

# FICHE – AGROFORESTRY CASE

## “FODDER TREES AND SHRUBS FOR DAIRY COWS IN FRANCE AND NETHERLANDS”

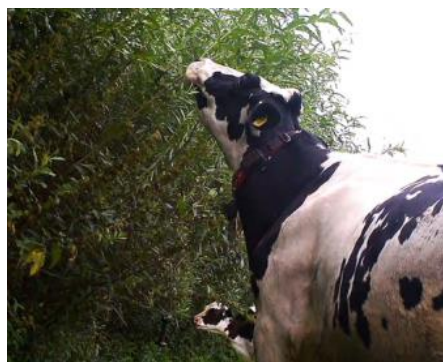
Data extracted in May 2021

**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	France, Netherlands
Climate zone	Maritime/ mediterranean
Geographical level	Farm
Description	In both systems, fodder trees are incorporated in dairy farms. Either to substitute maize silage and concentrates, and for supplementing cows with macro and micro elements or to extend the grazing period and for wood chip.
Key descriptors	<ul style="list-style-type: none"> <li>• Animal welfare (shading on pastures and stabilized climate)</li> <li>• Livestock fodder and reducing dependency on external feed inputs</li> <li>• Climate change adaptation and farm resilience</li> <li>• Soil conservation and restoration</li> <li>• Carbon sequestration, above and below ground</li> <li>• Sustainable intensification of agricultural area</li> </ul>
Agroforestry system	Silvopastoral, alley cropping
Production system	Livestock: dairy cows; permanent crop: willow, alder (NL); pollards of white mulberry and alder; coppices of willow, elm, back locust and alder; high-stem honey locust, sorb and pear tree (FR).
Actors involved	3ha in France, 10ha in Netherlands
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



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

Alley cropping of fodder trees and bushes in grazed paddock	
Sustainability trade-off	<ol style="list-style-type: none"> <li>1) Planting trees reduces the available grazing area. This loss will be recovered once trees become productive. Double and triple row sets of trees are more beneficial than single row in terms of time needed to control the understory vegetation and on costs.</li> <li>2) Cows can damage the young trees and therefore inhibit their growth. Protecting young trees can be done through fencing (electric or metal) or allows cows only two years after planting on the paddock. Cows then browse the newly grown vegetation naturally. Only an annual coppice performed immediately before the growing season is needed.</li> <li>3) Although the fodder intake rate was low, the trees provided a natural source of macro- and micro-nutrients. Willow leaves are particularly high in selenium and zinc.</li> </ol>
Key barriers	<p>Infestation with diseases or leaf beetles can be an issue for all tree species as they can defoliate the tree or make them less attractive for browsing. Natural enemies like ladybirds, parasitic wasps and lacewings often keep pest populations low. Coppicing is a good method to restore vigor to the tree and help it to recover.</p>
Success factors	<ol style="list-style-type: none"> <li>1) Integrating fodder trees and shrubs in a cattle dairy farm can provide additional fodder, especially in summer and autumn, when grassland production is low. With increasing droughts due to climate change, this will be increasingly important and can contribute to farm resilience.</li> <li>2) Willow trees and nitrogen fixing alder trees are a good match for temperate climates, as they grow quickly and are richer in macro and micro-nutrients than grass.</li> <li>3) Trees enhance carbon sequestration, nutrient cycling, soil drainage and soil stabilization. Four years after planting, an increase in soil organic matter of 0.5% under willow and 0.3% under alder tree rows was measured as well as an increased earthworm biomass by 52% (alder).</li> </ol>

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

[Leaflet "Fodder trees on dairy farms"](#)

[Leaflet "Fodder trees for micronutrient supply in grass based dairy systems"](#)

Magnard A (2015). Video related to the future use of fodder trees in the diet of cattle in the OasYs project of the INRA experimental station of Lusignan. <http://www.lafranceagricole.fr/videos/elevage/elevage-laitier-des-arbres-dans-la-ration-des-vaches-1,0,16901225.html>

Luske B, N v Eekeren (2015). Potential of fodder trees in high-output dairy systems. Grass land Science in Europe 20: 250-252.

Emile JC, Delagarde R, Barre P, Niderkorn V, Novak S (2017). Evaluation of the feeding value of leaves of woody plants for feeding ruminants in summer. 19th EGF Symposium on "Grassland resources for extensive farming systems in marginal regions: major drivers and future scenarios", Alghero, Sardinia (Italy) Grassland Science in Europe, vol 22, 548-550.

Dijk H v, Schukking S, Berg R (2015). Fifty years of forage supply on dairy farms in the Nether lands. Paper presented at the Grassland and forages in high output dairy farming systems. Proceedings of the 18th Symposium of the European Grassland Federation. Wage ningen, The Netherlands, 15-17 June 2015.