

AGROFORESTRY INNOVATION NETWORKS



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AFINET

Agroforestry (AF) is a type of climate-smart agriculture (CSA) practice of deliberately combining trees or shrubs with crop and/or animal systems to resulting ecological and economic interactions.

Recognizing the economic and environmental relevance of this activity, a consortium of 13 European countries, launch AFINET (AgroForestry Innovation Networks) a thematic network aimed to foster the exchange and the knowledge



01-02-2019

Spanish RAIN meet to present and promote innovative agroforestry initiatives



31-01-2019

II Polish Agroforestry Conference: "Perspectives

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Newsletter N°4 January 2019

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AGROFORESTRY INNOVATION NETWORKS

13 **CULTIVATING THE KNOWLEDGE GAP**

TREES FOR SHADE, SHELTER, SURVIVAL AND BODY MAINTENANCE

How offering access to trees can improve the welfare of domestic animals



THE WHAT AND WHY

Why offer animals access to trees?

The benefits of silvopasture to domestic animals include access to shelter in the winter and shade in the summer, as well as providing scratching posts to maintain coat condition. The behaviour of domestic animals can be grouped into the maintenance of immobility, nutritional, behavioural

when an animal is hungry it will seek and eat food. Similarly, when hot or cold, it seeks shade or shelter and trees, shrubs and shelterbelts can offer effective protection. Coat condition is important in maintaining animal health and tree trunks and branches are readily used as scratching posts. The newborn offspring of farm animals are either hiders (e.g. cattle) or followers (e.g. sheep) but mothers of all species, seek out available shelter when giving birth.



Twingreen plantations: a living barn providing shade and shelter for dairy cattle, 2013 in Chen Viskum, Denmark. L. Whitmore

10 **INNOVATION**

MANAGING THE TREE ROW UNDERSTOREY IN AGROFORESTRY SYSTEMS

A range of possibilities



THE WHAT AND WHY

The tree understorey – challenges and opportunities

In a silvopasture agroecosystem, there is always a certain area under the tree canopy (e.g. strips of land under the tree rows in alley cropping systems, where it is difficult to cultivate the main crop. We call this the tree row understorey here. However, these areas can have several important functions: (i) tree protection against possible damage through e.g. agricultural activities; (ii) animal access to the trees for tree maintenance

row understorey can also be part of the AF production system itself, although the management of this area seems often to be a challenge where following questions need to be addressed: (i) What is the optimal width of the tree row understorey? (ii) What is the best way to manage this area? Managing the tree row understorey in silvopasture practices can be done in many ways, and will depend on the main objective of the trees, the type of understorey vegetation, the available machinery and the amount of time one can or wants to spend.



How to manage the tree row understorey in the tree row: (i) Short rotation coppice (Sustainable) at an agroforestry field of Walsgrove farm, Victoria, Australia - Consortium Agroforestry Victoria/Biovision

the benefit of animals

offers protection against insects, since pine species have insect repellent properties. The positioning of trees is important in their effectiveness as protection against the weather. Shelterbelts offer good protection when perpendicular to the prevailing wind and porous shelterbelts slow down wind, offering better shelter than dense barriers that cause high levels of turbulence. Access to tree trunks and low branches enable animals to use them as scratching posts.

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01 **INNOVATION**

MANAGING THE TREE UNDERSTOREY

Opportunities for crop diversification




Aerial view of Walsgrove Agroforestry, Suffolk UK, shows how 25% of the land area is occupied by the tree rows. Ref: Permaculture Association, UK

THE WHAT AND WHY

The tree understorey – a waste of space?

Planting trees into arable or vegetable fields means that land is taken out of annual production, depending on the design of the system, this could be up to 25% of the cropping area. There may be no return from the trees for many years after planting; this varies from approximately five years for fruiting species or short rotation coppice systems, to several decades for timber species.

In many agroforestry systems, the area between the trees and under the tree canopy is an overlooked and underutilised space and, unmanaged, this can create problems with weed control. Rather than being viewed as a wasted space, this understorey area could provide new opportunities for introducing new crops, therefore increasing production and diversifying the range of marketable products from the system.



Rhubarb as an understorey crop at Salsford Organic, UK. Ref: Organic Research Centre

12 **CULTIVATING THE KNOWLEDGE GAP**

BROWSE, PRESERVED TREE FODDER AND NUTRITION

How offering access to browse and feeding tree fodder can supplement the diet of domestic animals



THE WHAT AND WHY

Why offer animals access to browse or tree fodder?

In general, browse (i.e. fresh tree leaves and small branches) and tree fodder (preserved browse) are good sources of nutrition and compare favourably with grasses grown in the same environment. Trees are also a good source of micronutrients including vitamins and particularly minerals. Where animals have access to trees or hedgerows, they will readily browse indicating its attractiveness as a feed. Browse can range from 12-55 %, 20-35 % and 60-93 % for cattle, sheep and goats respectively. Goats tolerate high levels of browse in the diet due to their saliva that can bind tannins and a large liver that actively processes tannins. Although the gastrointestinal tract of cattle is well adapted to a grass diet, it does not inhibit efficient digestion of browse. Browse is acceptable up to a height of 7 m for cattle and 1.2 m for sheep. Goats are termed vertical browsers, having no meaningful browse height, given their physical agility.

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Trees with a clear browse line from cattle in 2017 Stonehenge, UK. L. Whitmore



Herd of cattle browsing in a mixed-species hedgerow in 2014, Hareford, UK. L. Whitmore

HOW IS THE CHALLENGE ADDRESSED

The benefits of feeding browse and tree fodder

Sourcing good protein for animal feed is a global issue. Crude and degradable protein levels in tree leaves, particularly in ash, lime and mulberry, compare well with levels found in alfalfa and ryegrass. Additionally, although condensed tannins in browse inhibit normal digestion of protein in the rumen, the stomach enzymes breaking the proteins are themselves broken down in the abomasum, effectively delivering a good-quality rumen

bypass protein to the small intestine. Mineral content in browse can also be high. Zinc plays a role in important biological functions and promotes the efficient metabolism of protein and carbohydrates. Selenium deficiency is common in natural grazing systems. Selenium and zinc are abundant in willow. Browse can also be an important source of vitamin E, particularly in dry conditions.

HOW IS THE CHALLENGE ADDRESSED

Herbs, flowers, fruit, vegetables..... take your pick!

One option is to plant new crops in the tree rows to provide an income in the years following tree establishment, or longer term if shade tolerant species are used. Ideally, the new crop will complement what you are already producing (e.g. new trees of fruit or vegetables in a horticultural enterprise) but you may need to find a new market or generate interest for the new crop within your existing

could be established underneath the trees include herbs, flowering bulbs or cut flowers, perennial fruit and vegetables such as globe artichokes or rhubarb, mushrooms and berry bushes. Within the different crop types, some species and varieties will be better suited to the conditions found in tree rows (particularly levels of tolerance to shade) and it may be worth trialling varieties or species on a small scale first

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Keywords: Tree fodder; Browse; Protein; Minerals; Selection; Feeding; Learning; Silvopastoral systems.

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Stewart Hendry	Managing Cattle in Woodlands
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Peter Aspin	Shropshire Agroforestry
Sokratis Stergiadis	Benefits of plant tannins
Irene Mueller-Harvey	Tree fodder: food for

KNOWLEDGE CLOUD

The screenshot shows a web browser window with several tabs open. The active tab is a Zenodo record for the paper "Silvopasture: a combination of grasslands and trees to green livestock production" by Mosquera-Losada M.R. and Rigueiro-Rodríguez A. The page displays the title, authors, and a brief abstract. On the right side, there are statistics for views (1) and downloads (2), and a section for OpenAIRE indexing. Below the abstract, there is a preview of the document, which is a PDF file. The browser's address bar shows the URL: https://zenodo.org/record/2540644#XFrC4Vz7TIU. The browser's interface includes a search bar, navigation buttons, and a window title bar.

September 15, 2017

Managing Cattle in Woodlands

Stewart Hendry

Stewart Hendry of Forest Enterprise Scotland shares his experiences of balancing livestock production with conservation of biodiversity in the Scottish Highlands as part of the UK RAIN meeting held on 15 September 2017.

The screenshot shows a presentation slide titled "Managing Cattle in Woodlands" by Stewart Hendry - Forest Enterprise Scotland. The slide features a photograph of a landscape with a lake and trees, and a cow grazing in a field. The slide is displayed in a preview window with a blue header bar containing navigation icons and a page indicator (Page: 1 of 12). The slide content includes the title, a small logo for Forest Enterprise Scotland, and the author's name.



AGROFORESTRY INNOVATION NETWORKS

TRAINING SESSIONS



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Aberdeen Angus cattle in farm woodland in Fife



Forthcoming Events

[2018 Farm Woodland Forum Meeting](#)
Tuesday 10th July 2018 to Wednesday
11th July 2018
[Arable and Livestock UK Agroforestry
Group Meeting](#)
Monday 16th July 2018

The Farm Woodland Forum

The **Farm Woodland Forum** aims to facilitate the generation and exchange of information that supports best practice in and improves opportunities for farming with trees. We are an informal group of farmers, foresters and researchers with a common interest in farming with trees in all its aspects.

The Forum holds annual meetings at which there are presentations to describe the latest research, development and practice related to agroforestry and

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