidades de investigacion a nivel mundial El INIBAP facilita la secretaria ejecutiva para el PRO*MUSA* A nivel regional el INIBAP contrato a dos coordinadores regionales para Africa y establecio oficinas regionales en Uganda y Camerun

Los coordinadores en las dos subregiones estan ya desempenando un papel fundamental en el fomento de redes de investigacion del banano y la movilizacion de recursos para la investigacion sobre el banano en toda la region El apoyo prestado por INIBAP a la investigacion estrategica ha contribuido a impulsar la produccion de bananos transgenicos Se ha producido plantas transgenicas en las que se han introducido genes codificantes para proteinas antifungicas y que expresan el gene antifungico Se ha terminado la elaboracion del programa informatico para el Sistema de Informacion sobre Germoplasma de *Musa* (MGIS) y se ha capacitado a varios encargados de los bancos de germoplasma a fin de que puedan utilizarlo Para los encargados el MGSI constituye un importante instrumento para la gestion del germoplasma Este sistema facilitara la racionalizacion de las colecciones y favorecera un aumento del intercambio de informaciones entre las partes interesadas

Programa de Recursos Genéticos del Sistema del GCIAI (SGRP)

El SGRP contribuyo a la labor de los programas mundiales sobre la biodiversidad y los recursos geneticos y participo en reuniones de la FAO y el CDB Las publicaciones incluyeron el informe anual del SGRP de 1996 y el Anexo al informe del examen externo de las operaciones de los bancos de germoplasma del GCIAI realizado en 1995 En Geneflow se incluyo una seccion especial dedicada al SGRP y sus actividades, y por medio de los servicios de la radio Wren Agfax y los organos de prensa, se difundio informacion sobre las actividades del Centro en Asia y Africa La Red de informacion sobre los recursos geneticos para todo el sistema (SINGER) se ha integrado a Internet y se ha publicado una version en disco compacto Con la Singer es posible consultar colectivamente los datos relativos a las colecciones de recursos geneticos conservadas en los centros del GCIAI A finales de 1997 se mantenian mas de 50 000 registros El desarrollo del Sistema internacional de informacion sobre cultivos se extendio a los cultivos mas importantes incluidos en el mandato del GCIAI para permitir que los mejoradores puedan acceder a una informacion integrada procedentes de fuentes diversas sobre la genealogia y rendimiento de las lineas de germoplasma Se establecio una base de datos para documentar las colecciones de investigacion sobre organismos fijadores de nitrogeno conservadas en diferentes centros del GCIAI

 See pp. 135–136 for Abbreviations

Abbreviations

ACIAR	Australian Centre for International Agricultural Research
ACSAD	Arab Center for the Studies of Arid Zones and Dry Lands
ACTS	African Centre for Technology Studies
ADB	Asian Development Bank
AECI	Agencia Espanola de Cooperacion Internacional
AFLP	Amplified fragment length polymorphism
Africover	Africa GIS Centre Project
AFTSC	ASEAN Forest Tree Seed Centre Thailand
AGRIS	International Information System for the Agricultural Sciences and Technology
ANSWER	Asian Network on Sweet Potato Genetic Resources
APAARI	Asia Pacific Association of Agricultural Research Institutes
APO	Asia the Pacific and Oceania
ARI	Agricultural Research Institute
ASARECA	Association for Strengthening Agricultural Research in East and Central Africa
ASPNET	Asia and Pacific Regional Network INIBAP Philippines
BADC	Belgian Administration for Development Cooperation
BARNESA	Banana Research Network for Eastern and Southern Africa
BBC	British Broadcasting Corporation
BPI	Bureau of Plant Industry Philippines
CAAS	Chinese Academy of Agricultural Sciences
CABI	CAB International
CAN/PGR	Central Asia Network on Plant Genetic Resources
CATAL	CIAT s Library Catalog Database
CATIE	Centro Agronomico Tropical de Investigacion y Ensenanza Turrialba Costa Rica
CBD	Convention on Biological Diversity
CFC	Common Fund for Commodities EU
CGIAR	Consultative Group on International Agricultural Research
CGN	Centre for Genetic Resources the Netherlands
CIAT	Centro Internacional de Agricultura Tropical Colombia CGIAR
CIFOR	Centre for International Forestry Research Indonesia CGIAR
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo Mexico (International Wheat and Maize Improvement Centre)
CINS	Cooperazione Italiana Nord Sud
CIP	Centro Internacional de la Papa Peru CGIAR
CIRAD FLHOR	Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement Departement des Productions Fruitieres et Horticoles France
CNIC	Centro Nacional de Investigaciones Cientificas Cuba
CNPMF	Centro Nacional de Pesquisa en Mandioca e Fruticultura (EMBRAPA) Brazil
CNSF	Centre Nacional de Semences Forestieres
COGENT	International Coconut Genetic Resources Network
CORAF	Conference des Responsables de Recherche Agronomique Africains (Southern African Centre for Cooperation in Agricultural Research)
CORBANA	Corporacion Bananera Nacional Costa Rica
CPCRI	Central Plantation Crops Research Institute India
CPRO	Centre for Plant Breeding and Reproduction Research
CRBP	Centre Regional Bananiers et Plantains Cameroon
CRI	Coconut Research Institute Sri Lanka
CTA	Technical Centre for Agricultural and Rural Cooperation the Netherlands
CWANA	Central & West Asia and North Africa
DANIDA	Danish International Development Assistance
DFID	Department for International Development UK
DIT	Documentation Information and Training
DOR	Directorate of Oilseeds Research Rajendranagar India
DSE	German Foundation for International Development
ECP/GR	European Cooperative Programme for Crop Genetic Resources Networks
EGAD	Evaluation Group for Analysis of Data
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuaria Brazil
EPMR	External Programme and Management Review
EPU	Editorial and Publications Unit IPGRI
EU	European Union
EUFORGEN	European Forest Genetic Resources Programme
FAO	Food and Agricultural Organization of the United Nations
FAUSAC	Facultad de Agronomia Universidad de San Carlos

FRIM	Forest Research Institute of Malaysia
GATT	General Agreement on Tariffs and Trade
GEF	Global Environment Facility
GIS	Geographic Information Systems
GMS	Genebank Management System
GPA	Global Plan of Action
GRIN	Germplasm Resources Information Network USDA
GRST	Genetic Resources Science and Technology
GTZ	Deutsche Gesellschaft fur Technische Zusammenarbeit Germany
HRI	Horticulture Research International Wellesbourne UK
IARC LARS	International Agricultural Research Centre Long Ashton Research Station UK
IARI	Indian Agricultural Research Institute
IAV Hassan II	Institut Agronomique et Veterinaire Hassan II Rabat Morocco
ICAR	Indian Council of Agricultural Research
ICARDA	International Centre for Agricultural Research in the Dry Areas Syria CGIAR
ICCO	International Cocoa Organization
ICGR	Institute of Crop Germplasm Resources China
ICIPE	International Centre of Insect Physiology and Ecology
ICIS	International Crop Information System
ICLARM	International Center for Living Aquatic Resources Management
IC PCR	Immuno capture polymerase chain reaction
ICRAF	International Council for Research in Agroforestry Kenya CGIAR
ICW	Inter Centres Week
ICWG GR	Inter Centre Working Group on Genetic Resources
IDB	Inter American Development Bank USA
IDRC	International Development Research Centre Canada
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture Nigeria CGIAR
ILRI	International Livestock Research Institute
IMTP	International *Musa* Testing Programme
INERA	Institut d Etudes et de Recherches Agricoles
INIA	Instituto Nacional de Investigacion y Tecnologia Agraria y Alimentaria Spain
INIBAP	International Network for the Improvement of Banana and Plantain Montpellier IPGRI/ CGIAR
INRA	Insitut National de la Recherche Agronomique
IPGRI	International Plant Genetic Resources Institute Italy CGIAR
IPK	Institut fur Pflanzengenetik und Kulturpflanzenforschung Germany
IPPC	International Plant Protection Convention
IRAT	Institut de Recherches Agronomiques Tropicales Madagascar
IRAZ	Institut de recherches agronomique et zootechnique
IRRI	International Rice Research Institute the Philippines CGIAR
ISO	International Standards Orgranization
ITC	INIBAP Transit Center
IUCN	International Union for Conservation of Nature
IVIA	Instituto Valenciano de Investigaciones Agrarias Spain
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
KIB	Kunming Institute of Botany
KUL	Katholieke Universiteit Leuven Belgium
LAC	Latin America/Caribbean
LACNET	INIBAP Regional Network for Latin America and the Caribbean Costa Rica
LIPI	Lembaga Ilmu Pengetahun Indonesia (Indonesian Institute of Science) Indonesia
LIS	Library and Information Service
m asl	metres above sea level
MGIS	Musa Germplasm Information System
MOU	Memorandum of Understanding
NARC	National Agricultural Research Center Islamabad Pakistan
NARO	National Agricultural Research Organization
NARS	National Agricultural Research Systems
NBPGR	National Bureau for Plant Genetic Resources India
NBRI	National Botanical Research Institute
NGB	Nordic Gene Bank Sweden
NGO	Non governmental Organization
NHK	Nihon/Nippon Hoso Kyokai (Japan Broadcasting Corporation)
NPGRC	National Plant Genetic Resources Centre
NPGRL IPB	National Plant Genetic Resources Laboratory Institute of Plant Breeding
NPGS	National Germplasm Resources Laboratory
NRI	National Research Institute
NSSL	National Seed Storage Laboratory USA
NTSP	National Tree Seeds Programme Tanzania
OIV	Office International de la Vigne et du Vin
OPI	Oil Plant Institute of Vietnam
pcGRIN	a version of the GRIN database adapted for use on personal computers
PCR	polymerase chain reaction
PGRI/PARC	Plant Genetic Resources Institute Pakistan Agricultural Research Centre
PNG	Papua New Guinea
QDPI	Queensland Department of Primary Industries Australia
RAPD	Random amplified polymorphic DNA
RBG	Royal Botanic Gardens Kew UK
RECSEA PGR	Regional Committee for Southeast Asia Plant Genetic Resources
RISBAP	Regional Information System for Banana and Plantains in Asia and the Pacific
RVAU	Royal Veterinary and Agricultural University Denmark
SADC	Southern African Development Community
SGRP	System wide Genetic Resources Programme CGIAR
SINGER	System wide Information Network for Genetic Resources CGIAR
SPGRC	SADC Plant Genetic Resources Centre
SSA	Sub Saharan Africa
SSR	simple sequence repeats
TAC	Technical Advisory Committee of the CGIAR
TBRI	Taiwan Banana research Institute
TRIPs	Trade Related (Aspects of) Intellectual Property Rights
TROPIGEN	Amazonian Plant Genetic Resources Network
UCV	Universidad Central de Venezuela
UKM	Universiti Kebangsaan Malaysia
UMS	Underutilized Mediterranean Species
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UPM	Universiti Putra Malaisia (University of Agriculture in Malaysia)
UPOV	International Union for the Protection of New Varieties of Plants Geneva Switzerland
USAC	Universidad de San Carlos Guatemala
USDA	United States Department of Agriculture USA
UTFANET	Underutilized Fruits in Asia Work
VIR	N I Vavilov Institute of Plant Industry Russia
VISCA	Visayas State College of Agriculture
VVOB	Vlaamse Vereniging voor Ontwikkelingssamenwerking ent technische Bijstand
WANANET	West Asia and North Africa Network for Genetic Resources
WARDA	West African Rice Development Association Cote d Ivoire CGIAR
ZADI	Zentralstelle fur Agrardokumentation und Information Germany

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