COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 30.06.1997
COM(97) 327 final

REPORT FROM THE COMMISSION TO THE COUNCIL
AND THE EUROPEAN PARLIAMENT

# on the implementation of Council Regulation (EC) No1467/94 of 20 June 1994

# Contents

* Copies of these documents (only available in English) are available from
The secretariat of the Division for the Coordination of Agricultural Research,
Commission of the European Communities (DG VI F II 3),
200 rue de la Loi (Loi 130 6-233),
B-1049 Bruxelles, Belgium.
fax: (+32) 2 296 30 29, attention "Genetic Resources",
e-mail: Richard.Hardwick@dg6.cec.be.

# 1 Introduction

## 1.1 Historical background

Council Regulation (EC) No 1467/94 "On the conservation, characterization, collection and utilization of genetic resources in agriculture", was adopted on June 20th, 1994.

The objective of the Regulation is to "coordinate and to promote at Community level work on the conservation, the characterisation, the collection and the utilization of genetic resources in agriculture undertaken in the Member States, with a view to the achievement of the aims of the Common Agricultural Policy, and, in accordance with the principle of subsidiarity, to support and supplement the efforts made in the Member States where current work appeared inadequate".

The Regulation establishes responsibilities for the Commission and for the Member States in order to achieve the above objectives. It provides for a first Community programme for the conservation, characterization, collection and utilization of genetic resources in agriculture. This first programme was adopted on November 21th of 1994, for a period of five years and an estimated budget of 20 mecu.

## 1.2 This Report

Regulation (EC) 1467/94 stipulates (Article 11.1) that during its third year of implementation (the third year is the period June 1996 - June 1997) the Commission shall carry out a review of the Programme and an analysis of the situation, in particular, the financial position, and that the Commission shall present a report to Parliament and to the Council on the results of the review. This report is made in conformity with Article 11.1 of the Regulation. The main substance of the report is presented in section 2 (page 5), and the immediately important, managerial, conclusions and recommendations are presented in section 3 (page 15).

Conclusions regarding more minor, operational, aspects of the Regulation, and conclusions for the attention of Member States and their experts, are presented in section B.1 ("Desirable developments", page x).

An appendix is also provided (section A, page iii) with supporting information on administrative details, and on scientific and technical details, plus various reference documents. Section A also provides the material called for by Article 16 of Regulation (EC) 1467/94.

Article 16 lays down that the Commission shall present a regular report to the Parliament and to the Council on the measures for the conservation, characterization, collection and utilization of genetic resources in agriculture. This report is thus the first of the "regular reports" mentioned in Article 16 of Regulation (EC) 1467/94 (until now, there has not been sufficient material to warrant a separate report under Article 16).

# 2 The Current Position

Regulation 1467/94 lays down that the procedures for implementing the programme are to include

1. a permanent inventory of genetic resources in agriculture in the Community,
2. concerted measures, and shared-cost projects for the conservation, characterization, collection and utilization of those genetic resources,
3. accompanying measures.

This Section describes the current position regarding the above measures applied under Regulation 1467/94, the coordination at Community level, and also

4. the financial situation.

## 2.1 The Permanent Inventory

The permanent inventory is to consist principally in the establishment, regular updating and publication of the state and nature of genetic resources in agriculture collected in the Community and the listing of current work on the conservation, characterization and utilization of those genetic resources. Expenditure on the establishment of the inventory and its regular publication is to be covered from the total appropriations granted for the implementation of the programme.

The Commission Services have produced a first version of a permanent inventory (section 2.1.1) which has recently been updated as a draft second version (section 2.1.2).

Further administrative details of the Inventory are to be found in the Appendix (section A.1, page iii).

### 2.1.1 Permanent Inventory Version 1

In November 1994 the Commission completed a first version of its Inventory of Plant Genetic Resources for Agriculture in Europe. The printed version of the Inventory comprises 441 pages. For each collection, the inventory provides the following information: the name and the complete address of the collection, the name of the curator or person responsible, the type of the Collection, plus information on work in progress, and references to published results.

The inventory comprises information on plant genetic resources. It was assembled from a questionnaire which was distributed throughout the Member States, to which was added information provided by the International Plant Genetic Resources Institute (Rome, Italy), and information from a search of on-line databases of scientific publications.

This first version of the inventory was distributed to Member States (in both printed and electronic (database) formats) at the first meeting of the Programme Committee (21 November 1994). Each Member State was requested to check and revise the data as relevant.

### 2.1.2 Permanent Inventory Version 2

Since the first version of the Inventory was produced and circulated to the Member State representatives, large volumes of "technical, economic and financial information on specific measures for the conservation, characterisation, collection and utilization of genetic resources in agriculture" have begun to appear on the "World Wide Web" (W.W.W.). These developments make possible a second version of the inventory which would be more dynamic and potentially more useful than the first version.

Accordingly, the Commission services have made a preliminary inventory of sources of information which are available on the W.W.W.. To this has been added complementary information on Regulation 1467/94. Thus the second version of the inventory comprises the following chapters.

1. An "inventory of sources" of information available over the internet. Each paragraph of the inventory provides the reader with a brief description of the source in question (either plant or animal genetic resources for agriculture), plus a link over the internet to that source. Thus the interested reader who seeks further information can "move" directly to the source itself. So far, a total of some 200 such "links" have been identified. For example, the inventory section on "sugar-beet" provides immediate access to the "home pages" of:
   - a computer in the Netherlands which contains information on a shared-cost project on the genetic resources of sugar-beet;
   - the FAO database "World Information and Early Warning System on Plant Genetic Resources" (WIEWS) which contains some information on International institutes, their holdings and their activities.
   - and so on.
2. 1467/94 contact points in the Member States,
3. 1467/94 texts (all languages) of the Regulation and of the Work Programme,
4. information on each of the projects funded by the Programme,
5. a Preliminary List of European Union Legislation in the Area of Plant Genetic Resources (see page xxxii).

It would be possible to add also the first version of the inventory distributed to Member States in 1994; but some of the information in the first version of the inventory is already available over the W.W.W., and thus the first version of the Commission's inventory may now be redundant.

The "inventory of sources" was distributed to the Programme Committee on 16 October 1996 for comments and additions. It comprises approximately 565 kbytes on diskette. After the draft has been corrected it is intended that, if the problem of lack at Commission level of staff charged with the implementation of Regulation 1467/94 can be resolved, the inventory will be made available in printed as well as in electronic form.

## 2.2 Shared cost and concerted actions

Shared cost actions comprise new work for the conservation, characterization, collection and utilization of genetic resources in agriculture, carried out by two or more unconnected participants established in different Member States.

Concerted measures consist of work undertaken by the Community to coordinate individual measures for the conservation, characterization, collection and utilization of genetic resources in agriculture, already ongoing in the Member States.

Contracts for concerted and shared cost actions must, as a general rule, be concluded following an official selection procedure based on calls for proposals published in the Official Journal of the European Communities. It is expected that each project will produce its first results in the short term to medium term, that is to say within 3 or 5 years. The results are to be diffused widely, so as to maximise the impact of this initiative across the European Union.

There have been two calls for proposals, the first published on the 23 December 1994 and the second on the 19 April 1996. Brief information on each project selected is given below. Full administrative and legal details of the concerted action and shared cost project process (Legal basis and modalities; Consultation of the Committee; Evaluation; Summary of the Calendar) are provided in the Appendix (section A, page iii).

### 2.2.1 Shared Cost and Concerted Actions; The First Call for Proposals

In response to the first Call for Proposals, 72 proposals were submitted, and, following an evaluation of their technical and scientific merits by independent experts, 9 projects were selected by the Commission Services, as a function of the Regulation's priorities of technical excellence and potential contribution to the needs of the CAP. The selection was submitted to and given a favourable opinion by, the Programme Committee. The selected projects are as follows:

"Pig genetic resources" ("European gene banking project for pig genetic resources"; Reference number 012).

"Rabbit genetic resources" ("Inventory, characterization, evaluation, conservation and utilization of european rabbit genetic resources"; Reference number 060).

"*Allium* crops and wild species" ("Protecting future European Community crops: a programme to conserve, characterise, evaluate and collect *Allium* crops and wild species"; Reference number 020).

"Minor fruit tree species" ("Conservation, evaluation, exploitation and collection of minor fruit tree species"; Reference number 029).

"Potatoes" ("Genetic Resources of Potato" including 'Conservation, characterization and utilization of secondary potato varieties for ecological production systems in Europe' "; Reference numbers 034 and 045).

"European rice" ("Constitution, description et gestion dynamique des ressources genetiques riz (*Oryza sativa*) a vocation europeenne"; Reference number 037).

"European beets" ("Evaluation and enhancement of *Beta* collections for extensification of agricultural production"; Ref 042).

"Roses" ("European network for characterisation and evaluation of genus *Rosa* germplasm"; Reference number 052).

"*Prunus*" ("International network on *Prunus* genetic resources"; Reference number 061).

Further information on the objectives of each of the above projects is provided in the Appendix (section A.2.6, page vi).

### 2.2.2 The Second call for proposals

In response to the second call for Proposals, 28 proposals were submitted, and following an evaluation by independent experts, 5 projects were selected by the Commission Services. These were submitted to and given a favourable opinion by the Programme Committee. The selected projects are as follows:

"Elms" ("Coordination for conservation, characterization, collection and utilization of genetic resources of European Elms" ; Reference number 078).

"Grapevines" ("European network for grapevine genetic resources conservation and characterization" ; Reference number 081).

"Maize" ("Implementation of the European Network for Evaluation, conservation and utilisation of European maize landraces genetic resources"; Reference number 088).

"Olives" ("Conservation, characterization, collection and utilization of Genetic Resources in Olive (*Olea europaea*)"; Reference number 097).

"Animal Inventory" ("A permanent inventory of European farm animal genetic resources and of activities on characterization, conservation and utilization of those resources"; Reference number 083).

Further information on the objectives of each of the above projects is provided in the Appendix (section A.2.7, page viii).

## 2.3 Accompanying measures

The Regulation 1467/94 (Annex 1; II General Provisions) allows for the granting of Community financial contributions for Accompanying measures. Accompanying measures are defined as "the organisation of seminars, technical conferences and workshops, internal coordination measures through specialized technical groups, training and mobility schemes for specialist personnel, the promotion of the utilization of results".

### 2.3.1 Specialized technical groups

On 20 April 1994, during the discussion on the Draft Regulation on the conservation, characterisation, collection and utilization of genetic resources in agriculture, the Commission made a Statement to the Parliament that: *"At least once a year, the Commission will organize meetings on the conservation, the characterization, the collection and the utilization of genetic resources in agriculture. Representatives of all appropriate competence will be invited, in view of an exchange of information. This will be done in the context of the programme's accompanying measures. Having in mind the important role which the informal sector plays in the conservation, characterization, collection and utilization of genetic resources in agriculture, the Commission will ensure in particular that representatives of persons working in the informal sector are invited to these meetings, according to the subject matter of the meeting".*

The first meeting in fulfilment of the Commission's Statement to the Parliament was held on 14 April 1996. Member State representatives on the Genetic Resources Committee were asked to provide a list of non-governmental organizations active in the area of genetic resources in agriculture in their country. On the basis of this information, 44 non-governmental organisations were invited and 29 NGO representatives came to the meeting. Representatives of the European Parliament also attended. There was a general exchange of views, covering many aspects of the implementation of 1467/94 and of complementary legislation.

The meeting decided to recommend the following :

- information on the modalities of implementation of 1467/94 should be diffused as widely as possible,
- a call for proposals for training actions should be considered.

It was also suggested that the invitation list for the next similar meeting should be extended to representatives of the formal sector, and that projects which propose work on the same species should be encouraged to work together.

It is intended to repeat the meeting before the end of 1997.

### 2.3.2 The organisation of seminars, technical conferences and workshops

Apart from the meeting of non-governmental organisations, mentioned above, no other seminars, technical conferences or workshops have been organized up till now. This is due to the lack of staff. Due to administrative constraints it has not been possible to appoint any personnel to the Programme (see section 2.5 page 12 for a discussion of the problem; the impossibility of using "mini-budgets" for financing resources within the Commission). If the staffing situation is resolved quickly, and if credits are available in 1997, the Commission intends to organize a series of conferences, starting in 1997, probably including the following subjects :

**Management of animal genetic resources** ; a Conference on "Role of animal rescue centres in conservation, characterization and utilisation of animal genetic resources",

**Utilisation of plant genetic resources** ; a Workshop on "*In-situ* conservation of plant genetic diversity; crop mixtures and control of plant disease",

**Cattle genetic resources** ; a Workshop on "Cattle genetic resources - erosion of rare breeds and uniformisation of common breeds ",

**Standards for plant genetic resources databases** ; a Workshop on good database practice, for those beginning to construct a database of their gene banks.

**Putting databases on the internet** ; a Workshop for curators who already have a database and who wish to diffuse their database by making it accessible over the Internet.

### 2.3.3 Training and mobility schemes for specialist personnel

Due to the lack of staff, no actions have been made up till now to undertake this accompanying measure. If this situation is resolved quickly, and if funds are available in 1997, the Commission envisages to explore in 1997 the possibility of organizing:

- a 3 weeks training scheme for specialists in plant genetic resources.

The objective would be to give an introduction to the basic science and recent developments in curating techniques for genetic resources collections: seed conservation, *in vitro* conservation, , *in vivo* conservation, molecular methods of characterisation, characterisation of agronomic value, questions of sample size for conservation, .... The students would be expected to put their studies directly into practice.

### 2.3.4 The promotion of the utilization of results

Article 6.2 of Regulation (EC) 1467/94 charges the Commission with "promoting the dissemination and exploitation of any results of work in the field of the conservation, characterization, collection and utilization of genetic resources in agriculture which could contribute to the achievement of those aims".

The Inventory (second version) mentioned above (section 2.1.2, page 6) will contain a description of each genetic resources project supported in this Programme, and the information will be diffused via the internet. Results of each project will be included as they become available. If the problem of lack of staff can be resolved, this Guide will be made available in printed as well as in electronic form, thereby assisting the dissemination and exploitation of results of the work done.

## 2.4 Coordination at Community level

Article 1 of 1467/94 stipulates that the Commission is required to "coordinate and promote at Community level work on the conservation, characterization, collection and utilization of genetic resources undertaken in the Member States".

### 2.4.1 International Negotiations

Coordination of the Community position as concerns plant genetic resources, has been done in the context of the FAO Fourth International Technical Conference on Plant Genetic Resources (Leipzig Germany 14-23 June 1996). The Commission produced a List of European Union Legislation in the area of Plant Genetic Resources (section D.4, page xxxii) and each Member State prepared an extensive survey of the national situation regarding plant genetic resources, their conservation and utilisation. For further details see the Appendix section B.2.2, page xv below. A draft declaration by the European Union at the International Conference was discussed with experts from the Programme Committee and from the Seeds Committee on 15.01.96, 21.03.96 and on 28.03.96 and approved by the Council Committee Produits de base (PROBA). The draft declaration (see Appendix section D.3, page xxxii) was then submitted to FAO through the usual channels.

### 2.4.2 Community Programmes of Research and Technological Development

Regulation 1467/94 expressly lays down that *...the following actions are specifically not eligible for Community financial support in this programme: theoretical studies, studies to test hypotheses, studies to improve tools or techniques, work involving untested techniques or "model" systems, and all other research activities....*

In fact, Community programmes of research and technological development are organised in the Framework Programme. Some of these programmes involve research on Genetic Resources; notably the BioTech, the Environment and Climate, and the FAIR programmes. Commission services keep close contact with these programmes:

The Biotechnology programme is developing molecular tools to accelerate and to deepen the measurement of biological diversity. One of the current projects is investigating molecular tools for ungulates (cattle, sheep and goats); a second focusses on molecular tools for forest trees and a third focusses on particular genetic elements ("transposable elements") of major crop plants. In each case, the objective is to measure biodiversity in a particular class of organisms and to attempt to understand its nature. Thus animal breeds may differ from one another at a few points in the chromosome (loci), or in a more generalised fashion across the whole genome, studies are under way to clarify this; individual forest trees are known to be very diverse, and PCR techniques need to be refined accordingly; transposable elements can be used as markers to identify and measure genetic diversity in crop plants and a systematic effort is being made in this area.

The Environment and Climate programme has established an ad hoc working group on Research and Biodiversity. The aim is to produce a common research agenda, discussed and agreed by several concerned actors as researchers, decision makers, international bodies, NGOs, private sectors, etc.. A first indicative draft of a document "Research into Biological Diversity", as well as a questionnaire, are available on the World Wide Web at http://www.oden.se./~ ewgrb.

The "AIR" and "FAIR" Programmes have a number of projects on the evaluation of genetic diversity and its utilisation for a sustainable agriculture; notably the analysis of genetic diversity in cattle, a "European observatory" on strawberry varieties, and the location and exploitation of genes for pest and disease resistance in *Brassicas*..

### 2.4.3 Other Community Regulations and Directives

There are a number of other Community Regulations and Directives relevant to the conservation and sustainable utilization and exploitation of genetic resources in agriculture. Commission services are in frequent correspondence and consultation with the services responsible for, notably:

Regulation (EC) 2078/92, one of the "flanking measures" of the reform of the Common Agricultural Policy, on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside. It provides, *inter alia*, for the payment of an annual premium to farmers who raise animals of endangered breeds, and also for the cultivation and propagation of useful plants adapted to local conditions and threatened by genetic erosion.

Regulation (EC) 2081/92, on the protection of geographical indications and designations of origin for agricultural products and foodstuffs; and

Regulation (EC) 2082/92, on certificates of specific character for agricultural products and foodstuffs. These two Regulations assist the marketing of high quality products and foodstuffs having an identifiable character and geographical origin; as for example, those foodstuffs based on a local race or variety.

Criteria and modalities for studbooks and herdbooks as laid down by Council Directive 77/504/EEC and Commission Decision 84/247/EEC (bovines); Council Directive 89/361 and Commission Decision 90/254(EEC) (sheep and goats); Council Directive 90/427/EEC and Commission Decision 92/353/EEC (equidae).

## 2.5 The Financial Situation

The Regulation specifies a first programme of 5 years, with an estimated budget of 20 Mecu, including the cost of personnel and administration. An indicative breakdown of the budget is given in annexe II of Regulation 1467/94 and reproduced below. Note in particular that the ratio of expenditures (plants:animals) is indicated to be 3:1.

| | | |
|---|---|---|
| Permanent Inventory | | 10% |
| Conservation, characterisation, collection and Utilization of Genetic Resources: | | |
| | Plants | 66% |
| | Animals | 22% |
| Program Evaluation | | 2% |
| Total | | 100% |

Note that the definitive yearly amounts are determined by the budgetary authority.

The indicative multiannual schedule for the Programme is given below:

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|---|
| Engagements, mecu | 0.017 | 3.5 | 2.5 | 0 | ... | ... |
| Payments | 0 | 0.051 | 1.1 | 1.915 | ... | ... |

In 1994, because the work programme was not adopted until November 1994, it was not possible to launch a Call for Proposals that year.

In 1995, the first Call for Proposals was launched and 3,500,000 ecu were committed to fund the projects selected.

In 1996, 5 projects have been selected under the second Call for proposals and 2,500,000 ecu were committed before the end of 1996.

In the 1997 Avant projet of the General Budget, the Commission put "Pour memoire" against line B2-5170 in order to attract the attention of the Parliament to the fact that the Commission services have been obliged to manage 1467/94 without any additional staff, and that there was an urgent need to find a solution to this problem.

This situation is due to the fact that Regulation 1467/94 was conceived at a time when costs of manpower could be defrayed from part B2 of the budget, as in, for example, the research line B6. While Regulation 1467/94 was being agreed by the Council and by the Parliament, the above procedure was suspended. So, in spite of the formal text, by the time that the Regulation was ready to be implemented, there was no possibility of engaging funds for expenditure or manpower costs.

As to the future, there is an important need to balance the expenditure in favour of animal genetic resources. While the Regulation establishes an indicative ratio of expenditures (plants:animals) of 3:1, for the 14 proposals selected in the first and second calls for proposals the actual figure is 4.3:1.

In order to be able to redress the balance (plants:animals) towards the indicative figure of 3:1, the funding available for each Call for Proposals needs to be increased. This is because projects on animal genetic resources tend to be, by their very nature, substantially more expensive than projects on plant genetic resources.

It is concluded that, subject to the availability of funds and the agreement of the Budgetary Authority, the sum available per Call for the two remaining years (1998 and 1999) should be increased to ±5 mecu so as to make best use of the remaining funds, and in order to be able to approach the indicative figure of 3:1 balance of funds between plants and animal projects.

# 3 Conclusions and recommendations

The following conclusions and recommendations regarding managerial aspects of the programme derive from the analysis presented in section 2 of this Report.

A number of conclusions and recommendations regarding scientific and technical aspects, and which merit managerial attention, are also presented. These derive from the *Survey and study of developments of actions in the Member States* presented in the Appendix (section B.2, page xv).

Further conclusions deriving from the Study are presented in section B.1, (page x).

## 3.1 Managerial aspects

- The Programme Committee has emphasised the importance of increasing expenditure on animal genetic resources, in conformity with the Regulation, which establishes an indicative ratio of expenditures between plants and animals as 3:1. In order to achieve this ratio, the relative expenditure on projects on animal genetic resources must be increased. Because projects on animal genetic resources are generally more costly than projects on plant genetic resources, this will require larger tranches of funding for each of the remaining Calls for Offers.
- In view of the ever-increasing power and utility of the Internet and of the associated World Wide Web, for storing and diffusing information, a special effort should be made to complete the Commission's "Inventory of Sources" so that it can be published on the World Wide Web.
- Particular efforts should be made in the context of accompanying measures, which up till now have not been activated. There is a special need for:
  - Seminars, workshops and technical conferences, in particular on aspects of the sustainable use of genetic resources, and to complement the subjects covered by existing shared-cost and concerted actions;
  - Training, specifically targetted at helping NGOs who are managing genetic resources in their day to day work. Also seminars, workshops, technical conferences to help NGOs coordinate and prepare submissions to a Call for Proposals.

## 3.2 Technical and scientific aspects

A *survey of the developments of actions in the Member States and an exploratory study of desirable developments in the conservation, characterisation, collection and utilization of genetic resources in agriculture in the Member States* is provided in section B.2 of the Appendix, page xv. Relevant conclusions of section B.2 are provided below.

- The Regulation: Section B.2.1, page xv: *Should the Council decide to renew the five year programme (for the period 1999-2004), it may be appropriate to revise the wording of the Action Plan, to make it quite clear that the Regulation covers not only "European" genetic resources but also their wild relatives.*
- Plants Section B.2.2, page xv to xvii: *Member States are agreed that internationally agreed and universally implemented access agreements are crucial to the effective conservation and durable utilisation of plant genetic resources for agriculture. If a strong European presence is not maintained in all forums where international access agreements are negotiated, there is a real risk that the genetic resources held in Europe will lose their utility not only to Europe but also to the world.*
- Plants Section B.2.2, page xv: *in order to ensure that the new situation established by the Convention on Biological Diversity is fully coordinated in the Member States, it would seem useful that curators of collections in the Member States should meet to consider together how these new internationally-determined priorities can best be met.*
- Plants Section B.2.2, page xv: *In view of the importance of the Global Plan of Action, and the engagements undertaken at Leipzig by the Member States, it is appropriate that the implementation of the Plan in the Member States should be placed as a permanent item on the agenda of the Committee for Genetic Resources in Agriculture, for consideration and discussion.*
- Plants Section B.2.3, page xvii: *In view of the activities of European genetic resources experts in ESCORENA, EUFORGEN,* [1] *etc, it would seem advisable that the management of 1467/94 should maintain regular contacts with its homologues in other international programmes, in order to achieve the maximum synergy and added value. A special effort should be made to launch activities under 1467/94 to cover promising areas that are currently neglected in other international fora, such as minor crops, and industrial crops. Coverage is also needed for neglected sectorial subjects, such as facilitating dialogues between curators of plant collections and users.*
- Plants Section B.2.4, page xviii: *European coordination and linking is required, in order to enable Member States ensure that National Programmes make best use of the available financial and bureaucratic resources.*
- Plants Section B.2.8, page xxi: *In order to encourage the sustainable utilisation of genetic resources, and to define market opportunities, costs*

[1] ESCORENA = European System of Cooperative Research Networks in Agriculture; EUFORGEN = The European Forest Genetic Resources Programme

*and benefits, the economic and business aspects of genetic resources need to be studied.*

- Animals Section B.2.14, page xxvii: *In other respects than 2078/92,* in vivo *conservation of individual local breeds in individual Member States is considered to be an action for Member States alone.*
- Animals Section B.2.15, page xxvii *It may be appropriate to keep under review the activities of FAO and other international bodies in the field of animal genetic resources. In any event, as the work of the FAO Commission progresses, full Community coordination will be needed.*
- Animals Section B.2.15, page xxvii *In view of the current difficult international discussions on access to and ownership of plant genetic resources, it would be wise for the Union to establish a unified position on animal genetic resources, pre-emptively.*
- Animals Section B.2.18, page xxix: *It may be appropriate to make particular use of the accompanying measures of 1467/94 to help NGOs to coordinate in the preparation of proposals to 1467/94.*
- Animals Section B.2.18, page xxix: *The "steps" laid down in the Work Programme of 1467/94 should not be changed in any future revision, if this would be to the detriment of good project management.*

# APPENDIX

# A The Work Programme

These appendices provide supporting information for section 2, copies of relevant documents that are already published by the Commission, and a *Survey and study of developments of actions in the Member States* (section B.2, page xv). A summary of the conclusions of the Survey is presented in section B.1, page x, for reference.

## A.1 The Inventory

This appendix provides supporting administration information regarding the Inventory

### A.1.1 Legal basis

As laid down in Article 3.2 of Regulation 1467/94, the Commission is required to keep "a permanent inventory of the measures and, by means of appropriate measures, encourage exchanges of information between competent organizations in the Member States, ...".

The permanent inventory is to consist principally in the establishment, regular updating and regular publication of the state and nature of resources in agriculture collected in the Community and the listing of current work on the conservation, characterization, collection and utilization of those genetic resources. As laid down by Article 3.1, Member States are required to "provide the Commission on a regular basis and at least once a year, with technical, economic and financial information on specific measures for the conservation, characterization, collection and utilization of genetic resources in agriculture carried out or planned under their authority".

The aims of the inventory are to support the programme activities and encourage the widest possible knowledge and use of preserved material. The inventory should provide a guide to collections of conserved germplasm and associated activities in the European Community.

Two versions have been produced, as follows:

### A.1.2 The first version of the Inventory

The first version of the Inventory was constructed from three sources:

Commission questionnaire In 1992, the Commission services sent a questionnaire on genetic conservation to the Member States.

IBPGR Inventories The database has been cross-checked and augmented with information taken from the Directory of Germplasm Collections (International Plant Genetic Resources Institute, Rome).

On-line databases Complementary information particularly regarding work-in-progress were obtained by searching on-line databases of scientific authors and publications.

The first version of the inventory was distributed to Member States (in both printed and electronic (database) formats) at the first meeting of the Programme Committee (21 November 1994). Each Member State was requested to check and revise the data as relevant.

### A.1.3 The second version of the Inventory

The preparation of the second version of the Inventory is discussed on page 6 (section 2.1.2).

## A.2 Shared cost and concerted actions

This appendix provides supporting administration information regarding the shared cost and concerted actions.

### A.2.1 Legal basis

Regulation 1467/94 provides for a first programme with a budget of 20 mecu for a duration of five years.

The biggest portion of the budget is foreseen for concerted actions and shared cost projects.

Concerted Actions provide for the coordination of individual actions that are already under way in the Member States. Shared Cost projects provide for the support of new actions.

The programme of work defines the detailed objectives, the type of actions to be applied and the relevant financial provisions to be adopted. Public calls for proposals are published on the basis of the programme of work (art.10 of 1467/94).

The work programme lays down that each Concerted Action and each Shared Cost project should target its work, notably by concentrating on a specific plant or animal group (for example, genus, species or subspecies, as appropriate). Each project should aim at a coverage of its particular subject area that is significant on the Community scale.

As to modalities, the Regulation stipulates that each project will proceed by a series of six logical steps as follows:

Step 1 Establish the workplan

Step 2 Characterize the collections

Step 3 Evaluation (Secondary Characterization)

Step 4 Sort the collections

Step 5 Rationalize the collections

Step 6 Acquire (collect) genetic resources

Work concerning a later step is not eligible for funding unless there is proof that the preceding steps have been concluded whether in this programme or previously. In particular steps 1-5 must be performed before step 6 (collecting) may begin.

Regulation 1467/94 annexe I chapter III stipulates that priority is given, to concerted action and shared cost projects which involve:

- contributions from two or more unconnected participants established in different Member States. Any natural or legal person who is a national of a Member State and established in the Community may participate in the programme. Priority is given to projects assuring as broad as possible a coverage of the Union. The participation of nationals of third countries and the Community financial contribution relating to such participation, is examined on a case by case basis.

- the participation of all relevant disciplines (e.g.physiology, taxonomy, pathology, quantitative genetics and molecular biology). Disciplines that offer to improve the utilization of conserved genetic resources are especially encouraged to participate;

- particular preference to the use of genetic resources for diversification of production, improved product quality and better care for the environment.

### A.2.2 Consultation of the Committee

The Regulation establishes a Committee "on the conservation, characterization, collection and utilization of genetic resources in agriculture, composed of representatives of the Member States and chaired by a representative of the Commission" (Article 13 of 1467/94).

On 29.11.95 and as stipulated in Article 9 of Regulation 1467/94, the Commission duly consulted the Programme Committee on "the draft work programme and on the content of the public calls for proposals for action".

### A.2.3 First Call

The First Call for Proposals of the Programme Genetic Resources was published on 23 December 1994, and closed on 31 May 1995 (OJ C368 p24).

72 proposals were received. 28 proposals concerned genetic resources of farm animals, and 44 proposals concerned plant genetic resources (agricultural, horticultural plants and forest trees). Some 400 organizations from across the EU participated in the first Call for Proposals, including genebanks and orchard collections, scientific laboratories and associations of animal breeders, universities and seed companies from the public and the private sectors (including non-governmental organisations).

The members of the Programme Committee furnished names of 261 experts. As a function of expertise, availability, and the proposals received, 25 independent experts were convoked to evaluate the proposals (10 experts on farm animal genetic resources and 15 experts on plant genetic resources). They worked in Brussels during the period 3-14 July 1995. 23 projects were evaluated as technically "B" (good) or "A" (very good): 4 proposals on animal genetic resources and 19 on plant genetic resources. After consultation of the Commission services, a shortlist of 10 proposals was selected for Community support.

### A.2.4 Second Call

The Second Call for Proposals of the Programme Genetic Resources was published on 19 April 1996, and closed on 28 June 1996 (OJ C114 p21).

28 proposals were received. 14 proposals concerned genetic resources of farm animals and 14 proposals concerned plant genetic resources (agricultural, horticultural plants and forest trees). Some 200 organizations from across the EU participated in the first call for proposals.

As a function of expertise, availability, and the proposals received, 12 independent experts were convoked to evaluate the proposals (6 experts on farm animal genetic resources and 6 experts on plant genetic resources). They worked in Brussels during the period 15-19 July 1996. 11 projects were evaluated as technically "B" (good) or "A" (very good ) comprising 4 proposals on animal genetic resources and 7 on plant genetic resources. After consultation of the Commission services, a shortlist of 5 proposals have been selected for Community support (3 on the main list, 2 on the reserve list). This shortlist was approved by the Programme Committee on 16.10.96.

### A.2.5 Summary

| | 1st Call | 2nd Call |
|---|---|---|
| Approved by the Committee | 21/11/94 | 06/02/96 |
| Published in OJ | 23/12/94 | 19/04/96 |
| Closing date | 31/03/95 | 28/06/96 |
| Postponement published | 29/03/95 | |
| Postponed date | 31/05/95 | |
| Proposals received | 72 | 28 |
| Proposals selected | 10 | 5 |
| Proposals selected approved by Committee | 29/11/95 | 16/10/96 |
| ecu engaged | 3,400,000 | 2,411,000 |

### A.2.6 Detailed information on the nine projects selected in the First Call

"Pig genetic resources" ("European gene banking project for pig genetic resources"; Reference Number 012). There are already some 'produits du terroir' that are based on autochthonous pig breeds. This project should help that trend. It will also help to diversify methods of pig production, via the support of robust outdoor-adapted races. The robust type of pig will need less drugs. The project also aims to survey intramuscular fat, an important contributory factor to meat quality (e.g. the Gascon x Meishan cross gives better results than Landrace in the final hybrid pig). Outdoor pig production using robust pigs should be less polluting than indoor intensive production

"Rabbit genetic resources" ("Inventory, characterization, evaluation, conservation and utilization of european rabbit genetic resources"; Reference Number 060). The project will help more farmers to raise rabbits, and will help the diversity of rabbit breeds available. The project will also contribute to production of angora wool, and fur (and felt). It will offer possibility of a bigger choice of rabbit meat products.

The project aims to help protect the most diverse representative breeds among the 100 breeds thought to exist in the Community (and for which the Community is responsible, under the BioDiversity convention).

"*Allium* crops and wild species" ("Protecting future European Community crops: a programme to conserve, characterise, evaluate and collect *Allium* crops and wild species"; Reference Number 020). The project will offer forgotten varieties of chives (ciboulette), leeks (poireaux), shallots (echalottes) to growers, and in the long term, it would also help breeders to increase quality characteristics such as high dry matter, which is important for the industry. It will offer material to breeders developing varieties that are naturally resistant to pests and diseases, and hence not needing chemical pesticides (i.e. less inputs, less intensive production). The project will also provide short term results such as the diffusion of virus-free, and hence higher-yielding, garlic.

"Minor fruit tree species" ("Conservation, evaluation, exploitation and collection of minor fruit tree species"; Reference Number 029). The minor fruit tree in question are the following species of the Mediterranean basin; Fig, Pomegranate, Japanese Persimmon, Loquat, Prickly-pear, Quince for fruit production, sweet Chestnut, Pistachio, Mulberry, Carob, Azerole, Medlar, Madrona, Cornelian sherry, Jujube and Sorb. The project aims to help promote these underutilised fruit. It will evaluate commercial traits such as post harvest characteristics, production of juices and extracts. The information will be passed on to extension services and growers organisations. A further objective is to identify and eliminate 'doubles' from the collections. This will greatly improve the quality and fiability of material offered for sale. Some of these fruit are particularly suited to marginal areas, and hence to environmental protection.

"Potatoes" ("Genetic Resources of Potato" including 'Conservation, characterization and utilization of secondary potato varieties for ecological production systems in Europe' "; Reference Number 034 and 045). This project will provide for the diversification of the range of potato varieties available to the consumer. Some shops and supermarkets are now actively seeking a wider range of material; this project will help expand knowledge and use of minor varieties of potato. There is a special emphasis on eliminating virus from the stocks, thus increasing their quality as seed. Old varieties will also be characterised for taste, cooking qualities, storage performance. The resistance to virus, scab, blight (*Phytopthera*) and weevil will be assessed. Efficiency of use of fertiliser will also be assessed. This is a particularly important step forward towards an eventual extensification of potato production.

"European rice" ("Constitution, description et gestion dynamique des ressources genetiques riz (*Oryza sativa*) a vocation europeenne"; Reference Number 037). The Community has some 350,000 ha of rice fields, producing 1.2 million tonnes of soft rice (japonica). This project will eventually benefit breeders who seek to improve resistance to pests and diseases and environmental stress (in particular 'pyrale', 'pyriculariose', 'helminthosporiose', salinity, low temperature), and, help to spare the environment of chemical sprays.

"European beets" ("Evaluation and enhancement of *Beta* collections for extensification of agricultural production"; Ref 042). Though vegetable beets were known to the Assyrians, sugar beet has a narrow genetic base (Silesian beet); the modern sugarbeet is relatively homogenous, and vulnerable to disease. Resistance to diseases will eventually enable reduction in pesticides. Drought resistance will also be sought, and the project will also eventually have some positive effects on beet quality.

"Roses" ("European network for characterisation and evaluation of genus *Rosa* germplasm"; Reference Number 052). This concerted action puts together a partnership who are working to help diversification into this most important flower crop, to improve quality, and to find and use sources of resistance to diseases and pests.

"*Prunus*" ("International network on *Prunus* genetic resources"; Reference Number 061). This project aims to characterise resistance of almonds, cherries, plums, peaches, nectarines to important diseases (*Pseudomonas*, *Monilinia*), and viruses, and pests (aphids). The information will be made available to breeders in order to reduce need for chemical pesticides. The aim is to provide material future breeding programmes, for varietal improvement; disease resistance and also, e.g., longer cropping season. Some attention is also paid to Prunus as a noble hardwood and landscape tree.

A.2.7 Detailed information on the five projects selected in the Second Call

"Elms" ("Coordination for conservation, characterization, collection and utilization of genetic resources of European Elms" ; Reference Number 078). The Elm is an important hedgerow and landscape tree, giving a useful timber, but now severely threatened by the "Dutch Elm Disease". This project aims to coordinate the existing European collections of Elms, to characterise the holdings in a coordinated fashion, and to organise the evaluation of natural resistances to diseases, notably to the "Dutch Elm Disease".

"Grapevines" ("European network for grapevine genetic resources conservation and characterization" ; Reference Number 081). This project will coordinate all the major collections of grapevines in the Union, and by a series of steps, will achieve a better coordination and utilisation, notably by identifying both double entries, and material which is under-represented.

"Maize" ("Implementation of the European Network for Evaluation, conservation and utilisation of European maize landraces genetic resources"; Reference Number 088). The maize plant was brought from America to Europe by the first explorers. Since then it has diversified into a number of landraces, some of which prove to have valuable agronomic characters (such as resistance to cold). Many other landraces have been collected, but not yet evaluated. The project will characterise and evaluate the European patrimony of this important crop, and make the material and the information widely available.

"Olives" ("Conservation, characterization, collection and utilization of Genetic Resources in Olive (*Olea europaea*)"; Reference Number 097). The cultivated Olive is native to the area of the Mediterranean basin. Curators of the European collections of Olive already meet together on an occasional and informal basis. By this project, the collections will work together in a coordinated and consolidated fashion, putting the emphasis on the coordinated characterisation of Olive plants for quality characteristics, and for natural resistance to pests and diseases.

"Animal Inventory" ("A permanent inventory of European farm animal genetic resources and of activities on characterization, conservation and utilization of those resources"; Reference Number 083). Animal genetic resources have been well documented on a local basis, notably by herdbook societies, but until recently there has been remarkably little work on a European scale. This project aims to provide the first steps towards an enriched database of European farm animal genetic resources. The database will help, notably, workers wishing to survey for endangered breeds; quantify the cultural and genetic importance of a breed; identify the appropriate management techniques for long term preservation of a particular breeds; find information on the specific utilisation characteristics of a given breed.

# B Study of Desirable Developments

## B.1 Conclusions of the Study

This Section presents, for reference, the conclusions of the exploratory *Study on desirable developments in the conservation, characterization, collection and utilization of genetic resources in agriculture in the Member States.*

The full text of the survey is to be found below (section B.2, page xv).

Conclusions on "desirable developments" which are relevant mostly at the level of individual genebanks are presented in section B.1.3, page xii. Conclusions which are more relevant at the national level are presented in section B.1.2, page xi, and conclusions regarding the operation of Regulation 1467/94 at Community level are presented in section B.1.1. Those conclusions which concern the management of Regulation 1467/94 are presented above in section 3.2 of the Report (page 16).

### B.1.1 Community level

- Plants Section B.2.2, page xv: *In the context of defining, rationalizing and consolidating national collections in the Member States, it is time to consider whether the information technology developed for the World Wide Web, could be used to achieve a comprehensive system of distributed, public-domain databases of plant genetic resources in Europe. The chief issues in realising this potential are the development of data standards, and the establishment of quality control procedures*
- Plants Section B.2.5, page xix: *More help is required to ensure that expertise of agricultural museums and other* in situ *conservationists is incorporated in 1467/94 projects.*
- Plants Section B.2.7, page xxi: *Because all databases used in 1467/94 projects need to be able to exchange data, in the interests of European solidarity, work may be needed on data standards for plant and animal databases, in line with established international guidelines.*
- Plants Section B.2.7, page xxi: *There is a need to increase the use of rapid and cheap evaluation tools, using biochemical and molecular techniques for germplasm characterization. Training in these modern techniques may need to be developed and offered.*
- Plants Section B.2.8, page xxi: *In order to encourage the sustainable utilisation of genetic resources, and to define market opportunities, costs and benefits, the economic and business aspects of genetic resources need to be studied.*
- Animals Section B.2.11, page xxiv: *It would seem useful to encourage the persons responsible for the maintenance of "animal" databases in the Member States to meet together from time to time.*
- Animals Section B.2.11, page xxiv: *It would be useful for experts who have some experience with the FAO and EAAP databanks to meet together as a community of database-users from all Member States, to consider experience and recommendations for enhancing the value of the database to end-users.*

- Animals Section B.2.11, page xxiv *It may be appropriate and timely to launch a European Expert Consultation on the Management of Animal Genetic Resources, based on the needs of the Common Agricultural Policy, and considering also the recommendations of the FAO experts. The results of the consultation should be forwarded to the Programme Committee for Genetic Resources in Agriculture.*

- Animals Section B.2.12, page xxvi: *In the general context of Animal genetic resources, the management team of 1467/94 should maintain regular contacts with the other international fora, both formal and informal.*

- Animals Section B.2.12, page xxvi: *It might be appropriate to consider a special action under 1467/94 "accompanying measures" for exchanges between breeders of the same or closely similar breeds in different countries, with the objective of developing joint programmes of conservation.*

- Animals Section B.2.13, page xxvi: *We have already noted that the Genetic Resources committee may need to keep under review the activities of international bodies in the field of animal genetic resources; the committee should also receive reports from time to time of activities at national level on animal genetic resources.*

- Animals Section B.2.13, page xxvi: *The Committee should consider whether there would be value in encouraging international exchanges between national breed societies.*

- Animals Section B.2.16, page xxviii: *It may be appropriate to consider supporting under the Framework Programme, research to test anecdotal reports of adaptability (etc) of particular rare breeds.*

- Animals Section B.2.16, page xxviii: *Community inventories supported under 1467/94 do not need to incorporate the data that are available on genetic values, but they do need to provide pointers to where such results can be found.*

- Animals Section B.2.16, page xxviii: *There is no need to incorporate the results of work on genome mapping into Community inventories supported under 1467/94, but it is important that these databases provide pointers to where such results can be found.*

- Animals Section B.2.18, page xxix: *it may next be appropriate to convene a discussion meeting on trans-border aspects of the management of animal genetic resources for agriculture (observations requested from Member States at the last meeting, 16 October 1996).*

### B.1.2 National level

- Plants Section B.2.2, page xv: *in order to ensure that the new situation established by the Convention on Biological Diversity is fully coordinated in the Member States, it would seem useful that curators of collections in the Member States should meet to consider together how these new internationally-determined priorities can best be met.*

- Plants Section B.2.4, page xviii: *European coordination and linking is required, in order to enable Member States ensure that National Programmes make best use of the available financial and bureaucratic resources.*
- Animals Section B.2.14, page xxvii: *In other respects than 2078/92,* in vivo *conservation of individual local breeds in individual Member States is considered to be an action for Member States alone.*
- Animals Section B.2.14, page xxvii: *It may be appropriate to consider whether activities such as forming a gene pool for the most endangered breeds should, and can, be organized at European level.*
- Animals Section B.2.15, page xxvii: *In other respects,* in vitro *conservation of local breeds is considered to be an action for Member States themselves to undertake in the first place.*

B.1.3 Project level

- Plants Section B.2.4, page xviii: *Collaboration between the genebanks and their potential users should be further improved, so as to profit from the diverse contributions available from scientists, farmer and consumers.*
- Plants Section B.2.5, page xix: *In order to respond effectively to public, and market, interest, old, and new, cultivars, need to be evaluated in order to test the claimed adaptedness of old varieties. Activities may then be required to exploit and thereby conserve landraces and old cultivars in situ on-farm.*
- Plants Section B.2.6, page xix: *Rationalisation and safety duplication is a matter of priority. (It is, moreover, a key requirement which is placed on all relevant projects under 1467/94).*
- Plants Section B.2.6, page xix:*A more coordinated approach is needed in the conservation of breeders material (it is part of the requirements in every project under 1467/94).*
- Plants Section B.2.6, page xix:*In order to confirm that the apparent "gaps" in collections are real, and important, better tests of provenance and relatedness are required. It is important to note that all collecting must respect the international obligations imposed by the Convention on Biodiversity. This is particularly important where the collected genetic resources may leave the country of origin.*
- Plants Section B.2.6, page xix:*Experience in the Member States suggests that methodologies for regeneration of germplasm respecting the genetic integrity of the accessions still need to be improved, especially for outcrossing species.*
- Plants Section B.2.8, page xxi: *In any collaboration between Member States, quarantine rules for the safe movement of germplasm need to be scrupulously obeyed.*
- Plants Section B.2.8, page xxi: *Genebank managers need to be helped to collect data from the users of their collections.*

- Plants Section B.2.8, page xxi: *The characteristics required by consumers may be found in germplasm collections; the need is to make the search as quick and efficient as possible.*
- Plants Section B.2.8, page xxi: *The practical pros and cons of the "core" collection approach need to be evaluated. Training in the approach may need to be developed.*
- Animals Section B.2.15, page xxvii: *Actions on "European" breeds should take into consideration, as appropriate, the results of genetic distancing work on related work on related breeds in other countries.*
- Animals Section B.2.16, page xxviii: *Genetic distance mapping is an important activity, to follow on the primary characterisation of each animal breed. The resulting data need to be made available in the databases.*
- Animals Section B.2.17, page xxix: *There may be a need to collect, test and diffuse anecdotal information on agriculturally useful characteristics of rare breeds, and to encourage formal tests of such claims.*

## B.2 Survey and study of developments of actions in the Member States

This section provides a survey of the developments of actions in the Member States and an exploratory study of desirable developments in the conservation, characterisation, collection and utilization of genetic resources in agriculture in the Member States and the coordination of work in that sphere at Community level in the light of the aims of the common agricultural policy and of the results already achieved under the present programme. *The desirable developments are printed in italics,*

### B.2.1 The Regulation 1467/94

Annex 1 of Regulation 1467/94 ("Detailed rules for the implementation of the Action Programme; Scope - Eligible activities") reads

...This programme concerns the conservation, characterization, evaluation and utilisation of genetic resources, plant and animal, which occur within the territory of the European Community and which are likely to be lost if special measures are not taken. .....

The above sentence could be interpreted as excluding any work on material which is potentially useful to European agriculture but is only found outside Europe (e.g. the ancestors of most crops and farm animals).

*When the next five year programme (1999-2004) is being prepared It may be appropriate to revise the wording of the Action Plan, to make it quite clear that the Regulation covers not only "European" genetic resources but also their wild relatives.*

### B.2.2 Plant genetic resources; The international context

The development of actions on plant and animal genetic resources in the Member States during the period under review has been largely conditioned by the preparations for the FAO World Technical Conference on Plant genetic Resources for Food and Agriculture (Leipzig, June 1996; preparatory meeting of the European Region Nitra, Slovakia, September 1995). For the Nitra meeting each Member State prepared an extensive survey of the national situation regarding plant genetic resources, their conservation and utilisation. The Commission produced and distributed a List of European Union Legislation in the Area of Plant Genetic Resources. The following account is drawn heavily from those surveys, and from the summary prepared for Nitra by the services of the International Board of Plant Genetic Resources.

Two international meetings at the end of the period under review also conditioned national thinking. These meetings were the third Conference of the Parties to the Convention on Biodiversity, which discussed agricultural biodiversity (Buenos Aires, November 1996) and the meeting "L'Europe rurale en l'an 2000; le development rural integre, enjeu politique majeur" (Cork, November 1996), which announced a ten point rural development programme for the European Union, including, inter alia, (Point 4) "Policies should promote rural development which sustains the quality and amenity of Europe's rural landscapes (natural resources, *biodiversity* and cultural identity)".

However, the general background to all the above is set by the United Nations Conference on Environment and Development (UNCED), which took place in Rio de Janeiro in June 1992.

The "Earth Summit" produced two binding Conventions (The Convention on Biological Diversity, the Convention on Climate Change), and three further documents (Agenda 21, the Rio Declaration on Environment and Development, and the Agreement on forest principles).

The signatory parties to the Convention on Biological Diversity (which include all Member States, and the Commission) bound themselves to conserve their indigenous genetic resources, *in situ* and *ex situ*, to meet broad development needs. This requires the identification of *in situ* conservation sites and, in the case of existing *ex situ* collections, their consolidation and rationalization into collections representative of available indigenous diversity and inclusive of other diversity of potential importance to the country.

For many collections, particularly those at breeding institutes in the Member States, this means that they have to set priorities for long-term conservation, and consider conservation of plant genetic resources *in situ*, both in the wild in natural habitats and through cultivation on-farm and in gardens and orchards. This is added to the traditional objective of such collections, which is to support breeding objectives. *Therefore, in order to ensure that the new situation established by the Convention on Biological Diversity is fully coordinated in the Member States, it would seem useful that curators of collections in the Member States should meet to consider together how these new internationally-determined priorities can best be met.*

The FAO Fourth International Technical Conference on Plant Genetic Resources (Leipzig Germany 14-23 June 1996) produced a "Leipzig Declaration", it agreed to the publication of a "Report on the State of the World's Plant Genetic Resources for Food and Agriculture", and it approved a "Global Plan of Action on Plant Genetic Resources for Food and Agriculture". The Plan comprises a series of recommendations for priority activities, arranged in four sections:

- *In situ* conservation and development
- *Ex situ* conservation
- Utilization of plant genetic resources
- Institutions and capacity building

The Plan is to be implemented by individual Member States. As will be seen below, the Member States are actively engaged in all the above activities. *In view of the importance of the Global Plan of Action, and the engagements undertaken at Leipzig by the Member States, it is appropriate that the implementation of the Plan in the Member States should be placed as a permanent item on the agenda of the Committee for Genetic Resources in Agriculture, for consideration and discussion.*

One of the first steps in order to meet international obligations under the Biodiversity Convention and the Global Plan of Action is the process of defining, rationalizing and consolidating national collections. This is currently underway in several Member States. There is still a lack of national inventories of the genetic diversity, either that which exists in the country (*in situ*) and that which exists in national collections (ex situ). Such

inventories are helpful for conservation programmes that are effective and economic, and are among the obligations to the Convention and Agenda 21. A decentralised or distributed database offers universal access with decentralised maintenance, and it enables solutions to the traditional problems of centralised databases (compilation costs, risk of duplication of effort). *Therefore, in the context of defining, rationalizing and consolidating national collections in the Member States, it is time to consider whether the information technology developed for the World Wide Web, could be used to achieve a comprehensive system of distributed, public-domain databases of plant genetic resources in Europe. The chief issues in realising this potential are the development of data standards, and the establishment of quality control procedures*

The Biodiversity Convention has necessitated the revision of the agreement regarding access to genetic resources. Negotiations are currently underway in the FAO Commission on Genetic Resources. *Member States are agreed that internationally agreed and universally implemented access agreements are crucial to the effective conservation and durable utilisation of plant genetic resources for agriculture. If a strong European presence is not maintained in all forums where international access agreements are negotiated, there is a real risk that the genetic resources held in Europe will lose their utility not only to Europe but also to the world.*

### B.2.3 Plant genetic resources: International partnerships

Before the Regulation 1467/94 was adopted, many of the plant genetic resources experts in the Member State were accustomed to collaborate together bilaterally, and in international fora such as the Nordic Gene Bank, ESCORENA, EUFOR-GEN, WANA-NET, and ECP/GR.

During the 1980's the Commission worked with ECP/GR (European Cooperative Programme for Crop Genetic Resources Networks) to facilitate regional collaboration of experts in plant genetic resources. This resulted in a number of joint Commission / IBPGR publications on plant descriptors. The IBPGR "networking" has continued in a series of collaborative initiatives in the period under review. In 1994, ECP/GR entered its fifth 5 year phase. Seven working groups are active (*Allium*, *Avena*, Barley, *Brassica*, Forages, *Prunus* and Grain Legumes). The initiation of further groups is under discussion (namely concerning wheat, and *Malus*). The ECP/GR activites correspond to Commission "concerted actions", and funds are not available from ECP/GR for new work. But actions which have developed under ECP/GR have resulted in successful submissions from EC partnerships for funding of conservation activities under 1467/94 (*Allium*, *Prunus*) and also for funding of research activities under the FAIR programme (*Brassicas*, Grain Legumes)

The European System of Cooperative Research Networks in Agriculture (ESCORENA) was established by FAO in 1974 on the recommendation of the European Commission on Agriculture (1972). Within this programme 10 crop-specific networks and three ad hoc research groups are currently operational, dealing to a varying degree with the problems of genetic resources. A project on olive genetic resources was developed by an ESCORENA partnership, and subsequently submitted to and selected in the Second call for Proposals (see section A.2.7 above, page ix).

The European Forest Genetic Resources Programme (EUFORGEN) was established in 1994 following the recommendation of the Ministerial Conference on the Protection of Forests in Europe in Helsinki (1993). The main tasks of EUFORGEN are to coordinate and promote the *in situ* and *ex situ* conservation of forest genetic resources in Europe and the exchange of expertise and information. The Programme is coordinated by IPGRI in close collaboration with the Forestry Department of FAO. Pilot networks have been established for Norway spruce (*Picea abies*), cork oak (*Quercus suber*), black poplar (*Populus nigra*) and noble hardwoods.

*In view of the activities of European genetic resources experts in ESCORENA, EUFORGEN, etc, it would seem advisable that the management of 1467/94 should maintain regular contacts with its homologues in other international programmes, in order to achieve the maximum synergy and added value. A special effort should be made to launch activities under 1467/94 to cover promising areas that are currently neglected in other international fora, such as minor crops, and industrial crops. Coverage is also needed for neglected sectorial subjects, such as facilitating dialogues between curators of plant collections and users.*

### B.2.4 Plant genetic resources: National partnerships

The Biodiversity Convention requires countries to put into place the necessary legislation and policy for the conservation, sustainable use and accessibility of plant genetic resources at national and international levels. In the Leipzig Declaration (June, 1992), Member States engaged themselves to establish National Programmes for plant genetic resources in agriculture. Such programmes will include all relevant partners from various competent ministries, research institutes, universities, private partners and NGOs. National programmes may need an adequate legal basis and an appropriate framework and mechanism of coordination in order to avoid duplication of efforts, to make best use of the available resources, and to facilitate participation in international collaborative work. *European coordination and linking is required, in order to enable Member States ensure that National Programmes make best use of the available financial and bureaucratic resources.*

Many non-governmental organizations (NGOs) are actively involved in conservation and sustainable use of plant genetic resources. There is an increasing tendency to link government departments and institutions in partnerships with NGOs in national programmes. The informal sector, including NGOs, farmers associations and various other types of associations, may also play an important, and often a complementary, role in the conservation and sustainable use of PGR. Links between the formal and informal sectors need to be encouraged. Plant breeders, plant physiologists and biochemists, and other users of germplasm play an important role in the process of conservation, as well as utilisation of plant genetic resources. *Collaboration between the genebanks and their potential users should be further improved, so as to profit from the diverse contributions available from scientists, farmer and consumers.*

### B.2.5 Plant genetic resources: *In situ* conservation

All Member States have measures in place to protect specific habitats and specific species. This enables conservation of ecosystem and species. All Member States have areas of forest, other natural vegetation and specific habitats, protected under legislation. Most Member States have surveyed and identified endangered native species, drawn up 'red lists' and put in place measures to protect these species and the habitats where they grow.

The forest species relatively well protected in this way. Less attention has been paid to *in situ* and on-farm conservation of plant genetic resources for food and agriculture (PGRFA). Only a few countries have specifically surveyed the status of wild species related to crops[2].

A foreseeable development is that countries may decide to designate protected areas simply to conserve plant genetic resources for food and agriculture in situ. *Methodologies appropriate for* in situ *conservation, documentation and utilization of agricultural plant species need to be developed, so that full advantage can be taken of the move towards* in situ *conservation.*

In the period under review there has been an increase in public interest in the "greening" of agriculture through the use of more traditional organic and integrated farming systems. It is often claimed that agricultural landraces and old varieties are better adapted to low input, sustainable and environmentally friendly farming. *In order to respond effectively to public, and market, interest, old, and new, cultivars, need to be evaluated in order to test the claimed adaptedness of old varieties. Measures may then be required to exploit and thereby conserve landraces and old cultivars in situ on-farm.*

Non-governmental organizations are particularly active in promoting the conservation and use of local crops and varieties. In several Member States, agricultural folk museums are prominent in maintaining and making available the landraces and old cultivars. *More help is required to ensure that expertise of agricultural museums and other in situ conservationist is incorporated in 1467/94 projects.*

### B.2.6 Plant genetic resources: *Ex situ* conservation

*Ex-situ* conservation is usually the best, and often the only, way of assuring long term survival of particular germplasm. There is no doubt that many old varieties are disappearing from farms. Italy, for example, reported to the Nitra Conference, that out of 41 farms growing landraces of forage legumes in the 1970s, only one now carries through this activity. Among species reportedly under threat of erosion are both cultivated (e.g. lentils, chick-peas) and naturally occurring crops (e.g. *Artemisia granatensis, Satureja* spp., *Thymus* spp., *Beta maritima, Sideritis* spp., *Origanum* spp., *Nepeta cataria, Digitalis lanata, Astragalus dasynthus, Calamintha nepeta*). Most of the seed material that has disappeared from farms has been collected in ex-situ collections. *Attention needs to be paid to the safety of stored material over the long term.*

The following is a list of *ex situ* base collections of seed crops located in Europe for which agreements were made with IPGRI (then IBPGR) for the long-term conservation of crop genepools:

[2] see "A catalogue of the wild relatives of cultivated plants native to Europe", by Vernon H Heywood and Daniel Zohary, published in Flora Mediterranea, volume 5, pages 375 to 415 .

Belgium Jardin Botanic National de Belgique, Meise; Wild *Phaseolus* spp., Wild *Vigna* spp.

France INRA - CIRAD, Corsica; *Citrus* and related species Regional: Africa + Mediterranean (field genebank)

France CIRAD-CA, Montpellier; *Gossypium* spp.

Germany Institut fuer Pflanzen-zuechtung und Kultur-pflanzenforshung, Gatersleben; *Lycopersicon* spp. *Lupinus* spp.

Germany Institut fuer Pflanzenbau (FAL), Braunschweig - Voelkenode; *Avena* spp. *Beta* spp. *Brassica carinata, B.campestris, B.juncea, B.napus, Sinapis* spp., *Phaseolus* spp.

Greece Greek Gene Bank, Thessaloniki; *Brassica, Nicotiana, Beta* spp.

Italy Germplasm Institute (CNR), Bari; Wheats

The Netherlands Centre for Genetic Resources, (CGN); Wageningen Lettuce, *Allium cepa, A.ampeloprasum,* Wild *Allium* spp., *Capsicum* spp., *Brassica oleracea, Solanum melongena*

Portugal Portuguese Gene Bank, Braga; Maize

Spain Universidad Politecnica, Madrid; Wild relatives of cruciferous crops

Spain INIA, Madrid; *Citrus* and wild species *Cucumis* spp., *Citrullus* spp.

Sweden Nordic Gene Bank (NGB), Alnarp; *Pisum* spp., *Hordeum* spp., *Avena* spp.. *Secale* spp., *Beta* spp.

United Kingdom Royal Botanic Garden (RBG), Kew; *Trifolium* spp. *Cenchrus* spp., *Digitaria* spp., *Lotononis* spp.

United Kingdom Horticulture Research International (HRI), Wellesbourne; Carrot, *Brassica oleracea, B.campestris, B.juncea, B.napus, Raphanus* spp., *Allium* spp., *Beta* spp.

In general, the level of safety duplication of collections in Europe is difficult to judge. Much of the material, particularly in some of the eastern European collections, is advanced cultivars which are common to many genebanks. However, only a few programmes have, as yet, identified unique holdings and ensured their safety duplication. This means that important accessions are at some risk. *Rationalisation and safety duplication is a matter of priority. (It is, moreover, a key requirement which is placed on all relevant projects under 1467/94).*

There is some concern over the fate of germplasm material which is no longer of direct interest to breeders: it is suggested that there is a risk that material which finds no immediate may be neglected by conservationists. *A more coordinated approach in this area is needed; it is part of the requirements in every project under 1467/94.*

Material which is readily available elsewhere does not need to be held at all. Methodologies and agreements need to be developed and implemented, to identify and eliminate duplicate, accessions. Some curators have identified significant gaps in their collections and indicate that collecting has to

be carried out. But good management requires that before engaging in further collecting, the material already collected should first be inventoried. *In order to confirm that the apparent "gaps" in collections are real, and important, better tests of provenance and relatedness are required. It is important to note that all collecting must respect the international obligations imposed by the Convention on Biodiversity. This is particularly important where the collected genetic resources may leave the country of origin.*

Many Member States are recognizing the need to restrict the size of national collections; either by concentrating on a "core" collection, or by limiting the collection to germplasm originating in the country and of particular value to it.

Some preserved germplasm may be at risk through low viability. Regulation 1467/94 allows the regeneration of material as an eleigible expense in shared cost actions. *Experience in the Member States suggests that methodologies for regeneration of germplasm respecting the genetic integrity of the accessions still need to be improved, especially for outcrossing species.*

### B.2.7 Plant genetic resources: Characterisation

Characterization and evaluation are essential to make the resources more immediately useful. These tasks require substantial inputs. *There is a need to increase the use of rapid and cheap evaluation tools, using biochemical and molecular techniques for germplasm characterization. Training in these modern techniques may need to be developed and offered.*

Potential users of germ plasm collections need to be able to find the data they are looking for. At present, only a few collections have a complete and convivial documentation system, but with the development of technology for the internet / World Wide Web, the necessary tools are becoming available.

It seems that almost each germ plasm collection has its own system for storing the results of characterisatation. Some argue for the centralised harmonization of documentation systems at both national and Community level. However, as noted above, it seems more cost effective to adopt a distributed, decentralised model, which offers universal access with decentralised maintenance, and less duplication of effort). The chief issues in realising this potential are the development of data standards, and the establishment of quality control procedures. *Because all databases used in 1467/94 projects need to be able to exchange data, in the interests of European solidarity, work may be needed on data standards.*

### B.2.8 Plant genetic resources: Utilisation

No country is self-sufficient in PGR nor can all countries accumulate resources which would satisfy all their needs. This means that Member State experts need to collaborate at local, regional and international levels. *In any collaboration between Member States, quarantine rules for the safe movement of germplasm need to be scrupulously obeyed.*

The level of utilization of PGR stored in genebanks is difficult to assess. There is a general lack of feedback documentation on the final use of the distributed material. *Genebank managers need to be helped to collect*

*data from the users of their collections.* This is an eligible cost in 1467/94 projects.

In order to produce crops less dependent on chemical products, plant breeders are searching for resistance to abiotic stress (e.g. drought, cold), resistance to biotic stress (e.g. diseases, pests), quality traits, and better use of inputs without detriment to income. There is a growing demand for a wider choice and variety of horticultural crops and agricultural products, for which diversity in taste, colour, nutritional values and earliness/lateness is highly valued by the market. *The characteristics required by consumers may be found in germplasm collections; the need is to make the search as quick and efficient as possible.*

Recent years have seen the development of rapid chemical methods to measure genetic characteristics, and of biometric methods of handling the resulting data sets. The resulting calculation of the "genetic distance" between accessions can be used to identify a small subset or "core" which contains a large proportion of the total variability of all the accessions. It is then possible to characterization and evaluate the "core" collection, knowing that most of the variability has been sampled. The establishment of core collections is one means of simplifying access to the wider diversity in collections. This cost-effective approach to documenting collections is being pursued in a number of centres. *The practical pros and cons of the "core" collection approach need to be evaluated. Training in the approach may need to be developed.*

Public interest in underutilized crops seems to be increasing. However it is unclear just how large, and just how stable, is the market for any of these new products from minor crops. *In order to encourage the sustainable utilisation of genetic resources, and to define market opportunities, costs and benefits, the economic and business aspects of genetic resources need to be studied.*

### B.2.9 Animal genetic resources for agriculture: Background

Evidence from a range of recent studies shows that animals are inherently less diverse than plants. Conservation operations for animals are both more time consuming than they are for plants. The resources of domestic animals have tended to receive less attention from conservators than the resources of agricultural plants. Thus management aspects of animal, and of plant, genetic resources are significantly different, and is sometimes argued that animals are relatively "disadvantaged".

### B.2.10 Animal genetic resources: International context

The United Nations Conference on Environment and Development, at Rio de Janeiro in June 1992, adopted a number of documents including "Agenda 21". Chapter 14 of Agenda 21, entitled "promoting sustainable agriculture and rural development" notes that animal genetic resources are under threat and recommends that vocal animal breeds with their specific adaptations and disease resistances should be preserved. It goes on to state that a 10 year programme of action is needed for the description of all breeds of livestock and it calls for programmes to be established to preserve breeds

at risk and to develop measures for the survival and development of indigenous animal breeds. Endangered animal species should be identified, it suggests.

Agenda 21 created the United Nations Commission on Sustainable Development but the Agenda itself is not a legal agreement or instrument. Governments and other agencies are free to pursue its recommendations, or not. Some Member State governments and non governmental bodies were already pursuing the above objectives before the Rio meeting; others have begun to implement some measures more recently. At a concerted level the most significant event has been the publication of the "Hannover" database, also known as the EAAP Animal Genetic Data Bank (EAAP: European Association of Animal Production). This database corresponds to some of the objectives established by Agenda 21. In particular it monitors information on cattle, sheep, goats, pigs and horses, in the 15 Member States and in 18 other non member European countries as well.

The aim is to watch over developments and risks, and to encourage use and conservation of the genetic diversity of farm animals in Europe. It contains information on a total of 877 breeds of farm animals.

The same data have been provided to the Global Databank for Farm Animal Genetic Resources, being develop and maintained by the FAO. This enables the European situation to be put into global perspective.

The Member States are registered on the Hannover data base as holding 586 races of farm animals (172 races of cattle, 229 sheep, 52 goats, 68 pigs, 65 horses). The data for Europe are provided in the recent FAO publication "World Watch List for Domestic Animal Diversity" (FAO, 1995[3]). Both the 'Hannover' database and the 'FAO' database are now available on the internet, making available information from the Member States. The FAO data base provides information by country, by species group, by risk status and in alphabetical order by name.

According to FAO, Europe possesses around two-thirds of earth's animal genetic resources for the chicken, duck and goose species, half of the cattle, horses and turkeys, and one-third of its goat, pig and quail breeds.

In the Member States, the estimated numbers of races are defined as *critical, endangered, critical-maintained, endangered-maintained* are as follows:

cattle
- 13 critical
- 15 endangered
- 23 critical-maintained
- 21 endangered-maintained

goat
- 7 critical
- 11 endangered
- 0 critical-maintained
- 6 endangered-maintained

horse/ass
- 13 critical
- 23 endangered

[3] ISBN 92-5-10 37 29-9

- 6 critical-maintained
- 10 endangered-maintained

sheep
- 15 critical
- 19 endangered
- 5 critical-maintained
- 19 endangered-maintained

pig
- 5 critical
- 4 endangered
- 7 critical-maintained
- 3 endangered-maintained

poultry
- 47 critical
- 57 endangered
- 0 critical-maintained
- 0 endangered-maintained

### B.2.11 Animal genetic resources: International developments

Although domestic animal diversity was recognised as an important component of global biodiversity by the United Nations Conference on Environment and Development (Rio de Janeiro June 1992), by the Biodiversity Convention and by Agenda 21, formal international activities on the conservation of animal genetic resources for agriculture are still very sparse compared with those on plant genetic resources. This is not to neglect the informal activities of workers on animal genetic resources, who have worked together across national boundaries for many year. These contacts have intensified recently with the development, for example, of cooperative international repositories for genetic information on the pig, bovine and poultry genomes.

At the formal level, in January 1992, the Commission convened an ad hoc group of experts. Their recommendations are mentioned at various places in this document. In April 1992 FAO convened an International Expert Consultation on animal genetic resources. The FAO group made recommendations in four areas;

- international structures,
- monitoring animal genetic resources and criteria for prioritization of threatened breeds,
- breed development and conservation programmes,
- biotechnology

These recommendations are to be implemented by FAO under the aegis of the Genetic Resources Commission. The Commission, and the Member States, are full members of the Commission. Little has been discussed as yet. *It may be appropriate and timely to launch a European Expert Consultation on the Management of Animal Genetic Resources, based on the needs of the*

*Common Agricultural Policy, and considering also the recommendations of the FAO experts. The results of the consultation should be forwarded to the Programme Committee for Genetic Resources in Agriculture.*

*It has already been suggested that the Committee should keep under review the implementation of the FAO Global Plan for Plant Genetic Resources. It may also be appropriate to keep under review the activities of FAO and other international bodies in the field of animal genetic resources.*

*In any event, as the work of the FAO Commission progresses, full Community coordination will be needed.*

In technical terms, the most notable event during the period under review has been the appearance of a World Watch List for Domestic Animal Diversity. This was published by the FAO with the support of UNEP. The contents of the database owe considerably to European work; in particular the "World Dictionary of Livestock Breeds, Types and Varieties", which was originally an in-house document of the Commonwealth Agricultural Bureau (UK), and later published by them, and the database "Databank on Animal Genetic Diversity in Europe", maintained at Hannover, Germany, funded by the Deutsche Forschungsgemeinschaft, and organised under the aegis of the European Association on Animal Production (EAAP). The EAAP has had support from the European Union for a number of years. It may be appropriate to support actions to enhance the quantity and quality of the data in the EAAP database. In fact, a project on this subject is has been selected in the context of the Second Call for Offers (see A.2.7, page ix above).

Member State governments and others can now consult the FAO and EAAP databases over the internet. Because they are mostly conserved in vivo, animal genetic resources are very much more evanescent than plant genetic resources. The databases therefore require regular monitoring and reporting. *It would seem useful to encourage the persons responsible for the maintenance of "animal" databases in the Member States to meet together from time to time.*

Member State governments can also obtain a copy of the databank entries for the animal genetic resources located in their territory. It is sometimes argued that the endangered status and concern for any particular breed is already well known in the country concerned, and that effort on databanking is misplaced. Others point out that databanks are particularly useful for four types of management enquiry:

- what is the utilisation potential of any particular breed ?
- what is the risk of genetic erosion for any particular breed ?
- what is the urgency of conserving any particular endangered breeds (what are its specific genetic qualifications, its cultural importance, do similar breeds exist in other countries, ...) ?
- which conservation management should be performed (change risk factors, what type of cryoconservation, ...)?

*It would be useful for experts who have some experience with the FAO and EAAP databanks to meet together as a community of database-users from all Member States, to consider experience and recommendations for enhancing the value of the database to end-users.*

### B.2.12 Animal genetic resources: International partnerships

As noted above, the European Association on Animal Production (EAAP) is one of the very few international fora or programmes in which experts on animal genetic resources have become used to working together. The NGO sector is represented by organisations such as SAVE (Safeguard for Agricultural Varieties in Europe), and Rare Breeds International. The Danube countries collaborate in DAGENE (Germany and Austria with Czech Republic, Slovenia, Slovakia, Croatia, Hungary, Romania)

*In the general context of Animal genetic resources, the management team of 1467/94 should maintain regular contacts with the other international fora, both formal and informal.*

Little cooperation exists between breeders of the same breed across national frontiers (the exemplary collaboration between Austria and Italy and also Romania, Hungary, Slovakia, for breeders of the Lipizzan, is an exception). Such collaboration is not established overnight. *It might be appropriate to consider a special action under 1467/94 "accompanying measures" for exchanges between breeders of the same or closely similar breeds in different countries, with the objective of developing joint programmes of conservation.*

### B.2.13 Animal genetic resources: National partnerships

Under the Biodiversity Convention, "States have sovereignty over their own biological resources", and are responsible for "conserving their biological diversity and for using their biological diversity in a sustainable manner". Thus, both under the Biodiversity Convention, and under Community rules of subsidiarity, the conservation and use of animal genetic resources must first be organised at local and national level. *We have already noted that the Genetic Resources committee may need to keep under review the activities of international bodies in the field of animal genetic resources;the committee should also receive reports from time to time of activities at national level on animal genetic resources.*

Although some countries (e.g. France, Spain) have passed laws making conservation fall under national regulation, and though several countries give state support for genetic resources preservation (subsidies to owners of rare breeds, support of cryopreservation programmes, coordination of work at a national level), there is still relatively little work coordinated at the national level on the conservation, sustainable use and accessibility of animal genetic resources for agriculture.

On the other hand national activities in animal genetic resources are well developed in one domain in particular; that is, the work of the herdbook societies. Herdbook societies can be regarded as industry oriented organisations. Many societies possess uniquely detailed information on the genealogies of every animal in the country which belongs to their particular race. Major breeds tend to rely on national societies, minor breeds tend to be supported on a more local scale.

In recent years other NGO's, interested in the conservation and use of animal genetic resources, have sprung up, and (as noted below) much of the practical work on *in situ* conservation of the rarer animal breeds is done by NGO's. Often this work is local in character. *The Committee should consider whether there would be value in encouraging international exchanges*

*between national breed societies.*

### B.2.14 Animal genetic resources: *In vivo* conservation

Breeds at risk of extinction, or genes of a particular animal, may be conserved in the form of live animals in their original location (*in situ*, in vivo), as live animals in zoo parks or rescue stations (*ex situ*, *in vivo*), or as frozen sperms, oocytes or embryos (*in vitro*).

*In vivo* conservation satisfies cultural and historical interests, it enables gene-combinations to be preserved, and regeneration time is the shortest possible. On the other hand, *in vivo* conservation is expensive, the material is at risk of inbreeding depression and mutation, and of fiscal accidents. Some but not all countries invoke Regulation 2078/92, which is one of the Accompanying Measures of the Reform of the Common Agricultural Policy, and which enables payment of a subsidy to owners of rare breeds, on a headage basis. (It is appropriate to note here that in September 1994 the Council discussed some technical aspects of Regulation 2078/92, regarding alternative criteria of rarity, and alternative modalities of payment.) Since animals of the same (or very similar) rare breed may be found in more than one Member State Member States which maintain breeds that are similar may need to be helped to coordinate their actions at a European level. For example, in the case where it is impossible to conserve all of a group of endangered breeds, their genes may be preserved by forming a gene pool with random mating (in botanic terms, a polycross). *It may be appropriate to consider whether activities such as forming a gene pool for the most endangered breeds should, and can, be organized at European level.*

The activities under 2078/92 are considered an important contribution to in vivo conservation. *In other respects than 2078/92,* in vivo *conservation of individual local breeds in individual Member States is considered to be an action for Member States alone.*

### B.2.15 Animal genetic resources: *In vitro* conservation

*In vitro* conservation enables a high proportion of genetic diversity to be preserved indefinitely; it facilitates managed breeding programmes, it maintains genepools against introgression (cross-breeding) and genetic drift, and it maintains the potential for applying new technologies. Some insist on the need for the conservation of oocytes, or embryos, or for conservation in situ. But it is generally agreed that the collection and storage of semen from a number of sires is the simplest, least expensive and most effective method of genetic conservation for animal genetic resources. It provides a safeguard against genetic erosion; both in minor and in the most numerous breeds.

The latest figures for *in vitro* conservation of rare or endangered breeds in Europe are as follows (data from the EAAP databank):

Cattle Total of 232 breeds noted in the Member States, semen stored for 65% of 71 breeds regarded as endangered

Sheep Total of 283 breeds noted in the Member States, semen stored for 11% of 51 breeds regarded as endangered

Pigs Total of 73 breeds noted in the Member States, semen stored for 23% of 30 breeds regarded as endangered

In many cases, only a few males have been sampled. Only for 5% of all breeds have samples been obtained from more than 25 males; 25 is regarded by many experts as an absolute minum. It is to be noted, moreover, that geographical Europe comes first in the World tables for numbers of breeds of cattle, goat, horse and sheep. (The EAAP database notes 76 breeds of goat, 110 breeds of horse, in the Member States).

This suggests that there is urgent need for action in Europe to ensure that semen has been stored from a significant number (more than 20) of distantly related males of each endangered and distinct breed of cattel, sheep and pig.

It is not necessary to conserve sperm from every male, nor yet from every breed; to be a candidate for conservation, a breed needs to be considered as genetically unique. Member States which maintain breeds that are similar may need to be helped to coordinate their actions at a European level. *In other respects,* in vitro *conservation of local breeds is considered to be an action for Member States themselves to undertake in the first place.*

Many of the animal breeds currently found overseas are European in origin. For example, the cattle that settlers took to Latin America had their origin in the Iberian peninsula. *Actions on "European" breeds should take into consideration, as appropriate, the results of genetic distancing work on related work on related breeds in other countries.*

*Ex situ* conservation raises some questions, as yet unresolved, regarding rights of access, ownership of offspring, and legititmate rights and ownership of intellectual property incorporated in any given genome. *In view of the current difficult international discussions on access to and ownership of plant genetic resources, it would be wise for the Union to establish a unified position on animal genetic resources, pre-emptively.*

## B.2.16 Animal genetic resources: Characterisation

In January 1992, the Commission convened an ad-hoc group of experts. They identified in particular the need for research on genetic distancing and mapping. During the period under review the technologies have become considerably more effective. The long term goal, so far as Conservation is concerned, is to investigate the extent to which two breeds may share a common DNA heritage. The characterising of genetic distance sharpens the scientific rigour of choosing which breeds should be preserved. *Genetic distance mapping is an important activity, to follow on the primary characterisation of each animal breed. The resulting data need to be made available in the databases.*

Some of the rare breeds are claimed to be uniquely adapted to their particular environment, or to have a general "hardiness". The databases should contain such information, but it is important to indicate the degree of fiability, from anecdotal, via farmer-tested experience, to replicated trials, including on-farm trials. While characterising is an important activity under 1467/94, research work to test some particular hypothesis is not eligible. *It may be appropriate to consider supporting under the Framework Programme, research to test anecdotal reports of adaptability (etc) of particular rare breeds.*

Council Directive 77/504/EEC of 25 July 1977 (OJ No L 206, 12. 8. 1977 p. 8) (as modified by Commission Decision of 27 July 1994, OJ L 207/30 10.8.94, and earlier) lays down performance monitoring methods and methods for assessing cattle's genetic value for pure-bred breeding animals of the bovine species. The data are to be collected and published by approved bodies in each Member State. *Community inventories supported under 1467/94 do not need to incorporate the data that are available on genetic values, but they do need to provide pointers to where such results can be found.*

Genome mapping may eventually lead to the isolation of DNA sequences that code for particular traits that constitute "hardiness", such as tolerance to parasites. Indeed, work is already under way in these areas. *There is no need to incorporate the results of work on genome mapping into Community inventories supported under 1467/94 , but it is important that these databases provide pointers to where such results can be found.*

### B.2.17 Animal genetic resources: Utilisation

All Member States have already undertaken, as signatories of the Convention on Biological diversity (June 1992), to develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity, including agricultural biodiversity. Regulation 1467/94 is part of this planning in the European Union, covering animal genetic resources as well as plant genetic resources.

It is convenient to classify the utilisation of animal genetic resources in an ascending scale of economic worthiness:

- Culture in the broadest sense (e.g. farm park and touristic activities)
- Environmental preservation (e.g. animals as grazer-maintainers of firebreaks in forests)
- Quality of product (e.g. Reggiana cattle for the production of Parmesan cheese)
- Diversity of product (e.g. the recent appearance in supermarkets of the meat of game animals, and of exotic animals such as ostrich, crocodile)
- Production in particular environments (e.g. North Ronaldsay sheep, adapted to life on the shoreline and a diet of seaweed). Minor breeds may be used either in their own rights, or in a breeding scheme, providing one half or one quarter of the genome of the final productive animal.

While the animal's owner is well aware of the particular characteristics and utilisation potential of that breed, the information is not always diffused and classified in the standard literature. *There may be a need to collect, test and diffuse anecdotal information on agriculturally useful characteristics of rare breeds, and to encourage formal tests of such claims.*

### B.2.18 Special characteristics of animal genetic resources

There has been some criticism, in the case of animal projects, of the stepwise progession of the work in 1467/94 through 6 obligatory steps; it is

argued that these are not appropriate in animal work. When the point was discussed in the Programme Committee it was pointed out that the objective of the Council Regulation in imposing the "steps" is to ensure that every project should proceed in a coordinated and coherent fashion. *The "steps" laid down in the Work Programme of 1467/94 should not be changed in any future revision, if this would be to the detriment of good project management.*

The committee has also discussed the observation that, in the member states, the work of NGOs is very important for Genetic Resource conservation. This position was contrasted with the low level of NGO participation in this Programme. *It may be appropriate to make particular use of the accompanying measures of 1467/94 to help NGOs to coordinate in the preparation of proposals to 1467/94.*

The Committee has also debated the the needs, and the difficulties, of management of genetic resources across national borders. Clearly, trans national cooperation is much easier on endangered varieties of plants than it is on endangered races of farm animals. The creation and updating of an inventory of animal races in Europe, with full details of the current number of breeding males and females, should be a useful first step (see A.2.7, page ix); *it may next be appropriate to convene a discussion meeting on trans-border aspects of the management of animal genetic resources for agriculture (observations requested from Member States at the last meeting, 16 October 1996).*

# C Publications in the Official Journal

## C.1 Regulation 1467/94 (OJ L159 p1 of 28.06.94)

The text of the Regulation is attached in annex C.1.

## C.2 Work Programme and additional information for proposers of concerted action and shared cost action

The text of the Information Package is attached in annex C.2.

## C.3 First Call for Proposals (OJ C368 p24 of 23.12.94)

The text of the Official Journal is attached in annex C.3.

## C.4 Second Call for Proposals (OJ C114 p21 of 19.04.96)

The text of the Official Journal is attached in annex C.4.

# D Declarations by the European Union

## D.1 Declaration of the European Community at the FAO preparatory meeting of the European Region, Nitra. Slovakia (Sept. 1995)

The text is attached in annex D.1.

## D.2 Declaration of the European Community at the Second extraordinary meeting of the FAO Commission on Genetic Resources, Rome (March 1996)

The text is attached in annex D.2.

## D.3 Declaration of the European Community at Leipzig (June 1996)

The text is attached in annex D.3.

## D.4 A preliminary List of European Union Legislation in the area of Plant Genetic Resources

The text is attached in annex D.4.

ISSN 0254-1475

COM(97) 327 final

# DOCUMENTS

EN 03 15

Catalogue number : CB-CO-97-318-EN-C

ISBN 92-78-21751-4

Office for Official Publications of the European Communities

L-2985 Luxembourg