Soil and Nutrient Network

Helping farmers improve soil and nutrient management

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Case study -
Dunadd - Argyll

The hosts for the Argyll Soil & Nutrient Network are C.R Foster & Partners. Whilst the home farm is Ashfield Achnamara, the partners have expanded their business taking over the ownership of Dunadd this year.

The total land area now under the Stewardship of the Foster family including rented land is 720 hectares approximately; 9 ha of woodland with the remainder a mix of hill and permanent grassland. The lands are a mixture of Region 1 and 2 land type classifications.

Dunadd is the host farm a traditional beef and sheep farm circumventing the River Add. The soil type is predominately Humous iron podzols with the edges Saline Gleys McAuley Grade 4.2. There is a mix of Region 1 and 2 ground with the latter on the lower end of the farm and is subject to flooding at times. This results in careful management being taken when grazing with sheep during the winter months. The historic monument of Dunadd Fort sits within the area and is listed as a historic fort of significance with free and open access all year round on the Historic Scotland website

Stocking at present is only 260 Blackface and Mule ewes and gimmers with 80 hoggs, however, the aim is to expand to 500 plus ewes and establish a suckler herd probably Angus! To date, hoggs have been grazed and fields were shut up for silage with the long term aim of establishing fodder crops, and with plans to reseed and drain some areas to improve overall output of the farm.

Dunadd - Soil Analysis and Nutrient Status

Historically the fields have been grazed with sheep and cattle, plus cropped for silage. No lime nor reseeding has been undertaken for several years.

In order to get a baseline for where the soil pH and nutrients were sitting, soil sampling was undertaken during May/June 2018.

The results shown in Table 1 proved interesting and indicated the need for applications of both lime and phosphate. These were applied during the summer months, making full use of the dry summer and ground conditions, to reduce tracking and minimise the risk of soil compaction.

Table 1

Field	Crop	pH	P	K	Mg
1	Grazing	5.1	L	L	L
3	Grazing	5.6	L	L	M
4	Grazing	5.7	VL	L	H
5	Grazing	6.2	L	M-	M
7	Silage	5.9	M-	L	M
9	Grazing	5.8	L	M-	M
14	Silage	5.8	L	L	M
15	Grazing	5.1	L	L	M
17	Grazing	5.1	L	M+	M
Bxt2	Grazing	4.8	L	M-	L
Bxt3	Grazing	4.9	L	L	L
Bxt4	Grazing	5.2	M-	L	M

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Know Your Soil Type

Soil specialist Seamus Donnelly was a guest speaker during the first meeting held at Dunadd. Using a copy of the VESS score chart, Seamus explained the value of knowing your soil type. Online maps are available that will indicate your soil type, but nothing beats taking 10 minutes with a spade to have a look at your own soil type and structure. Very often when looking at soil structure, signs of compaction can be identified. Knowing what depth the compacted layer is can give clues to underlying problems and then help to identify the best way to fix it. Seamus led an informative session around the topic of soil drainage, stressing the importance of the determining the flow of water, soil type and the use of backfill around your drains to ensure that they will function for years to come. Seamus also explained the need for regular maintenance of drains blocked from iron ochre, a naturally occurring mineral compound in some soils, but one that can completely block a previously running field drain, causing a drainage issues further back up the field.

The challenge at Dunadd is the nearby presence of the Moine Mhor National Nature Reserve and SSSI, protected for the raised bog and habitats within. The SSSI management priority is to maintain this area of wetland, which running so near to Dunadd poses a challenge for the farm to maintain suitably drained farmland .

Professor Davy McCracken, Head of Integrated Land Management, was the second guest speaker at this event. Managing SRUC's Hill Research Farm at Kirkton & Auchtertyre Farms,he gave a detailed overview of the work and research being carried out at the farms and highlighted the similarities to mid-Argyll in terms of landscape. There were interesting discussions about draining, even near sensitive sites in order to aid rush management, but Davy was able to highlight the benefit of such grounds to farmland waders, some species of which are seeing large declines in numbers. Looking ahead to managing grassland that has been improved through drainage, soil structure and nutrient management, Davy outlined the need for farmers to keep alert to the damage and ensuing losses from leatherjackets. With chemical control no longer an option following the ban of previously used products, farmers need to think ahead and use natural management tools to reduce the risk of leatherjacket infestation. The Soil Association are currently investigating the use of garlic powder as an alternative to chemical control; early identification of risk sites, rolling ground to destroy the grubs and making use of break crops are all methods that farmers need to consider.

Soil pH

Manage your soil pH to ensure effective nutrient uptake was a key message from Dr. Bill Crooks during the second meeting of the group.

Aim for a pH of 5.8-6.0 for grassland soils depending on soil type. Outside of this range and the plant can't access some nutrients as they become 'locked up'. For N this leads to losses which cost both financially and environmentally. Resulting crop yield losses are often overlooked, but can often make a big difference to profitability.

Key to ensuring your maintain your soil pH is regular soil testing at no less than every 5 years, but crucially - act on the information you receive back! Apply lime, but look carefully at the neutralising value when considering the best cost option. Different limes have different NVs, so a cost-benefit is necessary to ensure you're comparing like with like.

Don't forget to time your applications carefully. If slurry or urea has been applied, leave at least a week before an application of lime. Since lime increases volatilization losses from urea and slurry, leave ~3 months between applications if lime has been spread.

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Agro-forestry

Woodland Specialist, Peter Jones, outlined the current funding options available to land managers for agro-forestry. There are a number of different woodland grant schemes in place which provide funding to aid planting a woodland and in some cases construct suitable infrastructure to allow machinery onto site to harvest the crop.

In addition to the financial benefits on offer through such schemes currently the sale of timber or income from grant aid is tax free; and there is no capital gains tax on the growth of the crop value.

Peter was keen to highlight the many other benefits from planting farm woodlands. Not only will trees offer wildlife corridors and habitats to improve the overall biodiversity within the area, but used as a shelter belt, the plantations can improve livestock productivity, by improving farmland drainage, the risk of liverfluke can be reduced all of which help farm profitability.

For wetter areas within the farm, tree canopies can reduce the speed at which rain reaches the ground, the over-ground flow of water is vastly reduced and the water infiltration to the soil is sixty times greater in woodland than in pasture. Clearly with benefits like these the integration of agroforestry could help with an increasingly wetter climate.

With an increasing focus on carbon emissions, forestry plantations act as carbon sinks and can help to improve a farm's carbon footprint. There is also the possibility of realising an additional income by selling some of the carbon credits to companies who need to offset their carbon emissions.

There is more information about farm woodlands and a link to subscribe to the Farm Woodland News publication on the Farm Advisory Service website. Find out more about farm woodlands from

Sheep & Trees

The Scottish Government is working in partnership with the National Farmers Union, the National Sheep Association and Scottish Forestry to run a new initiative called 'Sheep & Trees'.

In this programme, funding is available for farmers and land managers to encourage the planting of trees in hill and upland situations. This specific initiative allows farmers to apply for funding for both woodland creation and forestry infrastructure on the same area, at the same time. To be eligible farmers must plant between 10 and 50 hectares of productive conifer whilst still farming a significant part of the holding. The funding will allow the construction of access routes to enable the creation and management of the new farm woodland.

The new woodlands can be grazed with livestock after the trees have grown large enough to prevent any grazing damage - typically within 10 years. In the meantime, if the woodland is planted on eligible land, there is no BPS penalty.

For more information or help to apply, contact your local Scottish Forestry office or visit www.forestry.gov.uk/scotlandgrants

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Maximise returns from reseeds

For the final meeting the group returned to the field where Seamus Donnelly had led the discussions during the first meeting. The group assessed the sward which had been reseeded earlier in the year and were disappointed by the openness of the sward and the resulting problems with weeds. There was some debate between those in the group about the best method of reseeding - some favouring the use of the plough, whilst others preferred the results from direct drilling the reseed.

Guest speakers John Holland (Kirkton Research Farm, SRUC) and Ewan Campbell (Farms manager, Kirkton Hill Farm) took this discussion a stage further by comparing the results of different techniques on various fields at Kirkton Hill Farm. John provided a financial cost breakdown of the different techniques; Ewan added to this with his experience of how the livestock have benefitted from the improvements. They concluded that there is no one 'right or wrong way 'to manage a reseed; methodology will depend on the individual farm situation.

Charles Murray from Clyde Agriculture, was the another guest speaker during the final meeting at Dunadd. He gave an in-depth presentation about seed selection for grass leys; multi-species grazing crops; forage brassica crops and blends, and general establishment costs of production for any crops.

The advice for multi-species winter grazing crops was to sow a wide range of species during peak grass production to produce a large volume of flowering and seeding plants for grazing with livestock during winter and early spring. Suggested crops included forage rye, kale, forage rape, turnip, birdsfoot trefoil, fodder radish and cereals. The benefits of such mixes include reduced wintering costs for livestock, a complete ration from grazing as well as improved soil structure, health and fertility from the variation in root types and the inclusion of legumes.

Charles' advice for grass swards was to be clear about what you want from the investment and to give suitable consideration to the environmental conditions e.g. soil type, rainfall etc. He highlighted the range of species available to include in a sward mix, e.g. typical ryegrasses, clovers, fescues, cocksfoot and also the often overlooked, alternative species that can be considered, such as sheeps parsley, plantain, trefoil and sheeps burnet.

The take home messages from this event were that there are no fixed methods to undertake a reseed - this will be site specific to each farm, the timing of the reseed and the soil type. A word of warning is to factor in the time lost from grazing for each method prior to making a choice.

Top Tips

- Test soil pH and take the time needed to raise it to the optimal levels before considering a reseed.
- Know the Neutralising Value (NV) of the lime your are using to assess how effective it will be to raise the pH.
- Know your soil structure - a Visual Evaluation of Soil Structure will reveal any potential compaction problems which could limit the productivity of any reseed.
- Ensure you are getting a seed mix that will meet your needs - discuss exactly what you want from the sward with your seed merchant.
- Keep on top of weed management during establishment to prevent early and prolonged loss of productivity.