

As part of the Tyfu Dyfi project, a 'Field Scale Trials' group has been established to expand the local crop repertoire. Katie Hastings describes how community organisation Mach Maethlon have been working with local growers to trial new crops and change the local food landscape...

Some people might be mistaken in thinking that the fields around the Dyfi Biosphere have always grown the same kind of foods. Pasture fed sheep and cows have always been a strength of our area, and have been produced here for centuries. But it wasn't so long ago that many of these livestock fields, especially the ones in the valleys and towards the coast, were part of a plaid of different crops, woven together across farms, to create a diversity of different local foods.

Local food resilience certainly isn't a new idea round here. Local farmer Alun Lewis recounts growing potatoes in Penegoes near Machynlleth in the 1940's. The potatoes were planted by him using farm machinery, with each local family harvesting their own sacks at the end of the summer. While running the Felin Crewi mill in Penegoes, he remembers using wheat grown in local fields to create local flour.

In recent decades, the diversity of local crops in the Dyfi Biosphere has massively declined. Vintage machines that were previously used to grow local oats, wheat and barley lie rusting. Potato planters are no longer sought after. Where have all the vegetables gone? What has happened to the golden fields of ripening grains in the summertime?

We are working as part of the Tyfu Dyfi project, an ambitious partnership between local organisations to increase local food growing. Under the Tyfu Dyfi umbrella – funded by the Welsh Government – we are running a 'peer to peer' learning group for local growers wanting to try growing a crop in their fields. Some of our group are farmers with land who want to explore a crop they have never grown. Others are growers on borrowed land wanting to experiment with something which they might be able to scale up in the future to fulfil a dream of becoming a farmer. What they all have in common is an interest in bringing some of the mixed patchwork of vegetables and grains back to the local fields.

So, how do we support these growers better?

In terms of practical help, our project is able to fund contractors with specialist machinery to assist our growers with tasks such as rotavating, ridging and seed drilling. With a huge decline in local crop diversity, vegetable and grain machines can be hard to come by. While this equipment may not be at the cutting edge of innovation, these are machines which our growers do not have. By offering the funds to rent the machines for a trial, we are sidestepping the barrier of buying expensive equipment to grow a new crop which might never come to fruition.

We are offering those in our group funding for expert advice. With one grower planning to cultivate seaweed, another looking at no till grain production methods and another wanting to produce organic liquid plant foods, our participants are thinking outside of the box of what they can produce and sell in the Dyfi Biosphere. By offering them funding to seek specific advice for their trials, we are recognising that the advice they need doesn't fit into a one size fits all training programme.

Finally, by connecting these growers together, we are providing a platform for them to share their journey with their peers. Growing can be a lonely pursuit, especially when your trial crop can seem strange to others around you. In my experience, there is no educational model more powerful than the horizontal learning that comes from growers exchanging their successes and challenges.

While we can offer this extra support, thanks to Tyfu Dyfi funders, the hard graft of trying a new crop will always fall to the growers out in the field. The participants of our Field Scale Trials group have put their ideas forward, and followed them through with determination and passion. We have seen some beautiful partnerships blossom between older farmers and younger farmers, between more experienced growers and new entrants, all working to the common aim of crop diversification.

Please give a round of applause for the growers who put their own time (and land) to test what is possible...

Fava Beans

With a growing discussion around pulses in the UK, Matilda Gomersall (Tilly) has spent the summer at Fferm Cwm Llywi Farm growing fava beans (*Vicia faba*). Producing a highly nutritious protein source that can be grown in our local conditions and stored easily, Tilly is working on replacing imported chickpeas with locally grown beans.

Going one step further than producing a crop, Tilly is working on breeding a modern landrace, the 'Dyfi Valley Bean Population'. It contains a wide genetic mixture of fava beans that are cross pollinating and evolving in the fields of the Dyfi Valley. These will be both naturally-selected and farmer-selected to grow well in the particular and changing conditions within this area. With a broad enough genetic base, the population should be more resilient to extreme climates and pests and diseases, without the need for chemical inputs.

Tilly held a focus group in 2022, with 10 local growers, retailers and consumers. The feedback from this focus group will help her to identify what people want from the bean population and select for these traits in the second breeding year. In the meantime, her dried fava beans have been available to buy in local greengrocer Siop Blodyn Tatws.

Naked Oats

Oats enjoy a rich history in Wales and are suited to our wet conditions. With a growing movement of people looking to bring oats back into production in Wales, not many are aware of the challenges in processing oats for human consumption. Oat groats are usually surrounded by a hull, which requires specialist machinery and processes to remove. Unfortunately, there are no oat mills left in Wales, making the possibilities for eating Welsh grown oats very limited. One of our growers has been trialling a solution to this processing conundrum.

Ecologist and beef farmer Joe Hope has been trialling naked oats as part of our Field Scale Trials group. The naked oat has no hull, and so is far easier to process and eat. Using his newly acquired 50 acres at Ynyslas, Joe is looking to not only have extra grazing land for his cattle, but also to provide a habitat for birds and rare wildflowers. Having sown 3 acres of naked oats this year, Joe has found the oats to grow well without chemical inputs. Using a small combine harvester to gather his haul at the end of the season, Joe has been able to store several tonnes of threshed naked oats.

He has been working with an artisan oat milk business in England to be trained in oat milk production, with plans to apply this learning to produce and sell oat milk here in the Dyfi Biosphere.

Tatws a Blodau (Potatoes and Flowers)

Having run local vegetable shop Siop Blodyn Tatws for five years, Mair Tomos was keen to see some of the produce she sells on the Machynlleth high street produced on her family farm Cwm Llywi near Abercegir. Using the field below the farm house, which has been sheep pasture for many years before Mair took over the land, she has been partnered with various local growers over the last few years who have experimented with crops such as wheat, oats and garlic.

2022 saw Mair take the reins, planting an acre of potatoes and native flowers in the field. Both crops were grown organically, with advice from local elder Alun Lewis, who used to grow potatoes himself back in the 1950's (see above). Vintage machines were used for the planting and ridging. Mair harvested her crop by hand, overcoming attacks from wire worm and successfully selling the potatoes in her shop throughout the harvest season.

Mair would like to increase vegetable production on her farm and is keen to develop the flowers into a sellable crop in the future.

Comfrey Plant Feed, “The Growers Best Friend”

Lucy McQuillan, and her partner Dave, bought a smallholding overlooking Aberystwyth in June 2022. With Dave returning to his childhood home, the couple set about renovating the house. Lucy has been keen to find ways to use the land to contribute to the local food economy. Looking at the use of fertilisers, Lucy wanted to produce an organic plant feed to support local food production, using a locally produced plant-based fertiliser, rather than relying on fossil fuel based fertilisers.

For the comfrey trial, Lucy planted 80 comfrey plants, grown on from cuttings, with the help of volunteers from Tyfu Aber. The comfrey strain Bocking 14 was chosen, as it is the most nutrient rich, non-seeding strain. The plants were mulched with rotted down old hay and planted approximately 1 metre apart. Comfrey has deep roots of up to 2 metres that reach nutrients deep in the subsoil that would be inaccessible to other plants. The grass between the plants was cut to make paths and the clippings used to mulch and feed the comfrey plants. Comfrey leaves contain a balance of plant nutrients – Nitrogen, Phosphorus and Potassium - and can be fed to plants as a powder, direct mulch, liquid feed or foliar spray.

Lucy harvested the comfrey leaves twice in this first year and experimented with a variety of production methods. Settling on producing a concentrated form of comfrey liquid feed (no water added) which stores for up to one year, smelling earthy and sweet. In this first year, ten 750 cl bottles of concentrate comfrey feed was produced and promoted at Garden Organics Summer Garden Fair, as well as being given to local growers to trial on their plots.

This trial has been a huge success, with potential to expand and supply more professional food growers with liquid crop nutrition produced in the Dyfi Biosphere reserve. The 80 plants will be mature for the 2023 season and production will be increased to a planned one hundred 750 cl bottles of concentrated comfrey plant food. Lucy plans to sell the feed at local farmers markets, Belit Deer Refill Shop Aberystwyth, Siop Blodyn Tatws in Machynlleth, and local community gardening projects.

Swedes for Cawl

This trial has seen a new partnership form across three generations. Professional grower Grace Crabb has partnered with long time farmer Edward Jones to plant up a field of Swedes, intercropped with flowers. Already running a flower selling business, Grace was able to dry and sell the flowers from the field for floristry. Wanting to increase education around food growing and farming, Grace partnered with school children from Ysgol Glantwymyn to plant and harvest the swedes.

This tasty local crop, hardy to the cold weather and fairly low maintenance, was added to produce grown by the children on the school grounds – leeks, potatoes and carrots – to make delicious cawl served at a local Christmas market. Not only did this trial showcase the ease with which swedes can be grown in the Dyfi Biosphere (aided by the expertise of farmer Edward Jones), it delivered an educational outcome for local children (not to mention the tasty food eaten by local people at the end!

Grace would like to continue to experiment with intercropping food crops and flowers, offering not only the benefits that this brings to biodiversity and soil cover, but also the financial benefit to having two crops from one field.

No Till Wheat

One of the ecological downsides to grain production can be the soil damage and carbon release from ploughing pasture for grain sowing. Another hit to field ecology can happen when grain crops require spraying with herbicides to knock back competing 'weeds' that will germinate amongst the crop. Sam Wren Lewis is a local baker keen to grow wheat with as little damage to local soil as possible. With a readymade market for the local grain – Rye and Roses Bakery in Machynlleth – Sam wanted to experiment with a 'no till' grain production technique which could make local wheat production far more sustainable.

Sam had a 'cover crop' of clover sown into a third of an acre in spring 2022, on regenerative farm Melindwr in Eglwysfach. Monitoring the cover crop over summer, his trial planned to drill wheat directly into the clover in autumn. Not only would the clover have suppressed weeds in the soil, it would also have fixed nitrogen for the upcoming grain crop to use. The hope was to see his wheat germinate in the autumn, outcompete the clover in the spring, and be harvested the following summer with minimal need for soil disruption.

The whole point of our 'Field Scale Trials' is to experiment, and in this instance, Sam learnt the importance of having 'clean' clover seed. In Summer 2022, he noticed a vigorous brassica crop growing tall in his clover cover. Understanding that his clover seed was contaminated, it was too late to resow. Sam also learnt that the grass was able to outcompete the clover, leaving a cover crop unsuitable for sowing grain into by autumn. This trial has provided invaluable learning for Sam to take forward into his next 'no till' grain experiment.

These trials will have a ripple effect beyond the crops they produced, enabling local growers to better understand the challenges and possibilities for re diversifying our local crop production. With more trials in the pipeline – seaweed cultivation, barley and heritage grain seed – we plan to continue to work together across farms to rebuild a local mixed farming system for the future.