

Genetic erosion and pollution assessment methodologies

Summary of PGR Forum Workshop 5

Ilha Terceira, Autonomous Region of the Azores, Portugal

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The main objective of PGR Forum Workshop 5 was to agree on genetic erosion and pollution assessment methodologies for European crop wild relatives (CWRs). Participants considered how plant genetic erosion might be predicted and assessed using existing methodologies, while questioning its effectiveness. The workshop also considered how plant genetic pollution might be predicted and assessed. There are no established methodologies for assessing plant genetic pollution, but the threat of genetic pollution or introgression, either from genetically modified organisms (GMOs) or from conventionally bred crops, to wild species has become an increasing potential risk to the *in situ* genetic conservation of crop wild relatives.

Overview of the Programme:

The workshop was held at the Training Centre of the Regional Directorate for Agrarian Development, from 8 to 11 September 2004, on Terceira Island, the Autonomous Region of the Azores. It was opened with a welcoming address by the regional entities hosting the meeting and the workshop organisers, followed by a presentation of the progress reports and an update of the coming workshops. These were followed by scientific presentations.

- Jozef Turok from the International Plant Genetic Resources Institute (IPGRI), Rome, Italy, gave a presentation on measuring and predicting genetic change in CWR species.
- The joint co-coordinator of PGR Forum Work Package 5, Brian Ford-Lloyd, from the University of Birmingham, UK, presented an overview of the workshop objectives, and focusing specifically on how conservation priorities might be established for the CWR of Europe.
- Stefano Diulgheroff, from FAO, Rome, Italy, gave an overview on assessing and monitoring genetic erosion of CWR and local varieties using WIEWS (World Information and Early Warning System on PGR).

- A presentation on the political, legislative and practical aspects of *in situ* conservation following the German example in the context of genetic erosion was given by Lothar Frese from the Federal Centre for Breeding Research on Cultivated Plants (BAZ) Gene Bank, Braunschweig, Germany.

Following the presentations, three parallel working groups held discussions:

- Group 1-“Political and legal issues”
- Group 2-“Genetic erosion”
- Group 3-“Genetic pollution”

The working groups’ results and recommendations were presented and discussed in plenary.

Day 2 was dedicated to practical aspects of measurement, monitoring and prediction of genetic erosion and pollution:

- Mike Wilkinson from the University of Reading, UK, talked about risk assessment and gene flow.
- Nigel Maxted, PGR Forum Project Coordinator, from the University of Birmingham, UK, gave a presentation on the usefulness of using ecogeography and GIS to assess genetic erosion.
- The applicability of the change indices as indicators of genetic erosion for the Red List assessment was presented by Caroline Pollock from the IUCN Red List Programme in Cambridge, UK.
- A practical example was given by François Lefèvre from the Unité de Recherches Forestières Méditerranéennes, INRA, Avignon, France, on “Genetic erosion and pollution - genetic and conservation consequences for *Populus* and other European forest species”.
- Lori De Hond from the Universidad Politécnica de Madrid, Spain, on “Using populations for monitoring and prediction”.
- Brian Ford-Lloyd presented the genetic tools, molecular and population, for genetic assessment.
- Jozef Turok gave an introduction to the five-country GEF-funded project “*In situ* conservation of crop wild relatives through enhanced information management and field application”.

These presentations were followed by three parallel working groups:

- Group 1-“Monitoring at the taxonomic level”
- Group 2-“Monitoring at and around the population level”
- Group 3-“Monitoring at the gene level”

The working groups’ results and recommendations were presented and discussed in plenary.

- Presentations on case studies from the CWR list took place on day 3 of the workshop: Mike Wilkinson talked about wild brassicas.
- Wild forages were presented by Michael Abberton from IGER (Institute of Grassland and Environmental Research), UK.
- Aasmund Asdal from the Norwegian Crop Research Institute, Norway, shared his work experience with a practical example of the consequences of changes in agricultural management practices.

- Using the example of the old world cottons, Vojtech Holubec from the Research Institute of Crop Production, Czech Republic, presented the situation regarding genetic erosion and extinction threat of *Gossypium* species.

The presentations were followed by three parallel working group discussions on specific needs for the assessment and prediction of genetic erosion and pollution for CWR:

- Group 1-“Agricultural”
- Group 2-“Horticultural”
- Group 3-“Forestry”

The working groups’ results and recommendations were presented and discussed in plenary. Damiano Avanzato, presented his work on “Genetic erosion of fruit varieties and their recovery from Historical gardens” pointing towards practical ways to halt, and even revert, genetic erosion.

Under the session “The way forward for CWR conservation: specific proposals regarding methodologies and prospects”, António Flor, from the Parque Natural das Serras d’Aire e Candeeiros (PNSAC/ICN), Portugal, shared his experiences on “Indicators for the CWR species list prioritisation”, after which three parallel working groups debated:

- Group 1-“The CWR species list prioritisation”
- Group 2-“The hierarchy of methodologies”
- Group 3-“Future demands/prospects/opportunities”

The working groups’ results and recommendations were presented and discussed in plenary.

Day 4 of the workshop was dedicated to a field trip during which the participants had the opportunity to visit sites of geological and ecological interest as well as appreciating traditional agricultural systems. Prof. Eduardo Dias of the Department of Agrarian Sciences, University of Azores, led the field trip.

PGR Forum is grateful for the very generous support provided by several regional authorities for the organisation of the workshop.