

Soil and Nutrient Network

Helping farmers improve soil and nutrient management



Case study - Stevenson Mains & East Bearford, East Lothian

Hugh and Alasdair Elder own and farm Stevenson Mains and East Bearford farm near Haddington in East Lothian.

The farms cover 336 ha growing winter wheat, spring barley, winter oilseed rape and a small area of grass for the 25 head of store cattle. The wheat and rape straw is chopped and worked back in, while spring barley straw is baled and removed. Both ploughing and min-till cultivation methods are used as appropriate.

Most of Stevenson Mains is Winton soil series, and East Bearford is mainly Macmerry. The majority of the land is classified as Grade 3,1 with some Grade 2 to the north.

The farms extend to the banks of the Tyne Water, and the Bearford Burn runs through the middle of the two units. Grass margins were established through agri-environment schemes, predominantly on the Stevenson Mains side, to help manage water margins.

Key findings from Stevenson Mains

- Regular soil analysis enables consistent pH and nutrient levels across the farm
- Variations in soil types within fields could be managed even more accurately using GPS and variable-rate spreading
- Min-till appears to have reduced surface smearing in wheat compared to crops established after ploughing
- Soil organic matter (OM) levels are the same in min-till and ploughed fields; it is the distribution that changes.
- Chopping and incorporating straw can maintain good OM levels in an arable rotation

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

Along with Stevenson Mains and East Bearford, 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.

Some of the findings from the first meeting at Stevenson Mains and East Bearford are overleaf. There is more information on the Soil and Nutrient Network, highlighting what other farmers have done at www.farmingandwaterscotland.org



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Soil analysis at Stevenson Mains

At the first SNN meeting, Hugh Elder gave a brief introduction to the farm and their farming system. Soils across the whole farm had been sampled and analysed in autumn 2013.

All potassium (K) levels were moderate, but phosphorus (P) levels were much more variable across the farm. Previous soil sampling had identified high P levels in the past; Hugh had been reducing P applications to balance soil nutrient status. The use of variable rate spreading could further help to even up the P status across the farm.

It's important to know and optimise soil nutrient status across the farm to maximise yield potential. Hugh will use GPS mapping across 61 ha and compare with conventional soil sampling. We will review the costs and benefits of this approach at the next meeting.

Soil Structure

Poor soil structure can often be overlooked and will have an impact on yields.

The group looked at two soil pits. The first was in a free-draining part of the field. A good 1.5 m of topsoil was evident, without any structural problems, on Darvel soil series. The second pit in the same field was on heavier Macmerry soil with a slight pan and wetter soil. Evidence of undecayed straw could be seen. However there was good fissuring further down the profile.

Soil pans and compaction can often be a hidden problem. Hugh and Alasdair will review soil structure across the farms and consider appropriate remediation techniques.

Points for future consideration

Although Hugh and Alasdair are already technically efficient, there are still opportunities to tweak practices and make better use of inputs. Areas for consideration include:

- GPS mapping to compare with the current traditional method.
- Measure soil OM and any visual differences in the wheat crops e.g. worm counts and other organisms
- Consider using compost or other organic manures – possibly start with half a field to compare the effects?
- The use of cover crops to capture nutrients and reduce the risk of soil loss through erosion and run-off
- More buffer strips, sowing grass cover in the strips
- Direct drilling as an option for crop establishment (if practicable)
- Continue to compare the min till vs ploughed wheat crop – e.g. grass weeds that may need additional control measures, green leaf area, crop yield etc.

The next SNN meeting at Stevenson Mains and East Bearford will explore which changes Hugh and Alasdair considered and review how the changes have benefited the farm business.

Protecting watercourses

Watercourses are a major feature on the farm. The Elders have used agri-environment schemes in the past to establish buffer strips in many areas. Extending these areas may help to achieve greening measures under the new SFP.

Diffuse Pollution General Binding Rules (GBRs) protect water quality, remember:

- No cultivation within 2 m of the top of the bank
- No application of inorganic fertilisers within 2 m of a watercourse
- No poaching within 5 m of a watercourse
- No storage or application of slurry or FYM within 10 m of a watercourse.



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