

Initial Stakeholder Meeting Report Silvoarable systems with fruit and high value timber trees in Switzerland

Work-package group 4: Agroforestry for arable farmers
Specific group: Silvoarable systems with fruit trees and high value timber trees in Switzerland
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## 1. Context

The AGFORWARD research project (January 2014-December 2017), funded by the European Commission, is promoting agroforestry practices in Europe that will advance sustainable rural development. The project has four objectives:

- 1. to understand the context and extent of agroforestry in Europe,
- 2. to identify, develop and field-test innovations (through participatory research) to improve the benefits and viability of agroforestry systems in Europe,
- 3. to evaluate innovative agroforestry designs and practices at a field-, farm- and landscape scale, and
- 4. to promote the wider adoption of appropriate agroforestry systems in Europe through policy development and dissemination.

This report describes one of about 40 initial stakeholder workshops to address objective 2. Further details of the project can be found on the AGFORWARD website: <u>www.agforward.eu</u>

## 2. Description of system

Traditional agroforestry systems such as orchards, chestnut selvas and wood pasture dominate the cultural landscape in many regions of Switzerland and are good examples of multifunctional land use. Innovative farmers have begun in recent years to develop the traditional systems further. High stem fruit trees are now integrated with arable crops. For the fruit trees ecological direct payments can be claimed, which makes the combination with arable crops attractive. Most of these modern agroforestry systems with high stem fruit trees are situated in the German speaking part of Switzerland. The aim of this initial stakeholder meeting was to discuss the potential and risks to establish silvoarable agroforestry systems in the French speaking part of Switzerland. The western part of Switzerland is much more influenced by the experience in France with silvoarable agroforestry systems with high value timber species. One of the farms, seen during the site visit, established an agroforestry system with timber trees on an area of 7.5 ha in 2011.



Figure 1 and 2. Some images of silvoarable agroforestry systems in Switzerland

### 3. Participants

The meeting on 25 May 2014 was attended by 22 stakeholders and four presenters. The meeting was organized jointly with the annual meeting of the "Swiss Interest Group on Agroforestry", which was founded in 2011. Nine participants were farmers with a strong interest in silvoarable agroforestry systems. Two farmers have already established such a system on arable land. Seven people were delegates from consulting, research and agricultural policy organisations, with representatives from the Federal Office for the Environment and the cantonal advisory services, as well as the research stations Agroscope Changins and HEPIA Geneva. Six people were interested students and members of the press.



Figure 3 and 4. Some images of silvoarable agroforestry systems in Switzerland

### 4. Introduction session

The meeting took place on 27 May 2014 from 9.00 to 16.30 and included presentations in the morning and two field visits in the afternoon. It was held on the farm of Nicolas Bovet, Arnex sur Orbe, in the Orbe Valley between Lake Geneva and Neuchâtel. The invitation was organised by AGRIDEA, David Caillet Bois and Mareike Jäger.

The morning included presentations by Sylvie Monier (Mission Haies Auvergne - Union Régionale des Forêts d'Auvergne, France), David Caillet-Bois (AGRIDEA), Felix Herzog (Agroscope) and Mareike Jäger (AGRIDEA). Sylvie Monier (Mission Haies Auvergne - Union Régionale des Forêts d'Auvergne, France) gave a presentation about the agricultural conditions for success. David Caillet-Bois (AGRIDEA) gave an overview about agroforestry in agricultural policy: legal basis and contributions. The presentation of Felix Herzog and Mareike Jäger (Agroscope and AGRIDEA) focused on the history and current project on agroforestry in Switzerland.

## Detailed review of the presentations

Sylvie Monier gave an overview of the advantages and disadvantages of various agroforestry systems for agricultural production. In particular, she compared silvoarable agroforestry systems with hedges in respect of benefits in the field of biodiversity and biomass production (Table 1). She reported on experiences in France with agroforestry systems and presented experimental results on the competition for light, water, and nutrients, and the effects of tree cutting measures on wood quality.

	Hedge	Avenue of trees	Grove of trees	Orchard	Intra-plot agroforestry
Climate protection	+++	+	+++	+	+
Water resources	+ + +	+	++	+	+++
Erosion control	+++	++	+ + +	++	+++
Cultural benefits	+++	+	+	++	+++
Production of wood and fruits	+++	+	++	+	+ ++

Table 1. The roles and issues of trees for agriculture (from presentation by Sylvie Monier, Mission Haies Auvergne, Arnex sur Orbe, 2014).

Felix Herzog (Agroscope) and Mareike Jäger (AGRIDEA) described the development of agroforestry in Switzerland from traditional systems (orchards, forest pastures and chestnut selvas) to modern silvoarable agroforestry systems. In Switzerland, there is a particular focus on high stem fruit trees (walnut trees, pome fruit and stone fruit) integrated with arable crops and also vegetables, fruits and berries. Even modern grazing systems, such as broiler in mobile stables or deer farming in agroforestry systems are receiving more attention. The speakers showed examples of farmers that have installed agroforestry systems in Switzerland. Since 2011, practitioners, consultants and researchers have worked together in the Swiss Interest Group on Agroforestry.

Mareike Jäger presented a new five-year agroforestry project, started in early 2014 called the "Swiss Agroforestry Network". One of the project's goals is to promote innovative silvoarable agroforestry systems as a form of sustainable land use in Switzerland. In total, 25 on-farm demonstration plots

across Switzerland will show a variety of silvoarable agroforestry systems - from intensive conventional horticultural farms to different organic farms, combinations with fruit trees, wild fruit species and forest trees. These demonstration plots will be used for "light" monitoring focused on biodiversity parameters, business surveys and carbon sequestration.

Another important project goal is to collect more practical knowledge and to link up farmers, advisors, scientists and other interested people. The Swiss Interest Group on Agroforestry will thus be strengthened in its function as an information hub and first point of contact. It will carry out regular activities, like field tours and regional meetings and exchange experiences. Finally, Felix Herzog presented objectives and contents of AGFORWARD.

In another presentation, David Caillet Bois (AGRIDEA) described the legal framework for agroforestry systems in Switzerland, including the rules and conditions for direct payments for high stem fruit trees in arable land.

### 5. Field visit

Two field visits took place in the afternoon. In 2011, farmer Nicolas Bovet planted various tree species nut trees (*Juglans regia*), also hybrid species and black walnut (*Juglans nigra*), lime tree (*Tilla spp*), wild pear (*Pyrus pyraster*), wild cherry (*Prunus avium*) and sorbus (*Sorbus aucuparia*) on his farm. He implemented agroforestry after he had read several books on this topic. From the beginning it was not his goal to get direct payments for his agroforestry system, because he didn't want to submit himself to any rules. He wishes for a future where agroforestry systems with timber tree species are promoted in Switzerland. In his opinion these systems should be promoted because the advantages of ecologically-oriented agriculture will improve the image of agriculture. Mr Bovet decided to plant valuable timber trees with well-formed trunks. The production of fruit is not a priority, because the high pruned trunks make harvesting impractical.



Figure 5 Images of the field visit: Nicolas Bovet planted 250 trees on his farmland in 2011

He planted 250 trees over an area of 7.5 hectares in 2011. The tree rows are in a 2 m wide strip of grass. The rows of trees have a distance of 29 m each. Under the trees he sowed a flower strip to suppress weeds and mice. In addition, 160 trees will be planted in the winter of 2014/15 on a 4 ha plot. The composition of the understorey was selected, in part, to promote soil fertility. The flower strips are mulched regularly. Because of the regional problem with soft brome (*Bromus hordeaceus*), he makes single application treatments with the knapsack sprayer. The crops are sown using zero-tillage, and in the first few years he is using a subsoiler to cut the lateral roots of trees.





Figures 6 and 7. Images of the field visit to Nicolas Bovet's farm

The second farmer visited was Alain Vulliamy from Oulens, who created an agroforestry system on an area of 9 ha. Because he already has 300 fruit trees in the orchard (some old and rare varieties), such as apple *(Malus)*, pear *(Pyrus)*, plum *(Prunus domestica)* and cherry *(Prunus avium supsp. juliana)* trees. He was already aware of trees and has a large appreciation for the ecological services of trees in the cultural landscape. In 2010 he was alone with his idea to create an agroforestry system. It was difficult to get French-speaking information in Switzerland, so he turned to France with 25 years' experience in using valuable timber trees on arable land. He was successful in receiving contributions for the trees from Federal Office for Agriculture, but he considered that the sums were not large in view of the ecological benefits of agroforestry systems. The timber trees were planted in rows 30 m apart. He was skeptical about fruit trees in combination with crops, because he cannot imagine how to accomplish the fruit harvest. He also uses a no-till system, but he also used a subsoiler in the initial years. He protects the trees against deer browsing, which is an expensive but necessary measure considering the location right on the edge of the forest



Figures 8 and 9. Images of the field visit to Oulens

# 6. Oral comments after visits

Most oral questions and comments after the field visits were based on technical aspects related to the cultivation system. A big problem is the mice control and, in this context, the maintenance of the green strip, in which the trees are located.

Lack of technical equipment restricts the mulching of the green strip. But the use of glyphosate, viewed in one example was not a solution because the trees can be damaged. In addition, there were many questions related to the pruning of valuable timber trees. This shows that the experience with the cultivation of valuable timber trees in farmland in Switzerland is still very low.

Regarding fruit trees on arable land, questions were asked about the management and varieties, so the harvest of fruits and crops do not overlap. Another aspect concerned the use of phytosanitary products, when there are fruit trees in the field. The opinion was expressed that silvoarable agroforestry systems are easier to manage in organic farming.

## 7. Qualitative written Evaluation

Following the event, the participants took the opportunity to answer a few questions for evaluation.

What did you like most on this day?

- The presentation by Sylvie Monier and the practical field tour
- The selection of speakers
- Good overview of the advantages and disadvantages of different agroforestry systems

What was missing?

- I missed seeing traditional agroforestry systems such as orchards, hedgerows, and wood pasture
- Too little time for professional exchange

What will you put into practice?

- Spread benefits of agroforestry in practice
- Certain cutting techniques
- Instructions for mice control and species composition in the green strip.

Do you have suggestions for other events on this topic?

- Agroforestry is a future topic. Everything revolves around the tree and its environmental benefits.
- It would be good to have a demonstration plot near the train station, one could visit regularly on meetings concerning agroforestry.
- Visit of plots, where even older trees can be seen.

### 8. Next steps

As a result of the meeting it was recognised that the activities in western Switzerland on the subject of agroforestry need to be better coordinated. The cultivation of valuable timber trees in farmland was particularly interesting. In western Switzerland, farmers manage large fields and many try to minimise erosion and nutrient loss. By contrast, there are many small fields in the German-speaking part of Switzerland and farmers typically seek greater output per unit area through agroforestry.

It is apparent that many technical questions regarding agroforestry remain unanswered. Future meetings will seek to bring together the technical aspects and personal experiences on agroforestry systems.

#### 9. Acknowledgements

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