The fourth meeting of the Climate Change Focus Farm discussion group at Castlemains focused on the value of maintaining soil organic matter.

**Key points:**

- Carry out regular soil sampling to assess nutrient and pH status.
- Know the nutrient value of organic manures and composts that you are applying and account for them in your nutrient plan.
- Ask for Loss on Ignition test to be included in soil sample analyses.
- Assess and monitor organic matter content - how can you protect and build soil OM?

**Soil organic matter**

Not just one substance but three different pools

There are three different pools in soil organic matter:

1. **Active temporary** — unprotected and actively decomposed, e.g. manures. Comprises <1% soil organic matter.
2. **Intermediate** - takes longer to decompose, roots are left in the soil structure after cultivations e.g. peat in the correct conditions would actively decompose. This biological decomposition process is what benefits the soil. The intermediate pool is heavily influenced by management.
3. **Stable (protected)** - chemically stable particles, soil biology can’t get to it. This will not disappear over night, erosion is the only problem ‘5,000 years to make a single gram of topsoil’

The major risk to soil organic matter in Scotland is from wind and erosion. The most important action a farmer can take to ensure good management of their soils is to protect them from soil erosion, as once soil organic matter is lost it takes thousands of years to replace.

Watch more on soil organic matter on the Castlemains page on our website www.farmingforabetterclimate.com
Reduced tillage and cover crops
Minimum tillage can drastically reduce soil erosion

Guest speaker Colin Hunter from Stonelaws gave an interesting presentation on why he has converted from traditional cultivation techniques to reduced tillage.

Following several wet years and the associated damage that machines were doing whilst working in poor conditions, Colin decided to look at different crop establishment techniques to save his soils. He has converted to a minimum tillage system across his whole farm.

Cover crops such as oats, vetch, forage rape and mustard were sown in 2013, compost was applied in January 2014 and then the field was direct drilled with beans. Colin found that the earlier cover crops worked the best. Cover crops stabilised the soil allowing him to travel on the fields during winter months which normally would be impossible, allowing him to spread composts in January.

In 2015 half of fields were sown in black oats cover crop mix and they found that the frost killed the black oat species. Colin believes that oats are better sown later on in the year to prevent this from happening. Some research has been done by Agrovista regarding cover crops and weeds such as black grass. Colin has also noted that earthworm numbers are increasing on his farm since he focussed on the use of cover crops and minimum tillage.

Donald Dunbar talked about the cover crops at Castlemains in terms of the soil benefits and encouraged everyone to take a look at their soils back at home. Copies of the Valuing your Soils brochure, a new document which gives a range of ideas to protect and improve farm soils was handed out at the meeting; you can view the booklet on the Farming and Water Scotland website www.farmingandwaterscotland.org in the soils and nutrients section.
Bill Crooks discussed the financial value of organic manures. The organic matter contained within a manure or compost will be actively decomposed in the soil within a few months of application, however the nutrient value will remain to benefit the crop as the manure is broken down. When purchasing and spreading organic manures the best approach is 'little and often'.

Many mixed farms see organic manures and slurries as a waste product to dispose of rather than a valuable nutrient source. Make sure you account for the nutrient value of manures and adjust your nutrient management plan accordingly.

Regular soil sampling is essential to allow you to target manures to fields that need it the most and to avoid fields that are high in P and K. For those buying in organic manures and composts, Bill recommended that you ask for a nutrient analysis so that you can accurately allow for the nutrient content. It is best to quickly incorporate organic manures to make the most of the nitrogen value.

Nutrient budgeting can be carried out using the tables in the SAC Consulting technical notes, or the PLANET Scotland programme.
Winter rye
Alternative markets for winter rye

We visited the field of winter rye which was being grown for a proposed local AD plant. Given the AD plant had been rejected, there was much interest and discussion with SAC Consulting's Julian Bell on alternative uses of the winter rye which has originally been grown to be cut as wholecrop. There is potential to cut the crop and lift straight into artic lorries, which would still allow removal of the crop within a reasonable timescale to permit early entry for oilseed rape. However, there was concern about the damage that heavy vehicles could do to the field. The proposal was that another AD plant from out with the area had shown interest in the growing crop in East Lothian. Given that it is a feed variety, the options for harvesting the rye as a cereal for alternative markets are limited, and it is likely that the best options are to consider ag-bagging the crop, or cutting and drying the cereal and straw for feed. The financial value of the crop is diminished as the distance to end users increases, meaning there is a limited market for the current crop of rye as a feedstuff.

What’s next?
Come to our next meeting. We will be visiting Colin Hunter’s farm, Stonelaws, to see no-till and cover cropping in practice.

There are nine climate change focus farms in Scotland. Keep up to date with their activities at www.farmingforabetterclimate.org

Meetings are free to attend and all farmers are welcome.

For Castlemains, contact farm facilitator Chris McDonald on 0131 603 7522 or via email at chris.mcdonald@sac.co.uk for more information.

Funded by the Scottish Government as part of its Climate Change Advisory activity