Building soil P fertility on intensive livestock farms

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Under the new Nitrates Action Programme (NAP), Ireland has been allowed additional fertiliser P application on very low fertility grassland soils (P Index 1 and 2) for four years starting in 2018 and finishing in 2021. This is to help build up soil P levels to increase the grass-growing ability of soils to meet the extra feed demand on livestock farms stocked above 110 kg Organic N/ha. Building soil P levels for example from Index 1 to Index 3 will increase grass yields on average by up to 1.5t DM/ha annually. This is worth €270/ha in extra grass on a dairy farm and €160/ha on a drystock farm.

Why correct soil pH before applying additional P?

The first step on the road to building up soil P levels is to correct soil pH to the optimum 6.3 to 6.5 on mineral soils and on peat soils to 5.5. This will increase soil P availability and may increase the soil P index (Index 1 to Index 2) on some soils. For example, acidic mineral soils (pH <5.9) fix and bind up applied P and once these soils are limed P is released and is more plant available. Therefore, check soil test results and apply lime as recommended on the soil test report. Lime is a low-cost input and will help reduce total P fertiliser costs when building soil P levels. Lime increases the availability of both soil and applied P as either manures or fertilisers. The return on investment from applying lime and correcting soil pH on mineral soils is between €4 to €7 of extra grass production for every €1 spent on lime for dairy and drystock farms.

How do I set about availing of this chance to increase soil P?

• Have soil test results for every 1ha on the farm and check soil organic matter status map.
• Engage with a FAS Advisor to complete a farm fertiliser plan.
• Complete a short training course on fertiliser planning.
• Apply to DAFM to avail of this P buildup.

How much extra P can I apply on my farm?

Once the fertiliser plan has been completed for your farm it will outline on a field-by-field basis the recommended rates of P required. Aim to apply 50% of the recommended P in the spring (March) and apply the remaining 50% between April to June in 2 or 3 applications (See figure 1).

Can I apply P build-up rates on mineral and peat type soils?

At time of soil sampling, soils need to be classified as mineral or peat type soils. See the soil organic map of Ireland (Source: DAFM) consult this map before soil sampling.

If you are not sure, it is worth testing the soil organic matter percentage. Soils that are above 30% organic matter on the soil test are classified as peats. On peaty type soils, P build-up rates are not permitted as peat soils cannot store phosphorus. On peat type soils it is only permitted to apply maintenance rates (Index 3) of P. The P fertiliser strategy on peat type soils is to apply maintenance rates of P during the growing season. On mineral soils P build-up rates can be applied. Mineral soils have the ability to store soil P due to their mineral (sand, silt and clay) content.

Which fertiliser type is most suitable for building soil P levels?

A high P fertiliser type will be required, for example straight P as in ‘Super P’ or an option. Alternatively, a fertiliser that will supply a good balance of N, P and K is preferable, for example an 18-12-15 or 10-10-30 etc. type fertiliser. Where soil K levels are medium to high, an N and P type fertiliser will be required to deliver high rates of both N and P, for example 25-50, 25-50, 34-7.5-0 type fertiliser blend.

When is the best time to apply P fertiliser build-up?

Once significant grass growth kicks off in spring for example March-April, aim to apply 50% of the recommended P fertiliser. The first P application is required early in the grass growing season to drive grass yield and early grass production. Apply the remaining 50% in the following two to three months with each round of N fertiliser (see figure 1 above). These later applications ensure there is adequate P content in grazed grass for animal nutrition.