

## Recommendations for the production and use of wild flower seeds adapted to local ecological conditions in Switzerland

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Since nearly 20 years, promotion of ecological aspects, including diversity of plants and animals, has been one of the important tasks of Swiss agriculture. The federal administration supports this plan by direct payments.

Measures are diverse; one of those is to set aside 7% of farmland as ecological compensation area. This area can include

- (1) border strips of a crop without weed control, sometimes sown with a mixture of (rare) indigenous weeds,
- (2) wild flower strips sown with indigenous species normally remaining no longer than six years at the same place,
- (3) rotational fallows with indigenous species integrated in crop rotations;
- (4) extensively managed meadows and pastures,
- (5) ruderal areas,
- (6) dry stone walls,
- (7) orchards with high-stem trees and so on.

The farmer can obtain more financial support if the compensation area is of particularly high quality, for example an extensively managed meadow with a characteristic and high biodiversity. This high quality can also be obtained by sowing appropriate seeds for restoring a high biodiversity.

The Swiss Commission of Wild Plant Conservation, CPS, has noticed already in 1992 that only a small part of the wild flowers sown was of Swiss origin. However, we know that the introduction of non-native seed can lead to erosion of native genetic variation by crossing between native and introduced plants. Helping to remedy this problem, the CPS set up „Recommendations for the production and use of seeds adapted to local ecological conditions“. These are not only helpful for agriculture but also for wild flower seed used along streets and railways, in gardens and parks, for restoration of grasslands on ski runs, and so on.

The most important guidelines of the recommendations are based on the bio-geographical classification, which is in relation with distribution of the indigenous flora and fauna. We distinguish 6 main regions and 11 subregions. According to the conservation status of the species the requirement for the seed origin is more or less strict. Seed of relatively frequent wild flower species has to come from the same main region in which it will be used; seed of rare or geographically disjunct species has to come from the same subregion. The use of endangered species can only take place in collaboration with the Cantonal Office of Nature Conservation. Further

more, we recommend that altitude and soil conditions have to be taken into consideration.

*What is the situation today? What are the results or effects of these recommendations? Are they followed? Which problems occur?*

Today, nearly all wild flower seed used in agriculture are of native Swiss origin and also multiplied in Switzerland. Only some species of Poaceae are still from foreign origin. However, recommendations of the CPS concerning the bio-geographical regions are still difficult to put in practice and are in general not considered.

Today, we can say, that thanks to an intensive communication work, awareness about the importance of using regional adapted seed has globally risen considerably. Cities like Geneva or Berne, organised their own seed production in collaboration with some specialised firms; a Website - [www.wildpflanzen.ch](http://www.wildpflanzen.ch) - promotes knowledge over the use of indigenous wild flowers and certain companies can provide suitable material if there is enough request.

*But the largest part of wild flower seed used in agriculture does not respect the regional origin recommended by the CPS. Why? Are the recommendations too strict and not applicable? What are the consequences? What could help to have the recommendations respected?*

In the beginning, a large effort of the producing companies was needed for understanding the biology, germination and growth conditions of species in question. Multiplication of some species was very difficult and requested special techniques to be developed. The question of the bio-geographic origin was not a priority. Most of the companies today offer up to 300 and 400 species (Switzerland counts about 2600 indigenous taxa) and their seed mixtures contain often 40 and more species. The firms offer also different seed mixtures for the different environmental conditions (soil pH, humidity, elevation, etc.). Diversity of the offer is such, that it is very difficult to organize the same kind of offer multiplied by the number of bio-geographical regions.

Some negative consequences of an indiscriminate use of wild flower mixtures are already visible. For example,

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*Anthemis tinctoria*, a species with a disjunct natural distribution in Switzerland, is widespread today. Some rare and endangered „weed“ species like *Nigella arvensis* or *Agrostemma githago* can be found today in areas where they never occurred before. Other consequences are supposed, such as crossing between native and introduced plants. Regarding these problems, the CPS is determined to find solutions together with the companies producing wild flower seed and with persons in charge of agriculture policies. Several proposals are promising, like reducing the number of species in seed mixtures, using only species according to

main bio-geographical regions and stopping the use of rare and endangered species. Technologies using wild flower seed have to promote the natural, local flora by using low seed quantities and density. With less species in a mixture, it should be possible to follow the recommendations.

For compensating the loss of profit for the companies, it is very important to encourage also the adapted use of indigenous wild flowers in gardens and parks.

All these efforts will, hopefully, preserve the biodiversity of our indigenous flora.

D. Agricultural production Land use change and rapid land use intensification have supported the increasing production of food, feed and fibre. Since 1961, the total production of food (cereal crops) has increased by 240% (until 2017) because of land area expansion and increasing yields. Fibre production (cotton) increased by 162% (until 2013). CHANGE in % rel. to 1961. and decreases of infestations (high confidence). Based on indigenous and local knowledge, climate. change is affecting food security in drylands, particularly those in Africa, and high mountain. regions of Asia and South America<sup>20</sup>. Ecological problems need urgent and minute observation. If you want to discuss this topic with your Intermediate students, here are some lesson ideas. While lots of people do care for nature and try to solve ecological problems, others do not know even how to handle it. Ecological problems need urgent and minute observation. Every person has their own attitude on this issue. If you want to discuss this topic with your Intermediate students, here are some lesson ideas. Choose public transportation. Buy local food. C) Plastic rubbish: Bring your own bags to the supermarket. Nomination of ecological corridors and ecological networks for conservation to the Protected Planet Database . . . 46. 8 Conclusion . . . .

Connectivity, ecosystem services and Nature-based Solutions in land-use planning in Costa Rica . . . 98 . 18. The need for ecological connectivity is essential for the survival of wild species. Internationally, the Convention on the Conservation of Migratory Species of Wild Animals (CMS), a multilateral environment agreement under the United Nations, provides a global platform for States to take necessary collaborative actions to address the conservation and sustainable use of migratory animals and their habitats. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved' (IFOAM 2009). Production of organic cash crops can improve the situation of smallholders in other ways than the pure implementation of its principles can: Witnessed was the development of social and political structures and therefore a new level of organisation through certification and cooperatives which can address issues like insufficient payment for labour and gender inequality. Wild area/ extensive use (ha). 40500 -----. 32640 Switzerland has therewith established a sound baseline for the future conservation of genetic resources in agriculture. Forest diversity is also assumed to be in a satisfying state with more than 90% of mature timber established by natural seeding a peak value in Europe. Aquatic diversity, however, is suffering from an insufficient eco-morphological state reported for 14â€™000 km of watercourses. Intensive land use in the past resulted in the large-scale alteration of the structure of surface waters. Specific attention is also given to wild foods; Description of the different production systems within the country, as well as an overview of their importance to the national economy and rural livelihoods. Preparation of the Country Report.