Agroforestry in organic livestock production

MIXED
EFFICIENT AND RESILIENT MIXED FARMING & AGROFORESTRY

AARHUS UNIVERSITY

Geographical scope: Denmark (Jutland)

Organisation name: Innovation Center for Organic Farming and Aarhus University

Number of participating farmers: 8 actively engaged farmers (with a larger associated group of over 20)

Total budget: MIXED project
Funding: Horizon 2020

A bit more about the Case Study

This case study focuses on integrating agroforestry into organic livestock farming systems across Jutland, Denmark. Participating farmers incorporate trees and shrubs with agricultural crops and livestock production, primarily organic pigs and dairy cattle. The trees serve as energy crops while also enhancing biodiversity, animal welfare, and environmental sustainability. The systems vary greatly in design, with some farms dedicating 20% of their land to agroforestry, while others (smallholders) incorporate trees across most of their farmland

The farmers are in general very interested in exploring new business models such as carbon sequestration, nutrient recycling, and reduced environmental impact. Additionally, the project explores new business models for utilizing trees beyond shade and shelter, such as honey production and truffle farming, to enhance economic value

Highlights

- Diverse agroforestry systems integrate trees and shrubs into organic pig and dairy farms across Jutland
- Exploring ways to increase the economic value of agroforestry, such as tree-based products like honey and truffles
- Collaborative events and workshops empower farmers with tools and knowledge to improve their systems

Website and project information

http://projects.au.dk/mixed/networks-national-teams/denmark/

https://projects.au.dk/mixed/

Photo by Søren Gammelmark

Key outcomes and insights

Innovative features

The integration of poplar and willow trees into livestock pastures offers shade, improves animal welfare, and enhances biodiversity. By combining energy crops with sustainable farming, these systems address challenges like nutrient recycling and carbon sequestration, demonstrating a multi-functional approach to agriculture

Agroforestry - an overview.
Photo by Moxtell og Thyviral

Environmental and socio-economic benefits

The agroforestry systems contribute to reduced nutrient leaching, improved groundwater quality, and greater carbon storage in soils. Farmers benefit from increased resilience, diversified income streams, and enhanced farm aesthetics, which can improve the marketability of organic products. Collaboration with researchers and policymakers further supports long-term sustainability and systemic improvements

Good practices & Lessons learned

Problem 1. Livestock damage to newly planted trees
Grazing livestock often damage young trees, leading to poor tree establishment

Solution 1. Use protective fencing and strategic planting layouts to safeguard trees from livestock while they establish

Problem 2. Non-flexible subsidy systems
Rigid regulatory frameworks and unclear subsidy structures make it difficult for farmers to plan long-term agroforestry investments

Solution 2. Advocate for policy adjustments and educate policymakers on the long-term benefits of agroforestry for farming systems and public goods

Problem 3. High workload during tree establishment
Establishing agroforestry systems is labor-intensive, requiring significant effort for tasks like planting and weed control

Solution 3. Organize cooperative efforts among farmers and provide guidance on efficient weed control and tree management practices

Problem 4. Farm machinery not compatible with agroforestry
Conventional farm machinery, designed for monoculture systems, is not suitable for navigating agroforestry, making it difficult to manage crops and livestock efficiently

Solution 4. The development of new technology and specialized crop management machinery tailored for diverse cropping systems with trees enables better integration of agroforestry into modern farming practices

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