

**Number of Arable businesses registered:**

**749**

**Number of Horticulture businesses registered:**

**328**

## Strategic Awareness Events



**6** FACE-TO-FACE AGRICULTURAL POLLUTION WORKSHOPS held with **88** ATTENDEES

## Demonstration Network

### Pantyderi: Growing a protein feed crop

Work at Pantyderi Demonstration Farm on improving self-sufficiency of feed stocks for growing and finishing 400 beef cattle led to a decision to grow a crop of peas and beans. Both crops were sown at full rate in two passes, with the beans sown first at a depth of 60mm, followed by the peas in a second pass at 30mm.

As well as providing a source of home-grown protein feed for the cattle, this pulse crop also contributes several benefits in terms of land management:

- It represents a break crop in terms of a grass or arable system
- The crop does not require any nitrogen fertiliser.
- Relatively few agrochemicals are required.
- The roots of the crop support nitrogen-fixing nodules containing rhizobium bacteria that live in symbiosis with the host plant. They collect and fix atmospheric nitrogen, and convert it into ammonia, which is used by the host plant.
- With a tap root development, this has the benefit of breaking up the soil structure, improving drainage and aeration at greater depths.
- This positive influence on soil structure reduces energy use in establishing subsequent crops.
- Residual nitrogen levels in the soil for the next crop are estimated at up to 100kg/ha.
- The crop enhances the soil microbiome and significantly promotes soil health as a result; increased soil microbial activity enhances nutrient release and improves soil fertility.
- The crop is highly water-use efficient in terms of litres/kg protein produced.
- The crop is highly attractive to insects, birds, and animals, increasing and sustaining biodiversity and improving the environment.
- Pulse crop production is well placed to be at the centre of rotations for the sustainable farming systems of the future.



Figure 1. Nitrogen-fixing nodules on roots of pea and bean crop at Pantyderi

### Pantyderi: Using soil-mapping information to sow barley using variable seed rate

Soil-mapping and partitioning of fields into management zones based on soil characteristics at Pantyderi Demonstration Farm facilitates sowing barley by variable seed rate, where the potentially less productive areas of the field are subject to higher seed rates.

Following the scanning and zoning of Llandre 18 (Fig 2), a variable rate sowing map (Fig 3) was drawn up, where the south-west half of the field was sown at a flat rate of 150kg/ha barley seed and the north-east side sown at a variable rate from 135 to 190 kg/ha.



Figure 2. Soil scanning results

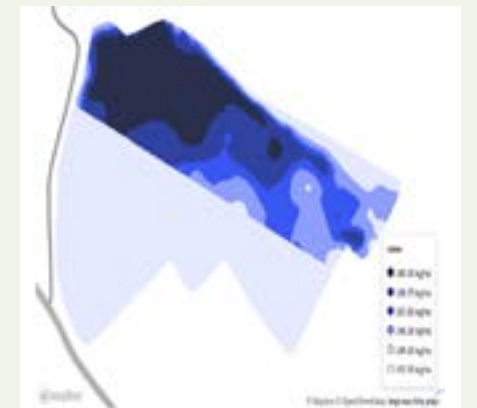


Figure 3. Variable rate sowing map

The variable rate sowing generated an extra 8% of grain yield valued at £70/ha (Table 1), leaving a net gain of £66/ha after allowing for the extra seed cost.

	Flat rate	Variable rate	
Barley yield t/ha	5.2	5.6	+8%
Straw bales/ha	14	16	+14%
Value grain £/ha		+£70	
Extra seed cost £/ha		+£4	
Net gain £/ha		+£66	



## Demonstration Farm and Focus Site events held on farm

24.8.21 Agroforestry, market gardening and regenerative farming – how to develop a multi-layered approach at Henbant Bach, Caernarfon

25.8.21 Exploring diversifying into growing crops and developing a pick your own enterprise at Cae Derw, Ruthin

16.9.21 Growing healthy pumpkins and operating safety considerations for hosting pick-your-own at Aberbran, Brecon

4.11.21 Under-sowing maize for environmental and economic benefit at Arnolds Hill Farm, Haverfordwest

25.11.21 Soil-mapping to enable precision land management and growing a protein concentrate feed crop at Pantyderi, Boncath.

## Knowledge Exchange Hub



ELECTROPHYSICAL AND NON-CHEMICAL WEED CONTROL: CURRENT TO CUT CHEMICALS



SPROUTS, MICROGREENS AND EDIBLE FLOWERS: POTENTIALS FOR INNOVATIONS



POTATO BLIGHT: SECURING OUR SPUDS



THE POTENTIAL FOR GROWING PLANTS UNDER ARTIFICIAL LIGHT



UNLOCKING THE POTENTIAL OF ALTERNATIVE CROPS: NEW INCOME AND ENVIRONMENTAL SUSTAINABILITY

## Advisory Service

Number of business who have received support through the Land Categories of the Advisory Service during this period:



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



**175 (individuals) 57 (group) groups received support through the Land categories of the Advisory Service during this period.**

Feedback from businesses on delivery of this Advisory service:

*“Advisor’s knowledge of subject was fantastic and was happy to spend time explaining soil/sward quality etc. All round excellent service. Enjoyed the experience immensely, will be concentrating on lime application and the use of farmyard manure fertiliser in particular”*

## Discussion Groups



A Carmarthenshire sheep discussion group met with Ben Taylor-Davies to discuss the Sustainable Soil Management Gold samples that were taken on their farm to determine their soil health and identify areas to improve. Ian Robertson of SSM was also present to break down the soil analysis that was handed out to each farmer upon arrival. Ian and Ben helped the farmers to understand their analysis, explaining factors such as soil Total Exchangeable Capacity (TEC), organic matter content, carbon content, crop available nutrients and trace elements and soil reserve nutrient and trace element levels. The relationships and ratios of these factors have a large effect on soil health and functionality, as well as the soils’ ability to sequester carbon.

Following the breakdown of the soil analyses, the group went to see a herbal ley that one of the group members had sown on his farm; this was as a result of a previous meeting that the group had with Ben. Establishment was excellent, with lambs in for their second grazing following sowing in late June. With over 20 varieties in the ley, the group had a session of species identification. Upon digging, both the excellent root structure established, and the symbiotic relationship of the varying root depth of various species for interchanging nutrients for the benefit of the soil and the plant structure could be clearly seen. Many of these species had natural anthelmintic properties, and it will be interesting to see how animals perform on this ley, as Ben claims to have not used any wormer, sheep dip or fly spray in the last four years since incorporating these leys into his farming system. The large biomass produced by these leys gives the ability to stock densely. It has the capacity to carry a lot of stock, giving rest to other areas of the farm or allowing the farmer to increase stock numbers and reducing the carbon footprint of each kg of meat produced. The majority of attendees declared an intention to use this specific ley next spring for summer grazing, and it will be very interesting to follow this through with the group.

## Training

Courses	Number of individuals trained during this period
Level 2 Award in safe use of pesticides PA1 & PA2	23
Rough terrain telescopic lift truck	22
Sit astride ATVs, including loads & trailed equipment	13
Chainsaw maintenance, cross-cutting, felling & processing trees up to 380mm	11
Level 2 Award in safe use of pesticides PA1 & PA6	10

## EIP Wales

**22** APPROVED LAND BASED PROJECTS WORKING

with

**65** FARMERS AND FORESTERS



### Comparing on-site preservation techniques for fresh Welsh birch sap for use in artisan products by local businesses

Birch sap is an innovative product gathering huge interest as an alternative to maple syrup in high-end cuisine. Birch is the third most common broadleaf tree species in Wales, but these trees do not make good timber, and are therefore under-managed. With some management, they offer a potential source of sap that can be processed to produce a sweet syrup that is highly prized.

When sap is collected from the trees (a process known as ‘tapping’), the sap degrades very quickly, and therefore rapid processing to stabilise it is essential. This project is aiming to test different methods of preserving the sap on-site to increase its shelf life and enable transport to a suitable processing facility.

In spring 2021, the group collected 1,200 litres of fresh sap and tested three methods of on-site processing: boiling in shallow pans over an open fire, reverse osmosis via micro-filtration and boiling in a catering urn.

All three methods showed some potential, but the catering urn required large amounts of energy. The open fire was simple and relatively cheap, as firewood is generally available on site, but the reverse osmosis offered the greatest potential because of the speed at which it could reduce the water content. Further investigations will take place in spring 2022 to refine the methods.



Figure 4. Boiling birch sap on an open fire

### Sap volume reduction vs time for reverse osmosis processing

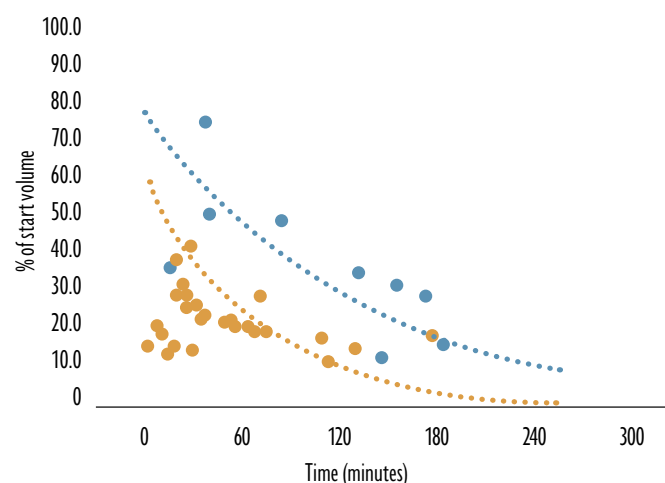


Figure 5: Sap processing times for two reverse osmosis systems

## E-learning

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

WEED CONTROL



IMPROVING SOIL HEALTH



PESTICIDE SAFETY



TREE IDENTIFICATION



Click [here](#) to visit the website.

