



Research Institute of Organic Agriculture FiBL
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Chances and challenges of agroforestry systems

Introduction to agroforestry in Switzerland

Organics Europe Youth Event 2022, Johanna Rüegg, 1.9.2022

Traditional agricultural landscape in the region

Arisdorf BL, 1926



Arisdorf BL, 2016





Pictures: M. Jäger, F. Sereke

Traditional agroforestry systems in Switzerland

- High stem fruit orchards & grazing cows
 - Chestnut-pastures in Ticino
 - Forest-pastures in the Jura
- multipurpose, synergies, increased productivity

Functions of trees and agroforestry

Productive

- Fruits
- Nuts
- Seeds
- Condiments
- Honey
- Stimulants
- Medicine
- Flavourings
- Colouring
- Fat
- Fodder
- Energy wood/wood
- Fine wood

(Agri-)Environmental

- Shade
- Weed control
- Regulation of pest and diseases
- Nitrogen fixation
- Biomass for mulching and nutrient recycling
- Carbon storage
- Erosion control
- Water retention
- Making water and nutrients available from deep layers
- Windbreaks
- Stable microclimate
- Maintain native biodiversity and habitats
- Reforestation of degraded areas

Socio-cultural

- Protection for animals and humans
- Pleasant working conditions
- Healthy and diversified food
- Possibility of innovation for producers
- Species of high cultural or social value

Multistrata system in the tropics (SysCom Bolivia)

Traditional systems for many food crops and later also for commercial crops as cocoa and coffee

- By-crops for self consumption
- Climate adaptation, mitigation, biodiversity, nutrient cycling

Challenges

- Shade tree management
- Management and markets for diversified by-crops



Silvoarable agroforestry (Agroforestry in Austria)

10 years old system with Black walnuts and mulberries

- Biodiversity, climate, nutrient leaching...
- Additional products



Silvoarable agroforestry (Agroforestry in Austria)

11 years old poplar hybrids

- Biodiversity, climate, nutrient leaching...
- Wood production



Silvoarable system (BioDiVerger)

Low-input orchard (low-stem)
with vegetable production
according to principles of
permaculture and agroforestry

- High biodiversity
- Good regulation of pests
- Increasing gross margins



Multistrata system (GAFAM, INRAE Restinclières, France)

Adult walnut trees in a apple
plantation – Research plot

- Influence on architecture of
apple trees?
- Photosynthetic activity?
- Allelopaty?



Silvopastoral system (ECORCE)

Grazing of sheep in orchards and vineyards

- Utilization of the grass/cover crop
- Weed control

Challenges:

- Copper toxicity
- Tree debarking

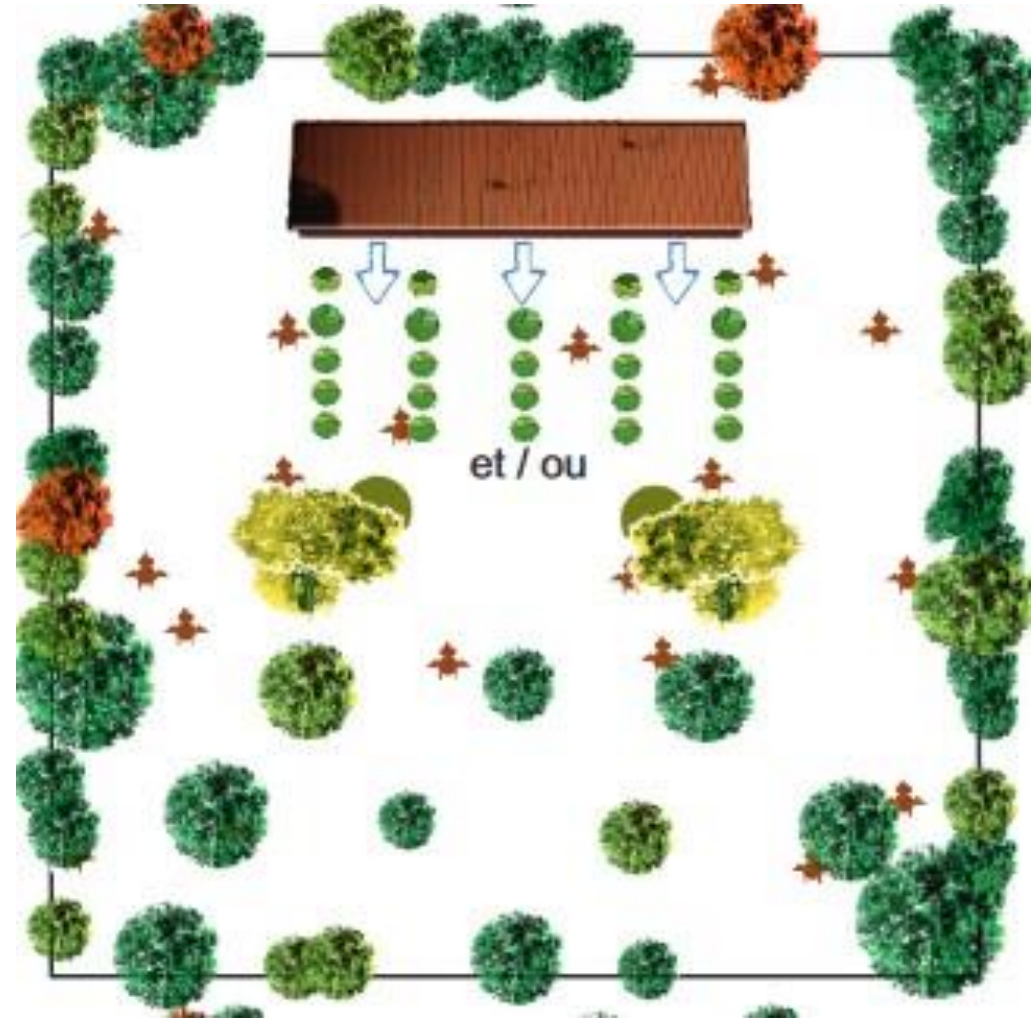


Silvopastoral system (Agro4esterie)

Structuring poultry and pig parks
with trees and bushes

Use of ramial chipped wood as
litter near the buildings

- Nutrient and soil fertility
management
- Animal welfare



Silvopastoral system (Agro4esterie)

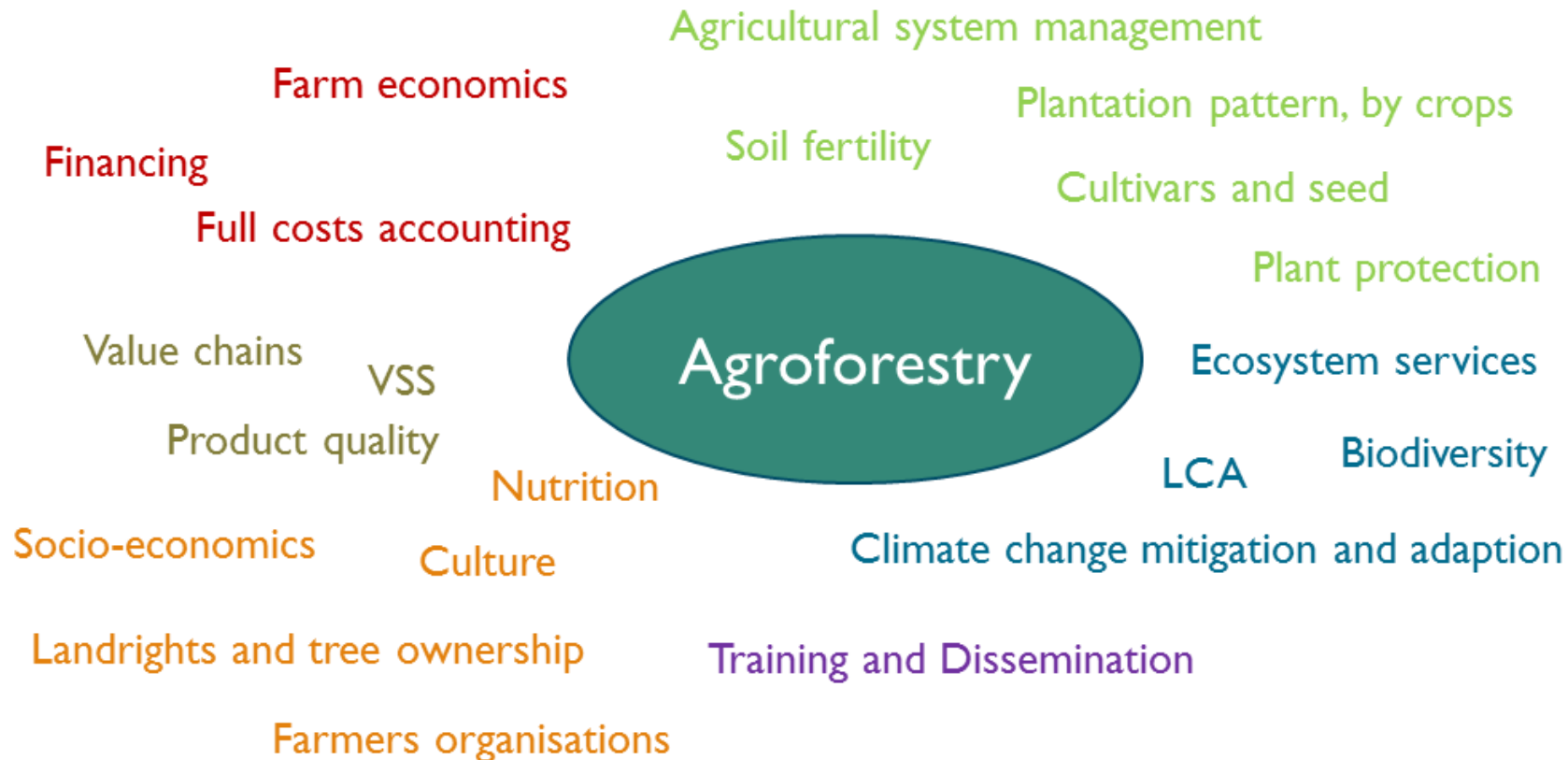
Fodderhedges with trees and shrubs

- Optimize production on same surface
- Extend grazing period
- Animal welfare (i.e. medicinal plants, shelter)



Credits : Jérôme Goust

Agroforestry – still many open questions for practitioners and scientists



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