

Soil and Nutrient Network

Helping farmers improve soil and nutrient management



Case study - Treshnish Farm, Isle of Mull

Treshnish Farm is owned and managed by Somerset and Carolyne Charrington. They have been running the farm for 20 years and have built up a successful farming and tourism business on this remote part of the North West coast of Mull.

Treshnish is a hill livestock unit extending to around 750 ha. The bulk of this is hill land, but the farm does have around 80 ha of permanent grasslands. The farm is stocked with 16 suckler cows

and 475 ewes and gimmers.

The farm used to be organic and despite coming out of organic certification, Somerset and Carolyne very much retain the ethos of this type of farming.

The main challenges facing Treshnish and many others on the island are how to grow grass cheaply and efficiently with minimal inputs due to cost of transporting lime and fertiliser to the island.

Soil and Nutrient Network—how can it benefit your farm?

Along with Treshnish, six other farms across Scotland are taking part in the **Soil and Nutrient Network (SNN)**.

Working with SAC Consulting, the aim of the network is to demonstrate practical steps on the host farms that all farmers can benefit from to improve farm soils, maximise nutrient efficiency and save money.

Improving soil and nutrient management could also help to reduce diffuse pollution risks and cut the farm carbon footprint.

The first meeting at Treshnish demonstrated how to balance nutrient flow especially in silage fields, maximise nutrient use from FYM, soil sampling to address pH levels, P and K soil status, as well as looking at soil structure and surface compaction issues.

Some of the findings and key actions points from the first meeting at Treshnish are overleaf. There is more information on the Soil and Nutrient Network, highlighting what other farmers have done at

www.farmingandwaterscotland.org

Key findings from Treshnish

- Take soil samples to assess your soil P, K status and pH levels.
- Check your silage field nutrient balance — especially if you are feeding out-wintered cattle.
- Check soil structure and identify compaction issue simply by digging a hole with a spade to see how water is moving through your soil.

Soil and Nutrient Network; Treshnish

Nutrient Budgeting at Treshnish

It is important to ensure that you are balancing the nutrients within the field to avoid draining the soil over the long term of its natural fertility.

Treshnish has both grazing fields and silage fields. For nutrient management, grazing fields are of less concern, as 80% - 90% of the P & K within these fields are recycled through livestock dung and urine.

Silage fields are more of a concern, as grass in the form of silage or hay is removed from the field and fed in a shed (or on the hill in an outwintering situation). As Treshnish has a cattle shed which produces dung, this can be spread back onto the silage fields to return the nutrients to the soil. Not all farms on the island however have the luxury of dung.

The nutrient budget below shows N, P and K balance on Treshnish silage fields in 2013. The dung applied balances with nutrient off-take.

Note that this budget does not take account of any N fixed by legumes such as clover and therefore the N balance should be acceptable. Treshnish fields are moderate or high in K, so the small negative balance is not a concern on this farm.

A similar nutrient budget, replacing dung with 3cwt/acre fertiliser showed that 17:17:17 gave a better nutrient balance than 20:10:10.

Where a farm does not have any dung to return to the silage field, extra care must be taken to ensure that P and K levels in particular are balanced.

Treshnish: Silage Field Nutrient Budget		Kg Nutrient/ha		
	Amount (t/ha)	N	P ₂ O ₅	K ₂ O
Silage taken off	14	96.6	26.6	110.6
Dung applied	11	66	38.5	88
Fertiliser applied	0	0	0	0
Field Nutrient Balance		-31	12	-23

Advice for Low Phosphate Soils

Soil analysis indicates that most soils on Treshnish are Low or Very Low in Phosphate, Moderate in Potash and have a low pH.

Conventional thinking would usually recommend targeting a moderate P status though applications of Triple Super Phosphate or ground mineral phosphate for this farm.

Applied phosphate is initially absorbed into the soil and will only be released to the plant at around moderate P status.

New thinking is questioning the cost / benefit of having to raise the soil P status to moderate—particular where the farm does not need extra grass.

Nitrogen is the engine that drives grass growth. If little or no N is applied, the farm can get away with keeping soil P status at its existing level as long as it does not decrease P status further through excess off-takes from silage/hay.

Lime is always a problem on a island situation due to haulage costs (current prices £75/t spread).

On Mull there is an option to bring lime on by bulk boat this summer. It is hoped that enough islanders will get together and order enough lime to justify the boat, so low pH status soils can be addressed.

Treshnish - Actions for Next Meeting

1. Apply N:P:K fertiliser to one silage field to assess yield benefit vs cost.
2. Apply phosphate to half of one field with a Very Low P Status. Assess visual impact on grass and actual impact through soil sampling on soil P status.
3. Lime priority fields as identified in soil analysis—if can source Lime through bulk transport
4. Continue to use aerator, especially where fields are more heavily trafficked by tractors and other machinery, or by livestock, for example fields where sheep are being fed.



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