

THEME REPORT

MORAY MONITOR FARM EVALUATING LIME PRODUCTS AVAILABLE IN MORAYSHIRE

THE CHALLENGE

The Morayshire Monitor Farm management group were instilled to investigate the different lime products available locally as the price of lime has increased significantly in recent years. Currently lime is generally priced between £12 and £25/tonne, plus delivery. Calcipril is priced at £120+/tonne. The cost of lime makes it a considerable investment on farms, particularly when liming large areas of ground and/or using GPS maps to target spread lime to even out the soil pH across the farm.

WHAT WE DID

Lime samples available locally were collected and sent for analysis to determine their individual characteristics (dry matter, grading) and properties (neutralising value, calcium and magnesium content). Once the results were received, two of SAC Consulting's soil specialists, Alex Sinclair and Gavin Elrick commented on the results.

When considering which lime material to purchase, the following should be considered:

- **Neutralising Value (NV)** - NV tells you the lime's capacity to neutralise soil acidity.
- **Fineness** - the finer the particles of lime, the faster they react with soil, however which is more difficult to determine is "how fine, is too fine", very fine lime can be carried in the air with less lime landing on the field where you want to apply it. Coarse lime takes longer to react, neutralise and break down.
- **Calcium and Magnesium Content** - your soil test results and your crop's need of calcium and/or magnesium will help you decide which lime to purchase. Generally, Scottish soils have a high magnesium content therefore applying magnesium lime may have detrimental effects on soil structure due to an imbalance in Calcium : Magnesium ratio (discussed in more details in the results below).

RESULTS

The results were very interesting and sparked a lot of questions and discussion as part of the Monitor Farm meetings.

Full analysis results are attached and summarised below:

- Highest neutralising value sampled: 56.9% from North England lime.
- Highest calcium content sampled: 27.2% from Calcipril.
- Highest magnesium content sampled: 10.8% from Syke (Torrin) lime.
- From the grading it can be seen that the Fenstone (Yorkshire) lime was the finest, with the Limehillock lime being the coarsest, excluding Calcipril (prills).

It should be noted that while the lime sample results gave us good information to base lime purchase decisions on, lime products are derived from a naturally occurring resource and that variations will occur.

While it is useful to have the analysis of each of the lime products, one of the main aims from this project was to determine which lime products are best value for money. Lime neutralises soil acidity and reduces the availability of harmful heavy metals to plants which are present in acidic soils. Therefore one of the ways to

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complete a cost comparison of lime is to break down the costs parallel to their neutralising values. This can be done as in the following example:

- **Lime A** = 45% NV @ £20/tonne delivered and spread = £0.44/NV%.
- **Lime B** = 56% NV @ £30/tonne delivered and spread = £0.54/NV%.

In this case, Lime A, works out to be the most economic purchase when comparing the NVs.

Soil sampling is a useful tool at determining not only how much lime is required, but also what type of lime (calcium or magnesium) may be required on-farm. While interpreting the results of the liming products, it was highlighted that the different lime types should be taken into consideration when choosing which lime product to purchase. Calcium (Ca) in the soil is an element that causes the soil particles to move apart for aeration and drainage. Magnesium (Mg), on the other hand, makes the soil particles stick together. After much research, it has been found that it is not the extractable Ca and Mg in the soil that is important, it is the ratio of the two nutrients, e.g. both extractable Ca and Mg can be low or high, yet have the right ratio in the soil not to cause any effect on soil structure.

- In a clay soil an extractable Ca:Mg ratio between 4:1 and 7:1 is expected to ensure that the magnesium is not excessive and detrimental to soil structure and aeration.
- In general, if your soil test is showing high magnesium levels in the soil there is no need to apply more and doing so may impact soil structure. It is worth noting that Scottish soils generally have a high Mg content.

WHAT HAS CHANGED AT CORSKIE

At Corskie, the aim is to maintain soil pH at 6 - 6.2 for arable and grassland. Iain manages the pH of the soil and applies lime on a rotational basis, where required, based on GPS soil analysis and variable rate spreading. In recent years, Iain has invested in large quantities of lime to ensure the land remains as productive as possible.

After carrying out this project, Iain changed lime supplier. In future Iain plans to request lime analysis from the lime manufacturers/suppliers prior to ordering to allow comparison and to use as a base to make decisions on the most economic purchase.

FACILITATOR CONTACT DETAILS

Derek Hanton, SAC Consulting, An Lochran, Inverness, IV2 5NA
Tel: 01463 233 266 Email: derek.hanton@sac.co.uk

Samantha Stewart, SAC Consulting, 15 Hay Street, Elgin, IV30 1NQ
Tel: 01343 548 787 Email: samantha.stewart@sac.co.uk

