

Growing your own (organic) protein

A dairy cow needs a lot of protein. This is met for a large part of the year by protein-rich grazed grass. However, grass silage is much lower in protein and when cows are indoors on silage, they require a protein supplement.



This is especially true for farmers who milk cows through the winter months. So is it possible for Irish farmers to feed their cows entirely on Irish grown protein?

Bill George is an organic dairy farmer milking 150 cows at Coolanowle Organic Farm in Arles, Co Laois. Bill's father-in-law, Jimmy Mulhall, began conversion to organic farming in 2001 and it has had full organic status since 2003.

"The farm comprises of 140 ha including the 64 ha milking platform, 23 ha of tillage crops and 28 ha of red clover silage," says Bill. "The remainder consists of out blocks for replacements and grass silage. The stocking rate on the grazing platform is typically 2.5 LU's/ha with the overall farm stocking rate on the farm at 1.7 LU's/ha."

Bill operates a split calving herd with 40% calving in the autumn and 60% calving in the spring. Milk is supplied to The Village Dairy, Killeslin, Co Laois. "They are a local milk processor who are bottling milk for retail and also supply Gino's Gelato for gelato ice cream," adds Bill. "We also supply The Little Milk Company, which make a range of organic cheeses."

Over the past five years, Bill has significantly reduced the quantity of bought-in concentrate by focusing on growing more crops on his own farm. He has also entered into share farm agreements and contract cropping agreements with other organic tillage farmers.

Costs

"We now purchase approximately 10% of our feed requirements from feed merchants," says Bill. This has resulted in organic concentrate costing him approximately €500/tonne versus the almost €800/tonne price he would be paying if he was purchasing all of this concentrate all through an organic feed merchant.

It's worth noting that Bill is well set up in term of facilities to allow him store and crimp the purchased grain.

"The predominant crops that we grow, or purchase, are combination crops of a legume (peas or beans) grown alongside a grain (barley or wheat)," says Bill. "The legume crop provides nitrogen to the cereal crop while also helping to smother out competing weeds. The grain crop can act as a scaffold for the legumes."

The resulting crop typically delivers a 14 – 16% protein feed. When you consider that the vast majority of Bill's silage is in the form of red clover silage, which will also have a similar



Bill George with his organic dairy herd.

protein content, you begin to realise that he is very close to meeting all his protein requirements without having to depend on any imported sources.

But Bill is not satisfied to sit on his laurels and is now looking at novel ways of growing specialised protein crops on his farm in 2024, which is why he is participating in the VALPRO project.

VALPRO Path is a four-year Horizon Europe project involving 22 partners from nine countries. The mission of the project is to "pioneer fresh possibilities, validating and showcasing ways to enhance plant protein production for food and feed in the EU."

As part of the VALPRO Path project, five Innovation Production Systems (IPS) have been set up in Germany, Ireland, Italy, Portugal and Denmark. These are looking at protein crops such as pea, lupin, chickpea, faba bean and lentils.

Farmers, in collaboration with researchers and other project partners, will use their farms as field living labs to try out various protein crops and examine protein crop production solutions relevant to their own countries.

In Ireland, Teagasc Oak Park are working with a number of farmers,

including Bill George, to assess the potential of growing peas more successfully by intercropping the peas with faba beans.

The theory is that the beans will act as a 'scaffold' or support to prevent or significantly reduce lodging in the peas. Finding the most suitable pea variety to intercrop with the most suitable faba bean variety, and planting at the most suitable ratio of pea to bean will be a major focus of this IPS.

Climate

Bill is also growing a small area of lupins as part of the project to assess their suitability to the Irish climate.

In 2022, Bill's Greenhouse Gas (GHGs) emissions per hectare farmed were 5.76 tonnes CO₂ equivalent. This is approximately two thirds of the per hectare emissions of the national average dairy farmer.

Having a lower stocking rate as a result of farming organically is a significant contributor to this figure, but growing a high proportion of his feed requirements is also contributing to these impressively low GHG figures. "Our aim for 2024 is to feed the dairy herd entirely on Irish grown organic grain," concludes Bill.

150% increase in organic farmer numbers since 2022

In 2022 there were 2,000 organic farmers in Ireland. Today that figure stands at an impressive 5,000 farmers, who are now farming organically.

The generous financial incentives now being offered under the Organic Farming Scheme (OFS) had made organic farming very attractive for a large cohort of farmers, which is underpinning this increased level of demand.

The OFS scheme offers payment rates of up to €350/Ha for livestock and tillage farmers along with an additional participation payment (ranging from €1400 - €2,000).

It is expected that the Organic Farming Scheme will re-open this autumn for additional applications. Could organics be a good fit for your farming system? Talk to your local Teagasc organic advisor to find out more.

Cover crops: a proven tool to reduce nitrate leaching



Ciaran Hickey and Jonathan Leech say cover crops help improve soil structure.

ACRES and new Water EIP scheme are helping farmers fund the costs of planting cover crops, which can deliver a significant decrease in groundwater nitrate concentrations

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Nitrate leaching is most likely to occur in intensive spring sown tillage farms where land is left fallow over the winter. This can be mitigated by planting rapidly growing cover crops after harvest. These leafy crops are hungry for any nitrate present in the soil and 'give back' the nitrogen when ploughed under in the spring.

Experiments carried out at Teagasc Oak Park on light sandy soil, found that there was a significant decrease in groundwater nitrate concentrations under a mustard cover crop, compared to no cover crop. Nitrogen uptake by mustard was significantly higher than from naturally regenerated plant cover in all three years of the experiment.

However, results from this experiment also showed that nitrogen uptake by naturally regenerated growth was almost as high as uptake rates found for some other popular cover crops.

Nitrogen surplus

Nitrogen balance, (per hectare farmed), is used in the Teagasc National Farm Survey (NFS) Sustainability Report as an indicator of the potential magnitude of nitrogen

surplus on farms.

This indicates the risk of nutrient losses to water bodies, all other things being equal. It is calculated on the basis of nitrogen inputs, minus nitrogen outputs, on a per hectare basis.

Nitrogen surplus on tillage farms is low when compared to other enterprises, and it varies from year to year. Nitrogen surpluses are affected by a range of factors some of which are within, and some (such as weather) which are outside, the farmer's control.

Higher nitrogen surpluses tend to be associated with adverse annual weather/growing conditions. Large nitrogen surpluses of 62.0kg were recorded in 2018 when drought reduced crop yields. In the high yielding year of 2022, a surplus of 40.5 kg/ha was recorded in the NFS Sustainability Report.

Importance of sowing date

Sowing date of cover crops is crucial. The more crop cover there is, and the more vigorous the growth, the more nitrate will be taken up. Good establishment, helped by early sowing, is essential to achieve the large biomass production which will max-