

# agrovista SELECT

DEVELOPMENT INNOVATIONS


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# Sprayer set-up for maximum performance



Spray application technique can have a dramatic effect on the performance of residual grassweed herbicides.

Pre-emergence and post-emergence residual top-ups play an increasingly vital role on many farms. They can take the pressure off (or even replace) contact graminicides, which are often struggling to cope with rising grassweed resistance.

With bills approaching £100/ha on some farms for residual herbicides alone, growers need to eke out the best possible performance from their residual chemistry. It's very evident that to get the best performance from residual herbicides, we need to 'paint' the soil. To achieve this, we need to combine both higher water volumes and lots of droplets. These two traits can be difficult to achieve together.

“ To get the best performance from residual herbicides, we need to 'paint' the soil ”

This is because in order to achieve higher water volumes, traditionally we would switch to a nozzle with a larger orifice. This would obviously increase water volume, but also at a cost of increasing droplet size.

You will have 64 times as many droplets using a fine spray with a droplet diameter of around 100 microns than a coarse one with droplet diameters of around 400 microns for the same volume of water.

For best performance therefore, it is vital to retain a smaller droplet size as well as higher water volume for optimal coverage. There are several ways to achieve both of these traits simultaneously.

**Slowing down forward speed** is a simple way to increase water volumes and maintain a smaller droplet size. Whilst this may not be a popular move for large acreages, it is something that should be considered for difficult grassweed fields.

**Using twin lines** with the front line angled 30 degrees forward and the back line straight down has been a successful way of achieving best coverage in Agrovista's comprehensive application development work over the past few seasons. Not only does this allow higher water volumes without having to increase droplet size, but it also brings in lateral movement to spray droplets, significantly improving coverage.

**A twin cap** on each turret can replicate twin line performance for sprayers without twin line capability. As with the twin line set-up, the front nozzle in the twin cap should be angled 30 degrees forward and the back nozzle angled straight down – not backwards, as this increases drift.

The best results for a number of seasons now have been with flat fan nozzles angled forwards and down using either twin lines or twin caps. Using blue 03 nozzles at 3 bar angled forward 30 degrees and straight down in the same turret allows double the water volume whilst maintaining and not compromising spray quality. At 9.6 kph that would deliver approx. 300 litres per hectare (150 forward & 150 down), and this has consistently produced the best results.

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# Sprayer set-up for maximum performance continued...

The following photos show the difference between the best and worst performances from the same product, applied to the same field on the same day using traditional farm equipment, boom heights and forward speeds:

Where 300 l/ha is impractical, the same configuration at 14.4 kph forward speed would deliver approx. 200 l/ha (100 forward & 100 straight down). Whilst this performance has proven not to be as good as the higher water volume, it has consistently been the next best and significantly better than air inclusion nozzles.

To complement smaller spray droplets, the closer the nozzle is to the target (while still achieving the correct spray pattern) the better the performance is going to be.

“ The performance of air inclusion nozzles can be improved significantly by using application aids such as Remix ”

One of the biggest problems these days is that with wider booms and increased forward speeds, the opposite is happening. Most spray booms are being carried too high, compromising efficacy and leading to excessive drift. If you can reduce your boom height to around 40-50cm above the target, that's a real step in the right direction.

Whilst air inclusion nozzles are very popular and can potentially bring in extra spray days, the performance has been consistently poorer than flat fans. Like with flat fans however, the performance of air inclusion nozzles can be improved significantly by using application aids such as Remix.

Adding Remix, a paraffinic oil made up of long-chain molecules designed to reduce spray drift, had a dramatic effect. Remix improves the spray pattern, giving a more even distribution of herbicide onto the soil. Its long-chain molecules give it a positive charge which helps to bind the herbicide active to clay and organic matter, keeping herbicide in the surface layer for longer. This improves efficacy of the residual herbicides.

Not only does this keep the herbicide in the zone of activity for longer, but it also helps reduce crop damage by reducing chemical getting washed down to emerging seedlings - something that has become an increasing problem as more and more residual chemistry is stacked pre-emergence. This can be further exacerbated with poor seed beds and/or heavy rain soon after application.

## Trooper 2 l/ha + Herold 0.3 l/ha applied on same day to same field



Twin cap delivering 300 l/ha total



Air Inclusion nozzle 150 l/ha

## Draughton 2016-2017

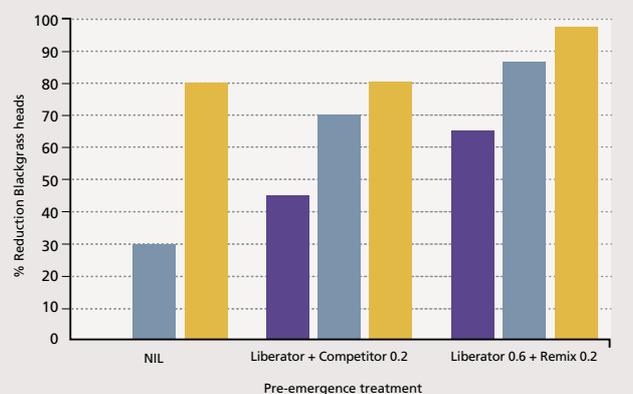


Liberator 0.6 + Competitor



Liberator 0.6 + Remix

The use of a high-quality application aid improves efficacy of residual chemistry



Early post-em treatment

■ NIL ■ Avadex / Fence 0.25 + Herold 0.3 ■ Avadex / Fence 0.25 + Herold 0.3 + Xerton 0.6

# Project Lamport

## Evaluating different approaches in the battle to control blackgrass



**Top Left:** Plantsystems Precision Technology expert Jack Harris showcases the new Veris Soil Sensor.



**Left:** Technical Manager Chris Martin takes visitors through the largest ever single field drill comparison.

**Above:** Steve Butler of Plantsystems discusses how technology is changing the way we farm and what opportunities this presents.

**Top Right:** Technical Manager Mark Hemmant takes visitors through the different systems at Lamport.

Now in the fourth year of the long-term project, the key objective for the site cannot be forgotten – can we develop an approach to reliably drill spring crops on heavy land?

If the last three seasons have proven anything, it is that the answer to the above is yes we can.

We have successfully managed to drill spring crops into the heavy Northamptonshire land, and we have shown the vast potential of the correct cover crops to aid in the reduction of the blackgrass infestation, while providing multiple soil, production and environmental benefits.

It is well documented that ploughing, delayed drilling and most importantly spring cropping are key to controlling grassweeds.

“ We have shown the vast potential of the correct cover crops to aid in the reduction of the blackgrass infestation ”

The challenge is to spring drill consistently and the correct cover crop has proven invaluable for this.

We have achieved consistency by using the correct cover crop for the situation. Low autumn biomass allows blackgrass to germinate in the cover crop. With huge potential to condition the dry soils over winter, combined with our management best practice, we ensure:

- Correct desiccation timing for soil stabilisation
- Tractor tyre pressure is checked to reduce unnecessary soil movement
- Appropriate speed and direction of drilling to reduce soil movement

The long-term goal is to significantly improve the soil condition, reduce the impact of grassweeds and ultimately return the field to a wider rotation including winter cropping.



If we compare the Agrovista spring cropping system with common spring cropping practice, we can start to see the additional benefits the cover crop rotation brings to farm profitability.

System AUK Spring wheat following cover crop				Common Practice Spring wheat following stale seedbed			
Input-Output £/t	Yield t/ha	Profit £/ha	Blackgrass heads/m <sup>2</sup>	Input-Output £/t	Yield t/ha	Profit £/ha	Blackgrass heads/m <sup>2</sup>
21.92	7.98	902.30	8.4	23.30	6.01	671.35	53.2

Input costs adjusted for cover crop seed and wheat at £135/t

As we have seen at the site, there is potential to destroy your cover crop earlier. However, this is not an option in year one of the system. As a spring option, barley has the potential to be profitable and highly competitive with weeds.

Spring wheat following early destruction cover crop				Spring Barley following cover crop			
Input-Output £/t	Yield t/ha	Profit £/ha	Blackgrass heads/m <sup>2</sup>	Input-Output £/t	Yield t/ha	Profit £/ha	Blackgrass heads/m <sup>2</sup>
20.23	8.65	992.75	1.4	17.69	9.89	1011.80	4.8

Input costs adjusted for cover crop seed and wheat at £135/t & barley £120/t

Production costs are rising and profitability is sharply declining for common spring cropping practice due to the ever-increasing blackgrass competition. The AUK system is reducing blackgrass pressure, seed return to the soil and ultimately the blackgrass seed bank.

This can be illustrated by looking at the viable seed return to the soil after each year.

System AUK Spring wheat following cover crop	Common Practice Spring wheat following stale seedbed
Viable Seed Return Kg/ha	Viable Seed Return Kg/ha
40.67	263.87

Assuming 100 viable seeds per blackgrass head and TGW 2.48g

Common spring cropping practice has returned over six fold the viable blackgrass seed to the soil compared to the AUK system and failed to achieve consistent blackgrass control in the growing season.

### Key Principles of Successful Cover Crop use:

- Choose the right cover crop for the job
- Correct drill for minimal soil disturbance in the spring
- Attention to detail

Crop management is key to perfecting this innovative approach to spring cropping and blackgrass management.

“ The long-term goal is to significantly improve the soil condition, reduce impact of grassweeds and ultimately return the field to a wider rotation ”

# Agrovista researched Cover Crop Mixtures

Product	Mixture	EFA compliant 2017	EFA compliant 2018	Pack Size	Sowing Rate	Grassweed Situation	Non Grassweed Situation	Catch Crop Situation	Companion Plant	Agronomy	Sowing Depth	Sowing Date	Destruction	Key Features																												
Chlorofire 25	Black Oat + Common Vetch	Yes - if already on BFS Form	Yes	25 kg	25 kg/ha	Yes	Yes	Yes	No	In a grassweed situation following OSR or early sowing reduce seed rate to 20kg/ha. Check previous herbicide use	15-25 mm	August - mid September	Glyphosate should be applied 6-8 weeks pre crop drilling. Second Glyphosate application should be applied close to drilling to remove small grassweeds	Unique combination developed as cover crop mix, allows germination of autumn weeds and improved soils structure via different rooting profiles for Spring drilling																												
															N-Structure + Berseem Clover	Not yet	Almost certainly - awaiting EU ratification	25 kg	15 - 25 kg/ha	Yes (15 kg/ha)	Yes	Yes	No	In a grassweed situation following OSR or early sowing reduce seed rate to 15kg/ha. Check previous herbicide use	10-15 mm	August - early September	Glyphosate should be applied 6-8 weeks pre crop drilling. Second Glyphosate application should be applied close to drilling to remove small grassweeds	Addition of berseem clover provides pivotal rooting structure with minimal soil disturbance, and breakdown quickly to recycle nutrients														
																													Tillage Max + Asian Radish	Yes - if already on BFS Form	Yes	25 kg	20 - 25 kg/ha	No	Yes	Yes	No	Suitable for rotation where peas/beans have replaced OSR. Avoid where OSR or brassica crops in rotation. Early sowing reduce seed rate to 20 kg/ha. Check previous herbicide use	15-25 mm	August - mid September	Glyphosate should be applied 6-8 weeks pre crop drilling. Second Glyphosate application should be applied close to drilling to remove small grassweeds	Asian radish works in combination with the black oat to provide deep soil penetration and improved drainage. Not suitable for grassweed situations
Straights / Bespoke Mix Partners	Tabor Berseem Clover	No	No	10 kg	2.5 - 5.0 kg/ha	Yes (1.5 kg/ha)	Yes	Yes	Yes	Companion Planting: March Berseem clover kg/ha to OSR seed rate. Cover/ Catch crop match rate to situation. Check previous herbicide use	10-15 mm	Companion plant Drill with OSR Cover crop: August - early September	Companion Crop: Frosts should kill Berseem clover. If mild winter use clopyrid type product e.g. Galera or Astrokerb. Cover crop destruction 6-8 weeks prior to drilling	Powerful tap root of Berseem clover provides penetration which the OSR roots follow improving establishment of the crop																												
															Phacelia	No	No	TBC	3.0-6.0 kg/ha	No	Yes	Yes	Yes	No	10-15 mm	Spring - early summer	Phacelia should be destroyed before seed set and 6-8 weeks pre drilling	Phacelia offers excellent soil conditioning, but due to growth pattern not suitable for grassweed situations, unless low rates used. Ideal partner for black oats														
																													Sprinter-P	Black Oat + Phacelia	Yes	Yes	20 kg	15 kg/ha grassweed situation, 20-25 kg/ha Non grassweed situation	Yes (15 kg/ha)	Yes	Yes	No	10-15 mm	Atresse mix Spring to July, Panache mix August to end of September	Glyphosate should be applied 6-8 weeks pre crop drilling. Second Glyphosate application should be applied close to drilling to remove small grassweeds	Specific black oat varieties for low CN ratio to allow quick breakdown of nutrients. Dries soil at depth with excellent soil conditioning properties
Development Mixes																																										

# Unpredictable conditions require flexible crops

Synchronicity, for those of us of a certain age, was a single by The Police released in the 80's and was synonymous with late 20th century farming practice – the drive towards uniformity in wheat variety development.

Yet moving into the 21st Century with global warming disrupting weather patterns, the concept of an asynchronous variety may be proving better suited to the unpredictability of seasonal change. This is where the unique variety Belepi may just have an advantage over others.

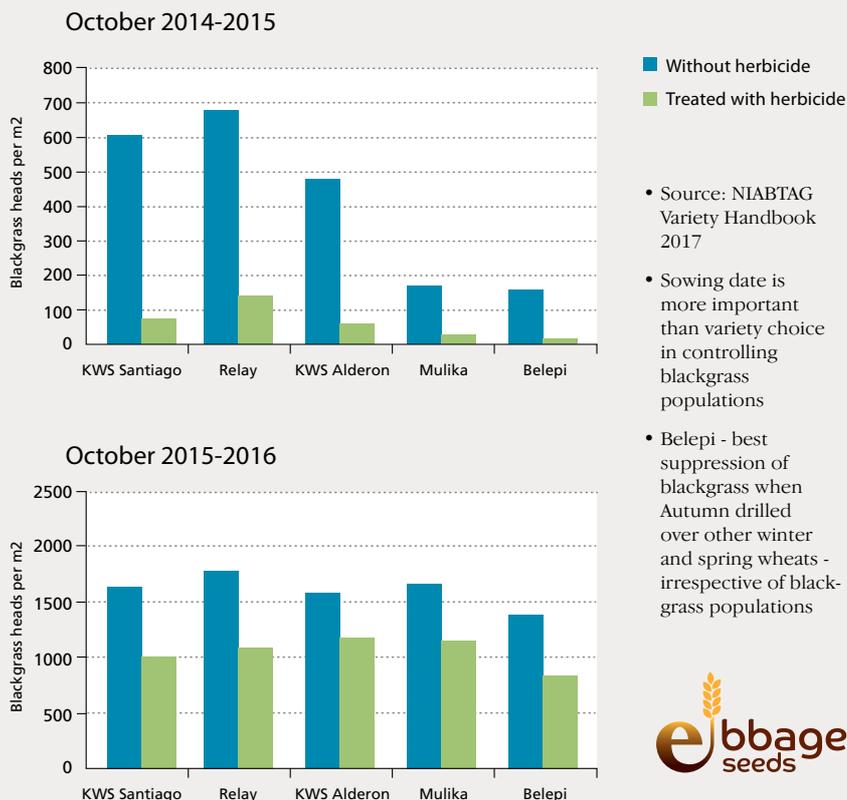
Asynchronous tiller distribution offers wheat plants the ability to accommodate changing weather patterns year-on-year. Coupled with 'fast finishing' and early maturity, it enables varieties to mature naturally before early plant death is initiated by the intense late June temperatures of 30 degrees.

Now in its third year of market availability, Belepi is undoubtedly a management tool for farmers first and foremost, with significant yield capability where all factors fall in to line. Yields of 14 tonnes per hectare have been commercially recorded - October drilled, out-yielding Evolution (in this instance) by 0.5 t/ha; highlighting Belepi's best drilling position.

Yet, with a six month drilling capability, the majority of plantings tend to be following root crops and maize. The variety's flexibility enables safe purchase of seed in the autumn without the worry of drilling it before the weather 'sets in' in November. With the opportunity of drilling in March, Belepi is uniquely the only soft endosperm available.

To conform to a standard growth pattern is a requirement of the 20th Century protocol of the AHDB Recommended List

## Belepi Blackgrass suppression when October drilled



and, like other similarly early varieties (e.g. Soissons), Belepi is non-conformist. Though a winter wheat, drilling in September is not generally recommended as its growth habit (so beneficial in out-competing blackgrass), is too rapid when drilled in this month.

Belepi is ideally suited to October drilling, but even then by May, it can be a full growth stage ahead of other winter wheats drilled at the same time.

To question its yield is to misunderstand the key benefit of Belepi. It offers a number of input cost-savings:

- Reduced seed rate requirement
- OWBM resistance
- Helping to control blackgrass
- Excellent end of season disease resistance for fusarium and septoria tritici
- Earliness of harvest
- Excellent pre-entry for oilseed rape and cover crop mixtures

Also unique to Belepi (England/Wales) is its recognition as a spring wheat for the purposes of the 3-crop rule. This enables Belepi to be drilled in October alongside other winter wheat and yet count as two crop groups, ideal for heavy land farmers in particular.

Belepi is no slouch when it comes to yield. Notwithstanding the earlier 14t reference, Belepi also performs well as a second wheat and whether drilling October, November or pre-Christmas it is recognised by experienced Belepi growers that a reduced sowing rate of some 15% below standard, is all that is required.

### STOP PRESS:

2017 harvest: October-drilled Belepi at Framlingham, Suffolk was harvested dry 1st August, standing to the end, while Alys Thompson of PC Kindred & Son, looks around at hectares of other winter wheat still out in the field and worse still, flat on the floor. Yielding a respectable 11 t/a (drilled at 80 kg/ha), Alys is delighted with the variety's performance.

[www.ebbageseeds.co.uk](http://www.ebbageseeds.co.uk)