

Managing Soils After a Wet Winter

Jade Prince, soils specialist with Hutchinsons, delves into effective strategies for managing soils post a wet winter, with a focus on addressing gaseous exchange through soil capping and meeting the nutritional needs of the following crop.



Jade Prince (Hutchinsons Soils Specialist)

Balancing Gaseous Exchange and Plant Nutrition

The aftermath of a wet winter has presented numerous challenges for farmers; a wet winter leads to destabilising of soil aggregation which looks like soil compaction, reduced gaseous exchange, and nutrient deficiencies, all of which can impact plant growth.

Soil Capping

One significant consequence of excess moisture is the formation of a soil crust or cap, preventing proper aeration. This results in reduced oxygen availability for plant roots and a build-up of respiration exhaust gasses. In turn, root respiration is hindered along with microbial activity crucial for nutrient cycling.

In these anaerobic conditions, populations of denitrifying bacteria, those that utilise nitrite and nitrate for oxygen, increase.

This means that when nitrogen is applied in these conditions, the bacteria work hard to return it quickly to the atmosphere, preventing its use by the intended crop.

So what can be done to prevent this happening and optimise the uptake of Nitrogen? Breaking or managing soil capping can be achieved through various techniques, one of which is mechanical aeration. Aeration via rolling or light cultivation helps break up compacted soil, allowing for better gaseous exchange and root development.

For longer term soil resilience look to incorporating organic matter and keeping stubble or crop residue on the soil to improve its structure and water-holding capacity, reducing the likelihood of future compaction.

Cover crops are another valuable tool for increasing soil aggregate stability. Their root systems help create channels in the soil, promoting

water infiltration and feeding the soil microbial communities whilst the above ground biomass helps in preventing the formation of a crust. Choosing cover crops with deep root systems, such as radishes or legumes, can be particularly effective in breaking up compacted layers or stabilising soils that have been subsoiled or deep cultivated.

Feeding the Need

Wet conditions leach essential nutrients from the soil or force them deeper down into the soil profile, leading to deficiencies that compromise plant health. To compensate for this, it is crucial to implement targeted nutrition strategies and plant manipulation.

Incorporating organic amendments, such as compost, solid digestate, biosolids or well-rotted manure,



- Managing soils after a wet winter requires a multifaceted approach addressing physical impediments, like soil compaction, and nutritional inadequacies.
- Employ techniques to enhance gaseous exchange, such as breaking up soil caps through aeration and cover cropping.
- Replenish nutrients through organic amendments and fertilisation to improve conditions for plant growth and productivity.
- Manage nutrient streams as a joined system of soil microbial food, soil plant food and then foliar applied key nutrients to manage deficiencies to increase efficiencies.



Surface soil capping

Soil has tightened around this crop, limiting the oxygen supply to its root



not only improves soil structure, but also adds essential nutrients.

These amendments act as slow-release fertilisers, providing a sustained source of nourishment for plants and the soil microbiome.

In cases of acute nutrient deficiencies, foliar feeding via the sprayer can be a rapid and efficient way to deliver nutrients directly to the plant. Utilising water-soluble fertilisers sprayed on the leaves ensures quick absorption, remember not to overfeed in a single application.

Use a balanced fertiliser that includes nitrogen (N) and the nutrients required by the plant to get this nitrogen to amino acids, magnesium (Mg) and Manganese (Mn) and then to protein – phosphorus (P), Sulphur (S), Boron (B), Potassium (K) and Zinc (Zn) in appropriate ratios. This helps maintain overall plant health and supports essential functions like root development and flowering.

Hutchinsons Healthy Soils team are working closely with farm manager Josh Maher of Maurice Crouch Farms near Wisbech to look at how to manage his wet, fen soils this spring, to encourage some poorly established crops.

“One of our fields of winter wheat, grown on medium silt, grade 1 soil, has really struggled with the wet conditions. The field was ploughed and combination drilled, which then capped over because of the conditions,” he explains.

“These fertile, silty fen soils are known to cap on and just below the surface, and after digging several holes in the field it was clear that this was an issue,” explains Ms Prince.

Talking to the Healthy Soils team, the decision has been made to roll the field once conditions are more favourable, which will break open the cap, let oxygen into the soil and encourage further root development.

Early nutrition to get the crop tillering is key. “However, the answer is not just to go on with early nitrogen, it is important that the soil is ready for it, to optimise access of the nutrients to the plant,” says Ms Prince.

“Therefore, once the soil has been rolled, a foliar application of nitrogen will be used to encourage uptake.

By directly feeding the plant through its leaves rather than the soil, it is possible to bypass compromised root structures and kickstart crops into action, while stimulating root development.”

Mr Maher says: “On the Fenland skirt soils, we drilled straight into a sprayed off cover crop in late November and overall establishment has been better. The soils have not capped, and crop emergence has been more even, so there has been a definite benefit to leaving trash on the surface.”

Ms Prince agrees, putting this down to the trash opening up the soil, ‘acting almost like a snorkel’ thereby letting precious oxygen into the soil.

However, Mr Maher has noticed a striping effect from the combine chaff belts and believes this is because the chaff is holding nutrients back from the wheat, so will address this using liquid nitrogen in bands along the combine strip.

He points out that he is understanding and learning more about his soils all the time. “There is always something new to learn and this season is certainly testing our approaches, but it helps us to move forward in the long term and create a more sustainable and working soil environment for our crops.”

If you have questions about managing wet soils, contact our specialists: soils@hlhlt.co.uk

Planning T1s in a variable season



David Howard (Hutchinsons head of ICM)

*The variability of crops between fields and within the same field poses big challenges for fungicide planning. Hutchinsons head of integrated crop management, **David Howard**, offers some advice ahead of the all-important T1*

From highly stressed crops that suffered weeks of waterlogging, to early sown cereals that escaped the worst of the conditions and show good promise, 2024 is one of the most variable seasons for many years.

The variability applies within individual fields too, as many growers will have seen patches of standing water at some point over the autumn and winter.

Water stress has immediate effects on crops, especially for root development, biomass production and nutrient availability, but the impacts often continue long after the water recedes and soils dry out.

Alleviate stress

Stressed crops are inherently more prone to disease, so the first step in any control programme is to alleviate stress. Not doing so risks increasing disease pressure as the season progresses.

Actions must be tailored to individual situations, and care taken to make sure tank mixes do not become too complex or stressful for already struggling crops. Many growers will have already applied early nutrition to replace nutrients lost from the soil, or are simply less available due to the impact of

waterlogging on soil microbes, while some have included biostimulants with the T0 to promote rooting.

Early action is best, but there are still things we can do at T1 to improve rooting and help alleviate stress. Indeed, the AHDB growth guide estimates root development doubles during stem extension and the construction phase, from around 15 km of roots/m² at GS31, to 31 km/m² by anthesis (GS61).

Phosphites are a good option, both for stimulating root development and helping meet the crop's increasing nutritional demands at this time.

Plant growth regulators can also help by reducing apical dominance, prompting plants to divert more energy into rooting rather than top growth - often an inevitable consequence where early nitrogen is applied to boost struggling crops.

Timing challenges

One response of crops to stress can be to race through growth stages faster than normal, sometimes dropping leaves in the process, making fungicide timing difficult.

In recent seasons, some growers have been caught out in such situations, either going on too early where the leaf that emerged was not

the target leaf, or vice versa, where the target leaf had been dropped and the leaf being covered was more important than thought.

Careful plant dissection to establish the exact growth stage and optimum spray timing will therefore be vital, especially where crop development is more variable.

Growth stage 32 is the traditional T1 timing, however the target leaf three must be fully emerged before treating, which can be between GS31-33.

Where fields have areas of crop at different stages of development, it is impossible to treat everything at exactly the right time, and waiting for backward areas to catch up simply risks letting disease establish on the better parts. The best advice is to time sprays based on the areas of the field with the highest proportion of higher yield potential.

Protecting lower leaves

It is worth noting that in backward crops, or those with lower plant numbers, there is less biomass, which means the lower leaves could be more important than normal for building yield. In thicker crops, lower leaves often get shaded out by the flag leaves and tighter spacing between well-tillered plants.



*Monitor crop growth stages closely
to ensure optimum spray timings*



Effective, long-lasting early sprays are therefore vital to protect lower leaves as long as possible.

The big challenge is knowing how much disease is present, especially Septoria, which has a long latent phase - lengthened in cool conditions - so symptoms may not be apparent at the time of application. T0 fungicides tend not to focus on Septoria either, as rust is usually the target.

Wet weather ahead of T1 increases the risk of Septoria spreading up the canopy, particularly in denser, more advanced crops, while in dry conditions the opposite may be true. Septoria spread can also be slower in thinner, backward crops, but always consider the risks on an individual basis.

Yield potential is an important consideration when planning fungicide choices, but beware of cutting inputs unnecessarily. Fungicide strategy should be related to disease pressure, not yield. Fungicides do not create yield, they protect the potential, so avoid doing anything that impacts the potential of an already compromised situation.

Weighing-up the options

Septoria is generally the focus for T1s, and there is a promising new addition this year in isoflucypram.

The active promises excellent Septoria efficacy, and performs well against rust, especially when partnered with a rust-active azole (e.g. prothioconazole or tebuconazole). It is also good on eyespot, which may be a risk given the wet conditions and generally low varietal resistance.

Other good T1 options include bixafen, Fluopyram + prothioconazole, or fluxapyroxad + Mefentrifluconazole.

If rust is the target, rather than curative Septoria control, then benzovindiflupyr + prothioconazole is still the leading choice, while strobilurins offer good rust protection too. Both lack Septoria efficacy though, so should be partnered with suitable chemistry where necessary.

Fenpicoxamid is one of the strongest for curative Septoria activity, however it may be better saved for the T2, given the importance of upper leaves in building yield. If disease pressure is very high early in the season though, using stronger products earlier in the programme may be necessary.

The multisite folpet is a worthwhile addition to T1 programmes, not least as part of an anti-resistance strategy.

Applying the metabolite-based product, **Scyon**, at T1 has also shown good results in winter wheat. The product stimulates plant health to reduce disease severity, and coupled with a good fungicide programme, has given consistent yield benefits where disease is present, notably Septoria.

Novel disease approach

Trials with Nottingham University have been investigating whether biological products applied at T1, can improve the disease resistance of leaf two as it emerges.

Traditional T1 strategies generally aim to stop disease progressing up the plant, allowing the T2 to protect leaf two before disease reaches it.

However, with a 3-4 week gap between T1 and T2, disease can often get to leaf two, from which it is only a short distance to the flag leaf, therefore improving the plant's inbuilt defence is potentially very valuable.

Results last year were encouraging, with less disease found on both leaf two and the flag leaf.

Barley T1 options

With a tendency for putting on rapid spring growth, barley can be prone to stress, particularly where rooting is compromised. Stress may well increase as growth accelerates and roots struggle to meet nutrient demands, which in turn raises the risk of diseases such as mildew and ramularia.

The latter is an endophyte that lives within the plant without causing symptoms until stress occurs, typically drought or heat stress later in the season. But we could see ramularia appear earlier this year if crops are stressed.

Options for ramularia and established mildew control are fairly limited, so reducing crop stress through good nutrition and all-round disease control is again essential. Folpet is a worthwhile addition at either timing in barley, especially for its ramularia activity, while cyflufenamid is the primary active for mildew.

The wet weather diseases net blotch and rhynchosporium are others to watch for, as risk could be higher. Most barley fungicides still offer good efficacy against both diseases, however beware of increasing net blotch resistance to SDHIs and strobis, and tailor product choices accordingly to manage the risks.

Your Hutchinsons agronomist will be happy recommend a suitable disease control programme for you, or contact us: information@hlhltd.co.uk

Cereal PGRs — getting the timing right

Alice Cannon, Agronomist & Regional Technical Support Manager, highlights the benefits of well timed PGR application.



Alice Cannon (Agronomist & Regional Technical Support Manager)

It goes without saying, most of us have had a very wet autumn and winter this year, on the whole crops have suffered significant waterlogging leading to poor soil structure, surface capping and impaired rooting and crop growth.

It is during this foundation phase that the plant sets the tiller potential which in turn set ears/m² and therefore the yield, making this phase one of the most important.

Well timed Plant Growth Regulators (PGRs) will help to manipulate crops to improve their yield potential.

Reducing height

The most well-known effect of using a PGR is to reduce crop height. Shortening internodes and reducing plant height helps to reduce the risk of lodging by reducing the leverage force, however, because all the leverage force comes through the base, weakness here can be quickly exposed.

There are 2 other main areas that PGRs are useful for:

- 1. Stem Strength** – measured mainly through stem diameter.
- 2. Anchorage** – spread and depth of roots (root plate).

PGRs alter the partitioning of plant resources. This temporarily halts stem extension and allows more resources to be used to enhance stem wall thickness and improve rooting growth. They also reduce apical dominance which in turn

increases tillering as well as tiller retention which helps to generate a more uniform crop.

Each new tiller also produces at least two new crown roots which improves the root plate and therefore increases the anchorage strength.

Improving anchorage

Improving rooting should be a key focus in our crops this year. In waterlogged soils, water replaces the oxygen leading to anaerobic conditions. With no oxygen, root growth stalls forcing the rooting architecture to change, increasing surface rooting where oxygen is in greater supply. This not only leads to shallow rooting but also reduced nutrient uptake, in turn limiting plant development.

It will also lead to reduced water uptake, dare I say it currently, that will be crucial later in the season, especially if we come into a dry period at grain fill.

Shallow rooting often causes lodging issues later in the season. Seasonal weather increases the leverage pressures on the plants, beyond what shallow rooting can support. This is mostly associated with tall crops, however the possible lower crop height this year is likely to be offset by the significantly poor root anchorage we have.

Whilst historically GS30 applications (T0) have been tailored around disease pressure, it is just as important to use it for crop and root manipulation.

Tillers can be aborted from stem extension which simply is not an option this year given that we are already facing a reduction in tillering due to a waterlogged foundation phase. Planning your GS30 application early will ensure it is not missed and your crops are protected.

Prohexadione Ca and/or Trinexapac Ethyl will be the most suitable actives at this early growth stage because of their speed of activity and their active temperature range. Our tramline and small plot trials last year also clearly showed these actives were significantly beneficial to building overall stem diameter and stem width. Whilst care is needed with product choice and rates on backward crops, more forward, early-sown cereals will benefit from a slightly higher rate.

The number of fertile tillers is determined by the number of leaves present at stem extension, so keeping GAI going through March will be crucial to building tiller numbers. Early nitrogen applications will help build and maintain GAI, as will utilising zinc and phosphites with early PGR applications.

You may also consider using Cambridge rolls when soils dry sufficiently, but before stem extension occurs, to help consolidate soil and enhance tillering/rooting.

If you have questions about using PGRs, your agronomist can advise on best actives and timings.



Cam Murray (Northern Technical Manager)

Be careful with spring herbicides

*Great care is needed when planning spring herbicide applications to crops that experienced prolonged periods of waterlogging and anaerobic conditions, says Hutchinsons northern technical manager, **Cam Murray**.*

Such conditions are likely to have compromised root development and increased crop stress, which needs to be addressed before applying post-emergence chemistry, he says.

"Even if autumn weed control was compromised and you're keen to apply a spring herbicide once conditions allow, don't do anything if crops are showing stress or yellowing; it'll just make a bad situation worse."

In such situations, it may be better to delay herbicide application, especially of stronger contact grassweed chemistry, and wait until early nutrition has stimulated growth and improved the resilience of crops to any potential herbicide effects.

"Accurate spray timing is paramount this spring and key to not doing any more damage than has already been done by the weather."

Targeted approach

With hugely variable crops across the UK, and even within some fields, decisions must be made on a field-by-field basis, Mr Murray advises.

"Assess crop condition and weed pressure first, then consider the most suitable strategy."

Ideally, spring weed control will include contact herbicides to treat weeds already present, plus residual

chemistry to catch later emerging weeds, and avoid the need to return with more expensive contact chemistry later. But that strategy may need modifying this season, he says.

If, for example, conditions have not allowed travel until March to apply residual chemistry, there could be more sizeable weeds by then, so the focus may be better spent on contact chemistry rather than residuals. Crops drilled last autumn that did not receive any pre-em, may also face greater immediate weed pressure, requiring stronger contact chemistry, especially where black-grass emerged late.

Iodosulfuron-methyl-sodium + mesosulfuron-methyl mixes are good for a plethora of grass and broadleaf weeds, but should ideally be accompanied by a residual partner to control later emerging weeds, Mr Murray says.

"Remember too that, for black-grass and ryegrass in particular, much depends on the weed's growth stage. Be realistic about the control you expect to achieve from post-em, especially given the levels of ALS resistance generally. There's no silver bullet."

Even where crops received a pre-em last autumn, heavy rainfall has reduced the persistence of residual chemistry, so a spring top-up may be required to control any

flush of problematic grass weeds like black-grass, ryegrass and brome.

The main residual options for black-grass control are flufenacet-based chemistry, with diflufenican, picolinafen or pendimethalin. But, with evidence showing wider resistance to flufenacet in ryegrass species, care is required as to its use, and testing is paramount to understand the issues faced.

Research into three-way mixes of chlorotoluron, diflufenican and pendimethalin at the pre-emergence stage, shows promising results, with improved control of ryegrass and bromes in particular, he notes. "If you can get on at that stage, then use contact chemistry later, you can probably get decent control, although it's all down to timing and the weather."

Glyphosate caution

With little or no opportunity for stale seedbeds ahead of planned or unplanned spring cropping, pre-drilling glyphosate on stubbles is key to avoiding an excessive weed burden in spring crops.

Mr Murray reminds anyone using glyphosate to first check their water quality and pH, as hard water, or water with a high mineral content, contains more cations that can "lock-up" glyphosate and dramatically reduce its effectiveness in the field. This may be a particular risk for those extracting water from a borehole in a hard water area and not using a water conditioner.

Questions about spring herbicide applications?

Contact us:

information@hlhltd.co.uk

For more information on any of our products or services, please contact your local Hutchinsons agronomist, or contact us at:

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