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AGRICULTURE & HORTICULTURE DEVELOPMENT BOARD

Brigg Monitor Farm meeting report

Meeting 2: Soils – nutrition and cultivations

Speaker: Ian Robertson (Sustainable soil management), Philip Wright (Wright Resolutions)

Date: 23 November 2017

Location: Gander Farm, Hibaldstow, Brigg, DN20 9PJ

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

Meeting summary – key messages

- Build your crop nutrition plan around peak demand for; wheat, barley & oilseed rape
- How important is Sulphur? Check out Sulphur for cereals and oilseed rape
- Placement and timing is important to obtain best up-take
- Get out with a spade! Get to know your soil, understand what compaction looks like and build a plan to correct it
- No one system will suit all – some soils will work under no-till, others never will
- Attention to detail in cultivation is better than more power

Soil nutrition

Sustainable Soil Management Report

Farm name: Chappell Farms (Brigg Monitor Farm)
Fields: Sandhills 4 (S4) and Sandhills 5 (S5)
Date: Sampled in November 2017

pH
S5 has a more alkaline soil than S4, with a pH of 7.6 compared to 6.5 in S4. This may mean that although there are more cations available for nutrient transfer in S5, some of these will be unavailable to the crop, and indicates that it may have a poorer soil structure than S4.

Organic matter (OM)
13% in both fields shows that there is a huge amount in the soil which is generally a good thing. What it may be doing with these fields is masking the true characteristics of the soil and how they work.

Total exchangeable capacity (TEC)
The fields had a TEC of 28.93 and 28.51. The huge numbers indicate that these fields have large potential yields available in them, however, some of the nutrient ratios are out of line and stopping them from reaching their potential.

Calcium to magnesium ratio (Ca:Mg)
There are huge amounts of calcium in these fields, however, there is also a huge amount of magnesium. In a perfect situation, these two elements should be in a ratio of 6Ca:1Mg – in these cases the ratio is far closer to 1:1. It is hard to remove Mg from the soil so to achieve the target ratio of 6:1, more calcium needs to be added. Applying gypsum (3t/ha for the first 2–3 years) to increase Ca levels and reduce the water holding capacity of Mg within the soil will make both fields far more farmer and crop friendly. Still add in foliar Mg in the summer due to drying effects of Mg on the soil, making nutrient uptake limited.

Phosphorus (P)
The background levels of P are small within both fields. In biological terms, the levels of P should be 5–8%. In these fields, the levels are around 1%, so they are only 15–20% of where we would like them to be. Increasing OM levels will not necessarily help to make P more available to the plant as there is already a large amount in the soil. The best way to get P into the crop is through applications of organic formats of phosphate – manures, slurry, digestate, P-grow etc. that will not be locked up by the high calcium levels in the soil. DAP placement at drilling for spring crops and OSR will be beneficial on a year by year/crop by crop basis. Foliar applications in autumn will be taken up by the crop more efficiently than broadcast TSP, e.g. 1.5l Maxi-Phi Fast Root added to BYDV insecticide.

Potassium (K)
Large amounts of K in the soil, however, again linking with the Mg levels in the soils, K may not always be as available to the plant as first thought. Drying effects of Mg in the summer months will dry soils out and restrict nutrient uptake through the plant roots. Foliar applications of K added to fungicides in the late spring/early summer will be an efficient way to get some K into the crop e.g. 4l/Ha Yara Foliar K or 1.25l/Ha K-Leaf added to T2 and T3 fungicides in wheat and T1 + T2 in barley.

Boron (B)
Good levels of B with figures of 1.7 and 1.9 so there is no need to apply for cereals however, benefits from foliar applications will be seen in OSR and sugar beet.

Manganese, copper and zinc (Mn, Cu, Zn)
Autumn and spring foliar applications will help with root promotion e.g. 1l/Ha Yara Mancozin in with BYDV insecticide and T0 fungicide. These nutrients need to be available while the roots are growing. Having a good root system will mean that the crop is able to reach nutrients in the soil – there is a positive correlation between root length and yield. Vertical farming utilises the land downwards rather than horizontally.

Iron (Fe)
High levels indicate that there may be some structural issues with the soil. Gypsum applications along with reduced cultivations will help to lower the effects of Fe – this will help increase the availability of Mn and P in the soil.

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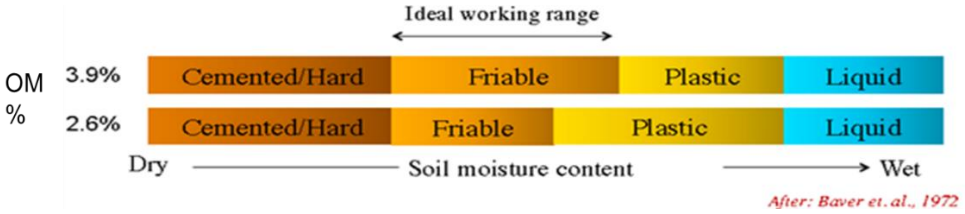
Cultivations

Dry hard soils

Friable soil (just)

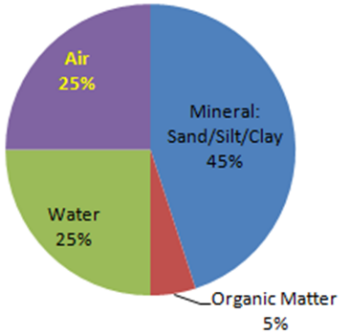
Plastic soils



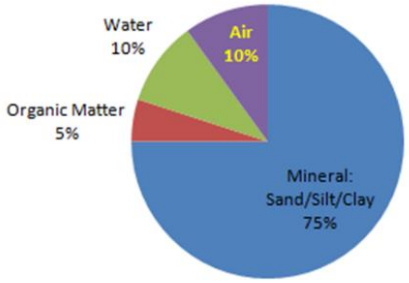
Traffic damage likely in plastic >6/10psi
Traffic damage likely @ friable >12/15psi

- Ensure your drainage is functioning – number one!
- Accept the soils you have, use thought before power
- Use your tyres correctly, adjust pressures to suit the job
- Use dual wheels for optimum tractor and flotation
- Don't cultivate deeper simply because you have the power
- Soils will dry through cultivation, but wet soils will form clods
- Dig a small pit to see what soil moisture 15cm looks like

Optimum



Compaction Limiting



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Find out more – Links to AHDB information sheets or research

Nutrient Management Guide (RB209)
Sulphur for cereals and oilseed rape
Drainage Guide
Platforms to test and demonstrate sustainable soil management: integration of major UK field experiments

For more information on soils, visit ahdb.org.uk/geatsoils

Next meeting

Date: 21 December 2018

Topic: Phosphate and nutrient management

Time: 10.00

Location: Hibaldstow Village Hall

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