

Annex C

Guidance on the use of Nitrogen fertiliser and lime

In order to deliver climate change benefits, all claimants for the Basic Payment Scheme are required to maintain a Nitrogen Fertiliser and Lime Plan for their claimed permanent grassland fields that contain no arable land and/ or rough grazings.

This involves recording the amount of inorganic nitrogen and lime you intend to apply in each permanent grassland field for that scheme year.

Two of the main limitations to grassland production that farmers can manage are nitrogen (N) and soil pH. The efficient and profitable use of nitrogen and other plant nutrients in grassland can only be achieved if the pH is maintained at optimum levels and the soil structure and drainage are maintained in good condition.

Improving farm soil and making best use of nutrients can make your business more efficient by:

- reducing costs
- reducing diffuse pollution risks
- reducing greenhouse gases implicated in climate change

A study of agricultural soils in 2013 in Ayrshire found that 73 per cent of grassland soils were being managed below optimal pH status. This is both a production and an environmental issue as the fertilisers applied are being used less efficiently.

This poses a potential risk to the environment from the emission of greenhouse gases, such as nitrous oxide and pollution of watercourses.

For soils with a pH lower than seven, natural processes (e.g. rainfall, crop growth and leaching in drainage water) and some farming practices (e.g. use of some nitrogen fertilisers) tend to acidify soil.

Acidifying processes can cause soil pH to fall quite quickly, particularly in sandy soils, and regular pH checks every four to five years are required

Soil pH impacts on the plant availability of the P and K fertilisers you apply and has a role in determining nitrogen use efficiency.

Soils in Scotland naturally have a low pH. It ranges from about pH 4 (very acid), when most crops will fail, to about pH 8 (alkali) for soils naturally rich in calcium or magnesium carbonate. Maintaining the optimum pH in the topsoil in all parts of the field is important to achieve optimum yields and consistent quality.

Where the pH status of the soil is too low, applying lime is a simple and effective way to increase grassland productivity.

For each field the amount of lime to apply will depend on the current soil pH, texture, organic matter and the optimum pH needed. Clay and organic soils need more lime than sandy soils to increase pH by one unit. A lime recommendation is usually for a 20 cm depth of cultivated soil and seven cm for grassland soil.

[SRUC Technical Note TN656: 'Soils information, texture and liming recommendations'](#) provides lime recommendation rates required for each soil types to achieve the optimum pH level.

Nitrogen is an essential element for plant growth and is needed to achieve good yields. Plant available nitrogen (N) is naturally scarce and the rate and timing of its application is central to profitable crop production.

Unlike other nutrients, soil testing is not used to determine nitrogen requirements. Rates and timing are based on crop type, establishment practices and yield requirements and these are available from the [SRUC Technical Note TN652 'Fertiliser recommendations for grassland'](#).

This technical note can be used along with [PLANET Scotland](#), a free software tool designed for routine use by Scottish farmers and consultants to plan and manage nutrient use on individual fields.

Overall, good soil management using soil testing on permanent grassland can have the following benefits:

- optimise nutrient use reduces costs
- maximise grassland productivity
- reduce nitrogen escaping to the atmosphere as nitrous oxide, a powerful greenhouse gas
- reduce nitrogen escaping into the water environment

Further information of other practical steps that can be taken to reduce your carbon footprint and save your business money can be found at [SRUC Farming for a Better Climate](#) webpages.

