

Conservation of genetic resources and coordination in a decentralized system: the case of Switzerland

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Abstract

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The conservation of plant genetic resources in Switzerland is carried out by public and private organizations. The most important genebank is located at the Federal Agricultural Research Station of Changins, where more than 10 000 accessions of different species are conserved.

A commission has been created with representatives of public and private organisations concerned with plant genetic resources in order to stimulate collaboration and coordination as e.g. making inventories and the development of common projects.

Switzerland has introduced a number of legal instruments for the protection of biological diversity, not only in the framework of the protection of nature, but also in agriculture.

Introduction

Conservation of plant genetic resources in Switzerland started nearly a century ago. Local varieties of cereals were already collected in 1900 by the Federal Agricultural Research Station of Changins (RAC) and the varieties are still available in the genebank. The RAC possesses the most important genebank in Switzerland, where accessions of cereals, forage crops, vegetables, soybean, vines and aromatic plants are conserved (Table 1).

Within the cereal collection, wheat is the most important species with about 4500 accessions, followed by *Triticum spelta*, (2200) barley (800), triticale (750), maize (370) and rye (60). The vegetable collection comprises about 25 species. The most important species is Swiss chard (*Beta vulgaris* subsp. *cicla* var. *flavescens*) with 60 accessions. The forage crop collection consists of ecotypes of *Festuca arundinacea*, *F. pratensis*, *Dactylis glomerata* and *Poa pratensis*. The soybean collection contains material from different origins and is related to the breeding programme. The vine cultivars are local varieties and the aromatic plants are wild species.

The RAC is not the only institute in Switzerland concerned with the conservation of plant genetic resources and several private and public organisations are involved. The conservation of cultivated plants in Switzerland is decentralized and this makes coordination necessary.

Table 1. Number of accessions of species of different groups conserved in the genebank of the RAC.

Group	Number of accessions
Cereals	8770
Soybean	622
Vegetables	500
Forage crops	260
Vines	137
Aromatic plants	14

Coordination

A meeting of all the organisations interested in plant genetic resources was organised in 1990. This led to the creation of two commissions. The first of these, the commission for the conservation of wild plants is supported by the Federal office for environment, forest and landscape. Its priority tasks are the inventory of the *in situ* presence and *ex situ* collections of species that are threatened on a European or Swiss scale (38) and of the development of concrete proposals for the conservation of these species. The second commission, that for the conservation of cultivated plants (CPC) brings together representatives of private and public organisations and is supported by the Federal office of agriculture. One of the first tasks of the CPC was the establishment of an inventory of all private and public organisations involved, with an indication of the species involved and the number of accessions conserved by them (Derron & al. 1992). More than 17 000 accessions of 160 species are preserved in 24 different institutes in Switzerland. Not all of them are acting as genebanks in which long term conservation is ensured. This coordination of effort allows solutions to be found if certain organisations are no longer able to ensure the maintenance of plant material. It also stimulates collaboration between the organisations e.g. by the development of common projects for conservation and evaluation. The commission intends to update the inventory every two years.

The conservation of fruit trees is almost totally undertaken by a private organisation, Fructus, that coordinates and manages standard trees orchards growing local varieties of different species. The organisation Pro Specie Rara e.g. is engaged in on-farm conservation of staple crops, industrial plants and vegetables.

Wild relatives of cultivated plants

Switzerland is a small country composed of very different regions in terms of climate, soil and geography. This is reflected in the large genetic variability within e.g. forage species. Switzerland by its nature is a land of herbage with 1.4 million hectares of grassland and pastures. The most interesting ecotypes of forage crops can be found on traditionally cultivated pastures and grasslands. Breeders from all over Europe converge

on these grasslands to collect interesting ecotypes for the creation of new varieties (Kleijer & al. 1990).

About 100 wild species of aromatic and medicinal plants are found in Switzerland. Some of these species are endangered because of excessive harvesting and 25 species are on the national red list (Landolt 1991). The RAC started a breeding program and is studying the production of aromatic and medicinal plants. The most important species are *Alchemilla xanthochlora*, *Achillea millefolium*, *Arnica montana*, *Artemisia annua*, *Artemisia umbelliformis*, *Epilobium parviflorum*, *Hyssopus officinalis*, *Melissa officinalis*, *Pimpinella peregrina*, *Origanum vulgare*, *Salvia officinalis* and *Thymus vulgaris*. For a number of these species, wild relatives collected in Switzerland are used in the breeding programme.

Legal aspects

Switzerland has introduced various forms of legislation for the protection of biological diversity, not only in the framework of the protection of nature, but also in agriculture. (Kleijer & Kohler 1995).

The federal law on the protection of nature and landscape was revised in 1987 and allows, on a legal basis, a close collaboration between farmers and nature protection organisations. Farmers obtain indemnities if they renounce intensive land use or if they carry out supplementary work without an economical output for the maintenance of biotopes that are very rich in species.

Nature protection in Switzerland is under the responsibility of the cantons (counties). The application law has to be implemented by the cantons and today most of them have such a law. Cantons have concluded contracts with farmers on a voluntary basis and different models based on regional needs have been developed. The specifics for example the date of the first cut in the light of altitude.

In the framework of the law on agriculture contributions have been envisaged for particular ecological allowances. Those that concern the maintenance of biological diversity are the following :

- contributions for extensive grasslands, hedges, and country coppices, under particular conditions e.g. no fertilizer, first cut in relation to the type of grassland and altitude.
- contributions for extensive grassland on set-aside land or not very intensive grassland that is also maintained under particular conditions.
- contributions for growing standard sized fruit trees.

The total amount paid by the Swiss government in 1994 for these three measures is about 55 million Swiss francs. Although these measures are not in the first place aimed at *in situ* conservation but are the result of a modification of agricultural policy, they have a positive effect on *in situ* conservation. The CPC has presented proposals to introduce contributions that will encourage the maintenance and cultivation of traditional landraces. They are not for the moment included.

There exists a legal possibility in Switzerland for commercialisation of landraces of cereals. They do not have to fit all the requirements that apply to the commercialisation of modern varieties.

Genebank managers must ensure that the preservation of biological diversity is included in national legislation. They must bring to the attention of both the public and the politicians the importance of their work and the need to have adequate funds at their disposal.

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