my technical brief

frontier

September 2016

News and crop production advice from Frontier

In this issue

Five years of findings from black-grass trials

Five years of black-grass focused trials at Frontier's Staunton 3D thinking site have revealed interesting data. With profitability over the rotation a key criteria, the project was set up to challenge a whole range of management techniques and rotations to see how they work together to minimise black-grass seed return. Research and technical support manager, Christine Lilly shares the results which have shown alternative means of improving control and how growers can get the most from herbicide programmes.

Located at Staunton in the Vale, the soil type is heavy Nottinghamshire clay which is prone to waterlogging in winter. When the trials began, the field had always been in an OSR/ wheat rotation with cultivations based on non inversion tillage. The field had not been ploughed for at least 15 years and the site was supporting a high population of black-grass.

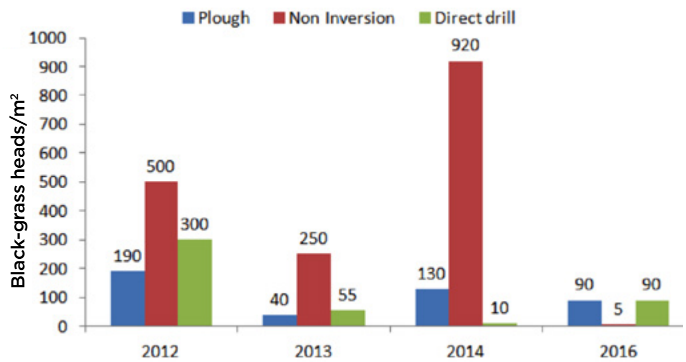
Over five years, the impact of employing different establishment techniques in combination with different drilling dates and seed rates has been tested. Plots are 0.5ha in size and examine other measures too, such as spring cropping and winter wheat following a 12 month fallow. A full herbicide programme is applied to the crop each season.

Black-grass growing in lines from seed loss following silaging of previous crop and baling.

Ploughing, inversion and direct drilling

When in winter wheat, and comparing the plough with non inversion blocks in 2012, there was a clear benefit to ploughing (190 heads/m^2 v 500 heads/m^2). Black-grass populations continued to be lower in the annual results from ploughed plots compared to non inversion for the next three seasons.

In autumn 2014, the black-grass population in the non inversion block was considered to be too high to continue trials, so it was rotationally ploughed to allow a clean start. Annual ploughing continued in the adjoining block, resulting in a black-grass population of fewer than 10 heads/m^2 in both the annual plough and the rotational plough in summer 2015. For 2016, the block that had been rotationally ploughed reverted back to non inversion. In a reversal to the previous seasons, the annual plough had more black-grass than the non inversion, since the seed bed had dried out following ploughing and had to be disced twice before establishing OSR which mixed up the black-grass seed throughout the profile. In comparison, the non inversion block which had a low seed return in 2015 was only lightly cultivated and little seed was brought from depth.



Graph 1: Comparing inversion, non inversion and direct drilling

Five years of findings from black-grass trials

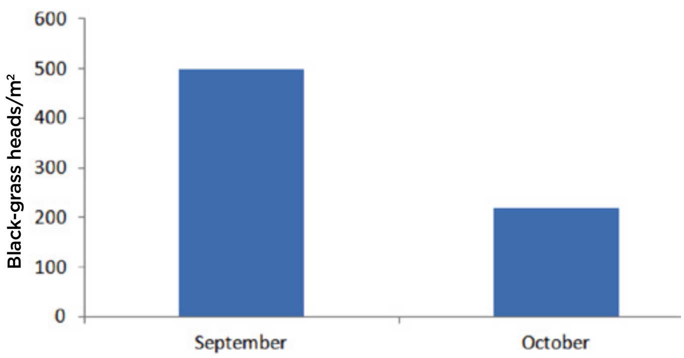
Ploughing technique

Ploughing technique has also been examined within the ploughed blocks, comparing full inversion to partial inversion. In some seasons it has been clear that where ploughing has been uneven, resulting in uneven furrows, the black-grass population has been higher. It's also important when ploughing to bury the seed to a known depth and it was obvious that with the partial inversion the black-grass was being distributed throughout the profile. This has knock-on effects in subsequent seasons when shallower tillage systems are employed.

In the first two seasons, plots direct drilled with either a Sumo or Mizuri drill had a black-grass population higher than the plough but lower than the non inversion. In 2015, black-grass population had increased and was the highest of all the establishment methods. In 2016, the crop was again carrying a high population of black-grass. The slightly wider rows made the crop less competitive and allowed black-grass to tiller and seed return has been high.

Drilling date

In the early years of the project, drilling date comparisons were included. Delaying drilling until mid October reduced black-grass numbers by 50%, though there were still in excess of 200 heads/m^2.



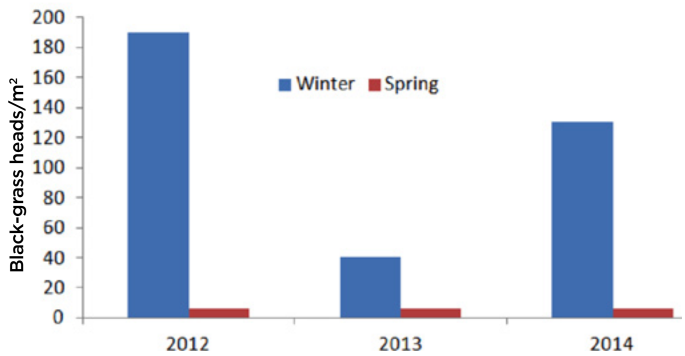
Graph 2: Time of drilling

In 2015, a similar effect was seen in the small plot herbicide trial at the site. Where delayed drilling was employed, the herbicide requirement to achieve the same levels of control was much lower.

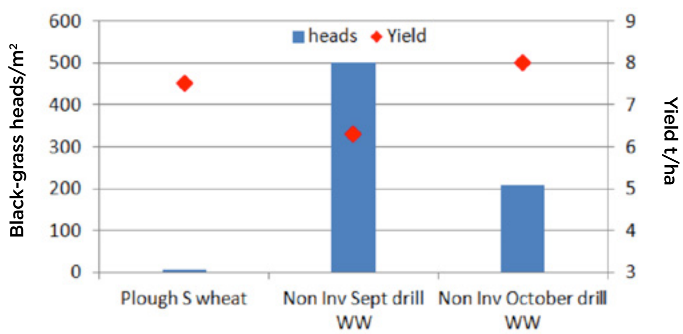
Winter cropping, over-winter fallow and spring cropping

A winter cropping rotation (ww, wosr, ww) was compared with a spring rotation (sw, sosr, sw). Black-grass in the winter rotation was variable and high in two of the three years. Over winter fallow followed by a spring crop kept black-grass numbers low. After three years of spring cropping and low black-grass population, the decision was taken to revert this block back to a winter crop for the last two seasons. The black-grass population remains low.

The graph below shows the yield effect from different populations of black-grass from three different systems – spring wheat or non inversion winter wheat drilled early or late. Black-grass population is much higher in the early drilling and corresponding yield reduction compared to the later drill date. Spring wheat with a low black-grass population gave a very good yield.



Graph 3: Comparing winter and spring cropping



Graph 4: 2012 Black-grass (heads/m^2) and yield (t/ha)

Alternate winter wheat/fallow rotation

In the first year of the project, one of the blocks started as a 12 month fallow before being drilled with winter wheat. This rotation has continued throughout the project. In the early years of fallow, the block was managed and received cultivations at depth to encourage black-grass germination. Subsequent cultivations over the fallow period were at shallower depth. This alternate wheat/fallow rotation has proven to be one of the most successful techniques for reducing the black-grass population.

Whole crop removal

With more interest in whole crop removal for AD plants, both rye and winter wheat were removed in late June 2014. The rye plots had a similar number of black-grass plants to the winter wheat but the plants had smaller ears with fewer grains, reflecting the competitiveness of the taller and thicker rye crop compared to the wheat. Removal of the black-grass did reduce the amount of seed return for two seasons, but in harvest 2016 black-grass populations had increased again. This was mainly due to the rye crop, now in its third season, being shorter and having a more open canopy. The numbers of black-grass plants in early spring were relatively low but the open nature of the crop allowed any plants that were present to tiller profusely. One area of complication revolves around the ideal harvest date for rye to achieve maximum biomass; in mid to late July, this is too late for effective control of black-grass as the weed's seed maturity is mid June, so there will inevitably be some return of viable seed. Interestingly, this block was split in autumn 2015 and whilst part of the block stayed in rye, the other half of the block was put into OSR. Final head counts were 180/m^2 in the rye and 25/m^2 in the winter OSR. This showed that continually cropping with rye was not a long term solution for black-grass control.

It was also evident that the method of removing the crop and black-grass was important. Due to equipment availability, crop removal was by cutting and then baling. In the following season, lines could be seen down the field where the crop had been dropped on the ground before baling. Foraging and putting straight into a trailer would prevent seed shedding, even though it was not considered to be mature at the time of cutting.

Key findings

Spring cropping has been influential in reducing in-crop black-grass populations particularly when combined with ploughing at this site

Delaying drilling from September to mid October reduced black-grass but populations were still very high

Alternate wheat/fallow has consistently had the lowest level of black-grass throughout the project

In-crop glyphosate has reduced black-grass in the subsequent crop in non-inversion situations

Cover cropping has tended to delay germination of black-grass into the following spring crop.

Cover cropping

In summer 2014, oil radish was established to determine what effect a cover crop versus an over winter fallow would have on the black-grass population. The oil radish established well but did not achieve complete ground cover. The fallow was disced in August and March. Black-grass population was very high in the fallow, reaching a thick matted 100% cover by spring. Slightly less black-grass was present in the cover crop, indicating crop competition. Spring barley was then established in both blocks. Head counts indicated that there was more black-grass in the spring barley following oil radish than in the fallow.

The same blocks were redrilled with cover crops in summer 2015 before drilling spring oilseed rape. With a wet spring in 2016 delaying drilling until April, soil conditions were more conducive to drilling in the fallow. The seed bed achieved in the fallow was finer than after the oil radish which was wetter and created slots. Rape plant population was higher after the fallow. Black-grass emergence was much higher after the oil radish than after the fallow and was reflected in final heads/m^2 (150 v 30)

In-crop glyphosate use

In 2014, a small area of wheat with a high population of black-grass was sprayed off with glyphosate in a non inversion block in late June. Winter wheat was established using a non inversion technique in the autumn and black-grass in the following wheat crop was very low compared to where glyphosate was not applied. This indicated that much of the black-grass that was germinating that autumn was seed shed from the previous crop.

Benefit of glyphosating-off black-grass in the previous wheat crop.

Trials at this site for the coming season will continue to look at drilling timings, direct drilled spring crops, grass leys as part of the rotation and bringing the wheat/fallow blocks back in to continual cropping. To find out more about findings and events at Staunton and other sites in the 3D thinking network, visit www.frontierag.co.uk or speak to your local Frontier contact.

"Ongoing trials of a number of approaches have shown spring cropping to be one of the most influential in reducing black-grass populations."

Christine Lilly
Research and technical support manager

Economics and agronomic decision making

Farm economics may seem an unusual topic in My Technical Brief, but agronomic decisions and farm economics are inextricably linked. Some of the key drivers of decision making and planning are our technical challenges, such as black-grass management or the impact of cabbage stem flea beetle in rape. These challenges will play a part in deciding which crops are grown where in the farm system. Output and financial returns clearly link into technical decision making too in these challenging times.

National technical and development manager, Stuart Hill, explores how focused analysis and long term planning, in partnership with your agronomist, can help boost the business bottom line.

Debt, lending and outside economic factors

Farm debt is increasing by £1bn each year and that requirement for additional lending looks unlikely to subside soon. The increase has been partly due to investment in businesses to improve performance and productivity, but more significantly, it has also been to support deficits which have arisen over the last few seasons due to market volatility and lower prices. Volatility and change are going to be constants, so the aim of our integrated relationship with growers is to help develop solutions to the challenges faced, whilst building further business resilience.

The challenge will be providing sufficient information around costs and projected returns so that it is possible to identify where improvements in the system can be made across a broad range of areas such as soil improvement, rotations or cultivation systems.

With increasing challenges, expert advice from an agronomist is more important than ever.

Table 1: Farm long term profitability: Using rotation to benefit output

	Wheat	OSR	Wheat	OSR	Wheat	Winter barley	OSR	Spring barley 1.85% Propino	Spring Oats
Price £/t Nov 2017	128	300	128	300	128	110	300	140	127
Yield t/ha	8.0	3.5	8.0	3.5	9.5	8.5	4.0	7.5	70
Output £/ha	1024	1050	1024	1050	1216	935	1200	1050	889
Seed	75	65	75	65	75	75	65	70	70
Nutrition	195	195	195	195	195	170	195	130	130
Crop protection	260	230	260	230	260	170	230	120	110
Total variable costs	530	490	530	490	500	415	490	320	310
Gross margin	494	560	494	560	716	520	710	730	579
Fixed costs*	450	450	450	450	450	450	450	450	450
Cost of production (£/t)	123	268	123	268	100	112	235	103	101
Margin (£/t)	+£5	31.50	+£5	31.50	+£28	- -£2	65	+ £37	+£26
Average margin (£/t)	+£18.25				+£30.80				

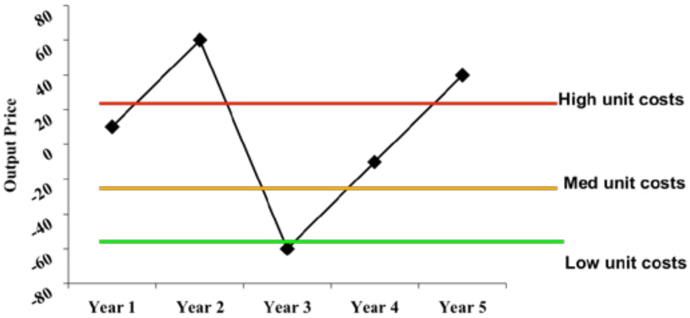
**No rent or other fixed costs included / No Basic Payment added*

Knowing your own costs

Through strategy and agronomy, the goal is to improve farm productivity. We should aim to build a picture of specific costs rather than using averages and industry figures. While industry figures are useful to benchmark against and use for analysis and further decision making, every farm is different and costings are unique to each situation.

Having the ability and knowledge to adapt farm systems will be critical to the resilience of the farm business and coping with the volatility of the market. Graph 1 demonstrates a relative example of this. Farms with high costs will be profitable in high output years but loss making in moderate to low output years. Conversely, in lower fixed cost situations, the overall performance over the years is much more consistent.

Graph 1: Example of relative output volatility versus unit costs
(Source: HSBC)



The agronomist's role

Traditionally, the agronomist role has been based around inputs advice and the industry has seen significant steps as a result of this advice. With weed, pest and disease resistance, increasing regulation and stewardship, advice coupled with a longer term view is even more valuable. Variable costs are, in reality, becoming fixed.

The agronomist has clear value to add in the fixed cost area. They have a direct input into agronomic issues on farm which need managing with a longer term approach involving both fixed and variable costs, to benefit overall yields and resilience. With variable levels of black-grass control, for example, a change of approach will be needed to prevent an increase in black-grass levels and yields declining, or at best remaining static. Detailed analysis of soils, structure management, rotation, cultivation and the establishment system is a critical start point. This will involve considering how to minimise the impact of machinery, which could include precision farming and use of alternative crops, such as cover crops, to improve structure and drainage and build organic material. Many of these areas are long term change and their benefits need proving in each farm system.

The figures in table 1 are an example of the impact that can be made through assessment of current agronomic issues, reviewing output and costs and consequently changing the rotation for the long term, ultimately reducing the black-grass burden, improving soil vitality and reducing the cost per tonne of production. The additional benefits of an extended rotation will be minimising issues caused by soil pathogens such as take-all in cereals, club root and verticillium wilt in oilseed rape.

What began as a discussion about a single issue, controlling a grass weed via chemical means, has developed into a more thorough long term analysis making use of a wide range of expertise and advice in a joined up approach.

The future

Our ultimate aim is to improve farm productivity and output. The genetic yield potential of cereal varieties is over double our current national average yield and clearly there is room for exploiting this. With variable costs becoming more fixed, aiming to increase yield will dilute cost of production (table 1). It will also build a system that will capitalise on more advanced varietal genetics on the horizon.

Taking a long term, more holistic approach will have the greatest impact on sustained farm profitability and help to minimise the effects of market volatility for growers.

"Having the ability and knowledge to adapt farm systems will be critical to the resilience of the farm business and coping with the volatility of the market."

Stuart Hill
National technical and development manager

Careful planning key to cost effective nutrition

With this year's yield figures fresh in the mind, now is the time to evaluate the quantity of phosphate and potash removed by harvested crops and straw. Plans should be developed to replace nutrients and improve deficient areas, especially since offtake was also high in the previous two years. Fertiliser technical development manager, Mike Slater and SOYL's commercial director, Simon Parrington explain how to maximise P&K uptake for top crop performance.

Consider volumes carefully

Ten tonnes of wheat will remove 78kg of phosphate and 56kg of potash from the land. If straw is removed as well, these levels rise to 84kg and 104kg respectively. Producing a balance sheet of removals and inputs in fertilisers and organic manures throughout the rotation will provide a useful tool when calculating the following year's nutrition needs.

Growers taking a phosphate or potash holiday must first ensure that their soil's reserves are adequate to support expected yields. The effects of nutrient depletion can take a number of years to show, but rebuilding a deficiency in any one year can be costly and take time, during which crop potential will remain unfulfilled. Remember that even where the soil status is close to adequate, the application of some fresh water soluble phosphate will be highly beneficial to support good crop establishment and root development.

The general target indices of index 2 for both phosphate and potash should provide adequate nutrients to support the following crop, but these can be eroded if removals are not replaced. The analytical methods used to measure phosphates and potash are designed to mimic availability in the soil. Total phosphate and potash could be measured, but this would only highlight reserves and would not help to develop a fertiliser programme to support crop production.

Five key steps:

- Know your soil nutrient levels in detail
- Understand the nutrient needs of your crop
- Understand the nutrient content of any organic manures you have available
- Ensure fertiliser is applied to meet specific requirements e.g. autumn N for OSR
- Target additional fertiliser to meet crop needs.

Nutrient mobility

As well as nutrient availability, we have to consider how crops access nutrients. Nitrogen as nitrate is highly mobile in the soil. To a lesser extent, potash is also mobile and will move on a concentration gradient to the roots as long as there is adequate moisture. To access most of the phosphate required by crops, roots have to develop to explore the soil volume, as phosphate is virtually immobile in the soil. Soon after germination, the volume of soil explored by plant roots is very small and so fresh water soluble phosphate will help stimulate the early roots to develop, enabling them to explore a greater soil volume.

In low phosphate soils, placement of phosphates will play an important role in providing some easily accessible nutrient. For oilseed rape crops, where seed rates are low, the amount of phosphate within the seed that can contribute to initial nutrition is minimal and fresh phosphate is extremely valuable to support crop establishment. This has become even more important with the loss of flea beetle controls. A fast establishing crop has a better chance to resist flea beetle attack. Apply diammonium phosphate at 160kg/ha if broadcast. This can be reduced if the product is placed close to the seed.

Improve soil vitality for maximum nutrient uptake

Nutrient status will vary across most fields, often due to greater removals in higher yielding areas. This can be confirmed by mapping of phosphates and potash, which can be used to prepare plans to rectify the deficiencies. However, nutrient availability for crops is not just about the quantities in the soil. The roots need to be able to access the nutrients too and if the soil structure is damaged and roots can't penetrate it, the feeding area will be restricted and nutrient uptake reduced. Uptake can also be restricted when soils have a low level of microbial activity due to low organic matter levels or if soils remain anaerobic for too long over winter. All of these factors can be measured using Frontier's Soil Life service, which provides an excellent starting point for improving soil vitality to get the most from your crops.

Precision nutrition

With so many available sources of nutrition to meet crop needs, making the right choice is important but can be tough. Precision mapping is a valuable tool in the decision making process. Completed every four years, SOYL's precision nutrient audit provides a comprehensive baseline of each field's nutrient assets based on detailed soil sampling.

Table 1	Yield t/ha	P removal	K removal	Non bagged fert applied	Bagged fert applied	VR applied
Winter wheat	10	78kg/ha	56kg/ha	29kg/ha P 108kg/ha K (from FYM)		VR P and K applied using TSP and MOP
Spring barley	8	62.4kg/ha	44.8kg/ha	-	42kg/ha K (from CF KayNitro)	VR P to meet balance of SB and OSR needs
Winter OSR	4.3	60.2kg/ha	47.3kg/ha	-	76kg/ha P (from DAP)	VR K to meet balance of SB and OSR needs
Total for rotation	-	201kg/ha	148kg/ha	29kg/ha P 108kg/ha K	76kg/ha P 42kg/ha K	Balance of requirement

VR = variable rate *FYM = farmyard manure*

Developed by experts, the maps inform a cost effective four year nutrition plan to meet crop needs. Variable rate applications are only included if necessary and individual farm circumstances are taken into account, including:

- Crop nutrient requirement at point of peak uptake
- Rotational crop removal at harvest
- Crop nutrient timing requirements
- Budget
- Available sources of nutrients
- In-field soil test levels and variation
- Application equipment
- Storage.

Of the fields sampled by SOYL last year, 24% had areas that were deficient in phosphorous and 26% deficient in potassium. This presents an unnecessary risk to crop health and is simple to address.

Table 1 shows how this might be calculated for a typical winter wheat / spring barley / winter OSR rotation, taking into account existing nutrient decisions:

- DAP applied at 165kg/ha to give 30kg/ha N in front of the OSR
- FYM at 15t/ha that provides 29kg/ha P and 108kg/ha K for the winter wheat
- CF KayNitro at 320kg/ha giving 80kg/ha N for the first dose plus 42kg/ha of fresk K ready for the spring barley's peak growth period.

Implementing this plan gives the highest margin crop, winter wheat, the benefit of fresh in-season variable rate P and K. The spring barley and oilseed rape each receive one variable rate application to balance rotational needs, while using FYM as part of the solution reduces the reliance on bagged P and K and also boosts organic matter levels. All of this is achieved with just four variable rate applications over three years.

Know your PK sources

Great care should be taken to understand the content of organic manures. In most cases, any grower aiming for wheat yields of 10t/ha and beyond will need a combination of bagged fertilisers and manures. An integrated approach to nutrition takes advantage of timely in-crop NPK applications and organic manures to drive fertility and improve soil health.

Reflecting on these challenges and planning ahead will ensure adequate nutrients are available across the field and that they are providing maximum value to help crops fulfil their potential.

"Comprehensive soil analysis is the only way to navigate the complex world of phosphate and potash planning."

Simon Parrington
SOYL commercial director

Still time to gain from green cover

Mid September usually signals the cut off period for cost effective cover crop establishment. However, with the right variety choices and favourable weather the planting window can be extended, potentially into early October, with the same good results. Kings northern technical advisor, Clive Wood, explores the options available for late sown cover crop success.

Calculating returns

European farmers have grown cover crops for many years and are now experiencing vast improvements in soil vitality, leading to marked yield and quality increases and consistent, measurable reductions in production costs. Cover crops are becoming increasingly popular in the UK too. Though assessing their value and return can't be measured by a heap of grain in the store, the vast benefits can be accurately calculated within the growing cover crop and later in the farm office.

To see a viable return on expenditure, the cost of seed and establishment has to be balanced against the performance and potential benefits of the cover crop. Sowing any crop needs good planning and execution, but making the right choices is especially important when it comes to late sown green cover. Carefully chosen varieties can help to improve soil vitality, combat problems such as black-grass and nematodes and also meet Ecological Focus Area requirements to provide a surprising financial return. This is particularly useful this year, after the variations of this spring meant many crops have been later to mature and harvest.

Tillage radish can break through some of the most damaged and compacted soils.

Tillage radish

With hundreds of radish varieties developed and bred for different uses throughout the world, it's clear that this plant features high on the agenda globally. However, crop performance can vary dramatically in different climates so it's critical that we evaluate their capabilities at different locations within the UK. After careful research, Kings has replicated some of the more promising varieties in our own 3D thinking trial plots and on-farm trial blocks throughout England and Scotland. The results enable us to select the most suitable variety of radish for the geographic location and specific planting time.

One of the most interesting types of radish is the Tillage radish. Its performance is outstanding, breaking through some of the most damaged and compacted soils. To have a plant sub soiling while you sleep and not burning diesel or wearing steel is fantastic. The return from this radish can be easily measured and the cost recouped, but variety choice needs particularly careful consideration when being planted late.

A number of new Tillage radish varieties from a German seed company were grown and evaluated this spring at Frontier's 3D thinking sites. Initial results look exciting; speak to your local advisor to find out more and arrange a site visit.

Creating a mixture

A cover crop mixture is determined by the grower's aims, but usually includes at least three varieties and rarely more than five. Risk versus reward must be calculated. The mix needs to be assessed in terms of species choice and maturity, matched to the geographic location and time of year to be planted. It's equally important to look at plants obtained per square metre in comparison to the cost of the crop per hectare. For example, two key nitrogen fixing species often used in a mix stack up quite differently: a kilo of vetch provides approximately 2 seeds/m^2 in comparison with a kilo of berseem clover at 40 seeds/m^2, therefore costing much less per seeds/m^2 achieved. Both are effective nitrogen fixers but can provide very different returns in terms of performance when considering plants per square metre in comparison to cost.

With milder autumns and winters, phacelia is a useful component. It performs in later planted mixes by providing good soil conditioning through a fine fibrous root mass and is usually partnered with radish varieties which do the heavy soil structure repair work and capture nutrients.

Cereal components

Cereals can be a valuable addition to later sown mixes. Including winter rye or a UK common oat is a good way to provide ground cover and an effective root system, as these crops will perform well from a later planting and in colder conditions. As an early maturing variety, black oats present a higher risk if the autumn and winter is very mild as they could produce viable seed before Christmas which would reduce the longevity of the mix. The common oat is therefore a much more sensible choice.

Winter rye can also be used effectively to provide much needed ground cover for open soil following late harvested maize crops. This needs to be well planned, as herbicide programmes applied to the maize will need to be selected to allow the establishment of winter rye without any damaging residual effects.

Longer term, two year mixes such as Westerwolds ryegrass and clovers can be planted until the end of September and into the first week of October. Such a mix is grown specifically to suppress black-grass and build soil fertility and requires specific management for the best results. As a biannual grass, Westerwolds enables the land to be returned to production with ease after the mix has completed its task.

To find the right green cover varieties to meet the specific needs of your land, talk to Kings or your Frontier advisor.

Kings' 3D thinking trials assess different varieties and growing protocols to provide growers with the best seed and advice.

A radish, oat and phacelia mix in January, having been drilled the day after harvest. With high fresh biomass, it's ideal for EFAs.

Tillage radish is good at catching nitrogen as well as busting through compaction.

"The performance of the Tillage radish is outstanding. To have a plant sub soiling while you sleep and not burning diesel or wearing steel is fantastic."

Clive Wood
Kings northern technical advisor

Early season weed management in oilseed rape

Time spent establishing a vigorous, healthy OSR crop is a good investment, bringing useful weed control benefits and mitigating the effects of pest grazing. Residual herbicides are key to OSR crops reaching their potential, as they form the backbone of a robust weed management programme. Crop production specialist, Paul Cartwright explains how product choice and attention to timings and soil conditions will help maximise your crop's value.

Preparation

Alleviating compaction and preparing a firm, clod-free seedbed for OSR will allow unrestricted tap root growth and conserve moisture. This will help provide a ready supply of water and nutrients to produce a healthy, profitable crop and a competitive canopy that closes over quickly to shade later-germinating weeds.

Pre-emergence

Understandably, some growers will be tempted to wait for crops to fully emerge before applying residual herbicides especially if crop failure, due to pests, is a concern. However, if applications are delayed too long and applied post-emergence of the weeds, overall control may be compromised, depending on the species present and the combination of active ingredients applied.

Conversely, where seedbeds are loose or cloddy or soil coverage of the seed is inadequate, all herbicide applications must wait until the crop has established. This is to avoid inhibiting its growth, which would leave it more prone to slugs and flea beetles.

Know your enemy

Take into account the earlier establishment time of OSR compared to other combinable crops and the ease, or otherwise, with which you have achieved weed control in previous seasons. Where key broad leaved weeds such as cleavers, shepherd's purse and hedge mustard are anticipated, clomazone (e.g. Cirrus CS) will be an essential component of the programme. Applications must be pre-emergence, within 48 hours of drilling.

For advice on how to address weed challenges specific to your land and circumstances, talk to the experts.

Alternative chemistry

OSR provides an opportunity to use different grass weed chemistry, giving cereal herbicides a break as part of a resistance management strategy. Metazachlor and dimethenamid-P play key roles in grass and broad leaved weed programmes in OSR. Aim to apply a total of 750g/ha (metazachlor and/or dimethenamid-P) and start applications before weed emergence, whether targeting black-grass, ryegrass or brome species. Early treatments must be followed up with a programme of contact and residual graminicides through the autumn for maximum control. In drier conditions, dimethenamid-P will be slightly more active than metazachlor on a similar range of weeds.

Residual herbicides perform well when applications are timely, weeds are the correct size and moisture is present. Weeds absorb the herbicide primarily through developing roots near the soil surface. As they become established and root systems develop deeper in the soil, they risk not picking up sufficient chemical to accumulate a lethal dose and activity will be reduced.

Invariably, mixed broad leaved weed populations require combinations of active ingredients to widen their spectrum, especially when applied post-emergence. Co-formulations with quinmerac (e.g. Topkat) provide some contact activity and add valuable early poppy and cleaver control to the wide range controlled by metazachlor and dimethenamid-P, such as mayweed, groundsel and annual meadow grass.

Do not leave carbetamide (e.g. Crawler) applications too late. Recent studies suggest the best efficacy is obtained from earlier applications. Emerging grasses (before the half to one leaf stage) have shallow roots, which are easier to access with herbicides applied to the soil surface. Carbetamide is highly water soluble and will be more active in dry conditions than other graminicides.

"Residual herbicides perform well when applications are timely, weeds are the correct size and moisture is present."

Paul Cartwright
Crop production specialist