PN-AAR-191

000613

AGPG:IBPGR/83/49
August 1983

INTERNATIONAL BOARD FOR PLANT GENETIC RESOURCES

PRACTICAL CONSTRAINTS AFFECTING THE COLLECTION AND EXCHANGE OF WILD SPECIES AND PRIMITIVE CULTIVARS

Secretariat Consultation

14-15 March 1983

REPORT

IBPGR SECRETARIAT
Rome, 1983

The International Board for Plant Genetic Resources (IBPGR) is an autonomous, international, scientific organization under the aegis of the Consultative Group on International Agricultural Research (CGIAR). The IBPGR, which was established by the CGIAR in 1974, is composed of its Chairman and 15 members; its Executive Secretariat is provided by the Food and Agriculture Organization of the United Nations. The Basic function of the IBPGR, as defined by the Consultative Group, is to promote an international network of genetic resources centres to further the collection, conservation, documentation, evaluation and use of plant germplasm and thereby contribute to raising the standard of living and welfare of people throughout the world. The Consultative Group mobilizes financial support from its members to meet the budgetary requirements of the Board.

IBPGR Executive Secretariat
Crop Genetic resources Centre
Plant Production and Protection Division
Food and Agriculture Organization of the United Nations
Via delle Terme di Caracalla, 00100 Rome, Italy

CONTENTS

INTRODUCTION

1. The IBPGR, at its ninth meeting in February 1982, asked its Secretariat to organize a consultation to identify any practical constraints, other than quarantine, affecting the collection and exchange of samples of wild species and primitive cultivars and to suggest improvements. Such considerations are of importance in the effectiveness of the global network. Several such problems had been raised at the FAO/UNEP/IBPGR Technical Conference in April 1981.

2. The Consultation was held at the Beltsville Agricultural Research Center (BARC), Maryland, USA, 14-15 March 1983 at the invitation of the Plant Introduction Office. The following experts participated: Drs. D.C. Giacometti (Brazil), L. Holly (Hungary), K. Kumagai (Japan), G.V.H. Jackson (Solomon Islands), K.L. Mehra (India), R.D. Smith (UK) and G.A. White (USA). The Secretariat was represented by Drs. J.T. Williams, N.M. Anishetty and Ms. S. Feakin. Dr. N.M. Anishetty acted as Chairman of the Consultation. See Appendix I for list of participants.

3. The participants were welcomed on behalf of BARC and the IBPGR. The agenda as adopted is shown in Appendix II.

REPORT

IDENTIFICATION OF PRACTICAL CONSTRAINTS

Timing of collections

4. The most common constraints are (1) the lack of phenological information on the species to be collected and (2) the heterogenity of seed maturing time. While these constraints are less restrictive for cultivars, they present major constraints for the collection of wild species. Since heterogeneous seed maturing time is a frequent attribute of populations of wild species, a single, short expedition may yield only small portions of the existing variabili-

ty of wild species even when seed sampling and collecting procedures are well applied. This can be a major constraint during multi-crop collecting or when dealing with diverse species such as forages.

5. The Consultation recommends that more emphasis be placed on pre-planning of collection using all available information, viz:

a) climatic and meteorological data,

b) local information on sites and phenology,

c) the study of herbarium specimens, and

d) reports of any previous exploration missions.

6. Collecting can be expensive and any measures taken to reduce the chances of a collector not finding the target species at the correct stage of maturity for collection should be investigated and applied. Sometimes it is advisable to check or complement the available information by means of preliminary expeditions to the area for survey. Such expeditions usually require less personnel and time than actual collecting and can avoid future waste of time and money.

7. All collectors and their sponsors should, when planning expeditions, give attention to:

i) the identification of the correct official channel for the procurement of any necessary permits to visit, collect and export. (It is more efficient for a collector to be in the field collecting rather than to spend time obtaining permits.)

ii) the establishment of local contacts, including primarily the national coordinator and/or the IBPGR regional officer, and to determine their willingness to participate and support with personnel and facilities.

iii) the consideration of logistics, including the availability of transport, fuel, collecting materials, equipment and tools.

iv) the transfer of the seed from the country of collection to the appropriate base collection or distribution centre, including the identification of air freight agents or couriers operating in both the country of collection and destination consultation with the base and/or distribution centre concerning import regulations, the proper air freight address and how the airway bill number is to be transmitted.

Collectors

8. The Consultation agreed that there was a serious lack of well trained collectors, and an even more serious lack of trained counterpart personnel in the countries of collection. An even more serious constraint is the lack of personnel capable of taking care of and utilizing the duplicate collections left in the country of collection. All too often these are lost and never used. As a first step it is recommended that collectors report fully on the names and addresses of persons with whom collections are left and on the type of storage conditions to be used.

9. Collectors should be given adequate guidance on the amount of seed which constitutes an adequate sample of the target species. It should be stressed that small samples are very costly because they need multiplication before accession into a genebank.

10. Collectors should realize that unhealthy samples run the risk of not passing quarantine restrictions. They should try to provide information on known pests or diseases prevalent at the site of collection.

11. The Consultation noted that there was a need to maintain contact with collectors after the missions to follow up any future problems/queries.

Transmission of collected material

12. The Consultation noted that the main constraint to viable samples reaching genebanks is the length of time between collection and accession into genebanks. Any measures taken to reduce this time are to be recommended.

13. The Consultation noted that packaging procedures vary according to target species collected. It recognized the need for collectors to be given guidance on this topic and hoped that it would be covered in IBPGR practical manuals.

14. The lack of adequate legible labels on samples causes problems. Collectors should pay particular attention to this and the IBPGR should note the advances in labelling techniques of aluminium labels as used by the Centro Nacional de Recursos Genéticos (CENARGEN).

15. The length of time samples "sit around" in less than ideal conditions in the country of collection should be reduced, either by proper control of seed moisture content and providing local refrigerated holding facilities, or by sending several consignments if the collecting mission is of long duration.

16. In order to reduce the risk of losing samples, collectors should not leave samples with a third person to send. They them-

selves must either deliver the samples personally or airfreight (airmail) them and send details of airway bill number etc. to the distribution centre or recipient genebank (and also to the IBPGR).

17. Quarantine authorities should be alerted in advance of the arrival of consignments so that they can be transmitted with as little delay as possible.

18. The Consultation noted that many samples arrive uncleaned; this antagonizes quarantine officers and reduces the chances of entry. Collectors must be given guidance and time to deal with this problem.

19. Genebanks should be alerted in advance of the arrival of germplasm material and they should ensure that it is dealt with as soon as it arrives.

20. Collectors should report on any local problems which may affect future collections in that country, e.g. lack of facilities, trained personnel, supply of fuel and packaging materials, status of plant materials - those unable to be collected or on existing valuable germplasm which does not belong to the target species, etc.

21. All persons involved in the collection, handling or shipment of samples should be fully identified so that they can be contacted if additional information is required or tracing of the shipment is necessary.

Information

22. The Consultation confirmed that lack of documentation and information is probably the most serious constraint to any collected sample becoming available for use by plant breeders. Full passport data, including the designation at least to generic level, is essential. Collectors must fill in collecting forms with **all** the data required - including latitude and longitude (local names from maps are not sufficient) and these must be **legible.** Copies must be left with samples in the country of collection and copies must **at all times** accompany all transmitted samples. If samples are treated with chemicals then information on these treatments should be sent with the samples to the recipient genebank or distribution/multiplication centre.

23. Collection reports should be transmitted to all recipients of collected material. Any evaluation should be fully documented and all data should be sent to all recipients of the samples in the country of origin. Any information on evaluation and multiplication should be transmitted not only to the sponsoring organization but also to other recipients of the material, including that left in the country of collection. In order to accomplish this, the full address of the location of the samples and the name of the person responsible must be included in the collectors' reports.

Quarantine

24. The Consultation noted that information on the amount of collected material which arrives at a genebank after quarantine is not readily available. This type of information is now being collected by the IBPGR. In order to maximize chances of complying with international requirements of quarantine procedures, the following points are recommended.

i) collectors should be aware of the quarantine restrictions of both the country of collection and recipient countries. It is the responsibility of collectors to make sure that seed without obvious disease and which is free of extraneous materials reaches the quarantine authorities.

ii) collectors should try to ensure that collected material is not treated with any chemical but if treated, information should accompany the samples.

iii) the material must be sent according to the specific requirements of the local quarantine regulations of the recipient country through the appropriate channel, but it is strongly recommended that materials received be subject to post-entry quarantine.

iv) where specific problems exist with qurantine organization, genebanks wishing to receive material should undertake the necessary liaison with their national organizations.

v) the Consultation recommends that the IBPGR give serious consideration to the use of third country quarantine and/or production of disease-free material which may be necessary before important germplasm can be introduced into nations which do not have adequate post-entry quarantine facilities.

vi) exchange in vitro should be used for vegetatively propagated crops either in the form of meristems, shoot tips or plantlets derived from plants that have been indexed free of disease.

25. Any base centre designated by the IBPGR should be linked to post-entry quarantine facilities or be aware of any of their own national restrictions which may prohibit the flow of material and take steps to mitigate these.

26. The Consultation notes with regret that several countries do not issue phytosanitary certificates and that this omission appears to be a serious constraint to the free flow of samples within the IBPGR network.

27. It was also noted that several constraints could be avoided if quarantine authorities were aware that (i) genetic resources are not the same as seed stocks and (ii) it is not the responsibility of the quarantine authority to select from collected material which goes through quarantine - it should **all** be processed. A great deal of material never gets through because a few seeds are selected and only their progeny are released. In this way most of the variability is lost.

28. Quarantine authorities do not have facilities for holding seeds in good temporary cold storage conditions. Therefore the length of time samples are with them is critical.

Taxonomic verification

29. The Consultation recognized that many collected samples are simply stored in genebanks with neither taxonomic verification, multiplication, characterization nor evaluation. The Consultation noted that to be of use to breeders, collected material must be correctly identified. This can be done either by the collector, at the point of distribution or when it is accessioned into a genebank. At whatever stage this work is done, the information must be coordinated, documented and transmitted with the samples. Such information should be transmitted to the recipient genebank (and to the IBPGR).

Genebanks

30. It was generally agreed by the Consultation that there is a pressing need for the IBPGR to identify the duties of curators and that once identified an attempt should be made to ensure that all genebanks in the network be informed of these criteria and that their curators agree to adhere to them.

31. The fact that many curators do not pay sufficient attention to the management of the germplasm under their responsibility was considered one of the most serious constraints in the global network.

32. Some curators do not systematically keep accurate records, rejuvenate seed, verify collected material, nor regularly multiply and distribute collected material etc. In fact, they contribute more to genetic erosion than might occur in the field and are the major cause of "non-availability". There do not appear to be documented political reasons.

INFORMATION FLOW

33. At the pre-planning stage, copies of the mission should be sent to all organizations involved in distribution, multiplication or characterization of the material.

34. Collectors should be provided with collecting forms in triplicate, on different coloured self-carbon pages bound in books with distinctive hard covers. They should also be provided with printed cards to be returned to genebanks (and the IBPGR) stating the number of samples of each species, data of despatch and airway bill number etc. Collectors should retain one copy of the collecting form, leave one copy with the material in the country of collection and despatch one copy with collected samples to the genebank or distribution centre. (Information on any chemical treatment the samples have received should be added to the respective collection sheets.)

35. If supported by the IBPGR, a collector's report should be sent to the IBPGR within the agreed time limit. It should be checked by the officer concerned to ensure it contains all the required information. If not, it must be returned immediately for correction. Collection forms should accompany this report. When the report meets these specifications it should be distributed to all interested parties and to any other organization which will receive samples. The full list of recipient genebanks must become part of the report and should be attached by the officer concerned - who is also responsible for distributing extra copies to any recipient not on the original list of recipients of the Letter of Agreement.

36. Genebanks should acknowledge receipt of samples - possibly using cards.

ORGANIZATIONAL ISSUES

37. The Consultation discussed the effects of collecting and processing procedures on the subsequent storage of samples and recommends that the IBPGR urge its Committee on Seed Storage to prepare a technical paper on all factors affecting the viability of germplasm in long-term conservation and that this paper should also include a section on all chemical treatments which may be given to germplasm in transit, e.g. fumigation or seed dressings during quarantine procedures. The Consultation stressed that this paper should be of a practical nature and should emphasize simple procedures and techniques which would ensure that high quality seed is accessioned into genebanks.

38. In view of the considerations outlined above the Consultation requests the IBPGR to produce a new Collectors' Manual. The Consultation considered that the IBPGR should include in the Manual advice on packaging, labelling and transport of samples and also on the amount of seed required to provide an adequate bankable sample for each target species to help collectors make effective collections.

39. Given the value of herbarium specimens for taxonomic verification and in planning future missions, the IBPGR should consider placing greater emphasis on collecting this type of material and the need for collecting teams to have a technician to prepare and care for these specimens.

POLICY ISSUES

40. The Consultation agreed that multi-crop collections were far less effective than single crop collections, being more difficult to plan, execute efficiently and distribute material collected. It therefore recommends that in the future much greater emphasis should be placed on single crop and/or crop groups (forage legumes and grasses etc.) collection with a few exceptions, e.g. in countries where there is little chance of collecting again. Multi-crop collecting should be phased out of the IBPGR programme.

41. The Consultation, having considered at length the difficulties in providing full passport data and adequate documentation for samples collected in markets, other than those in remote areas where produce is directly sold by the farmer concerned, recommends that the IBPGR should, in the future, instruct collectors to concentrate on landraces and wild species collected in the field.

42. As mentioned in para. 30, there is a need for duties of curators to be spelled out. In drawing up these guidelines the curator's role as defined by the National Plant Germplasm System USA, Empresa Brasileira de Pesquisas Agropecuarias (EMBRAPA) Brazil, the Australian wheat collection, the National Systems of Japan, India and the Royal Botanic Gardens, Kew, UK, are useful.

43. The Consultation recommends that the IBPGR should take steps to improve the flow of information about its collections. It could maintain a list of contacts and useful addresses which could be consulted by anyone wishing to make a collection. The Consultation also suggested that the possibility of establishing an appropriate system of distribution centres to encourage and facilitate the distribution of germplasm collected under the auspices of the IBPGR should be addressed. These centres would provide services similar to those currently available at Kew for the African collections.

APPENDIX I

LIST OF PARTICIPANTS

Chairman

Dr. N. Murthi Anishetty
Assistant Executive Secretary, IBPGR
Crop Genetic Resources Centre, FAO
Via delle Terme di Caracalla
00100 Rome, Italy

Members

Dr. D.C. Giacometti
Chief, CENARGEN, EMBRAPA
Avenida W-5 Norte Parque Rural
C.P. 70.000
Brasilia, DF
Brazil

Dr. K. Kumagai
Chief, Seed Storage Laboratory
Division of Genetics
NIAS
Kannondai 3-1-1
Yatabe-machi
Tsukuba-gun
Ibaraki-ken 305
Japan

Mr. R.D. Smith
Royal Botanic Gardens, Kew
Ardingly
Wakehurst Place
Sussex
UK

Dr. L. Holly
Head, Gene Bank Section
Research Centre for Agrotany
NIAVT
H-2766 Tapioszele
Hungary

Dr. G.V.H. Jackson
Ministry of Agriculture and Lands
P.O. Box G11
Honiara
Solomon Islands

Dr. K.L. Mehra
Director, NBPGR
IARI Campus, Pusa Complex
New Delhi 110 012
India

Dr. George A. White
Plant Introduction Officer
USDA-ARS, NE Region
Building 001, Room 322
Germplasm Resources Laboratory BARC
Beltsville, Maryland 20705
USA

Representing IBPGR/FAO

Dr. J.T. Williams
Executive Secretary, IBPGR
Chief, Crop Genetic Resources Centre
Plant Production and Protection Division, FAO
Via delle Terme di Caracalla
00100 Rome
Italy

Dr. N. Murthi Anishetty (see above)

Representing IBPGR

Dr. D.C. Giacometti (see above)

Consultant

Ms. S.D. Feakin
IBPGR Secretariat

APPENDIX II

AGENDA

1. Introduction - purpose of meeting

2. Review of present practices and existing constraints

   i) Timing of collections

   ii) Sample size, quality and diversity

   iii) Packaging and labelling

   iv) Accompanying documentation, collection sheets, passport data, characterization etc. The mechanics of data transmission

   v) Taxonomic verification of material

   vi) Maintenance of genetic integrity

   vii) Quarantine procedures and chemical treatments

3. Establishment of standards and procedures

   i) Regeneration

   ii) Transmission of material - Guide for collectors

   iii) Responsibilities of genebank curators

4. Recommendations

5. Any other business