

Lime – the new fertiliser

Mark Plunkett
Teagasc Crops
Environment and
Land Use Programme,
Johnstown Castle.



Lime will play a key role in reducing the impact of projected high fertiliser prices in 2022. Optimising soil pH will increase the availability of soil N, P and K, and increase the efficiency of applied nutrients, such as organic manures (cattle slurry) or chemical fertilisers (CAN/urea/18-6-12 etc).

- **Soil N supply** – Liming acid (pH over 6.0) mineral soils to the optimum soil pH of 6.3-6.5 will result in the soil N supply increasing by 70kgN/ha/year. This will reduce farm chemical N requirements and fertiliser N costs by about €167/ha (€67/ac).
- **Fertiliser N efficiency** – Maintaining optimum soil fertility increases the efficiency of applied N from 35% on low fertility fields to 63% on fields with optimum pH, P and K (see Figure 1).

In 2022, building soil P and K levels may not be a priority due to high P and K prices. Correcting soil pH alone will result in an improvement in N efficiency from 35 to 53% where soil P and K are sub-optimal (Figure 1).

With record fertiliser N prices, spending money on lime to correct soil pH will ensure a better return from each kilo of N applied. For example, for every 100kg N/ha applied, the available N to grow grass increases from 35-53kgN/ha.

- **Soil P availability** – Correcting the soil pH increases the availability of soil P and its utilisation from either cattle slurry or chemical P fertiliser by the growing crop.

A study completed at Teagasc Johnstown Castle demonstrates how critical lime application can be for increasing soil P availability (Figure 2). For example, liming an acidic soil (pH less than 5.5) alone increased the soil P by around 6mg/l. On many farms, this would remove the need to build soil P levels and increase the productivity (1t dry matter/ha) of the grass sward at the least cost.

Take every opportunity to apply lime

When it comes to applying lime, we must take every opportunity during the growing season. Lime can be spread on any day of the year, provided soil and weather conditions are suitable.

- **Grazing ground** – When fields have

Figure 1: Percentage nitrogen use efficiency and grass growth response to N fertiliser across grassland fields according to the status of soil pH, phosphorus (P) and potassium (K) fertility.

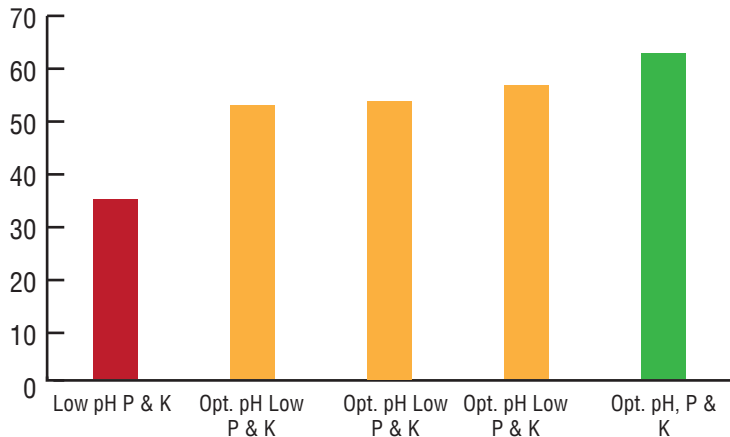
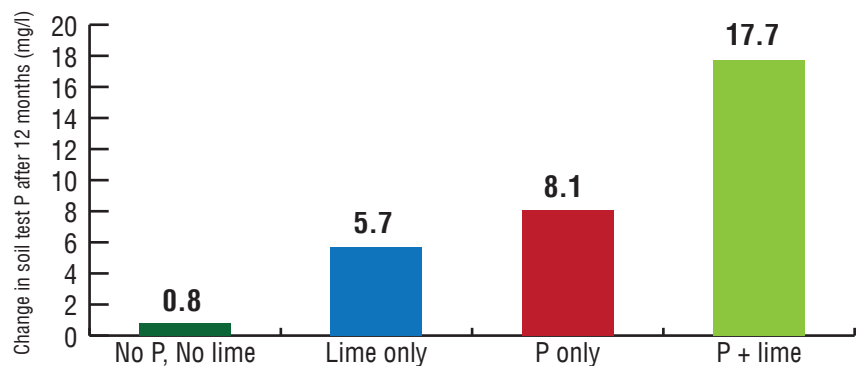


Figure 2: Average change in soil test P (Morgan's P test) across 16 mineral soils treated with P (100kg/ha of P), lime (5 t/ha of lime), and P + lime and re-tested after 12 months.



been grazed off is an ideal time to apply lime. Earmark blocks of land that need lime based on a recent soil test report – for example, this could mean ordering a load of lime (20-25t) after each grazing rotation to correct soil pH.

This could be done on number of occasions during the year when soil and weather conditions are favourable. This will not impact grazing animals, as the lime will be applied to low grass covers. Even in the event that a small amount of lime remains on the leaf, it will not affect grazing animals.

Aim to avoid covers of 600-800kg DM/ha. Pasture Base Ireland (PBI) shows that grass covers tend to be lowest during April and August, offering good opportunities for lime application.

- **Silage fields** – Ideally, leave a minimum of three months between applying lime and closing for grass silage.

Check soil pH levels and plan lime applications over the coming weeks.

- **Lime and slurry** – Leave three months between the application of lime and cattle slurry to reduce the risk of losing up to 50% of the N.

Where lime has been applied over the winter period and winter rainfall has washed it into the soil, you can reduce the interval from three to two months between lime and cattle slurry applications. Alternatively, to reduce N losses from slurry, apply the cattle slurry first and then apply the lime seven to 10 days later.

- **Lime and urea** – A similar situation as 'lime and cattle slurry' in relation to N loss. Apply the urea first and apply the lime seven to 10 days later to reduce the risk of N losses.

Where protected urea is used, early trial work indicates that it is safe to apply protected urea to fields that have been recently limed.