Field Lab Notes: July 2016 Meeting
Cultivating Soil Health

Discussions at the July 2016 meeting

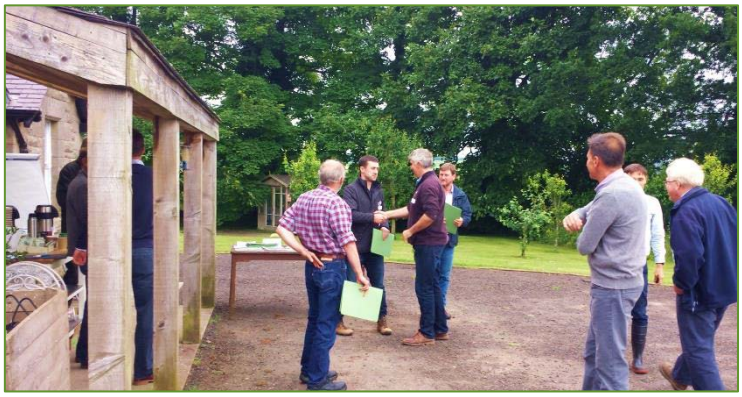
The cultivating soil health field lab started in 2016, at Newmiln farm, Perthshire, courtesy of Hugh Grierson Organic. It is investigating if reduced tillage methods can:

- Improve soil health (to improve the resilience of the cropping enterprises)
- Reduce production costs (to investigate if savings can be made by reducing tillage)
- Improve the farm's carbon footprint (by reducing the number of cultivations)

Trial setup

The field used has just come out of a 3 year grass ley, and sown out to Paragon spring wheat at a rate of 237 kg/ha on the 22nd April. It was split into four areas at the start of 2016. Before sowing these areas were:

1. Left as a grass ley and not sown (control)
2. Rotovated, then sown with a 3 m Claydon drill
3. Sheeted with black plastic and then sown with a 3 m Claydon drill
4. Ploughed (as normal), cultivated, then sown with a 3 m Claydon drill



How can we make the field lab better?

We had a discussion round the kitchen table at our meeting. We talked about how to proceed with the field lab, as well as about different ways to carry out reduced tillage in organic systems. Several suggestions were made about how to get better and more information, and also about how to address some of the issues that have arisen so far.

Soil analysis

- Carrying out a 'routine' soil analysis before and after the soil cultivations, to see if the cultivations themselves have an effect on phosphate (P) and potash (K)availability

Trial plots

- Carry out the same activity, in the same plots, in the same location – apart from the plot that was sheeted with black plastic , which should be slightly changed
- Split the plot that was sheeted with black plastic in two:
    1. Have 50% of the area sheeted with black plastic (as previous)
    2. Have 50% of the plot under permeable fibrous mesh to allow air and water to get out and in
- Allow the soil in the sheeted plot soil to dry out before sowing (to prevent smearing)
- Measure the amount of slugs in the sheeted plot, and also look for any slug predators

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Cost-benefit analysis

- Investigate the costs and financial benefits for each plot
    - A lower yield may be more than compensated for by reduced tillage costs
    - Sowing very quickly may also have a cost saving

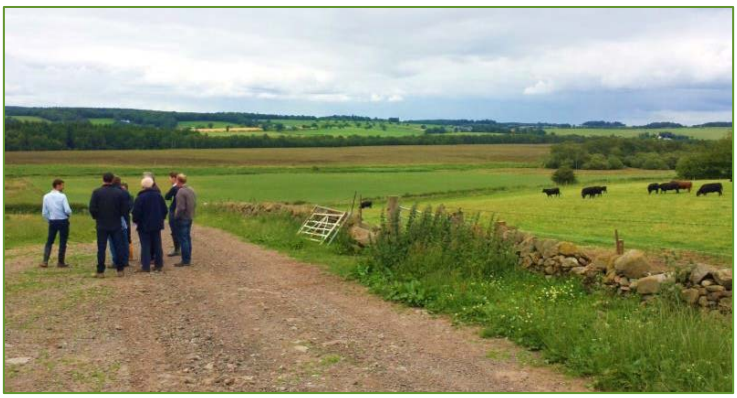
Replication

- Replicate this trial at another location to see if the soil analysis results are similar
    - It would be interesting to look at a non-organic, continuous cereals system

What else can we do?

Reduced tillage in organic farming systems were discussed in more detail. Several practical suggestions about other investigations of reduced tillage.

- Sow into a green manure that had been established the previous summer (such as forage rye and vetch)
    - Establish following a winter cereal
    - Crimp the green manure with a roller in the back end, and sow into the flattened and mulched crop
    - Use a Moore disc drill that would enable the seed to be placed in the soil
    - Have a roller on the front of the tractor
- Carry out the trial with an inter-row mechanical weeder
    - The large (4") spacing between rows in reduced tillage systems may result in too much weed competition in an organic situation
    - This may be an expensive option, so a cost benefit analysis could also be carried out
- Follow a forage brassica crop rather than a grass/clover ley when using reduced tillage



What else can we talk about?

Several topics came up from the group that will inform future meeting topics.

- Soil biology is complex – what is 'good' soil biology?
- Further information on breathable mesh is required – how many years would it last; how can it practically be rolled out, rolled up, and reused; and what are the costs?
- Would the use of sheeting as part of a reduced tillage system have adverse environmental impacts from increased water runoff?

Thanks to Hugh Grierson, Newmiln Farm, and Professor Bryan Griffiths, SRUC