

Mapping the route to expansion

Four farms in Tipperary have acted as latter-day pioneers in improving soil fertility.

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As part of the Teagasc / Tipp Co-Op joint programme, four farmers agreed to a programme of intensive soil sampling to target lime and P & K applications to correct soil fertility. On their journey to improved soil fertility a number of key findings emerged.

“The key message is that a one-size-fits-all approach would not have worked for the four of us,” says James Breen from Lattin. “Improving pH, P and K will certainly pay off but each farm needs its own unique plan.”

“Up until about eight years ago, we rarely spread lime except when reseeded. We were slow to spend money but we’ve seen over the years, through the Emly discussion group, for example, what other people were achieving and what might be possible here.”

James points out that group members, Simon Breen and others, have strongly encouraged him to do more with grass. “Fertility is the basis for grass production, so you have to start there,” says James. “And there’s plenty of evidence available. If one guy does a trial with lime and gets great results and another guy repeats that and he also gets great results you can be confident there is proof.”

James says he has seen the benefits of their new approach: “As a result of increasing our grass production we’ve been able to increase cow numbers from 145 to 190 and reduce concentrates fed per cow from 1,000kg to 500kg.”

Look under the bonnet – soil testing

“You’d never buy a tractor without looking under the bonnet,” says James. “The same goes for soil fertility, which means testing to see where you stand.” Every paddock/field on the participating farms was sampled each year to get the farm baseline fertility (pH, P & K) and monitor soil fertility changes.

Farm 1: Soil pH levels ranged from 5.7 to 6.4, with an average soil pH of 5.7. The lime requirement on this farm was 475t. 50% of the farm was at P index 4 and 33% of the farm was at K index 4.

Farm 2: Soil pH was on average pH 6.3 with a very low lime requirement of about 60t. On average, soil P levels were at index 2 and soil K levels ranged from index 2 to 3.

Farm 3: 40% of the fields had a pH 5 to 6, with an average farm soil pH 6.2. This farm had a very large lime requirement of about 700t of lime. 40%



James Breen and Leonard Betts admire the excellent structure in James’ soil.



You’d never buy a tractor without looking under the bonnet. The same goes for soil fertility

of the farm was P index 1 and 60% of the farm was P index 2. 80% of the farm was K index 4. **Farm 4:** 60% of the farm had soil pH 5.0 to 5.5, with a farm average pH of 5.5. The lime requirement on this farm was about 1,000t. 85% of the farm had a soil P index 1 and K index 2.

Analysing the above, soil pH was a major issue on three out of the four farms and there were significant lime applications needed to correct soil pH into the optimum range of pH 6.3 to 6.5. Secondly, soil P and K levels ranged from index 1 to index 4.

It was clear that a different approach to improving soil P and K levels would be required for each farm. Soil testing provided the basis for field-specific advice and a tailored approach to maximising the return from expensive fertilisers.

James Breen’s farm is Farm 4, where soil fertility was low for lime, P and K. Figures 1 – 3 indicate the farm’s progress.

Most of the farm had a soil P index 1 in 2015, as shown Figure 1. James prepared an annual fertiliser plan with his adviser Leonard Betts where they took advantage of additional P allowances as per the Nitrates Directive changes in 2014.

“We applied approximately 1,050t of lime

between 2015 and 2017 based on soil test results,” says James. “Soil pH increased from an average of pH 5.5 in 2015 to 6.6 in 2018.

“Cattle slurry was used as efficiently as possible and targeted to very low fertility/poor parts of the farm. Fertiliser practice changed and 18-6-12 was applied to supply the majority of P and K during the growing season.”

Soil P levels improved in 2016 and 2017, which can be attributed to, firstly, the improvements in soil pH during that period and, secondly, a higher rate of P being applied in the form of 18-6-12.

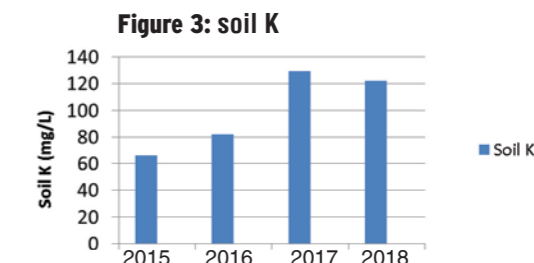
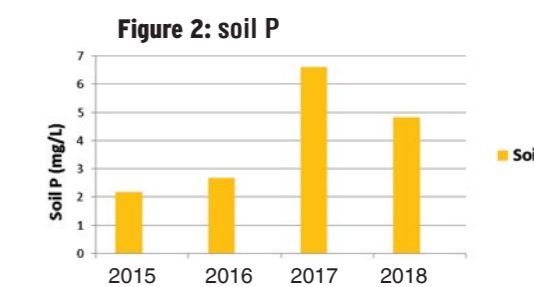
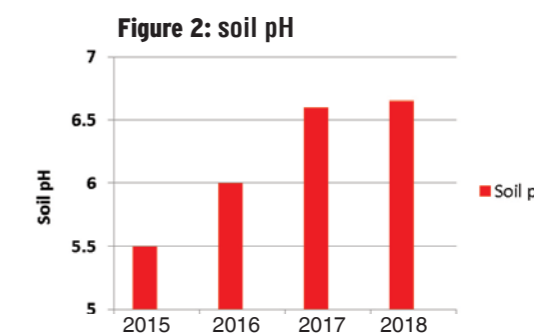
“In 2018, soil P levels dipped slightly which can be explained by the increase in grass production on the farm indicating that there is a larger P requirement required to sustain higher levels of grass production annually,” says James.

In 2015, average farm soil K was index 1 as shown in Figure 3. Between 2015 and 2017, soil K levels increased to the optimum soil K index 3. In 2018, there has been a slight drop due to higher grass production levels. On the farm a two-cut silage system is operated and the silage fields are easily identified as the soil K levels are at index 2. Additional K will be required later in the season (August /September) to replenish soil K reserves

KEY MESSAGES

It’s important to know where you are starting from and where you plan to go before you set out on that journey to improved soil fertility for your farm.

- 1 Soil sample every paddock / field
- 2 Establish farm soil fertility (pH, P & K) base line
- 3 Prepare a farm lime plan & only apply lime based on a recent soil test result
- 4 Apply recommended levels of P & K
- 5 Apply a 10-10-20 / 18-6-12 type fertiliser



using either slurry or 50% K (MOP).

Where rapid progress is needed, soil fertility improvements can be fast-tracked, with an intensive soil sampling programme implemented to monitor soil fertility levels. This provides field-by-field information specific to the soils and indicates how reactive they are to lime, P and K applications.

A fertiliser plan will provide direction on applying the correct rates of P & K and the selection of a suitable fertiliser type to deliver the correct balance of P & K at timely intervals during the growing season. The other three farms in the study – John Fitzgerald, Michael O’Dwyer and Gerry Ryan – have experienced improvements in soil fertility but have taken a slightly different approach depending on their soil test results.

“Leonard Betts of Teagasc, Andrew O’Neil of Tipp Co-op and friends have convinced me of the need to address fertility, but it’s also essential to have a good lime contractor,” concludes James Breen. “John Ryan in Lattin and his staff including Conor Breen have been excellent. They’ve applied lime when it suited me in terms of paddocks and grazing rotation and get it on very accurately. Optimising fertility takes a team.”