



Teagasc/Irish Farmers Journal
**BETTER FARM
BEEF CHALLENGE**

Is the fertiliser working?

Ciarán Lenehan looks at differences between soil samples on programme farms one year apart

The soil health challenge is one of the 10 set for our BETTER beef farmers. To pass it, they must have an average soil pH of at least 6.3 by year four (5.5 on peat soils) across their farms. In addition, 70% of soils must be index three for phosphorus (P) and potassium (K), or greater, in year four.

Growth and utilisation of grass has been the cornerstone of profitability in previous phases of BETTER farm. Indeed, Teagasc figures show that every extra tonne of grass utilised on drystock farms will increase net profits by €105. Based on grass measurements in 2017, our BETTER farms grew an average of 8t of grass DM/ha – ahead of the national drystock average of 6t. However, top of the table was Ballina man Tommy Holmes, who grew over 15t DM/ha. Tommy's performance shows the potential within the group for improvements in grass production. Grass had been his main focus for years prior to joining the programme. Our aim is to have 27 Tommy Holmeses by the end of phase 3.

Along with measurement, management, infrastructure and reseeded, soil health is one of the key areas we focus on when looking to drive grass production and utilisation – arguably jostling for top spot with infrastructure as the most important.

According to Teagasc's most recent national soil sample pool, a staggering 91% of Irish fields are classed as being deficient in terms of fertility.

Worryingly, given it is the cheapest fertility variable to correct, over 60% of national soils have sub-optimal pH status (lime). In a soil with index 1 status for P and K, correcting pH (lime) alone will lift grass production by 10%. Lime also has a crucial role in fertiliser uptake, at a soil pH between 5.0 and 6.0, we are effectively wasting up to 32% of our fertiliser application.

Looking at P and K, soils with a P index of 3 will grow approximately 1.5t DM/ha per year more than soils with P Index 1. Similarly, correcting a K deficiency will improve grass production by between 1t and 3t DM/ha annually.



Raymond, Dwayne and Gilbert Stanley. Inset: To pass the BETTER farm Soil Health Challenge, 70% of soils must be index three for phosphorus (P) & potassium (K), or greater, in year four.

The Stanleys, Co Tipperary

The Stanleys farm the biggest holding in the BETTER beef programme, with 123ha under grassland in one block on the outskirts of Thurles. Soil samples taken across the whole farm at the beginning of 2017 showed that 54% of the farm was at optimum status for soil pH, with just 4% optimum for P and 15% for K.

In May 2017, a reseeded project began on 17ha next to the farmyard. There are now 22 grazing divisions where before there were six. In 2016, a group of suckler cows and progeny would be let into the field to graze for a total of three weeks during the season. In 2018, the field will comfortably carry two groups of stock all year while producing surplus bales.

Soil samples on Stanley farm

	2017	2018
pH (1-14)	5.95	6.40
P (mg/l)	1.58	2.90
K (mg/l)	57.15	168.00

"Pre-BETTER farm soil tests showed that the field we reseeded had a pH of 5.95, a P concentration of 1.58 mg/l (index 1) and a K concentration of 57.15 mg/l (index 2)," Dwayne Stanley told me. "At reseeded time, we spread 3t lime/acre and three bags of 10-10-20. During the grazing season, we would have put out a further 1.5 bags of 18-6-12 and a bag of 10-10-20 too – I decided to pull back on nitrogen because grass was getting away from us and, it being year 1, we didn't have the stock to eat the grass and the yard was filling with bales."

Joe Healy, Meath

Joe Healy is a bull beef-producer, farming on the outskirts of Athboy village. Last year's soil analysis showed that 25% of his 44ha farm was at an optimum pH status (6.3), though the average was relatively healthy at 6.24. In terms of P and K, just 33% of the farm's soils contained optimum nutrient concentrations in both cases.

This year's soil analysis focused on Joe's main silage fields. Average pH in early 2017 here was 6.49, with P and K concentrations (mg/l) being 3.79 (index 2) and 58.65 (index 2) respectively.

"The lads identified my silage fields as being 'hungry'. I targeted my dung here in 2017 and, to be fair, it really shows in the fresh results. I also

Joe Healy.

Soil samples on Healy farm

	2017	2018
pH (1-14)	6.49	6.88
P (mg/l)	3.79	5.73
K (mg/l)	58.65	157.30

moved away from straight N fertilisers. Last spring, I got a good coating of dung out on half of the silage ground and 2,500 gallons of slurry on the rest. Pre-silage, I would've spread a bag of urea and 2.5 bags of 18-6-12 per acre. Thereafter, the whole area would've gotten two more bags of 18-6-12, with some of the ground getting slurry and some CAN used towards the end of the season.

Based on samples taken in January 2018, Joe's soil pH has moved from 6.49 to 6.88. This raises eyebrows, as no lime was spread on the area in question. There

Samples taken in recent weeks show that the Stanleys' soil fertility has improved significantly on this block. Vitality, pH has risen from 5.95 to an optimum level of 6.4. Phosphorus, a difficult nutrient to increase in soil, is now borderline index 2 (2.9mg/l) and P has rocketed from a low index 2 to an index 4 (168mg/l). Correcting lime has likely contributed hugely to this increase, making more K in the soil available for uptake.

"I can't get over the grass we grew with the paddock system. We installed water points all over the farm and, though it was a big investment, it has unleashed the farm's potential to produce grass. We made 260 unplanned bales of silage last year," Raymond Stanley added.

are two plausible explanations – a simple sampling error or a significant increase in organic matter activity having a turbulent effect, given the amount of organic fertiliser spread.

Soil P status has lifted from 3.79 to 5.73mg/l (index 3) with K moving from 58.65 to 157.3mg/l (index 4).

While Joe's whole farm grew an average of 10.1t of grass DM/ha in 2017, the land referred to above grew 13.4t DM/ha. Indeed, one of Joe's silage fields produced 17.4t DM/ha in 2017. The field itself had a soil pH of 6.5, a P concentration of 6.1mg/l (index 3) and a K concentration of 308 mg/l (index 4). It received both dung and slurry applications in 2017.

mg/l to index conversion - grassland

Soil index	Phosphorus (P)	Potassium (K)
1	0-3	0-50
2	3.1-5	51-100
3	5.1-8	101-150
4	>8	>150



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