LAND

December 2021 – March 2022

FARMING connect
cyswllt FFERMIO

Number of Arable businesses registered:
754

Number of Horticulture businesses registered:
337

Demonstration Network

Plas yn Iâl: Continuous Cover Forestry (CCF) in farm woodlands

In early December 2020, 10 sample plots were set up in the 12.76ha area of woodland at Plas yn Iâl, as part of an Irregular Silviculture Network (ISN) research stand. An ISN Research stand is designed to sample the farm woodland to record the woodland types, species composition and the productive capacity of the woodland. The sample plot locations were chosen to gather the wide range of variation in woodland types. The main result of the data gathered showed that the woodland volume is increasing at an estimated volume increment of 7.19m3/ha/yr. This equates to approximately 90 tonnes of timber per year, having an energy equivalent of 178,365kWh/yr. Their wood fuel demand is approximately 28,000kWh/yr, which means that introducing Continuous Cover Forestry (CCF) as a silvicultural management technique could provide 76 tonnes (or 150,365kWh) of saleable timber annually. CCF is where individual trees are extracted to maintain permanent woodland cover, while allowing the production of commercial timber hand in hand with biodiversity as a product.

The next stage of the project was to undertake a remote sensing trial of the woodland. By using a Digital Surface Model and a Digital Terrain Model, the Canopy Height Model (actual height of the trees relative to the ground) was estimated. In addition to this, the canopy cover was estimated to calculate the volume of the woodland's compartments. The objective of the remote sensing trial was to compare it with the results of the ISN survey and highlight the potential of its cost-effectiveness in understanding farm woodland structures over larger areas. Data from both surveys were also combined to create a CCF Woodland Management Plan.

The main conclusion of the remote sensing trial was that it can provide very accurate stem counts for conifer plantations, due to its ability to differentiate between different crowns. At Plas yn Iâl, broadleaves are the dominant woodland type, therefore stem counts were difficult to calculate at times. Despite this, results provide evidence of the usefulness of remote sensing to assist in assessing transformation to CCF. Following the writing of a Woodland Management Plan and the issue of a felling licence, the stands will be managed in transformation to CCF to meet the local demand for wood fuel and to produce high-quality, sustainable timber.

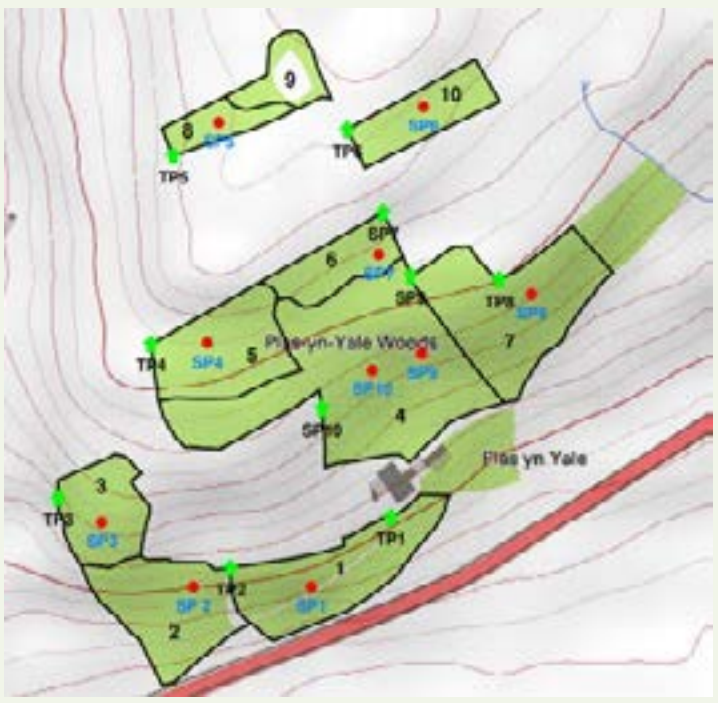

Figure 1. remote sensing trial of the woodland. By using a Digital Surface Model and a Digital Terrain Model.

Grassland trials confirms sulphur application as an economically valuable input

A Farming Connect trial has shown that applying fertilisers enhanced with selenium and sulphur can boost levels of selenium in grassland by up to five times, and increase grass yield by up to 11%.

Three Farming Connect demonstration sites took part in the project to establish the effectiveness of using fertilisers enriched with selenium and sulphur. Many soils in Wales are known to be deficient in selenium – a mineral that plays an important role in livestock performance.

Sulphur deficiency in grassland is also now more commonplace. This can have an impact on grass yields and protein and sugar levels and impede nitrogen uptake, resulting in residual nitrogen in soil, which can leach over winter.

Farming Connect partnered with Yara for the project, supplying its Silage Booster and Nutri Booster fertilisers for application, to trial against control fields spread with standard fertiliser blends.

The trial was run during the 2021 growing season at Rhiwaedog, a beef and sheep farm at Bala, Mountjoy Farm, a dairy farm near Haverfordwest, and Bodwi, a beef and sheep farm on the Lleyn.

Rhiwaedog ran the trial in two of its first cut silage fields, and Mountjoy Farm in a second cut silage field, while Bodwi monitored a field's performance at both first and second cut.

Rhiwaedog applied Silage Booster at 375kg/ha with 21:8:11 as the control, Mountjoy applied Nutri Booster at 375kgN/ha with ammonium nitrate as a control, and Bodwi applied Silage Booster at 375kg/ha on the first cut, and at 310kg/ha on the second, using 21:8:11 as the control.

Across all sites, in both fresh herbage and silage, the Booster fertiliser increased the selenium content – by typically five times in fresh grass, and by two or three times in silage.

Yield benefits of up to 11% were recorded on all three farms.

With the typical cost of adding sulphur to each silage cut at around £7/ha, the extra grass grown in this trial (300kgDM/ha) is worth nearly £50, in terms of energy and protein.

	Silage quality			
	ME	CP	S	Se
Bodwi 1 Con	10.8	14.4	0.26	0.08
Bodwi 1 S	11	12.6	0.27	0.19
Bodwi 2 Con	10.2	12.3	0.28	0.07
Bodwi 2 S	10.8	12.7	0.28	0.23
Rhiw Con 1	10.2	9.8	0.09	0.1
Rhiw S 1	11	10.2	0.2	0.21
Rhiw Con 2	10.2	12.4	0.2	0.07
Rhiw S 2	10.5	13.5	0.2	0.22

Figure 2. Silage results.

	Fresh herbage quality						Fresh herbage Yields kgDM/ha
	ME	NO3	S	Se	ME	WSC	
Bodwi 1 Con	13	100	0.23	0.016	9.3	8.2	5400
Bodwi 1 S	16.4	100	0.33	0.083	9	9.6	5700
Bodwi 2 Con R1	19.6	110	0.044	0.025	11.4	15	
Bodwi 2 S R1	9.4	50	0.067	0.073	10.7	16.4	
Bodwi 2 Con R2	18.4	100	0.064	0	11.4	16.7	
Bodwi 2 S R2	11.1	70	0.061	0.085	11.1	20.2	
Rhiw 1 Con	16	100	0.19	0.033	10	8.7	4600
Rhiw 1 S	15.6	100	0.26	0.22	9.8	9.4	4900
Rhiw 2 Con	15	100	0.21	0.101	10.4	10.2	4300
Rhiw 2 S	15.1	100	0.21	0.109	9.8	9.1	4300
Mjoy Con	14.9	250	0.18	0.026	10.4	13.9	4050
Mjoy S	13	100	0.231	0.135	10.8	17.1	4510

Figure 3. Fresh Herbage results.

Knowledge Exchange Hub

- FEEDING LEAVES, NOT SOIL: AN ALTERNATIVE ROUTE THAN THE ROOTS
- ECOSYSTEM FUNCTION AND RESILIENCE: WHY IS THIS IMPORTANT FOR AGRICULTURE?
- BATTLING BRACKEN: CONTROL AND ALLEVIATION STRATEGIES

Webinars

12 LAND WEBINARS HELD with **308** VIEWERS

Examples of webinars held include:

- Managing soil and swards for production and environmental protection
- Undersowing maize for environmental and economic benefit

Advisory Service

Number of businesses that have received support through the Land Categories of the Advisory Service during this period:

61 individuals received one-to-one support through the Land categories of the Advisory Service during this period.

488 individuals from 135 groups received support through the Land categories of the Advisory Service during this period.

Feedback from businesses on delivery of this Advisory service:

"The advice will hopefully make our business more productive. Cost-effective. More aware of how to use our resources wisely. Thank you"

"Very good professional service"

E-learning

Some of the e-learning courses completed within this period include:

- ORGANIC HORTICULTURE
- IMPROVING SOIL HEALTH
- PESTICIDE SAFETY
- GRASSLAND SPECIES

Click here to visit the website.

Training

Courses	Number of individuals trained during this period
Level 2 Award in the Safe Use of Pesticides (PA1) & Safe Application of Pesticides Using Vehicle Mounted Boom Sprayer (PA2)	33
Rough terrain telescopic lift truck	19
Chainsaw Maintenance and Cross-Cutting	13
Level 2 Award in the Safe Application of Pesticides (PA1) & Safe Application of Pesticides Using Hand-held Equipment (PA6)	12
Safe Use and Application of Slurry	10

Discussion Groups

Members of a beef and sheep discussion group in North West Wales had requested Nigel Howells (Nigel Howells Consultancy Ltd) as a speaker, on the EIP 'Foliar Feed' project he had been involved with on farms in South Wales. This is a method of applying nitrogen fertiliser in a liquid format directly to the plant leaf. The group members were interested in finding out if it would be a technique that they would be able to adopt on their own farms.

Nigel gave an overview of the work done in the EIP trial, whereby liquidised nitrogen was applied to different crop plots on four different farms. These were then compared to plots where nitrogen continued to be applied conventionally. He also explained how important the timing of application was: it was better to apply early in the day or early evening, when the plant was more receptive. The stage of plant growth was also crucial; a leaf needs to be present for the product to be incorporated into the plant, i.e. you couldn't apply to a paddock that had been grazed down, as there wouldn't be sufficient leaf surface there for the uptake of nutrients. The results of the project so far showed that the Nitrogen Utilisation Efficiency was increased significantly, as compared to conventional nitrogen application – Foliar feed being 80-85% efficient, as compared to 50-60% efficiency for conventional N.

The main 'take home' messages of the evening were:

- The usage efficiency of the nitrogen in foliar feeding is significantly more efficient than conventional N application, therefore less product is used.
- Fertilising via the leaf offers substantial cost savings in terms of N/Litre of Milk on the dairy farms that took part in the project.
- The cost savings are likely to be even greater this year, in view of the rising costs of conventional prilled nitrogen fertiliser.

The final results of the project will be available this year.

EIP Wales

Electrophysical Dock Control

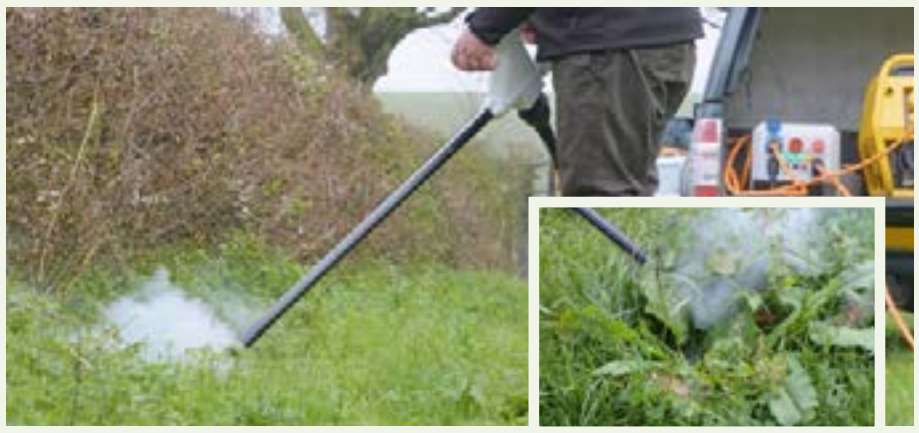

Figure 4. The RootWave Pro electrical weed er system was used in these trials, which sends a high voltage current through the plant effectively boiling all plant cells.

There is increasing interest within the agricultural sector in moving away from chemical methods of weed control or finding alternative methods that can be integrated with chemicals as an integrated pest management (IPM) strategy.

Trial results over two seasons have shown that electrically treating dock plants at three treatment timings is very effective and can be equivalent to a herbicide application alone. Electrical control is extremely promising as an additional tool For dock management in grassland, that would benefit organic Farmers or those seeking to reduce herbicide inputs.

Chemical treatments need to be applied at specific growth stages of the dock plant For optimum efficacy whereas the electrophysical technique is more flexible enabling wider treatment windows that can fit better with grazing or cutting regimes.

The limitations with the Rootwave Pro kit in this grassland field situation is lack of mobility and effective control requires three treatments compared to one herbicide treatment. Farmers require a tractor-mounted system that can travel at a reasonable speed before they will use this system on Farm, and this is what the companies in this sector are working towards.

Cronfa Amaethyddol Ewrop ar gyfer Datblygu Gwledig: Ewrop yn Buddsoddi mewn Ardaloedd Gwledig
European Agricultural Fund for Rural Development: Europe Investing in Rural Areas
Llywodraeth Cymru Welsh Government