

soils

How soil tests can make you money

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Over the coming weeks, fresh soil samples will be taken and soil sample results will be available to plan lime, organic manure and fertiliser applications.

Comparing these new figures with those for your last tests will reveal how your soils have responded to lime, phosphorus (P) and potassium (K) applications.

Soil type is key. Light soils can change relatively fast, while heavy soils take longer.

Soil K levels will increase more quickly than P levels.

Lime advice

The first feedback to be acted on is the lime advice.

Lime should only be applied based on a soil test report. Maintaining the optimum pH on mineral soils will help maximise the soil N supply during the growing season, reducing the need for bagged N.

Correcting soil pH to the optimum, pH 6.3 on mineral soils, will release up to 56 units N/ac, worth €28/ac/year.

P, K & Mg results

The next place to look is at the soil P, K and Mg results which are reported in mg/L and soil index. The soil test results show the availability of P, K and Mg.

Table 1 shows the soil P, K and Mg index system, the response to fertiliser and the recommended fertiliser strategy.

Soils at index 1 or 2 have a very low, to low, nutrient supply and respond well to applications of either P or K. At index 1 and 2 additional P and K is required to build soil nutrient supply (to Index 3) and generally takes a number of years depending on the soil type.

Soils at index 3 (the target index) have a good nutrient supply and require maintenance rates of P and K to replace nutrient removed in either meat or milk. Index 4 soils are very fertile.

For P, the advice is to omit P for two to three years and re-test to check soil P changes.

For soils at Index 4 for K, skip K applications for one year and revert to Index 3 advice until the next soil test. Soil Indexes for peat soils are different to mineral soils as shown in Table 1.

Cost of soil analysis

Soil sampling is very good value for money and provides information tailored to the soils on your farm. A standard soil test costs circa 0.60c/ac/year.

It is very important that the soil samples are taken correctly to ensure results are reliable. Teagasc provides a soil sampling service from preparing soil sample maps to taking soil samples to delivering farm nutrient advice.

Table 1: Grassland soil P, K and Mg index system, soil supply and fertiliser response and strategy

Soil Index	Soil P (mg/l)	Soil K (mg/l)	Soil Mg (mg/l)	Soil Supply	Response to Fertiliser	Fertiliser strategy
1	0 - 3.0	0 - 50	0 - 25	Very low	Definite	Build-Up
2	3.1 - 5.0	51 - 100	26 - 50	Low	Likely	Build-Up
3	5.0 - 8.0	101 - 150	51 - 100	Adequate	Unlikely	Maintenance
4	>8.0	>150	> 100	Sufficient	None	Omit



Mapping soil fertility

Cathal Somers
ASSAP advisor

Owen Power
Dairy advisor, Waterford

Conor Beausang is dairy farming with his father, Philip, on moderate to free-draining loam soil near Grange in southwest Waterford. Conor is keen to continually improve the farm and make it as sustainable as possible.

"Soil testing is very cheap and provides me with valuable information when planning fertiliser and slurry application. The alternative is going out and spreading blindly, not knowing if you're spreading too much or too little. I work closely with Owen Power to ensure soil fertility meets grass nutrient requirements. We're stocked at around 2.5 cows/ha and growing 15 tonnes of grass/ha.

A nutrient management plan (NMP) is designed for the farm each year and followed to improve the pH, phosphorus (P) and potassium (K) levels in the soil.

Farm soil fertility % (2015-2020)

Soil pH and P and K index	2015	2018	2020
pH >6.2	26%	100%	40%
P - 1 & 2	51%	45%	28%
P - 3 & 4	49%	55%	71%
K - 1 & 2	52%	38%	21%
K - 3 & 4	47%	62%	79%



Cathal Somers and Conor Beausang.

Making a fertiliser plan: what are the benefits?

Alan Nolan
Drystock advisor,
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Kevin Madden
Catchments Advisor, Ballinrobe

years and the preparation of a nutrient management plan.

In 2013, 21% of the soils had a pH > 6.2, while in 2019 80% of soils had a pH of > 6.2.

Traditionally, high N fertiliser products (27s and 24s) were applied but over the last six to seven years the fertiliser programme comprises 10-10-20 and 18-6-12.

"I now have swards which grow more grass and faster re-growths," says Kevin.

"Even on old swards there's better early grass production and sward density where soil fertility was improved. I can now get cattle to grass earlier in the spring, shortening the winter feed period and reducing costs."

Stocking rates increased from 1.5LU/ha in 2015 to 2.2LU/ha in 2019. Beef output has increased dramatically to 1,350kg/ha in 2019. As a result, the farm is now generating a healthy margin from the beef enterprise despite the current low beef prices.

The key lessons from Kevin's story are the importance of regular, accurate, soil sampling and following a detailed Nutrient Management Plan.

Kevin Feeney farms near Ballinrobe in south Mayo. He runs a dairy calf-to-beef system and a mid-season ewe flock on 25ha including some marginal land. Like a lot of farms in Mayo it's fragmented, with seven separate land parcels.

In 2015, Kevin changed to a dairy calf-to-beef system from a suckler system. "I found the winters getting longer each year with cows on heavy land so I opted for a lighter type of animal to suit my farm," explains Kevin.

Kevin farms in the Cregduff Catchment, which is part of the Agricultural Catchments Programme.

As a result, Kevin has followed an intensive soil sampling and Nutrient Management Planning programme for over seven years now.

This involved taking soil samples from each individual field every three

y improvements

As the farm has increased grass production the decision has been made to soil test every two years in order to monitor soil fertility changes and tailor nutrient applications based on soil and crop requirements.

Key management practices on the farm

- Slurry is targeted to silage ground and the remainder spread on fields with P index 1 and 2.
- Compound fertiliser such as 18:6:12 is targeted to fields between March and June.
- Additional P is applied to build soil P fertility levels.
- A colour-coded map of the farm (Figure 2) is up on the wall of the dairy and at a glance cattle slurry can be targeted to the right areas
- Index 4 soils are identified and do not receive chemical P.



Figure 1: Phosphorus status map, white and blue colours are index 1 and 2 paddocks, the greens are index 3 and 4.



Kevin Feeney and Kevin Madden.