Case study

Michael Shemilt (left) with Andrew Pitts

Healthier soils pay dividends in wet conditions

At the national Helix Technology Development Farm in Northamptonshire, Andrew Pitts of J W Pitts & Sons, drilled around 60% of his planned 400ha (1,000 acres) of winter wheat last autumn, despite half a year's rainfall (385mm) falling between mid-September and mid-January.

He believes the farm's concerted focus on improving soil health over the past 14 years was instrumental in allowing any drilling progress last autumn, and has also made it easier to travel on land in the spring. Soils include heavy Hanslope and chalky boulder clay, alongside Banbury clay and some lighter land.

"There were a couple of patches on the worst clay areas (43-45% clay content) that failed to establish, but the majority of winter wheat looks ok, although I expect yield potential is 10-20% down on where it should be, given the season so far."

Direct drilling transition

The farm's focus on soil health features rotational changes, the introduction of cover crops, removing unproductive areas from production, organic matter additions (greenwaste compost) and a wholesale shift in cultivation policy.

The 2019/20 season is the second year the farm has direct-drilled all crops with its new John Deere 750A drill, after starting the transition from a plough/power-harrow—based system back in 2006. Initially, a Vaderstad TopDown disc cultivator was used to move soil to around 23cm (9") deep, before gradually reducing tillage depth to nearer 5-10cm (2-4") over several years.

"Soil health has always been hugely important on this farm and this year we've reaped the benefits of a very good, friable soil structure, with excellent natural drainage, to get where we are with minimal damage."

"Switching to direct drilling has been a constant learning curve and we're still learning. Being a Helix demonstration farm has been good to make us look at how we can improve, or do things differently, though."

Working with his Hutchinsons agronomist Michael Shemilt, land has been assessed and monitored in a variety of ways to target and monitor the impact of management changes. This includes Healthy Soils assessments, high definition nutrient mapping with TerraMap, multiple layers of yield and crop data analysis using Omnia and regular soil nutrient testing.

In addition, regular (monthly) plant tissue tests are done ahead of the main fungicide timings, to identify potential nutrient deficiencies that need correcting.

"Last year testing showed magnesium was often in short supply, so we applied slightly more, typically from GS 37-39 onwards," notes Mr Shemilt. "Peak demand for magnesium is at flowering which can be when soils are at their driest, so if you think there's likely to be an imbalance it's important to get it applied earlier."

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Find out more

HEALTHY SOILS — Healthy Soils: **www.healthysoils.co.uk**

Omnia Precision Agronomy — Omnia & Terramap: **www.omniaprecision.co.uk** TerraMap

Helix — **Helix** Technology Development Farm: **www.helixfarm.co.uk**

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> Keeping crops healthy

Mr Pitts knows that supporting root growth is key to getting the most from winter crops this season and recognises the value of early, targeted nutrition.

His favoured approach has been to apply around half of nitrogen in split doses before GS 30, alternating between solid ammonium nitrate, liquid urea, and solid ammonium sulphate, depending on crop requirements, growth stage and conditions. Rates are varied according to crop need, soil mineral nitrogen levels, weather and any growth regulation requirements.

A robust fungicide programme is maintained on first and second wheats. This typically includes four sprays, with stronger SDHI chemistry used at T2 in most years. T1 and T3 sprays are kept more flexible depending on variety, the weather and disease pressure at the time.

Mr Shemilt has worked with Mr Pitts to analyse some 19 years of yield maps using the Omnia precision farming software; information that has been central to planning how to get the most from cropped land and for deciding the future of difficult-to-manage areas.

Yield maps have been converted into gross margin maps using the software, allowing them to easily identify the most resilient and profitable parts of the farm, as well as those that are loss-making and may be better off being put into environmental stewardship.

"There's no point throwing good money after bad," says Mr Pitts. **"Take a longer-term view and ask yourself whether cropping poor headlands or field corners is the right thing to do from a whole-farm business management perspective."**

Changes can be more seasonal too. For example, on parts of the farm that could not be drilled last autumn, or where crop establishment was very poor, land has gone into a spring break crop or a multi-species cover crop over the spring and summer, as a way of improving soil condition and providing a more timely entry for a higher-margin crop in the autumn (e.g. milling wheat).

"We know harvest 2020 will be a tough one and short-term cashflow will be a challenge, but farming is not about one year. Rather than damage our soils for several years to come by trying to force a crop in, it's better to take the hit now and focus on getting land into the best position to produce a profitable crop in 2021, to compensate for this year."

Tips for optimising crop potential

- Be prepared to invest in backward crops to get the most from them
- Focus on supporting root growth, retaining tillers and prolonging green leaf area with targeted nutrition, PGRs and fungicides
- Monitor crop growth stages closely to ensure optimum spray timings
- Ensure the gap between fungicide sprays does not exceed 3-4 weeks
- Be flexible - treat crops individually, as blanket approaches may be less effective
- Inspect soils to identify structural issues to address after harvest (e.g. subsoiling, drainage)
- Be prepared to make bigger changes on consistently poor performing areas e.g. putting headlands or field corners into stewardship, using cover crops and changes to cultivation strategy.

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HUTCHINSONS
Crop Production Specialists

H L Hutchinson Limited • Weasenham Lane
Wisbech • Cambridgeshire PE13 2RN

Tel: 01945 461177

Fax: 01945 474837
Email: information@hlhltd.co.uk

@Hutchinsons_Ag
HLHutchinsons

www.hlhltd.co.uk

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