

IRISH Farm Business

Volume 7 Issue 2 Autumn / Winter 2020 Edition
Price €4.95 / £4.50 (Stg)

DAIRYING



TIME MACHINES

Saving You Time And Money

PG 30

HOW GOOD IS YOUR
SILAGE?
PG 24

WHICH PHONE IS BEST
FOR FARMERS
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HOUSEKEEPING FOR
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PG 10



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Foreword

In this edition we have lots of tips from experts on important and relevant topics like how to plan for the winter months including a checklist for preparation. We have an extended machinery section as many farmers are finding it difficult to cope with labour shortages. As many farmers increased herd size and output it is now following through with the extra demands on mind and body. The main asset on the farm is the farmer and it is necessary to keep that asset safe and in good health. Not many farmers test silage, and it may be a good idea to think about it as you then know what you have in the pit and any supplementing that may be required to maintain the output of milk

from the cows. Once it drops it is difficult to increase it again. The new Government, are placing a great emphasis on climate change mitigation and protection of waterways etc. We have a detailed article outlining the potential benefits of Silvopasture: the integration of trees and animals on the same fields. We are likely to hear more about this in future as policy moves down the track. If you are thinking of getting a new phone for Christmas read Diarmuid McSweeney's article on smartphones first!

Hope you enjoy and gain from this edition...

Until the next time...

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With the increasing reliance on Apps in farming what should you look for in a phone so that it will suit your particular needs? By Dr Diarmuid McSweeney an expert in agri-technology.

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Joe Patton of Teagasc advises that it is worth getting silage tested so that you know what you have under the cover. He then gives details on the meaning of each part of the test and the actions to be taken as a result.

30 Time Machines: Saving you time and money.

In this edition Alistair Chambers, looks at some time and labour saving machines that could be employed on a modern Irish dairy farm.

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In this article the potential benefits of integrating trees on the farm are explored by the Irish Agroforestry Forum.

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Inform Nutrition introduce a new alkaline grain treatment called Kerva that can increase the usage of home grown grain, thereby saving on imports writes Des Cronin Head Nutritionist at Inform Nutrition.

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Farmers need to change our behaviour at work to make the workplace safe for the Farmer, family and others. It takes time and effort to change behaviour but is well worth it writes Martina Gormley.

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Why Dairy Farming And Silvopastoral Agroforestry Could Be The Perfect Match

“Silvopasture, is the practice of integrating trees, forage, and the grazing of domesticated animals in a mutually beneficial way.”

Could we be missing a trick here? Could silvopasture be a design solution to the environmental challenges facing farming? Can it be the ideal mechanism to combine agriculture, forestry and ecology with very positive outcomes for farmers? Well -designed silvopasture can help increase profits and productivity, animal, and soil health, diversify the farm business, buffer against increasingly variable weather, drought and flood risks while benefiting the environment, the water cycle and the carbon cycle.

Due to the lifting of milk quotas and industry pressures, there has been a considerable growth in farm herd size and milk production in the past few years. This has resulted in more intensive dairy farms seeking to grow their businesses to meet market demand efficiently and productively.

This productivity can sometimes come with environmental challenges. Irish agriculture is being scrutinised around issues of water quality, biodiversity loss, greenhouse gas emissions, tree cover and air quality. Nationwide, the obligations to meeting climate change mitigation goals are being pushed into the realm of the agriculture sector. These issues raise questions about our “social licence” to farm, hence the increase in scrutiny of farmers and farm practices in the media.

In the broader context, today’s agriculture can place a series of pressures on the natural environment. These environmental pressures include changes to land use, emissions of nutrients and leaching of pesticides from soils to waters, changes to biodiversity impacting flora and fauna and their habitats, and emissions of greenhouse gases (GHGs) and air pollutants such as ammonia. Eutrophication resulting from excess nutrients (N&P) from farmland is the primary water quality challenge. In 2018 the proportion of our rivers classes as ‘satisfactory’ was 53%, a decline of 5.5% from 2015 (EPA, 2020).

Greenhouse gas emissions from Irish agriculture in 2017 were recorded at 20.2Mt. Teagasc projections for 2030 suggest a figure of 21Mt, with a range around this figure depending on how the national bovine herd changes. Most of these emissions are directly related to livestock farming systems. Ammonia is one of the critical issues; it is a potent air pollutant with significant implications for biodiversity and human health. In Ireland, 96% of ammonia emissions come from agriculture. Reducing these emissions is one of the most significant challenges facing agriculture in Ireland.

Carbon dioxide take-up by trees is an excellent mitigation tool but overall tree cover in Ireland is well below the EU average and tree planting is not meeting national targets in recent years. Landowners cite contributory factors such as the lack of a forest/woodland culture, the need for more flexibility in support systems, as well as the need for integration with other farm environmental schemes.

In situations where conventional forestry is not an option to meet owner objectives, including climate benefits, due to the need to maintain existing grazing platforms agroforestry can provide options and has the potential to shift social perceptions towards combining farming and trees. With carefully planned silvopasture, dairy farms: indeed all farms, could integrate trees into their operations with minimal loss in pasture area, and produce integrated harvests of timber, or tree crops, all the while mitigating emissions, enhancing the environment and increasing farm resilience to climate challenges. There is evidence from examples across Europe that the attractiveness and tourism potential of even intensively farmed landscapes can be significantly enhanced by integrating trees in an agroforestry scenario. The broad social benefits of providing such public good would be far-reaching, including the promotion of high- quality Irish food products.



*A Dehesa - a historic and cultural silvopasture, with cork oak over pasture in Spain
(photo courtesy of www.agforward.eu)*



Agroforestry is a collective name for land-use practices where trees are combined with crops and/or animals on the same unit of land and where there are significant ecological or economic interactions between the tree and the agricultural components. In Ireland, the primary land use is livestock grazing. Silvopasture is the term used to describe the branch of agroforestry where trees are combined with grazed or cut pasture in a regular or varied pattern.

The role of hedgerows already sets a precedent for some of the benefits that perennial woody species can play in the landscape. On many farms, appropriately managed hedgerows perform a similar function as linear woodland strips, they enhance biodiversity, store carbon and afford many welfare benefits to livestock.

In addition to hedges, there is scientific evidence (much of it from the island of Ireland) that the introduction of wide-spaced trees in silvopasture systems can make these farmed landscapes more sustainable. Silvopasture can deliver a wide range of ecosystem improvements; improve water quality, generate healthier soil with increased carbon sequestration potential, increased tree cover and enhancement of biodiversity through a more complex, sustainable lower-input agriculture.

Climate and Environmental Benefits

Trees planted in an agroforestry setting improve soil structure which allows the soil to soak and filter water at much larger volumes. They have root systems which extend well below the understorey root network and can help absorb excess nutrients such as phosphate, and nitrogen, which might escape into the lower soil horizons and ultimately end up in the groundwater pool. There are additional benefits from root differentiation; a reduction in leaching losses of nutrients, faster nutrient cycling in the presence of grazing animals and reduced soil erosion. Silvopasture has a well-proven role in riparian buffer scenarios and gives resilience to grazing during extreme rainfall through improved soil permeability. Carefully designed planting of

agroforestry on hill farms can mitigate soil erosion and slow water runoff from higher slopes in water catchment areas, reducing the risk of flooding in waterways lower down.

Research in Northern Ireland has shown that silvopasture systems established with wide-spaced ash, measured at year 24, combined with grazed pasture can sequester up to 3.2 t C/ha/yr. If the sequestration potential of appropriately managed hedgerows is added to this, silvopastoral systems can support carbon-neutral livestock production at approximately 2 LU/ha. Hence, there is significant opportunity to help achieve our climate change targets by increasing the carbon storage potential from farmland through using soils crops and trees together.

With skilled silvicultural management, agroforestry is well placed to deliver high-quality timber. In this way, agroforestry can contribute to the broadleaf deficit in Ireland and create a resource supply for local sawmills. In turn, this has the potential to strengthen local economies and will increase positivity towards trees and instill a more significant forest and woodland culture into communities.

Most (92%) of ammonia emitted by livestock is released while they are housed and producing slurry. On an established silvopastoral site at Loughgall, Co Armagh it has been shown that the length of the grazing season (taken to be the period when soil saturation is below 40%) extended by up to 15 weeks compared to the control site without trees. The improved carrying capacity is due to better water infiltration allowing for better grassland utilisation. Shortening the housing period has animal health benefits and makes a significant impact on ammonia emissions and farm costs. Research is currently underway to quantify the volume of nitrogen trees can absorb from the atmosphere through their foliage when slurry is spread, and when stock graze below them emitting methane and ammonia.

Benefits to Farm Productivity and Profit

Environmental measures are often perceived as a sort of agricultural philanthropy, a sacrifice of time or space toward the greater good. On the contrary, silvopasture is a low entropy measure for restoring healthy soil function and nutrient cycling. The living roots of healthy plants are crucial to soil vitality. Together with pasture plants, trees and woody species add another layer of complexity and root depth to the system, cycling nutrients and building fertility and structure lower in the soil horizon.

The overall productivity of agroforestry systems is often greater than the sum of its individual parts when grown separately. Temperate silvopasture practices improve the productivity of land typically managed separately for pasture or trees by 42–55%, depending on whether the productivity of the pastures is measured by livestock or forage output, respectively (Pent, 2020).

Economic predictions from agroforestry are difficult, given the number of variable inputs and outputs from the system. However, studies carried out by the University of Wales at Bangor on the economics of agroforestry compared to pure agriculture or pure forestry, have found that, due to the dual output, the productivity of a parcel of ground can be increased significantly in some cases.

Animal Health and Welfare

Herd health correlates directly with farm profit; silvopasture can enrich livestock diet, the quality of their living environment and the length of time they can remain outdoors, all of which correlates with improved herd health.

One area of active research in silvopasture systems is the browse benefits of different tree species. Browse is defined as the edible leaves and shoots from woody species. The roots of trees can access and accumulate minerals from much deeper in the soil than most pasture plants. For example, willow leaves have cobalt and zinc in high concentrations. Hazel, another palatable native species, is high in copper. Secondary compounds or tannins in willow have anti-parasitic properties and also have a reductive effect on methane production in the rumen. Willow also contains salicylic acid which is an anti-inflammatory with pain relieving properties and animals have been observed self-medicating by browsing it.

The micro-climate under an open canopy of trees, especially when intersected with denser shelterbelts or hedges, is much less variable as it is buffered against extreme weather events.

Livestock can perform well, spend significantly more time under trees in hot, sunny weather and when it is rainy or windy than in the open. The intimate spatial integration of trees and agriculture provides shelter that reduces wind and temperature stress for animals. Livestock in an environment where they can maintain thermal comfort, graze more and are therefore more productive, i.e. produce more milk or gain more weight.

The shade and shelter effect is not only beneficial to the livestock, the pasture also thrives with this protection. From anecdotal evidence at the oldest silvopasture research site on the island of Ireland (established in 1989) at Loughgall in Co. Armagh, there was no reduction in grass growth observed during the droughts of 2018 and 2020. This result was attributed to the shade and shelter effect, reducing evapotranspiration and the increased water holding capacity of the soil under the trees. This sort of resilience and consistency of pasture growth is of significant value to any livestock operation, but especially to soils prone to severe summer drought, as farmers are better insulated from risk.

Trees also offer some protection from night frosts, which adds a considerable advantage to earlier spring growth and increasing the length of the growing season in autumn.

Dairy operations are particularly suited to the establishment of

silvopasture. A key aspect of managing a silvopasture is a system of rotational grazing, which is standard practice on dairy farms. Permanent paddock divisions offer ideal low-cost locations for initial rows of trees as you only need to build a new fence on one side of the trees rather than two. Tree layout and spacing can easily be configured around machinery use, with careful consideration to the width of alleys so to suit an exact number of passes with mowing equipment and the headlands measured for ease of turning, it is entirely possible to still cut silage between the trees.

Even a small proportion of a grassland on a dairy farm can be planted in silvopasture, the herbage can then be used at strategic times in the year to extend the grazing season while also delivering the benefits above. Areas of rougher grazing could also be a good starting point because well designed and managed silvopasture will undoubtedly improve that area and its pasture quality.



Dairy herd grazing around new silvopasture alleys designed for ease of machinery use between rows (photo courtesy of www.agforward.eu)

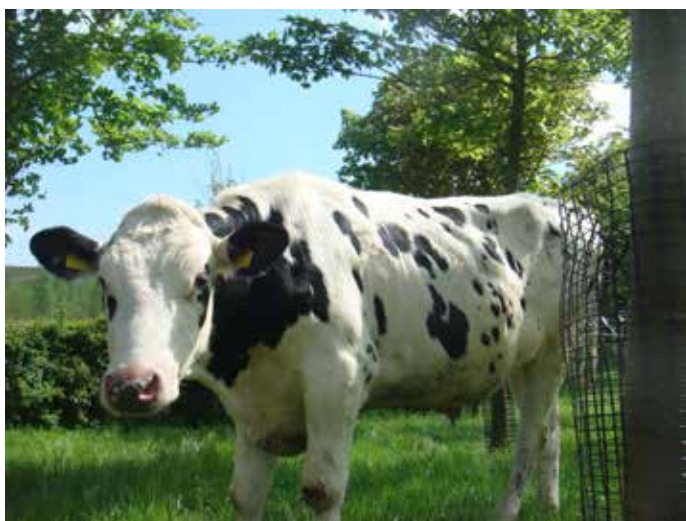
The Economics of Silvopasture

The range of financial benefits that silvopasture delivers is not only from the resilience it brings to soil and animal health. There is real potential for combining enterprises and having multiple yields from the same acreage. As silvopasture is not yet widespread in Ireland, or indeed the UK, commercial models are still too rare to claim robust financial forecasts on additional income. However, depending on the planned tree species and land utilisation, logical modelling of expected yields is undoubtedly possible. The main advantage of silvopasture over other farm forestry systems is that there are both short term and long-term harvests of the pasture crop and the tree crop, respectively. Fruit and nut trees can start giving returns between five to twenty years. In contrast, harvests from timber trees vary from five years for rotation coppice to 80+ years for standard hardwoods. The Soil Association in the UK has a fantastic downloadable publication - The Agroforestry Handbook - Chapter 6 outlines in detail financial forecasts for a suite of different models. - <https://www.soilassociation.org/farmers-growers/technicalinformation/agroforestry-handbook/>

Silvopasture is an ancient practice in many parts of the world, but relatively unexplored on working farms in Ireland. There is



*Dairy calves grazing in Gavin Lynch's four-acre silvopasture hazelnut orchard, in Wicklow.
(Photo by Clive Bright)*



undoubtedly a need for more pilot/demonstration sites and knowledge transfer programmes to raise awareness of the benefits of silvopasture systems.

The current agroforestry scheme in Ireland falls under the Afforestation Programme, and covers up to 80% of installation costs. The scheme allows for a wide range of tree species to be planted including fruit and nut trees, which may also account for up to 15% of the stock total. DAFM funding for agroforestry increased significantly in 2018 from an annual premium of only €260 per ha to a payment between €645 and €660 per ha (depending on area) for a duration of 5 years.

One of the barriers to uptake identified is that the agroforestry scheme is currently an area-based scheme and therefore, certain other area-based schemes like the Organic Farming Scheme payments cannot be claimed on the same area. This is either during the five years of the Agroforestry Scheme or thereafter, as the land area is categorised as forestry under the Forestry Act.

DAFM acknowledges these issues, and currently the scheme is under review. The new Programme for Government document has recognised the importance of trees on farms, stating the need to provide increased support for the development of agroforestry / silvopasture on Irish farmlands.

Silvopasture can help to better farm livelihoods, financial viability, and farm resilience without negatively affecting current farm production. At the same time, it can deliver a valuable array of environmental good and contribute to rural community stability. It is a win, win, win that could improve both the perception and reality of Irish agriculture.

This article was written by the Irish Agroforestry Forum. For further scheme details, refer to DAFM (<https://www.agriculture.gov.ie/forests-service/>) and Teagasc websites (www.teagasc.ie/forestry)

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