Event Report 24: Making the Most of Homegrown Protein

Date of Event: Friday 12th July 2024

Host: Tom and Nic Tolputt (FNZ Monitor Farmers)

Ensuring that rations contain enough protein for optimum livestock performance is a priority for many farmers. Often this can lead to buying in feed from off farm, including from other countries, which can have a high carbon footprint as well as a high environmental impact. To address this, Tom and Nic Tolputt are part of a UK Research and Innovation funded project on "Sustainable Farm-Based Protein for Organic Cows" looking at what type of protein crops can be grown.This event was made possible with thanks to the National Lottery Community Fund who fund the Farm Net Zero project.

Tom and Nic Tolputt farm 600 acres organically on a mix of owned and rented land between Fowey and Polperro in South-East Cornwall. They have a 45-cow Angus-based suckler herd and grow a range of arable crops for home-use and sale. The protein crop trials cover three fields and each contains a different bi-crop – beans and triticale, beans and wheat, spring barley and peas. Both been bi-crops were planted on the 13th January 2024, the field was ploughed and then disc drilled with a packer roller at a seed rate of 80kg/acre beens and 25kg/acre cereals.

On inspection, the beans were nodulating well (see photo, right) which is a sign that nitrogen fixation is occurring. The amount of nitrogen captured from the atmosphere and put into the soils by beans is directly correlated with yield, and can range from 10-50 kgN/ha. This can reduce the amount of nitrogen required for following crops, saving money and reducing carbon emissions from artificial nitrogen.

Tom plans to combine the bi-crops (potentially crimping them if the weather at harvest requires it) and keep to feed to fattening cattle, mixed with wheat or barley. He expects it to be mainly beans, with a little cereal grain due to the poorer cereal performance. The grain won't be separated as Tom finds this an expensive process, often requiring two passes. The headlands of the bean fields have been baled using a chopper baler to provide a high-quality finishing feed. The spring barley and peas may also end up as wholecrop bales if Tom is short of silage bales, but the aim is to combine and crimp this field.

Various organically-approved "bio-fertilisers" are also being trialed on these crops. Tom explained that the soil on the farm is low in calcium, so fields have received 400kg/ha of HumiStart which contains ground seashells and seaweed. On top of this, half of each field received applications of fish hydrolysate (two applications of 10kg/ha) to provide amino acids and boost soil biological activity, plus molasses and molybdenum
(two applications of 10kg/ha) which also assist soil biology. These applications are a repeat of work Tom trialled in 2023, with harvest data from 2023 showing that plots that received bio-fertiliser had a higher grain yield (ranging from 0.3 - 2.3 tonnes/hectare).

The meeting was attended by Dr Tim Daley from the University of Plymouth with a multispectral imaging drone. Tim used the drone to scan the crops for Normalised Difference Vegetation Index (NDVI) as a measure of crop health and photosynthetic ability. The drone showed that the half of the crop that had no amendments applied to it had a lower NDVI than the side that received the full bio-fertiliser applications, suggesting that the bio-fertiliser has benefitted crop performance.

This event was well-attended by farmers wanting to learn about growing more on-farm protein. Tom has said that the harvest results will be available for the Farm Net Zero project to report.

Key Takeaways:

- Increasing homegrown protein production can save costs and reduce protein imports with a high carbon footprint.
- Beans in particular can help to fix nitrogen into the soil, reducing input requirements for following crops.
- Bio-fertiliser can be used to reduce the use of fossil-fuel based artificial fertilisers, which have a high carbon footprint.