



## Continuous Monitoring of Agricultural Biodiversity in the Alpine Region: The Alpine Delphi

### **Final Report 2007 - Summary**



Photo: Pommiers Vallouise, M-F Tarbouriech

This Project is supported by the Swiss Federal Office for the Environment FOEN  
and Swisslos (Lotterie-Fonds of the Canton St-Gallen)

## **Background: Agriculture in the Alps:**

The Alpine Region provides a unique environment for agrobiodiversity. Over centuries, animals and plants have been developed by farmers to suit the very different landscapes of the Alps. Animals were bred for hardiness, fertility and sure-footedness. Plants were selected that could cope with the harsh conditions of the Alps: high altitude, intense sun and short vegetation periods. However, this did not lead to a homogenous "Alpine" agrobiodiversity, each valley and region had its own breeds and varieties.

Due to socio-economic factors, the drive towards industrialisation in agriculture came late to the Alps. This meant that many breeds and varieties were not irredeemably lost as in other European countries. However, the encroaching industrialisation brought high-yield hybrid crops and cross-breeds of high performance animals. These crops and animals were intended for the intensive farming of the lowlands and are not best suited to the Alps.

Robust animals and crops are still essential in the Alpine Region. Although Alpine farmers are, naturally, also interested in high yields and large profit margins, there is also value in good average yields and for regional products. A consistent yield and a quality regional product can allow the farmer to sell in the growing "gourmet" market. Finding a place in a niche sector of the market can be far more profitable than selling standardised, over-produced products. Many Alpine farmers, due to the harsh conditions of mountain farming, can never undercut the prices of the massive, intensive, lowland farms.

The Alpine region is traditionally farmed using transhumant agricultural systems. These are important both ecologically and economically. The importance of semi-natural habitats such as the Alps cannot be overemphasised. Vast areas of Europe are now either intensively farmed or are part of the urban sprawl and the infrastructure needed to support it. Creating and managing protected areas is expensive. However, encouraging the upkeep of traditional agro-eco-systems in the Alpine region creates a large area of semi-natural habitat, which can be utilised by birds and other wildlife as well as providing space for wild plants to propagate.

In order to promote sustainable development of agriculture in the Alpine region and provide economic security for marginal areas, traditional agricultural methods rather than industrial methods need to be encouraged. This includes the conservation and promotion of the traditional plants and animals in Alpine agriculture. Promoting these traditional systems also helps the conservation of Alpine wildlife, as they complement the ecosystem rather than placing additional strain upon it. Traditional farming systems help to prevent soil erosion and loss of soil fertility, through the use of methods adapted over centuries especially for the region they are used in. All these factors contribute to the production of the traditional Alpine landscapes, which are attractive to tourists.

Due to the frugality of the traditional plants and animals in the Alpine region, traditional agricultural systems use less imported fodder and fertiliser, thus placing less of a burden on other areas. The traditional agrarian system of the Alps has a small "ecological footprint" and its unique climate and altitude provide genetic resources adapted to harsh conditions, which may be essential for future food security in areas outside of the Alpine region.

Today it is still true in the alpine region that robust characteristics in animals and plants are of primary importance. In order to be armed against dry or wet, cold or hot years, great diversity, especially among cultivated plant varieties, is significant even today. In the mountains, it is not superior performance, but reliable average yield, that matters. Extensive cultivation of locally adapted breeds and varieties is moreover important toward the preservation and sustainable use of the alpine agricultural landscapes. Working from this realisation, the St.Gallen office of ProSpecieRara, stimulated by the Alpine Commission CIPRA, compiled the study "Agricultural Genetic Resources of the Alps (ISBN 3-905209-03-9). This was published in 1995 and successfully updated between 2000 and 2001 by the Monitoring Institute for Rare Breeds and Seeds. The update was published in 2003 (ISBN 3-258-06669-8). Both studies were generously financed by Bristol Stiftung, Zürich.

## Developing the Alpine Delphi:

In the above mentioned studies it became apparent that there was an urgent need to create a permanent, simple monitoring infrastructure equipped with an early warning system. However, it is clear that a study on a similar scale to the two previous ones cannot be repeated every two years. The aim of monitoring the Alpine Agrobiodiversity is to monitor the whole agrarian system. Data on stock numbers and cultivated areas is important but it is not the only factor that needs to be taken into account. After extensive research and testing of indicators had been carried out it became clear that the data that is generally accessible for long-term monitoring of trends in agrobiodiversity is not sufficient. Due to this, a completely different approach was taken: using the Delphi Method to survey expert opinions. By using the Delphi Method, the tasks of networking organisations and institutions, documentation and up-dating of relevant data and the establishment of an Early Warning System for critically endangered livestock breeds and cultivated plants could be better met.

The widely used indicator model "*Pressure-State-Response*" has been used in the development of biodiversity monitoring indicators in Switzerland. Under the list of indicators are Z1 and Z2, which concern monitoring the *State* of Agrobiodiversity. The results of this monitoring show the number and proportion of breeds in Switzerland. These results show two trends, firstly that the number of breeds is increasing and secondly that the number of animals from rare breeds is also increasing. Although this sounds positive, some factors are missing, though not unacknowledged. Firstly, the amount of breeds kept is growing due to imports. Secondly, the statistics do not show the genetic distance between individual animals. Thus it is possible that good statistics are hiding in-breeding and genetic erosion. Due to the restrictions within which the data is collected, many small farmers with genetically important breeds could be slipping through the net and this distorts the final picture presented.

Measuring the *State* of agricultural genetic resources is the most used monitoring device. This device is extremely important but there are pitfalls, which make the data produced less than reliable:

=> Constraints in data availability. Databases often have gaps.

=> Inconsistencies between data disseminated at the international level. Not all data is collected and recorded in the same manner. This means that data entered into an international database may be unusable.

=> Data sources. Data sources may be unreliable.

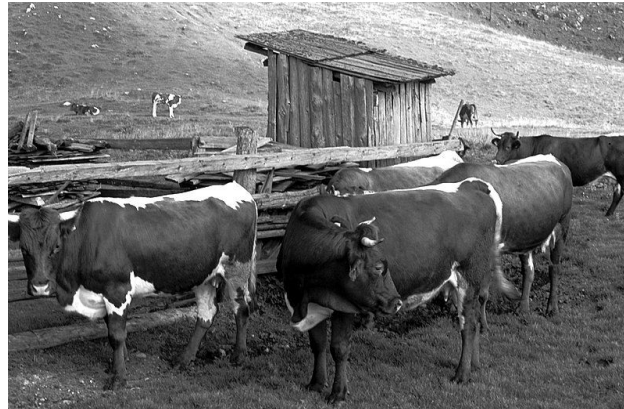
=> Data fatigue. Data duplication and lack of collaboration in data collection.

Even though there is constant improvement in this field, as long as there are gaps and inconsistencies, this form of monitoring, whilst undoubtedly essential, is not enough to ensure conservation of agrobiodiversity. Two aspects of *Pressure-State-Response*, which often get overlooked, are *Pressure* and *Response*. What are the *Pressures* on agrobiodiversity in the Alps? And what *Response* is required? The majority of experts working on the subject of conservation of Alpine agrobiodiversity strive to achieve good data on the *State* of agrobiodiversity in their specialist field. However, knowing the *State* does not guarantee future conservation. The *State* may show the positive or negative consequences of *Pressure* and may give an indication towards *Response*. A good monitoring system will explicitly make use of all three levels of *Pressure-State-Response*.

Experts from the various sectors of Alpine Genetic Resources were invited to take part in the Delphi research. The research was based on three questionnaires, which the participating experts were able to fill in online using a personal username and password. Each expert filled out a first questionnaire especially tailored to his or her expert knowledge. The second questionnaire was a more general one, based on the results of the first. The third questionnaire presented the participants with a rough draft of this report and asked questions based on the results of the second questionnaire and the conclusions of the report.

Through a system of coding, the results of the first questionnaire were divided into themes. The second questionnaire was based on these themes. For each of the four themes identified, statements were created that reflected the results of the first questionnaire. The participants in the second questionnaire were then able to say if they agreed or disagreed with these statements. In this way a broad picture was built up of the state of Alpine agricultural genetic resources and of the institutions working for its conservation. Last but not least, trends that will influence the future of Alpine Agrobiodiversity were also identified. The last round of the present Delphi study was the presentation of this report to the participants. They were invited to comment on the content of it. In this round there was also a third, short questionnaire.

*Bohinjska cikta  
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## **Conclusions:**

The three rounds led to the identification of two factors that need urgent attention:

- a) Cooperation between experts
- b) Research into the whole field of agrobiodiversity: from farmer through to consumer.

These two points would aid the generally widened research strategy, discussed at the beginning of this report, to create indicators of Pressure-State-Response in the Alpine region. It will only be possible to build up an early warning system to alert conservationists to major changes in Alpine agrobiodiversity if a more exacting methodology can be found that covers the whole region and the whole sector using the principles of Pressure-State-Response.

Cooperation between institutions should include an internationally agreed set of guidelines for collecting data so that it is comparable. Within bio-geographical regions there should be closer international and inter-institutional collaboration to ensure that the State of conservation is documented.

In general, the recommendations on the theme "The task and general situation of experts" are:

- There must be better cooperation between institutions including cross-border cooperation
- Inter-institutional and international definition and goal setting is urgent
- Monitoring and documentation of the State of agricultural genetic resources should be improved
- Knowledge of subsidies should urgently be improved.

Subsidies relate to the sectoral agricultural and land-use policy of the eight Alpine states and the EU. Through studying the subsidy structure, it is possible to find out if conservation of Alpine agrobiodiversity is really considered desirable or necessary by policy makers and politicians.

The fact that the Protocol on Mountain Farming remains unratified by three of the Alpine states can be seen to show that there is not only a lack of commitment to it in those three countries but also in the neighbouring countries. A lack of commitment to mountain farming in general leads to a lack of commitment to the conservation of Alpine agrobiodiversity. An exact overview of the policies of the eight Alpine states, the subsidy structures and the commitment to the Alpine

Convention is considered necessary. Additionally, lobbying is required to achieve complete ratification and implementation of the Protocol on Mountain Farming.

Also on the theme of “Subsidies and other financial support” it is clearly felt by the majority of the participants in the project that financial support to ensure conservation is not just required by the farmers. Money is needed by breed organisations to finance running herdbooks, researchers into Alpine Agrobiodiversity need more money to aid their research and the running of databases. Research into Pressure and Response, not just the State of agrobiodiversity should be supported.

On the theme of “Public Awareness, Tourism and Consumers” there are three main recommendations:

- Investigations into creating a label that identifies products as made from autochthonous Alpine breeds and plants should be undertaken; this would also partly fulfil the obligations of the Protocol on Mountain Farming.
- The traditional agro-eco-systems and traditional animals and plants of the Alps should be actively promoted to tourists; this too would also partly fulfil the obligations of the Protocol on Mountain Farming.
- The question of meeting consumer quality standards with the products of traditional Alpine livestock breeds, whilst preserving their breed characteristics, should be further researched.

Under the theme of “Farming and its environment” there are two main recommendations:

- Agricultural schools should be encouraged to teach traditional farming practise to agricultural students. The curriculum of agricultural schools in the Alpine states should be examined. This is also an opportunity to fulfil the Protocol on Mountain Farming.
- Hobby farmers and gardeners should be encouraged to take their part in conserving Alpine agrobiodiversity. Possibilities to include data about their efforts into the relevant databases should be explored.

It seems clear, from the responses given, that the conservation of Alpine agrobiodiversity must extend from the farmers through to the consumers, with the experts acting as guides. Without this strategic ‘whole-system’ approach to conservation, all attempts to conserve Alpine agrobiodiversity *in vivo* are futile. Lack of coordination between actors can lead to duplication of work and organisations and institutions working with different objectives or even against each other. The lack of cohesion in the conservation efforts can lead to inefficiency, a lack of transparency and a lack of usable data. Cooperation between experts encourages a process of social learning within which experts stand to gain further knowledge and understanding through collaboration with their peers. This process thus creates an epistemic community for the conservation of Alpine agrobiodiversity.

A regular repetition of this exercise based on the themes that have been brought up in this first Alpine Delphi should enable successful monitoring of the Alpine Region for many years to come.



*Klauser, Hans Peter, Alpabfahrt,  
Appenzellerland 1944  
<http://www.fotostiftung.ch/>*