

# FICHE – AGROFORESTRY CASE

## “TREES FOR WATERWAY PROTECTION ALONG DRAINAGE DITCHES IN ITALY”

Data extracted in May 2021

**Note to the reader:** This set of *fiches - agroforestry case* is offering additional information to the meta analysis literature review summarised in *general fiche* and set of *fiches* of the environmental aspects of AGROFORESTRY. Each individual case describes an agroforestry system within the European Union, delivering more detailed information on application and management practices.

### 1. DESCRIPTION OF THE AGROFORESTRY SYSTEM

Geographical location	Italy
Climate zone	Mediterranean
Geographical level	Farm
Description	Poplar hybrids and species were planted in an alley cropping system with arable crops in between young tree rows. Additionally, trees were planted linear along field edges, drainage canals and streams.
Key descriptors	<ul style="list-style-type: none"> <li>• Climate change adaptation</li> <li>• Increased biodiversity (habitat diversifications)</li> <li>• Carbon sequestration, above and below ground</li> <li>• Additional income</li> <li>• Sustainable intensification of agricultural area</li> </ul>
Agroforestry system	Silvoarable, riparian buffer strip, alley cropping
Production system	Permanent crops: poplar and oak; annual crop: corn, wheat, barley, soybean, sunflower, alfalfa, clovers; sugar beet
Actors involved	ca. 10ha farm
Project type	Part of the AGFORWARD research project funded by the European Union's Seventh Framework Programme for research (No 613520)
Project status/ date of report	November 2017

### 2. LAYOUT OF THE AGROFORESTRY SYSTEM



The alley cropping system, two years (left) and one year (right) after tree planting.

### 3. AGROFORESTRY PRACTICES AND THEIR SUSTAINABILITY TRADE-OFFS

Alley cropping system to protect waterways	
Sustainability trade-off	<ol style="list-style-type: none"> <li>1) Intercrop yields showed some decrement during the fourth year because of tree shade. Soybean, as a warm season crop, showed some negative effects in the near proximity of alley edges. Nevertheless, there are positive synergies between intercrops and trees regarding soil water and nutrients (poplar trees use soil moisture in deeper soil layers and are likely to reduce N leaching).</li> <li>2) Overall Oak has a much slower growth rate than hybrid poplar. Hybrid poplar trees showed only initially a slow growth, which may have been due to competition with the crops or weeds for water and nutrients. It is also possible, that soil around the trees was very compacted. The expected poplar rotation to reach marketable trunk dimension, should be 14 years.</li> </ol>
Key barriers	<p>Poplar cultivation has been declining due to stagnating domestic timber markets. Regional and global environment concerns such as climate change, soil erosion and providing bioenergy could open new opportunities for silvoarable systems with poplar, combining local bioenergy and food production with environmental benefits.</p>
Success factors	<ol style="list-style-type: none"> <li>1) Tree growth rate of hybrid poplar was comparable to monoculture plantations. Stem form and timber quality of hybrid poplars were not negatively affected in this study (as might have been expected due to the low planting density of an alley cropping system)</li> <li>2) Survival of oak trees was high, although their growth rates are much lower than hybrid poplars.</li> <li>3) Low-lying and flat alluvial soils, with frequent drainage ditches (at spacing of about 30-35 m), can be easily used for the establishment of alley cropping systems using fast growing hybrid poplars for timber production. Planting trees along one side of the drainage ditches optimizes the use of reclaimed land.</li> </ol>

### 4. SOURCES, PROJECT WEBSITE OR DATA COLLECTION ON THE CASE STUDY

[Hybrid poplar and oak along drainage ditches - Enhancing the financial and environmental value of farmland | EURAF \(utl.pt\)](#)

[Trees for timber intercropped with cereals - Agforward - en](#)

[Establishment and restoration of riparian buffers — Climate-ADAPT \(europa.eu\)](#)