

Downpatrick Monitor Farm meeting report

Soils and cultivations

Date: 5 March 2019

Speaker: Philip Wright (Wright Resolutions)

Location: Bright Community Hall, 74-72 Ballynoe Rd, Downpatrick BT30 8AJ

For more information, visit: cereals.ahdb.org.uk/downpatrick

Key messages

- Aim for prevention of soil structure problems – it's a lot easier and cheaper than remedy
- Soil structure target: a soil with 50% porosity, half full of water, half air – a structure that roots and worms can readily penetrate. Organic matter measurement is a good benchmark of progress
- Go into a field with a spade before a tractor; dig holes in and between tramlines and benchmark with a hole under the hedge
- Look at the roots to describe the soil structure
- Soil disturbance (cultivation) releases carbon and leads to loss of moisture
- Regard bare ground as a waste – grow something!
- Axle weights – spread the load
- Tyre pressures – reduce the problem

Update on Downpatrick Monitor Farm

- Crops are looking well and have developed good roots
- Jan / Feb rainfall only 59.4 mm
- Getting fertiliser onto crops
- Cultivation try out plots looking good
- Soil EC scanning been done
- Soil analysis results back and look good
- Filtration tests run to look at soil structure



Why is soil structure important?

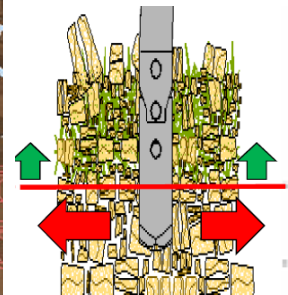
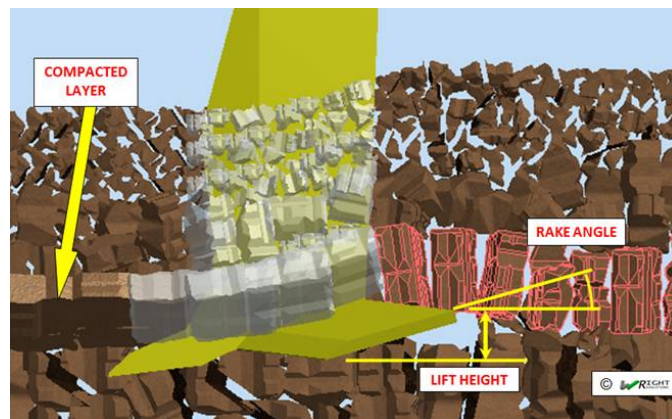
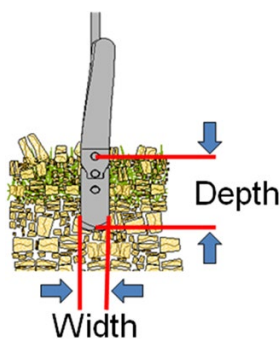
- Soil compaction costs us in yield in all crops
- Reduced drainage and waterlogging can also reduce yield
- Soil structure target: a soil with 50% porosity, half full of water, half air – a structure that roots and worms can readily penetrate. Organic matter measurement is a good benchmark of progress.

Compaction

- The effect of the drill tractor wheelings can reduce yield by 15% and on plough based systems the yield in the wheelings can be down to 61% of the rest of the field
- Tyre pressure can have a very big effect on compaction
- Axle load (weight) is also important, but pressure determines the extent and severity of the problem. Axle load determines how deep this is then pushed through the soil to depth
- Critical to manage pressures when soils are vulnerable – when loose, or damp/wet – hence when drilling, rolling, etc.

Cultivations

- Important to set bent leg loosener to work in fracture zone, lifting at 45 degree angle but not creating 'boiling' action. Angle reduces nearer to vertical as sand content of soil increases
- Tine settings: Every tine has a 'critical point' for depth of working. If tine goes below critical point, soil movement action goes sideways rather than lifting
- Rule of thumb, Chisel tine tip width x 6 or 8 = critical depth. E.g. 2" tip gives 12 to 16" critical depth. Need to ensure lifting to achieve pan fracturing but not to extent soil clods are pulled up
- If tip winged, need to consider rake angle (between wing surface and horizontal):
 - Too shallow – no pan fracturing action.
 - Too steep – creates compression, clod lifting, increased diesel usage



Soils at Meadow Farm

The group then went to the cultivation try out field to look at the soil structure and filtration tests:



Plough + Combination Drill plot
Drill tractor wheelings



Plough + Combination Drill plot
Between the wheelings



Claydon Drill plot



Field not ploughed for 6 years (tractor wheelings left / between wheelings right)

Find out more – Links to AHDB information sheets or research

[GREATsoils](#)

[Introduction to soil biology](#)

[Biological tests for soil health](#)

[Developing a soil health testing plan at Strategic Farm West](#)

[Field drainage guide](#)



Next meeting

Date: 2 April 2019

Topic: Maximising yield and YEN

For more information or to find out more about Farmbench, AHDB's benchmarking tool, contact: Michelle Nuttall

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