Fieldwise
AGRONOMY NEWS FROM HUTCHINSONS
Crop Production Specialists
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Future proofing
with variable rate inputs

We report on a Yorkshire farm that has turned to variable rate applications to build a more profitable and sustainable future

With 11,000 pigs and 650ha of combinable cropping and contracting, near Pocklington, Thirsk Farms sits across 7 sites within a 10-mile radius. The farm business is diverse, running various enterprises that extend to commercial lets, and more recently a commercial grain store, with 13,000 tonnes of grain storage for local farmers.

The business started its journey into precision farming three years ago when local Hutchinsons agronomist **Sam Hugill** had a couple of the farm's outlying fields **TerraMapped.**

"One of the fields ran alongside a housing estate and it was assumed the poor performance of the crops here was down to toxins or sediments running out of the estate. However, the TerraMapping showed this not to be the case at all – the soils were deficient in micro-nutrients and the previous soil sampling had not shown this up," explains Sam.

Impressed with the accuracy of data that TerraMap yielded over their previous soil mapping system, farmer Harry Thirsk and his manager Steve Baxter made the decision to move over to Omnia and sign up to have the whole farm TerraMapped using the **Standard + OM service.**

"We felt this was the right investment to make for our farm business and have not looked back."

Steve references how in the past it was challenging to get any

soil sampling done in-between combining and cultivations, and opportunities would often be missed, however this was certainly not the case with the Omnia team.

"In fact, we were the ones being chased as the TerraMap scanner was often waiting at the side of the fields as the combine came off – even late on a Saturday night!"

Omnia precision specialist **Chris Blashill** was able to bring all the Thirsk Farm data over from the previous system and incorporate this into Omnia.

"It was pretty straightforward to do and meant that all of the data which belonged to Thirsk Farms was brought into Omnia so we could use this going forward."

Variable rate nitrogen

Steve continues: "The nitrogen crisis was the pivot for us to look at how we could introduce variable rate nitrogen; we wanted to make the best use of our pig manure ensuring it was going where it was needed. We had always just gone on with a blanket approach and then topped up where and when we felt we should – 'pot holing' which we wanted to move away from – and on top of this make the most efficient use of any expensive nitrogen we were buying in."

The team worked closely together to incorporate data from TerraMap, manure management plans, historical field characteristics and the rotation to draw up variable rate nitrogen application plans.

Omnia generates variable rate plans built on all this data, explains Chris. "Then it is simply a matter of putting the fields onto a USB stick and these go straight into the tractor and away it goes."

"It's been a revelation, " says Steve. "We have had trailers arriving back to the store with bags of nitrogen that were not needed!"

Sam cites the example of one outlying field that had come out of five years of grass. "This was going into a first wheat, so just before the last cut of grass we had the field TerraMapped. We were surprised at how nutrient deficient some areas of the field were, but on discussion with Steve we realised it has not been receiving the same amounts of pig manure as fields closer to the home farm unit."

"Manure management plans were created in Omnia to address this, and this also led to the farm investing in new all-season stone tracks to allow manure to be tipped where needed during winter."

"We used NDVI Satellite imagery and chlorophyll mapping at key nitrogen application timings to generate the variable rate nitrogen plans within Omnia," explains Chris.

"The range at GS30 was quite something – only needed 207kgN/ha whilst others needed 293kgN/ha - that's a difference of 86kgN in just one field - that's £1900 of nitrogen saved on one field vs a blanket application!"

Left to right: Chris Blashill, Steve Baxter and Sam Hugill

"The crop evened up as it grew through the season with less and less variation, as you would expect," he adds.

Yields have responded positively across the farm, with Sam reporting improvements of anywhere between 3-5%, and this particular field yielding 9.19t/ha.

Future plans

The team are now looking at variable rate drilling for cereals this autumn in a bid to even up establishment across the wide range of soil types. As well as the soil data from TerraMap, weed pressure and slug maps will be created within Omnia.

"It's been a team collaboration from start to finish," says Steve. "Knowing that my agronomist and Omnia specialist are working closely together means that I don't have to worry about it. Sam walks the crops and knows which fields need what and when, and he speaks to Chris who manages Omnia so that field operations happen when the crop needs them. "

"There is no doubt in our minds that this is the way forward," he says. "Omnia has more than paid for itself just through the savings we have made on nitrogen. But more than that, it's better for our soils and long-term sustainability of the farm."

For more details about TerraMap or variable rate input plans, please contact your agronomist or Omnia representative, alternatively please visit the Omnia website: omniadigital.co.uk

David Howard *(Hutchinsons Head of ICM)*

Neil Watson *(Hutchinsons Technical Manager)*

BYDV in winter cereals: the challenge ahead

A challenge that we had thought we had negated was brought back into sharp focus by the autumn of 2022, and it is a threat we still face. ***Neil Watson*** *(Technical Manager) and* ***David Howard*** *(Head of ICM) at Hutchinsons, answer questions about BYDV*

Is the risk inherently likely to be greater this season?

No one knows what the actual risk will be this season, but what is clear is that there are several factors to consider:

The potential source of infection (in the previous crop).

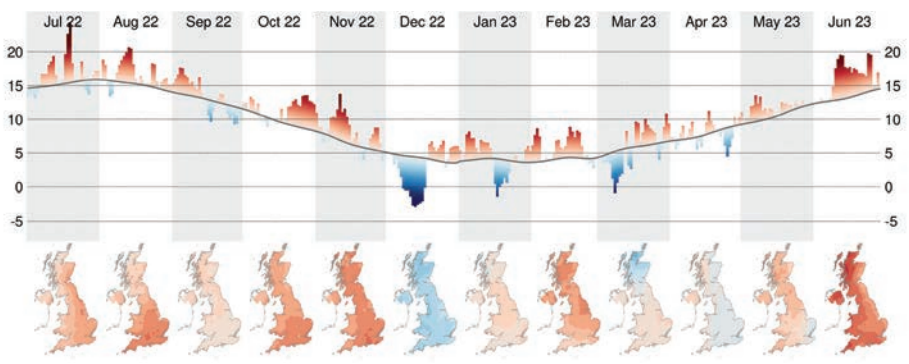
- There was more BYDV showing in crops this year, primarily because of late infections in a mild autumn/spring. The Met Office graph below illustrates this very point. The symptoms expressed were secondary infections so not your typical foci normally associated with BYDV.

The green bridge effect from volunteers

- Delayed harvest and poor late grain fill will impact seed size, so it would be expected to see a higher proportion of volunteers this autumn. At the time of writing the soils remain wet, making it more conducive for seed lost over the back of the combine to germinate.
- It will therefore be even more imperative this season to follow best advice and remove green stubbles early, preventing them acting as a primary source of infection.

Yearly UK climate summary up to 29 June 2023 (compared to 1991-2020)

Daily mean temperature (°C)



Graph 1 *Source: The Met Office. The anomaly maps at the base of the table show month by month variation across the country compared to the long-term norm. The line above shows the actual variation for the UK in terms of actual day degrees above that norm.* ***All bar December temperatures through the autumn and early spring were above the long-term average.***

Spraying or cultivating early, at least 5 weeks before drilling will help reduce the survival and early ingress of aphids into newly drilled crops. Remember in the early stages of die back, the volunteers might attract more aphids due to aphids being attracted to a yellowing crop.

The impact of drilling date

- The earlier a crop is drilled, the increased window of exposure an autumn crop will face, also the greater number of potential sprays required.
- A mild winter (as experienced last autumn) has the same effect of prolonging the window of vulnerability at the other end of the season. Aphid flight still occurs beyond 11°C air temperatures. Winter temperatures also impact aphid survival and the potential for late primary or even secondary infection.

Despite our best endeavours, it is increasingly probable we are more likely to see BYDV in our crops most years from now on. It will be more likely because of timing issues and short persistency of the products we are now having to rely upon.

With aphids is it just a numbers game?

- The other surprising factor not to be underestimated, was the potential number of aphids carrying virus, in some cases upwards of 30%, higher than the 5% historically considered the norm.

Have tolerant/resistant varieties a role to play?

- Increasingly so - it certainly takes away some of the risk.
- In wheat presently it is either RGT Grouse or RGT Wolverine, more options will be available in future.
- In barley it is more about tolerance, it is presently the domain of the six-rows. KWS Feeris is the only variety presently on the AHDB Recommended List, although others are available. In France, most of the new six-row varieties have tolerance, also the very first of the two-rows are now available (it is unlikely to be long before we see them start appearing in the UK).

Will reducing crop stress minimise the impact of BYDV?

- Yes, crop yellowing seems to attract aphids into the crop. It is therefore important to try to limit crop stress, particularly anything that might increase crop yellowing - whether that means maintaining adequate supply of micro nutrition, or minimising crop damage from herbicide stacks.

Can we take some of the guess work out of product timing?

- Yes, our Omnia digital web-based software has a BYDV risk tool built in. It combines 1km accurate weather data, with the drilling date of the crop, to give a field-by-field risk level using a traffic light system and indicating the timing as illustrated below.
- The BYDV model within Omnia uses the industry standard T-sum model and because drilling date, field location and climate data are already known, this model is immediately available in Omnia as soon as at-risk crops are entered.

The T-sum model does not tell you whether aphids have invaded crops, or not, it simply highlights the risk of the damaging secondary spread phase of BYDV as infected aphids march the disease out from the point of infection. It can be used to highlight risk and prioritise workload which can be particularly important when the season becomes unsettled.

As you can see in the image below, fields are colour coded according to their risk. Green means the field has not reached the required temperature yet. Amber shows that the key timing is approaching shortly, allowing for preparation time for application, and red represents high risk of movement if aphids are present.

Treatment dates can be recorded, and these will then allow the model to reset and begin assessing risk after treatment. Risk category and treatment are recorded and can be reported throughout the season.

A screen grab from the Omina BYDV model

The model should be used in conjunction with aphid trapping information, such as the Rothamsted Insect survey, and field observation to understand whether fields require treatment. It is important to note that if high populations are being found in field, then these should be treated urgently regardless of model risk category.

When BYDV sprays are required – do not delay application just to suit other applications to the crop.

What about using IPM4 (Insecticide free option) as part of my Sustainable Farming Incentive?

Insecticide free means just that. A starting point might be to see under what circumstances this might best fit. Although not something that immediately comes to mind, it might be better suited to stacking on top of other stewardship options other than necessarily using in cereals. This is something you could explore with our Environmental Specialists.

In cereals start by looking at the risks and factors to mitigate against them, for example with BYDV. Avoid hotspot areas/locations (historically bad for BYDV most years), and hotspots on farm, such as near woods, river valleys, i.e., topography of the fields. Cropping risk factors, and the order of impact from BYDV (greater to lesser). Oats (worst affected) ahead of Barley, then Wheat. Winter crops are more impacted than Spring crops, although with BYDV resistance in winter wheat it might override this differentiation. If choosing wheat use a resistant variety to BYDV and OWBM (RGT Grouse). Take out volunteers early to avoid direct transfer risk. Do not drill too early (Gout Fly Risk), do not drill in fields after grass (Frit fly, wireworm risk).

You cannot eliminate all risks; however you can try your best to minimise them.

Finally, there are the economics where the SFI payment for IPM4 is more likely to offset any yield loss. Especially when commodity prices are high, which makes it more likely an option on sites that have a lower yield potential.

Questions about BYDV this autumn? Contact us: information@hutchinsons.co.uk

Autumn residuals…
optimising performance

***Dick Neale** (Hutchinsons Technical Manager) considers best practice for applying residual herbicide packages this autumn*

***Dick Neale** (Hutchinsons Technical Manager)*

Whilst I do not intend to cover cultural controls in any detail within this article, for the various grassweeds that we deal with, cultural control remains the first, and vital, rung on the ladder of successful grassweed control.

It is absolutely key that cultural controls are used to present the minimum number of germinating seeds to the residual herbicide component of the programme. In general, it really is a case of do not blame the herbicide when high seed numbers are present.

In 2022/23 the residual packages have again demonstrated that 80% control is regularly achieved, but the outcome of 80% control of 200 seeds/m^2 is very different to 80% control of 1000 seeds.

2023 summer has presented a very different potential outcome to stale seedbeds or even leaving seed on the surface compared to the previous two seasons. Germination of early shed black grass seed has been impressive after summer rains, so the potential for high impact, non-inversion cultural control is significant this season.

Optimising residual performance

The base approach to residual use is understanding the weed you are treating, the weather pattern in place and seedbed conditions. While most grassweeds are dominated by a September to November germination period, Italian ryegrass will germinate continuously into the spring and soft brome will have a late spring germination flush …hence a large stack of residual, applied once in October, will not afford long enough control of these weeds.

For some years now, the optimum performance of residuals has come from a sequence of applications, for black grass and bromes, at least two sprays, for ryegrass and specifically soft brome a sequence of three sprays.

Sequencing is not about spending more money, it is simply recognising the fact that most of the key herbicides have a half life of around 30 days, so you must reapply to maintain control of later germinations. Longer lasting components like aclonifen, DFF, pendimethalin and tri-allate can be utilised early, but components like cynmethalin, flufenacet and prosulfocarb, where allowable, must be topped up or used in sequence. Aim to include a minimum of three herbicide modes of action.

"I'm drilling late, it's getting wetter and spray days are likely to be short" …does not change the fact that a single, large stack applied pre-em in late October will not last the course.

Optimising the application

Residual performance is very reliant on the quality of the seedbed and adequate moisture but also good coverage and deposition of the applied spray.

Much emphasis is placed on nozzle choice, and while important, it is forward speed, boom height and water volume that have most impact on the overall performance of residual herbicides.

Within reason, the slower you go the better they work and that is because the boom can be run lower, at least accurately to 50cm above the soil, and the boom remains more stable.

There is much debate about water volume to use but 200l/ha is a good all-round quantity to utilise, with higher rates often just compensating for less accuracy in other areas. It is far better to reduce filling time and spend a little longer on application at a slower speed, and by slower, I mean 8-12kph.

Angled nozzles are now widely used for a multitude of applications, but the technique is particularly useful for residual herbicides as it ensures good coverage to all sides of any clods within the seedbed. Angling of the nozzle also allows the boom to run even lower than the standard 50cm and still achieve the required nozzle overlap. This can be optimised with a number of excellent boom height control features now fitted to modern sprayers.

Questions about this article? Please contact us: information @hutchinsons.co.uk

Field Beans... worth further consideration?

With Oilseed Rape being a mainstay and quite often referred to as the 'banker's crop', it has been difficult for other break crop options to be brought into the rotation. However, with the problems associated with cabbage stem flea beetle prevalent in certain regions, other crops must be considered. Are Field Beans a worthy option? Cam Murray (Technical Support Manager) outlines the pros and cons.

As a break crop

- Low input from a fertiliser perspective due to the natural nitrogen fixing ability.
- Various ways of sowing from precision drilling to 'spin and plough in' technique allow flexibility in establishment, albeit more accurate drilling is preferred.
- Lower fungicide inputs than cereals/OSR – depending on variety and disease levels two well timed flowering sprays usually cover them.
- Great entry into a first wheat and beans can leave between 30 to 80kg of residual soil N for the new crop.
- Option for companion crops.
- Aid soil structure.
- If you can access the human consumption market, then good margins can be made.
- If done well good yields can be achieved.

Potential issues

- Bruchid beetle is a serious threat the further South you go, and damage from this pest eliminates human consumption.
- Yield can be variable – trials reveal that yield can fluctuate 35%, which makes them difficult to budget on reliably.
- Weed control programmes are limited and certain weeds like mayweed, chervil and cleavers can be an issue.
- Stem nematode is a serious threat.
- Home saved seed, that may not be tested, can lead to undesirable pests and diseases which can survive for years afterwards. Clean seed should always be sown.
- Sowing depth, 4 inches is the preferred depth for good establishment.
- Should not be grown more than one year in five rotation.
- Not considered a high margin / value crop.

CRD changes

CRD has made the decision to remove EAMU applications from major crops, this creates the need for an adjustment, particularly when it comes to weed control.

- Being a major crop, any chemistry that was based on an EAMU can no longer be used.
- All the straight pendimethalin and Prosulfocarb options were based on EAMU and therefore are now illegal.
- Pendimethalin + Imazamox is full label.
- Clomazone in different guises is full label.
- Kerb has a full crop label.

Volunteer beans as a companion crop

There are schools of thought that the volunteers can be a source of nitrogen and act as a companion to the wheat crop – this on the surface is initially true, there is however a distinct difference between volunteers, and adding bean seed to the wheat crop as a companion.

- Volunteers tend to be patchy in nature and will be more prominent where the combine has been.
- The use of stubble rakes or shallow cultivation can be used to drag the seed around and spread it more evenly.
- In a black grass situation, they can help shield the grass from contact herbicides.
- Where patches are extremely thick, they can inhibit germination of the following crop.

Cam Murray *(Hutchinsons Technical Support Manager)*

Planting beans as a companion crop

Encouraging work is being carried out, looking at beans as a companion crop in wheat.

- Reduction in N = reducing overall carbon footprint.
- Beans only produce enough N for themselves, however if there is a nitrogen hungry crop then they will keep making N to feed their neighbour.
- The introduction of two different root types adds new dynamics to the soil.
- Beans are deep rooted and beneficially bring water from depth to the surface.
- Initial work done shows companion beans will deliver circa 50Kg of nitrogen to the host crop.
- New work is showing reduced pathogens when used as a companion crop versus a mono crop.

Questions about including field beans in the rotation? Contact us: information@hutchinsons.co.uk