

# agrovista SELECT

DEVELOPMENT INNOVATIONS

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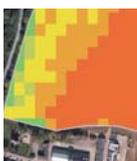
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# Project Lamport - the journey continues...



**Project Lamport is to be extended by several more years to help growers overcome blackgrass and grow profitable cereal crops while delivering a range of environmental benefits.**

Agrovista's flagship development programme in Northamptonshire was set up in 2013 to investigate a range of alternative methods to control blackgrass on heavy soils. It was originally designed to run for five years, writes Agrovista head of research and development Craig Morgan.

The project has been an outstanding success. It clearly illustrates that our key objective of reliably drilling spring wheat on heavy land is achievable in combination with a black-oat-based cover crop, enabling growers to maintain profitable cereal-based production in the face of high grass-weed infestations.

In addition, this Agrovista system has dramatically lowered seed return to the soil, reducing the weed seed bank in the process.

I believe we have nailed blackgrass control in physical terms. Despite five very different seasons, our cover crop/spring wheat system has achieved phenomenal successes year on year and shows no signs of breaking.

However, the work is still throwing up many technical questions.

“Despite five very different seasons our cover crop/spring wheat system shows no signs of breaking.”

First among these is the time it takes to deplete the blackgrass seed bank, and how quickly an infestation can bounce back if winter cropping is reintroduced too soon. Contrary to conventional wisdom, when we broke the system after two years the blackgrass was just as bad (see overleaf).

We also need to look at using extended runs of other spring crops in rotations. For example, we introduced spring barley two years ago and the early signs are promising.

This year we are also growing spring oats, partly to offer a different and growing market. This crop looks to be achieving as good control as spring wheat, but with the minimum of chemistry.

We also want to improve our system's ability to deliver environmental benefits.

Our cover crop/spring cereal system already ticks a lot of green boxes, including autumn cover cropping, no-disturbance drilling and the chance to establish wild flower margins.

If, as mooted, environmental payments do replace the Basic Payment Scheme, these and other measures could make spring cropping a much more profitable exercise than a winter-based rotation.

Soil health will be a massive driver at Project Lamport in the years ahead. We are already observing substantial physical improvements in the soil, but we have only just started to measure them. This will continue, along with trials to evaluate the role of biostimulants such as soil bacteria and mycorrhiza fungi.

After five years, Project Lamport has been more successful than we imagined. But, given the continually changing political and legislative backdrops plus never-ending technical advances, we believe there is a real need to keep the work going.

This will help give more growers the confidence to adopt a profitable and sustainable blackgrass control strategy, either through a wholesale shift to spring cropping or integrated alongside a winter wheat-based rotation.

# Project Lamport

## Two years of spring cropping not enough to overcome blackgrass

Spring cropping may have to be adopted for several consecutive years on heavy-land farms struggling to control high populations of blackgrass. Agrovista technical manager Mark Hemmant explains why.

The standout successful technique at Project Lamport continues to be direct-drilled spring wheat following an autumn-sown cover crop based on black oats.

While this system is delivering impressive results, the question many growers ask when they visit the site is how soon they can revert to growing clean and potentially more profitable winter wheat crops.

The simple answer is we don't know, but we're working on it. One thing is clear though – the widespread belief that two years of spring cropping will suffice before hitting the rotational reset button is nowhere near sufficient in a situation where there is a heavy and highly resistant background blackgrass population. It could turn out to be a very costly exercise.

Given the size of the challenge, that is perhaps not surprising. Blackgrass plant numbers exceeded 2000/sq m in untreated plots when Project Lamport began five years ago. The population was also highly resistant, with earlier herbicide trials achieving around 40% control.

The whole site was ploughed before Project Lamport commenced to reset the blackgrass, and subsequent cultivations were designed to leave the buried seeds undisturbed and to minimise surface disturbance, which can trigger germination in blackgrass seeds lying in the top few centimetres.

Over the past four very different seasons, the Agrovista spring-cropping technique has delivered excellent control, while producing yields that match a wheat crop with a moderate blackgrass infestation (see table, page 3) but at lower cost. The performance looks set to be repeated this year, with scarcely a blackgrass head to be seen.

In contrast, in autumn 2015 the “reset” plot was returned to winter wheat after



Craig Morgan shows how spring barley on heavy land is possible

“ Over the past four very different seasons, the Agrovista spring-cropping technique has delivered excellent control. ”

two successful years under the cover crop/spring cereal regime. Drilling followed a deep cultivation and stale seed-bed, mimicking likely farm practice.

However, the blackgrass head count rose to 129/sq m pre harvest 2016 and yields slumped to around 5.7t/ha. To regain control, the autumn cover/spring wheat option was immediately reintroduced in autumn 2016. Ploughing was not an option, given the huge number of viable seeds buried at the start of the project.

The blackgrass seed return was so high after the winter wheat crop that the resulting autumn flush almost out-competed the cover crop.

This was sprayed off with glyphosate + Companion Gold in late winter. This produced a wet mulch which then dried to a crust, shielding blackgrass from a further glyphosate spray.

A forest of blackgrass appeared in the following spring wheat crop, so we decided to limit our losses and spray it off to minimise seed return. On a farm scale this would have been a financial disaster.

However, we put the plot back into the Agrovista system again last autumn and the current spring wheat looks as good as any other in the trial.

### Blackgrass flourishing in winter crops

Compared with the dramatic reduction in head numbers and seed return under the Agrovista system, the farm's traditional rotation of two winter wheats/oilseed rape is struggling.

The blackgrass count looks set to rise again in the current second wheat, judging by the number of blackgrass heads that appeared this summer.

## Project Lamport

- Farm-scale plots on heavy land site in Northamptonshire
- Background blackgrass population – 2000 plants/sq m
- Established 2013 to identify techniques to control resistant blackgrass
- Comparing 14 different rotational systems
- Includes winter and spring cropping, autumn cover crops/spring wheat rotations, traditional fallows, hybrid rye for AD plants, a winter wheat/OSR rotation and later drilling of winter wheat
- Other features include compaction effects, drill and establishment techniques, precision farming systems and spray application methods.



Philip Wright on the power of roots and steel

This shows that a winter wheat crop with a moderate blackgrass infestation won't perform any better than a spring wheat, costs more to grow and is exacerbating the blackgrass problem – each year it is getting worse.

Once head counts reach 40-50/sq m, serious yield loss is inevitable and a significant change in blackgrass management is required. In the winter wheat/OSR rotation, the blackgrass head count rose from 55 in harvest 2014 to 500 last year.

### Cover crop key to control

- Chlorofiltre 25 – developed to optimise blackgrass control
- Consists of black oats and vetch
- Designed to maintain low autumn biomass, allows blackgrass to establish and grow
- Followed by rapid cover crop growth to condition soils and facilitate spring drilling
- Cover crop plus 'trapped' blackgrass sprayed off with glyphosate + Companion Gold in early winter
- Spring wheat direct drilled to minimise soil disturbance and blackgrass chitting.

### Giving roots a helping hand

Well-structured soils that drain freely and allow crop roots to grow unrestricted are key in the battle against blackgrass.

Such soils enable crops to compete better while putting blackgrass, which is more suited to wetter, more compact soils, at a disadvantage.

Speaking at the Project Lamport open day in this summer, cultivations expert Philip Wright, of Wright Resolutions said roots, rather than iron, were the ultimate soil-conditioning solution.

But work at Lamport showed that using some metal in conjunction with soil-improving cover crops in the first year or two resulted in much better soil structure than roots alone, and could accelerate the switch to efficient root-only systems.

Tillage radish alone struggled to make any impression on the heavy headland site chosen for the trial, said Philip. That begged the question: How little could be done to improve soils for the following crop?

Results showed that in the plasticky conditions last autumn followed by the wet winter, shallow, low-disturbance operations

(to about 15cm) gave better results than deeper, higher-disturbance passes. Deeper passes compacted channels in the soil, and the higher surface disturbance exposed more blackgrass seeds. Soils slumped over winter and the following spring wheat struggled.

However, where a black oat/berseem clover cover crop was established straight after the shallow, low-disturbance loosening operations, wheat establishment greatly improved and the crop produced an effective canopy much sooner.

The need for such cultivations in subsequent seasons should be assessed carefully, he added, aiming for roots only as the default position.

### Comparison of blackgrass control

#### Conventional rotation

Harvest year	Cropping	Yield (t/ha)	Blackgrass heads (sqm)
2017	First wheat	8.88	500
2016	OSR	4.24	-
2015	Second wheat	7.83	274
2014	First wheat	12.18	55

#### Spring cropping (after autumn cover)

Harvest year	Cropping	Yield (t/ha)	Blackgrass heads (sqm)
2017	Autumn cover/spring wheat	8.6	<2
2016	Autumn cover/spring wheat	8.65	<2
2015	Autumn cover/spring wheat	10.3	<3
2014	Late-sown autumn cover	-	-

#### Reset winter wheat

Harvest year	Cropping	Yield (t/ha)	Blackgrass heads (sqm)
2017	Autumn cover crop/spring wheat (destroyed)	-	-
2016	First wheat	5.69	129
2015	Autumn cover/spring wheat	9.5	<13
2014	Autumn cover/spring wheat	8.7	<3

# Regional development trials

## Wheat varieties and cultivations



Agrovista has launched a major trials programme to see if there is a link between cultivation regime and wheat variety performance and how any potential relationship might be exploited.

Cambridgeshire-based Agrovista agronomist Jack Hoyles explains.

The amount of low- and no-till carried out across the UK has increased rapidly in recent years, and is likely to rise further if government proposals to encourage it are carried out.

This shift in cultivation strategy has sparked a vast amount of trials work to help growers get the best results, but no-one seemed to be asking the question whether certain wheat varieties might be better suited to these techniques than others.

To that end, we have established a series of large-scale trials at each of our five regional development trial sites across England.

Already, these highly innovative trials have revealed some striking differences within and between varieties grown under high and low-tillage regimes, nowhere more so than at our eastern site at the Coldham Estate, near Wisbech, Cambridgeshire.

“Hundreds of growers had the chance to see the trials along with a range of latest technical developments.”

We chose four wheat varieties – a fast developer, KWS Siskin and a slow developer, KWS Barrel, plus the two highest yielders on the Recommended List, RGT Gravity and Gleam, which are likely to be popular over the next few seasons.

The varieties were established using either a low-till system, which at Coldham consisted of a shallow levelling pass with light discs before drilling, or a high-till system that involved a deep 25cm cultivation followed by two passes with the discs. In both cases crops were sown at 300 seeds/sq m on 11 October using a Weaving GD drill.

We saw some differences in uniformity of emergence. Low-tilled Gleam established less well, while RGT Gravity and KWS Siskin perhaps slightly favoured the high till. There was no difference with the KWS Barrel.

In terms of spring growth, KWS Barrel grew much thicker in the high-till plots and carried more disease. KWS Siskin looked better in the low-till plots, and appeared to be earlier under the high-till regime. By early July it was starting to senesce, whereas KWS Barrel remained much greener.

It will be fascinating to see if and how yields and margins both here and across the other sites will be affected. However, it is likely to take several seasons to see how much there is in this and how it might influence our agronomy advice.

### Regional development trial sites

Hundreds of growers had the chance to see the variety/cultivation interaction trials along with a range of latest technical developments at Agrovista's five regional development trials over the past few weeks, says Agrovista head of research and development Craig Morgan.

We were delighted with the interest growers have shown, and would like to thank all of them for taking the time to see the work we have embarked upon this season across the regions.

The aim is to focus on key technical issues while maintaining a focus on regional challenges. These trials, along with a host of smaller open days and events, will reinforce our commitment to supply farmers with the most relevant up-to-date advice wherever they farm.

### Regional trials

- Down Ampney, Gloucestershire
- Shrewsbury, Shropshire
- Coldham, Cambridgeshire
- Stoughton, Leicestershire
- Balne, Yorkshire

### Trials include:

- Wheat establishment
- Cereal varieties
- Fungicide trials
- Oilseed rape establishment
- Spring cropping/cover crops for blackgrass control
- Late-drilled wheats

# Variable rate drilling

## How to reap the benefits



As thoughts turn to establishing next season's crops, Agrovista's Jamie Camp provides some tips to help make the most of variable rate drilling.

Variable rate drilling of cereals can be a very useful technique to help optimise plant populations and therefore crop potential across each field.

It takes into account a range of factors that might affect establishment and adjusts seed rates accordingly.

The most common reason for adopting it is to allow for variation in soil type, usually to compensate for lower germination on heavier soils. These areas are often capable of producing good yields, but the trick is to establish enough plants in the first place.

There are also occasions when it might pay to reduce rates, such as on lighter areas of the field where germination is above average, especially where these areas are prone to drought out later in the season. Other physical factors like topography can also come into play.

“Drone images taken in the autumn provide an excellent record of crop establishment.”

Seed rates might also be adjusted to offset pressure from pests, such as slugs, in known problem areas, or to enable crops to better compete against weeds, such as blackgrass.

All this information can be gleaned from several sources, such as historical knowledge of the farm, crop walking observations, yield maps, soil conductivity maps (to determine soil types) and imagery.

For example, drone images taken in the autumn provide an excellent record of crop establishment, which can build up into a valuable resource over several seasons.

These layers of data are used to create a variable rate map divided into several seed rate zones. As the drill travels across the field, seed rate is automatically adjusted.

There are several rules of thumb to observe when embarking on variable rate drilling.

- 1 Be aggressive with seed rate changes**  
Be prepared to alter seed by as much as 20-40%. Anything smaller than this is unlikely to be sufficient, especially when aiming to offset poor establishment.
  - 2 Do a dry run before drilling**  
Head out into the field before your intended start date to ensure all components are working and talking to each other, and to give you time to investigate and fix the problem if they are not.
  - 3 Set maps up in +/- percentages**  
Setting zones up with percentage values rather than actual seed rates means all areas will automatically be updated when you adjust the base seed rate, perhaps to allow for poorer conditions or as the season progresses. If you use actual values you will have to adjust each zone.
  - 4 Be prepared to buy extra seed**  
Generally speaking, seed rates tend to be raised in more cases than they are reduced, especially in tricky fields. Overall seed use is likely to increase.
  - 5 Use caution when making decisions from yield maps**  
Yields can vary for all sorts of reasons other than plant population so the information may not always be representative.
  - 6 Make use of conductivity and imagery maps**  
Conductivity maps and imagery are excellent sources of information. Using our state-of-the-art Veris U3 soil analyser, we can measure electro-conductivity quickly and accurately in one pass of a field. We have also expanded our quadcopter fleet this season.
- Using our powerful in-house software called **MapIT Pro**, we can quickly process the masses of data collected by the Veris and drone to accurately assess in-field variation to create field zone maps.

# Winter wheat varieties

## Sorting the best from the rest

With 41 fully recommended winter wheat varieties currently vying for a place in growers' drills this autumn, Agrovista's head of seeds Tom Nickerson picks his potential winners to help ease the decision-making process.

A glance at the least significant difference column at the far right hand side of the current 2018/19 AHDB Recommended List (RL) for winter wheat list shows there is nothing to split the top two Group 1 varieties, the top seven soft Group 4 varieties or the top five hard Group 4 varieties when looking at fungicide-treated yields for the UK.

Even where the RL yield difference does start to become significant, that is often not borne out in commercial crops. We are talking marginal gains, which can change depending on location and farm system, so we need to be looking wider than yield alone.

Of the 41 varieties on the current list, I have chosen seven that I think will make a significant commercial impact this coming autumn and for the next few seasons.

KWS Zyatt follows on the success of Skyfall, which broke the mould for Group 1 wheat, offering feed-wheat yields and the chance of a breadmaking premium.

Zyatt's yield score of 102 is only 2-4 points behind the best feeds, and delivers strong agronomic scores, including 7s for brown and yellow rust and 6.2 for Septoria.

It has the second-highest untreated score on the RL, so has a lot of inherent yield potential. It is a good early variety and performs well as a second wheat.



Even where the RL yield difference does start to become significant, that is often not borne out in commercial crops, says Tom Nickerson.



Gravity



Gleam

Unlike Skyfall, it does not have orange wheat blossom midge resistance.

Group 2 variety KWS Siskin is perhaps my pick of the bunch. It has been a consistent performer, and has a tremendous disease resistance profile – 9s for the rusts and 6.9 for Septoria and shows no signs of weakening.

Its UK treated score is 103 so it is right up there. It can't be drilled early and it needs a good PGR programme, but there is definitely a place for it.

Turning to hard Group 4 wheats, RGT Gravity the highest yielding variety on the Recommended List at 106, is a high input variety, due to its Septoria figure of 5.2. But look after it and it will deliver.

KWS Kerrin topped the RL when it came onto the list last year, and it consistently produced the highest yields among our seed contracts.

Both these varieties have Santiago in their parentage, and they are two exceptional wheats. There is very little to choose between them agronomically and quality wise.

RGT Gravity does appear more consistent, claiming top yields across all regions, as first and second wheat and on heavy and light soil. If I were only adding one feed wheat this year, I'd look at this one first.

Supplies of Gleam will be limited this autumn. This impressive new high yielding feed wheat can be drilled early and has a good Septoria score.

Graham looks set to build share this season, especially in the west where it yields as well as anything else, helped by its Septoria score of 6.9.

Soft Group 4 variety LG Sundance has the highest Septoria score on the list at 7.4. It could be useful, again especially in the west, though it is weak on eyespot and has a specific weight of 75kg/hl.