

# Consultative Group on International Agricultural Research

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From: The Secretariat

April 16, 1992<sup>2</sup>  
MT/92/17

## Mid-Term Meeting, May 18-22, 1992 Istanbul, Turkey

### Agenda Item 8 - Intellectual Property Rights Issues

1. At ICW91, a "statement of principles" on intellectual property rights, biosafety and plant genetic resources was introduced for the Group's consideration by Mr. Lukas Brader, Co-Chair of the joint TAC-Center Directors Committee on Intellectual Property Rights and Plant Genetic Resources. On November 7, 1991, the Secretariat distributed a revised version of this statement (attached). Although there was substantial agreement on the content, some procedural matters were raised about issuing the statement at that time. It was agreed that the item would be brought before the Group again at its May 1992 meeting.

2. Consultations on IPR and biotechnology issues have been held over the last nine months within the CGIAR system. These have included discussions with representatives of NARS, NGOs, private companies and other CGIAR collaborators, as well as seminars and meetings such as the Biotask/ISNAR seminar in September 1991 on biotechnology policy. The joint TAC-Center Directors Committee met at IBPGR in January 1992 with representatives of Biotask and produced a draft paper entitled "CGIAR Discussion Document on Intellectual Property, Biosafety and Plant Genetic Resources". This paper was discussed at TAC57 (March 1992) and has been subsequently revised and is attached hereto.

3. The two aforementioned papers serve as background documentation for the discussion of Agenda item 8 - Intellectual Property Rights Issues. The Group will be asked to decide what further action, if any, is required on this subject.

Attachments

#### Distribution

CGIAR Members  
Center Board Chairmen  
Center Directors  
TAC Chairman  
TAC Members  
TAC Secretariat

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**DATE:** November 7, 1991  
**TO:** CGIAR Donors  
**FROM:** The Secretariat

### **Suggested Principles for a Future CGIAR Policy on Intellectual Property Rights**

The Center Directors, TAC, the Secretariat and others in the system have been working over the past two years toward analyzing the potential effects of intellectual property rights on the CGIAR. ICRISAT hosted a workshop on this subject for center representatives in Hyderabad earlier this year. It is generally agreed among participants in these efforts that the CGIAR develop an overall policy on intellectual property rights, plant genetic resources and biosafety.

Several discussions were held before International Centers Week concerning a proposed policy on intellectual property rights. It was agreed that a draft policy encompassing the major points listed above should be prepared for discussion at the Mid-Term meeting May 1992 in Turkey, and that the leading section of the draft policy should include statements of principle that would guide the proposed policy.

The Directors General prepared a list of principles and presented it for consideration by the Group during the final ICW91 business session. After considerable discussion it was decided that many delegations would like to confer at home before deciding to agree or disagree with the principles listed. The statement regarding the non-patenting of genes should not be interpreted to mean the CGIAR is prepared to patent other life forms. This issue will be given more attention and discussion within a larger audience in 1992. Therefore, it was decided the Secretariat would send the list of principles to members of the Group for consideration.

Members are asked to send any comments or objections to the CGIAR Secretariat by November 19, 1991. The short deadline is to clarify and facilitate the CGIAR's representation at the Convention on Biodiversity for the United Nations Conference on Environment and Development (UNCED), which will begin the third week of November in Nairobi, Kenya. Thank you for your assistance.

## **SUGGESTED PRINCIPLES FOR A FUTURE CGIAR POLICY ON INTELLECTUAL PROPERTY RIGHTS**

During the past year, the CGIAR System (Consultative Group on International Agricultural Research) has been working towards an overall CGIAR policy on plant genetic resources, intellectual property rights and biosafety with the involvement of the international agricultural research centers (IARCs), the CGIAR Technical Advisory Committee (TAC) and the members of the CGIAR (through BIOTASK- the CGIAR Task Force on Biotechnology). The CGIAR recognizes the need to make new biotechnologies available to developing countries to address problems in agriculture and the environment.

An overall CGIAR policy is currently being finalized. However, recognizing that the issues are of considerable and increasing international interest and concern, the CGIAR System agreed at its recent meeting in Washington, D.C., to release a statement of principle guiding its intent in these areas. These principles are:

- The CGIAR reconfirms that the plant genetic resources maintained in the genebanks of the IARCs are held in trust for the world community;
- The CGIAR reconfirms its adherence to the principle of unrestricted availability to its plant genetic resources;
- The CGIAR recognizes both Plant Breeders' Rights and the concept of Farmers' Rights, in accordance with the agreed interpretation of the International Undertaking on Plant Genetic Resources;
- The CGIAR considers that naturally occurring genes are common property, therefore the IARCs of the CGIAR will not seek intellectual property protection of such genes;
- The IARCS of the CGIAR, in respect of novel biotechnological techniques, processes and other inventions developed by them, will consider seeking intellectual property protection where necessary to ensure access to these technologies by developing country partners;
- The CGIAR does not see the protection of intellectual property as a mechanism for securing financial return for its own investments in research. If an IARC seeks intellectual property protection on an invention, any financial returns stemming from the commercialization by third parties other than NARS (National Agricultural Research Systems) in developing countries, will be used to further the conservation and use of genetic resources in developing countries;

- The IARCs of the CGIAR will continue to follow the existing internationally recognized OECD guidelines concerning biosafety;
- The CGIAR acknowledges the intergovernmental negotiations underway to establish an International Convention of Biodiversity for signature at the United Nations Conference on the Environment and Development (UNCED) in Brazil in June 1992. The CGIAR and its IARCs will ensure that its policy is consistent with the articles of the Convention once it is agreed.

DP/J2(cgipr)

From: The Secretariat

April 9, 1992

**Mid-Term Meeting, May 18-22, 1992**  
**Istanbul, Turkey**

**CGIAR Discussion Document**

**On Intellectual Property, Biosafety and Plant Genetic Resources**

**Distribution**

CGIAR Members  
Center Board Chairmen  
Center Directors  
TAC Chairman  
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## INTELLECTUAL PROPERTY

### 1. BACKGROUND

In developing its approach to the changing circumstances caused by the wider recognition of intellectual property, the CGIAR will maintain a clear distinction between plant genetic resources and research products. In relation to plant genetic resources, the CGIAR has already defined the role of the Centres as that of trustees, and stressed that the material is held on the understanding that it will be used for the benefit of global research. The CGIAR recognizes that the Centres' genebank collections cannot be considered amongst the Centres' assets.

As trustees of international germplasm collections, the Centres have an obligation to manage them for the benefit of the world community. This management responsibility includes the maintenance and enhancement of the accessions held in trust, their defence against physical destruction, and a guarantee of unrestricted access for the benefit of the world community.

In relation to their research products, the Centres primary responsibility is to ensure that they and the developing countries they serve continue to have access to needed products and processes. To do so means that they must take appropriate and prudent steps to manage their intellectual property. There might well be circumstances in which the Centres would wish to protect their own inventions in order to prevent preemptive protection by others, which might restrict the availability of those inventions, especially to the developing countries. Because much of today's advanced technology is subject to intellectual property protection, Centres cannot always expect to have free access to it. Consequently, they will increasingly have to collaborate with institutions that protect their intellectual property in order to obtain the use of new products and processes.

Application of the above principles to the formulation of future CGIAR policy would imply that the Centres would not seek financial returns from intellectual property protection, and that any financial returns that might arise from the application of intellectual property protection would not be used to cover the Centres' operating costs. Rather, any such returns would be used for the direct benefit of developing countries, perhaps by placing them in an international fund to be used for the conservation of plant and animal genetic resources. If such a policy were to be pursued, details of the administration of such a fund would have to be carefully considered.

Based on these principles, the following paragraphs give the rationale for the likely stance that the Centres would adopt in relation to different forms of intellectual property (See Index B for descriptions of the various categories of specific products and processes).

### 2: GERMPLASM COLLECTIONS

Germplasm accessions in the Centres' base and active collections constitute the material held in trust by them for the world community. The Centres would not seek patent protection or plant breeders' rights on this material. Further, when the Centres provide this germplasm to organizations other than the appropriate government authorities in developing countries, they would do so under material transfer agreements, and any national authority which received the material would be asked to follow similar procedures in passing it on to other organizations. The purpose of these agreements would be to ensure that any useful genes discovered in the material could not be withheld from the country from which the

**CGIAR DISCUSSION DOCUMENT**  
**ON INTELLECTUAL PROPERTY, BIOSAFETY AND PLANT GENETIC RESOURCES**

**INTRODUCTION**

The greatest contributions the CGIAR Centres have made to agriculture in the developing world have been associated with their ability to facilitate collaboration among scientists in different countries. They have been able to do this largely as a consequence of promoting the principles of free access to scientific discoveries and the free interchange of genetic resources. It is the CGIAR's intention that these basic principles should be fully enshrined in its future activities.

Against this background, the need has arisen to consider appropriate ways in which the CGIAR should respond to the increasing prominence in biological research of the concepts of intellectual property, which are creating both new opportunities and new concerns. The opportunities relate mainly to the possibilities for increased investment in biological research, thereby augmenting and accelerating the application to human needs of wide areas of biological science. The concerns relate both to the restrictions that intellectual property might impose on the free availability of these benefits to developing countries, and to the need to ensure safety in the application of new techniques and the release of new products. All these topics are interrelated, especially in those CGIAR activities that involve the use of germplasm and its products.

This discussion document takes a broad look at the implications of intellectual property for the work of the CGIAR and the interests of the developing countries. In considering germplasm, it builds on the 1989 "CGIAR Policy on Plant Genetic Resources" and takes into account the International Undertaking on Plant Genetic Resources (see Index A). It is intended as a further step in the continuing consultative process within the CGIAR System, and with its clients in developing countries. It sets the framework for evolving CGIAR approaches to the ownership of intellectual property, to biosafety and to the work it supports on the conservation of plant genetic resources.



material originated, nor could the Centres be prevented from using the material, or specific genes derived from it, for the benefit of developing countries.

Accordingly, these agreements would require the users to negotiate with the Centres if the original material, essentially derived varieties (as defined by the UPOV Convention of 1991), or genes isolated from the material were to be protected and used commercially. In these negotiations, the Centres would be primarily cognizant of the need to safeguard the interests of the developing countries, rather than to derive financial returns. The intention would not be to inhibit the use of the material in crossing programmes for purposes of conventional plant breeding nor, in any way, to restrict the free interchange of germplasm.

### 3. BREEDING MATERIAL UNDER DEVELOPMENT

Breeding material under development is defined as that which the Centres have improved through breeding. Increasingly, the Centres are moving towards the development of strategic germplasm (i.e. advanced lines or populations with potential value for further breeding research), rather than producing finished varieties. The Centres would not seek patent or plant breeders' rights on this material, and would supply it freely under a material transfer agreement.

Under such an agreement, the Centres would provide to public or private sector institutions material to be used for further breeding and commercialization. Material suitable for use as finished varieties would normally be made available solely to the appropriate government authorities in developing countries. Such authorities could either release such varieties themselves, or sub-license them to one or several firms in the private sector. The Centre's agreement with the national authority could take the form either of a single agreement or an umbrella agreement covering all aspects of germplasm exchange over an extended period of time. This would offer the national authority an opportunity to obtain a financial return, if it so wished, and thus to augment scarce financial resources. The primary purpose, however, would be to prevent a private company from imposing, through intellectual property protection, restrictions on the future use of that material by the Centre or by other developing countries.

In the case of industrial countries, the Centres could conceivably allow public or private institutions to gain rights to improved germplasm under plant variety protection, provided the rights were gained through a transparently fair procedure, and did not restrict future use of the material by the Centre. In such cases, any financial returns derived from the licensing agreement would be passed to an international fund as described above.

### 4. OTHER BIOTECHNOLOGICAL PRODUCTS AND PROCESSES

Biotechnological products include, among others, transgenic plants sub-cellular components, living cell lines, vaccines, diagnostic techniques, genetic maps and research procedures and methodologies. These are protected by a number of different intellectual property forms in industrial nations. In order to obtain these products, the Centres would sometimes find it necessary to negotiate and participate in strategic alliances and to recognize intellectual property rights to the various research products. In these negotiations, the Centres would ensure access to the new technologies and products of the research for developing countries.

## Transgenic Plants and Gene Constructs

The patenting of genes in major industrial nations involves rights over recombinant DNA containing the gene sequences, plasmids and vectors containing the sequences, plants transformed by vectors containing the sequences and products derived from those plants. The patenting of a gene in this fashion does not restrict conventional breeding using plant material in which the gene occurs naturally.

The CGIAR Centres are already cooperating with laboratories which have been isolating, and are sometimes modifying, important genes in order to insert these genes into plants to benefit developing countries. Effective negotiation of and participation in such cooperative programmes would exceptionally require the Centres to recognize certain patent rights in industrial countries and, in some cases, to pursue such patents themselves. As they develop these intellectual property rights, it would not be the intention of the Centres to seek any benefit from the exercise of these rights other than to ensure that the most beneficial advanced technologies and their products would be made available to developing nations at as low a cost as possible.

## Vaccines

Animal vaccines are typically protected by trade secrecy during the early research phase and by patents as the product moves closer to commercialization. There have been instances where it has been necessary for a Centre to collaborate with a major pharmaceutical company in order to gain access to new techniques and apply these to the control of tropical animal diseases. This has resulted, for example, in collaboration for the production of a new and improved vaccine against East Coast Fever. In this instance, one Centre is seeking patent protection on its invention to allow its collaborators to invest in the development of the vaccine for the market. Without such a strategic alliance it would not be possible for the new vaccine against East Coast Fever to be made available to many developing countries.

## Diagnostic Techniques

New diagnostic techniques for animal and plant diseases can be protected by trade secrecy and patents. Increasingly, both universities and industry are protecting these innovations by trade secrecy. The Centres would, however, generally make any new diagnostic techniques they develop available without restriction.

## Genetic Maps

The Centres will need to collaborate extensively with public and private sector institutions to develop genetic maps for the species of interest. Although these maps have often been subject to trade secrecy, the Centres would encourage their public availability.

## Research Processes

As a rule, the Centers would publish their results rapidly to prevent any possible patenting of their research procedures and processes by others. Only exceptionally would they protect their results through patents or trade secrets when this would be essential to ensure availability at lowest cost to developing countries.

## 5. OTHER PRODUCTS

For the range of other products that arise from Centres' activities such as publications, audio-visual materials, databases and computer software, protection is normally obtained through copyright and this is presently a widely adopted procedure by CGIAR institutions. Machinery and equipment invented by the Centres are frequently protected by patents, particularly to avoid misappropriation by others.

## 6. SUMMARY OF GUIDING PRINCIPLES

The CGIAR's preferred policy would be to publish protectable inventions to maintain them in the public domain. Within such a policy framework, the CGIAR Centres would seek intellectual property protection only after a specific judgement that such protection would assist in bringing the benefits of research to developing nation farmers.

## **BIOSAFETY**

Safety in biological research, in the application of its results, and in the use of its products is broadly referred to as "biosafety". In this context, biosafety relates to those regulatory procedures considered essential to safeguard human health and the stability of natural ecosystems. It covers not only biological science and technology but also the release of novel organisms, both those introduced from one country to another for purposes of biological control, and those produced by genetic engineering.

It is the policy of the CGIAR and the Centres it supports to adhere to national regulations and codes of practice of the countries with which they collaborate. Those CGIAR Centres and their contractors conducting biological research will form biosafety committees which will include appropriate representation from the host country and which will be responsible for monitoring the safe use of biological techniques both in the laboratory and under containment conditions. As regards the subsequent field testing and environmental impact assessments of exotic or novel organisms, the Centre and its collaborators will adhere to national legislation.

Where no appropriate legislation exists, the Centre will reach agreement with the government concerned on the procedures to be followed, based on international or regional codes of practice. Both Centres and national governments will, of necessity, be required to keep abreast of new developments in biosafety and risk assessment and the Centres will promote collaborative research to expedite such assessments. In the course of this collaborative work, Centres will also promote greater awareness of the importance of implementation of appropriate biosafety practices.

## CONSERVATION OF PLANT GENETIC RESOURCES

### 1. BACKGROUND

In addition to their overall importance for agricultural research and development, plant genetic resources are being seen increasingly as part of the wider concept of biodiversity. Consequently, CGIAR activities on plant genetic resources need to be seen in this wider perspective. The purpose of CGIAR support for work on plant genetic resources is to ensure that the diversity of germplasm of global or regional importance is safely maintained and made available for use in research and plant improvement programmes for the benefit of all people.

Work on genetic resources supported by the CGIAR has traditionally been dedicated primarily to the conservation, *ex situ*, of crop plants, pastures, vegetables and fruits, together with their wild and weedy relatives. Increasingly, however, attention is being given to trees and shrubs, as well as to the complementary nature of *ex situ* and *in situ* conservation. (See Indexes C and D).

In this document the term conservation is used in the broad sense to include collecting, characterization, documentation, evaluation, multiplication, storage and distribution. The term "plant genetic resources", is interpreted as including relevant plant species containing characters of immediate or potential value. In domesticated plants, as well as in trees and shrubs, the total resource is the potential inherent in all the genetic combinations produced in the process of evolution, including:

- wild and weedy species;
- landraces and local varieties;
- common varieties of poal value for plant improvement which are not commercially available or presently grown by farmers;
- elite germplasm, including inbred lines, breeder's lines, sources of resistance to biotic and abiotic constraints and other genetically modified forms for use in plant improvement programmes;
- genetic stocks for use in or produced by research, including special material with genetically stable and useful characters, such as aneuploid and polyploid lines, morphological and chemical mutants and biological material from biotechnological and other research.

Conservation of plant genetic resources and associated research are major activities of the CGIAR Centres. These activities are carried out in close cooperation with national research systems in the developing countries and with other institutions. Through technical advice, training and collaborative research, the Centres help to strengthen national capabilities.

The various elements of CGIAR policy on the conservation of plant genetic resources that require reaffirmation and wide recognition are outlined in the following paragraphs.

## 2. TRUSTEESHIP OF PLANT GENETIC RESOURCES

The plant genetic resources maintained in international base and active collections by the CGIAR Centres are held in trust for the world research and development communities. It is suggested that the CGIAR Centres should bring their base and active collections into the global network under the auspices of FAO, as defined in the International Undertaking on Plant Genetic Resources.

The CGIAR Centres will supply germplasm from their active collections, along with relevant data, to any research and development worker anywhere in the world, provided adequate stocks are held at the time the request is received or, if not, after multiplication. It is an established practice of the CGIAR Centres to repatriate samples of original accessions to countries and communities where it has become necessary to replace material no longer available in the national collections or in farmers' fields.

## 3. STORAGE AND SAFETY OF COLLECTIONS

The CGIAR Centres consider it their responsibility to store all material they hold in trust under internationally accepted conditions. In order to ensure the safety of the collections that the CGIAR Centres hold in trust, the base collections are duplicated in at least one other long-term storage facility. These duplicate collections will be treated in the same manner as the original base collections.

## 4. EXPLORATION AND COLLECTING

All exploration and collecting activities of CGIAR Centres are carried out in partnership with national programmes. During such missions, internationally accepted guidelines are followed, as well as the prevailing national regulations for germplasm collecting. The information gathered will include, to the greatest extent possible, traditional knowledge about the accessions. A complete set of both the material and the information is made available to the country concerned.

## 5. MULTIPLICATION AND REGENERATION

The process of increasing the quantity of a given germplasm accession available from seed or by vegetative means, is an important activity for each collection. It allows sufficient amounts of individual accessions to be available for exchange and use, as well as for characterization. The CGIAR Centres, in partnership with national programmes, ensure that germplasm is multiplied under conditions that minimize genetic drift.

## 6. CHARACTERIZATION

Characterization of germplasm collections is an integral part of the responsibilities of a genebank and an important prerequisite for the proper management of collections and the promotion of germplasm use. The CGIAR Centres carry out characterization of all the accessions in their collections, using standardized descriptor lists, which will continue to be developed and updated taking into account the latest scientific developments.

## 7. EVALUATION

Close cooperation among genebank managers, plant breeders and scientists from other disciplines is crucial to evaluate genetic material effectively for use in plant improvement programmes. The development of international crop genetic resources networks is seen as a major tool to achieve this aim. IBPGR and the relevant international commodity centres will play a major role in the development of these networks. Resulting evaluation data are made freely available to all users upon request.

## 8. DATA MANAGEMENT AND INFORMATION

The CGIAR Centres promote the development of databases for genebanks as a prerequisite for the proper management of plant genetic resources. The CGIAR Centres disseminate this information to users and facilitate its exchange between collaborating institutions. They also assist in the management of information for the known gene pool of the species for which they have accepted such responsibility.

## 9. GERMPLASM HEALTH AND PLANT QUARANTINE

The CGIAR Centres adhere to national quarantine regulations. For germplasm exchange, they apply internationally accepted phytosanitary standards, such as those set out in the FAO/IBPGR Technical Guidelines for the Safe Movement of Germplasm. The CGIAR Centres will continue to contribute to the development of guidelines, improved methods for indexing and treatments for plant health to strengthen still further the safe movement of germplasm.

The CGIAR Centres will routinely adhere to sanitation and testing procedures with the objective of progressively building collections free of known pathogens. In addition to the national plant health certificate, a standardized CGIAR germplasm health statement will accompany all outgoing germplasm.

## 10. RESEARCH AND TRAINING

The CGIAR Centres support relevant research on genetic resources, both at their own institutions and through collaborative projects. They also support workshops and conferences on plant genetic resources, as well as the training of germplasm specialists, giving special attention to modern biological techniques.

## 11. SUSTAINING AN INTERNATIONAL COMMITMENT

The long-term conservation of plant genetic resources requires the sustained commitment of all concerned. The CGIAR sees itself as an integral component of, and an active participant in, the global initiatives on plant genetic resources. The CGIAR accepts the responsibility it has assumed for the continued funding of the genebanks at the Centres it supports.

The CGIAR Centres are well placed to assist in strengthening international activities on plant genetic resources at the scientific and technical levels. The CGIAR Centres are committed to the allocation of appropriate resources to ensure the continued availability of the genetic resources they hold in trust.

It is the policy of the CGIAR to promote strong linkages between the conservation of plant genetic resources and plant improvement programmes. To this end, the CGIAR Centres play a catalytic role through such activities as the development of regional and global genetic resources networks. Strong and

sustained support for all these activities will be needed if the CGIAR goal of sustainable production of food-crops and trees in the developing countries is to become a reality.



## Index A

### International Undertaking on Plant Genetic Resources

The CGIAR welcomes the initiatives being taken in the framework of the FAO International Undertaking on Plant Genetic Resources. These initiatives recognize the contributions of farmers, rural communities, and countries to genetic resources, and acknowledge the need for international financial mechanisms to ensure sustainable conservation and utilization of plant genetic resources.

The basic principles were enunciated in 1983 by the FAO conference which adopted the International Undertaking on Plant Genetic Resources (FAO Resolution 8/83). The International Undertaking is a nonbinding legal instrument, the objective of which is to ensure that plant genetic resources, especially species of present or future economic or social importance, are explored, collected, preserved, evaluated, and made available for plant breeding and other scientific purposes without restriction. While recognizing national sovereignty, the Undertaking is based on the principle that plant genetic resources form part of the heritage of humankind and, therefore, should be conserved for future generations.

Subsequent resolutions (FAO Resolutions 4/89 and 5/89) recognized that Plant Breeders' Rights are not incompatible with the Undertaking and that developing countries, through the concept of Farmers' Rights should be collectively compensated for their contributions to the enhancement of plant genetic resources. The term "Farmers' Rights", is defined in the text of the International Undertaking as "rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources, particularly those in the centres of origin/diversity. These rights are vested in the international Community, as trustee for present and future generations of farmers, and supporting the continuation of their contributions, as well as the attainment of the overall purpose of the International Undertaking." The CGIAR subscribes to these principles.

## Index B

### Types of Intellectual Property

Plant Variety Protection or Plant Breeders' Rights This is a national protection, usually governed by the UPOV Convention, designed to give a breeder limited rights on marketable plant varieties. It generally gives the breeder a monopoly on the right to market the seed. Under the provisions of a new revised UPOV convention of 1991 this monopoly will last a minimum of 20 years for most plants and 25 years for trees and vines. A variety must be distinct, uniform, and stable to be protectable. Depending on the version of the Convention chosen and its national implementation, a farmer may be permitted to carryover a harvested crop to reuse for seed. Moreover, a breeder may use a protected variety for breeding purposes, but, again depending on the particular version of the Convention, it may require the permission of the variety holder to market any modified form that has been changed so little as to constitute "an essentially derived variety". This type of protection is appropriate for finished varieties. Plant breeders' rights differs significantly from patents in that there is only a product (but not a process) protection.

Patent Protection is the regular patent system, designed to protect inventions of broad applicability. It is also national, except in Europe, where there is a Europe-wide patent system. It gives a monopoly on the right to make, use or sell the invention, in return for disclosure of the invention. The monopoly is typically for 17 to 20 years. Normally, publication will prevent patenting. There is no equivalent to the farmer's privilege. In most jurisdictions there is a research exemption which allows experimentation with a patented invention for non-commercial purposes. Whether the product of the research infringes the original patent depends on the claims of that patent.

An invention has to meet a number of legal prerequisites for the grant of a patent. It must be: new; non-obvious (involve an inventive step); described adequately for another to practice the invention, and industrially applicable. The scope of protection is decided by the patent claims. These are carefully scrutinized in the examination process to ensure that the legal requirements are met for each of them.

Copyright is the protection appropriate to printed and literary works, and gives a monopoly on the right to make direct copies of protected material. The period of protection is much longer than for plant variety protection or patents. Certain limited copying is allowed for personal purposes. For the Centres, this type of protection is appropriate for publications and, under the laws of many nations, for computer programmes.

Trade Secret Protection is the protection derived from actual secrecy of information, which may be protected against theft and, by contract, against appropriation by employees or research partners. There are no formal statutory requirements and there is no time limit on protection; a secrecy agreement does not afford protection against independent discovery by another person. It is this form of protection that some companies use for the information contained, for example, in a detailed genetic map.

Material Transfer Agreements are contracts between the supplier and the recipient of material such as genetic material. They may include provisions governing such issues as the right of the recipient to retransfer the material, obligations to return the material, or rights in commercial profits that may accrue from the material. They may be reached in connection with each transfer or there may be agreements governing a number of transfers.

## Index C

### EX SITU CONSERVATION

All genebanks have two principal functions: the long-term preservation of plant genetic resources and the promotion of their use. In order to combine these two functions, two types of collections are internationally recognized which are defined as follows:-

Base collections contain distinct accessions under long-term, safe storage conditions, well-documented, monitored and managed. Accessions are removed from the base collection only for infrequent regeneration when seed viability has declined below an acceptable standard, or when stocks of an accession are no longer available from an active collection.

Currently, base collections are maintained only for orthodox seeds, e.g. seeds which can be dried and stored at low temperature without damaging their viability. They are dried, sealed in airtight containers and stored at a low temperature (usually  $-1^{\circ}$  to  $-20^{\circ}$ ). Base collections for the storage, in vitro, of vegetative tissues and recalcitrant seed embryos are currently in the research stage.

Active collections comprise accessions used for regeneration, multiplication, distribution, characterization, evaluation, documentation and medium-term storage. Currently, orthodox seed is maintained in active collections and stored at temperatures above  $0^{\circ}$  C but below  $15^{\circ}$  C.

Particular species that are difficult to maintain as stored seed are sometimes grown, *ex situ*, under field conditions or in nurseries. Such collections are called "field genebanks" and, in general, fall within the category of active collections. For some species, accessions maintained *in vitro* are approaching routine use as active collections but, for others, such developments are still at the research stage.

Working collections (also referred to as breeders' collections or research collections) contain material used for specific purposes. Storage of material in these collections is usually under ambient conditions or in air-conditioned rooms. The collections are regarded as outside the framework of genetic resources conservation, but a substantial part of them is made available through active collections.

The accessions in the base and active collections are normally identified in published catalogues which define the passport information specifying the origin of the material and biological and agronomic characteristics of interest to the user.

## Index D

### IN SITU CONSERVATION

The purpose of *in situ* conservation is to ensure the survival of material in its natural environment, be it through nature reserves, specific scientific reserves, national parks, farmers' fields (on-farm conservation) or protected areas. The conservation of germplasm in farmers' fields is also included in this category since it refers to the conservation of landraces and local varieties in their agro-ecosystem.

The CGIAR recognizes the value of this method of conservation and regards *in situ* and *ex situ* conservation as two complementary methods. *In situ* conservation is of particular importance for perennial species and other species that are wild or not far removed from the wild, such as many forage species. *In situ* conservation of landraces is one of many defenses against genetic erosion as a consequence of the introduction of modern cultivars in a particular region. The CGIAR Centres can play an important role in providing seeds of landraces for *in situ* conservation by local communities.