my technical brief

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News and crop production advice from Frontier

Oilseed rape; early decisions for a profitable crop

In this issue

There are a multitude of decisions to consider before drilling this autumn's oilseed rape crop. Stuart Hill, David Waite and Edward Downing discuss the range of factors that can contribute to a successful and profitable OSR crop.

Many growers are questioning the viability of the crop, especially with relatively low output prices and rising crop protection costs in light of the increasing flea beetle and peach potato aphid threats. We have also seen a significant challenge from light leaf spot which has traditionally been a greater issue in the North and Scotland.

Against this background a challenging discussion between grower, agronomist and trader is needed on each farm to understand how a long term, sustainable and profitable farm system can realistically be achieved. Clearly some rotational changes will be required to increase diversity and reduce weed, disease and pest burdens. This will also support greater yield increases, which in turn help dilute the significant costs of production.

End market

The end market should be one of the first considerations and a discussion, with both agronomist and farm trader, is essential to ensure joined up decision making throughout the whole process. There are 3 market options for oilseed rape. The commercial 'double low' market is the largest and the one for which most varieties are bred. HEAR (High Erucic Acid Rapeseed) and HOLL (High Oleic Low Linoleic) both provide more specific markets; they are usually grown on contract, and require particular varieties to achieve premiums. Eraton and Palmedor (HEAR) and V316oL and V295oL (HOLL) have the same yield as the double low varieties and there are premiums that make them an attractive choice for growers, indeed V316oL is the top variety on the HGCA list (East West).

Flea beetle control

From an agronomic perspective, flea beetle control often raises the discussion of conventional versus hybrid varieties. Hybrids do develop quicker than conventionals at certain stages, predominantly after the 4 leaf stage and then in spring. However, when it comes to early flea beetle attacks there is no real difference; trials have not shown that hybrids cope better with flea beetle attacks at this early establishment phase than conventional varieties, but anecdotally Picto and DK Extrovert do appear to establish well.

Effects of flea beetle

Seed treatment provides the next line of defence. Mesurol is currently the only option and availability is still to be confirmed on DK Extrovert only. Mesurol provides only 50% preventative control at best compared to neonicotinoids, but is beneficial in medium to high risk areas. At the time of writing the NFU has submitted an application for emergency approval of some neonicotinoids; the outcome of this submission will be known very soon.

"The product and method of getting nutrients to the plant will vary, but doing nothing or delaying application this autumn is simply not an option."

Edward Downing
Fertiliser technical manager

Oilseed rape; early decisions for a profitable crop (cont.)

Cultural considerations

Culturally, seedbeds are the single most important factor to help mitigate flea beetle damage and ensure rapid establishment beyond the danger phase. It is common sense, but nevertheless worth reiterating, that it is imperative to create an area around the seed that allows maximum contact, and therefore moisture uptake, to encourage rapid germination and emergence.

Remember too that drilling date is important, but moisture is even more so. Where a prolonged dry spell looks likely, unless historically you have had establishment success in such conditions, put the drill away until moisture is on the horizon.

Early maturity is another agronomic factor to consider. This will give you the longest window to encourage grass-weed germination and then burn off prior to the next wheat crop. Varieties such as Wembley, Harper, Alizze, Extrovert for the hybrids, and Picto and Ovation in the conventionals all display some early maturity.

Linseed flea beetle

Resistance

Disease resistance will be even more important this autumn, especially with light leaf spot. Cultural controls, including inherent varietal resistance, need consideration as we begin to see resistance challenges with crop protection products and also difficulties in timing applications correctly. Timings will need to be more protective in future as the curative properties of products become weaker.

"Variety selection, seed treatment, seed rate and sowing date are the cornerstone decisions for any crop. They are the foundations for every subsequent decision through the growing season."

David Waite
Northern seed manager

With light leaf spot, early indications from the Rothamsted disease monitor survey suggest high levels of infection in the current crop; this follows the widespread infections experienced across the UK last autumn and into early spring. Variety choice underpins successful crop protection programmes. In the North a minimum resistance score of 6 is required. If you have experienced high levels of light leaf spot on your farm then variety choice should be a priority. DK Extrovert (7), Harper (6), Cracker (7), Ovation (8), Amalie (7), V316oL (6), Wembley (6), Alizze (8) and Nikita (8) are all good options. For HEAR varieties care is needed as Eraton (5) and Palmedor (4) are more susceptible so robust, well timed protection programmes will be needed.

With the loss of neonicotinoids, peach potato aphid, which can cause turnip yellows virus, was also an issue last autumn. Underlying infections in crops can result in yield losses between 15 and 30%. Results from surveys this spring have yet to determine levels of infection in crops at this stage, but it is another pest that requires monitoring in autumn and the products required for control have increased the cost of production.

Amalie does contain resistance genetics against turnip yellows virus. Although lower yielding than some other varieties this can be offset by its turnip yellows resistance which mitigates losses from infection, one to consider based on experience from this season.

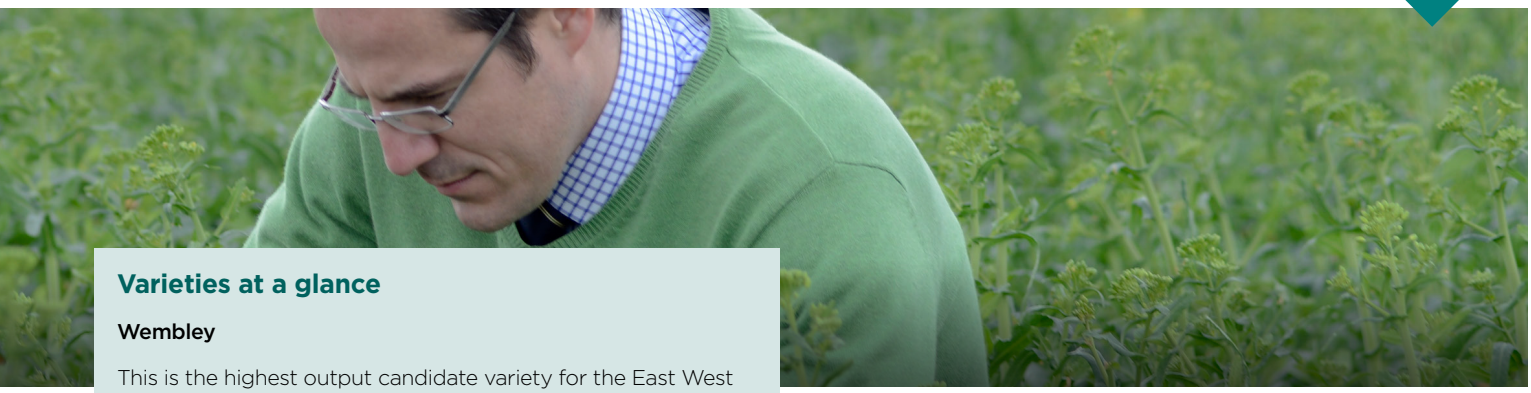
Early root development

It is vital to do everything you can to promote rapid emergence and earlier growth.

Winter survival and eventual crop yield are heavily influenced by early root development. Prosper ST, which has a high proportion of phosphite, stimulates root growth and similarly to manganese, this effect is enhanced by the use of a subsequent foliar application to the growing crop; this is never more critical than with oilseed rape. In addition to Prosper ST we treat all our OSR Seed with a nutrient rich additive called Seedlife. Results from 18 years of replicated trials have shown an average yield advantage of more than 0.2t/ha. With a crop value of £250/t this is worth £50/ha.

Starter fertilisers

Quick emergence and growth will allow the correct timing of foliar insecticide sprays but importantly it will also help to alleviate any damage caused by the flea beetle. The best way to achieve this is an early application of a nitrogen and phosphate product as both nutrients are essential for early growth and good rooting.



Varieties at a glance

Wembley

This is the highest output candidate variety for the East West HGCA recommended list in 2016. It comes from the same stable as Avatar and is the perfect choice to replace that popular variety

Picto

The top output for the HGCA East West list for 2015/16. It is an Ovation cross and has performed exceptionally well in our trials too. Its yield and gross output place it in a league above the others

Nikita

The top performing conventional candidate in both the East West region and the North. It is the only conventional variety that has an 8 for light leaf spot. Solid agronomics make this an excellent choice for managing disease risk

Harper

An early maturing hybrid, this stands out as having good light leaf spot and stem canker resistance

DK Extrovert

This is the top selling hybrid OSR in the UK and has topped Frontier trials for the last 4 years with 107% of control. It has excellent LLS (7) and stem canker (9)resistance. It also has a greater resistance to pod shatter than several other Dekalb varieties

Ovation

Consistently tops our trials with its gross output, good disease resistance, and early maturity. It appears to have good resistance to verticillium wilt, making it a great option for growing OSR in a tight rotation. Ovation has been a grower favourite for the last seven years and its consistency makes it stand out

RGT Alizze

A candidate for both regions of the HGCA recommended list, Alizze is a hybrid from the same family as Cuillin and Elan. It has very high yield potential and is the highest yielding candidate for the North region. It has a solid agronomic package and stiff stems, but what sets it apart is the score of 8 for light leaf spot

Mentor

Recommended for the North and East West regions. It has a specific place as it is resistant to certain strains of clubroot. Cracker is now showing signs of breaking down to light leaf spot so we are recommending a move from Cracker into Mentor where clubroot is an issue.

Application options

If you already have a drill capable of combining fertiliser and seed this should be used as this one-pass application not only reduces the pressure on time, but by placing nutrients directly next to the seed it will have maximum impact. If you don't have this capability you might want to consider a retro-fit kit.

Variable rate drilling

The choice of specific product to use in this situation is controlled by the capabilities of the drill. Speak to your local Frontier contact to find the best product for your situation. If you can't place the fertiliser, you must apply a traditional fertiliser product as soon as possible after drilling, or even onto the stubble before as long as you are only shallow cultivating or drilling. When making an overall application, 30kg of nitrogen per hectare is permitted and advisable. Using a product such as DAP provides a balanced boost of both nitrogen and phosphate for root development.

Remember that while true starter fertilisers (micro-granules or liquids) applied at low rates are very efficient at improving early uptake and establishment, they will not provide the crop with all of its nutritional requirements for the full season. Therefore, it is vital to know your soil nutrient status through recent sampling to determine whether follow up applications may be necessary.

In two years of starter fertiliser trials we've seen significant improvements in early growth and positive yield results which have been consistent over a range of soils and phosphate indices, but there have been differences between individual products. Therefore match the best product to your establishment technique and make sure you don't miss the opportunity to give your oilseed rape the best start this year.

"Early decisions are critical to drive yield and dilute the costs of production in oilseed rape"

Stuart Hill
Technical and development manager

Fungicides and foliar N; maximising the potential of milling wheat.

Experienced growers of milling wheat understand the importance of keeping the crop clean and free from disease. However with a significant increase in the area of the new Group 1 variety Skyfall and some farmers growing milling wheat for the first time, Christine Lilly, technical support manager and Edward Downing, fertiliser technical manager, focus on some of the key factors effecting yield and quality.

Maximising yield is important in any variety, but good grain quality is vital in milling wheat. Group 1 wheat should have a grain protein of 13%, specific weight of 76kg/hl, a minimum hagberg of 250s and a maximum admixture of 2%. It must also be below minimum standards for mycoxtoxins (see table 1).

Table 1 - Legal limits for mycotoxins (ppb) in grain intended for human consumption

	DON	Zearalenone
Unprocessed wheat & barley	1,250	100
Unprocessed oats	1,750	100
Flour	/50	/5
Finished products	500	50
Infant food	200	20

Mycotoxins

Mycotoxins are toxic chemicals produced by specific fungi which infect crops. Different fungal species produce mycotoxins of widely varying toxicity to humans and animals, hence there are different permitted levels in foodstuffs and feed.

There are five Fusarium species and two Michrodochium species that infect cereals and may cause head or ear blight. Microdochium species however, do not produce mycotoxins. The most common Fusarium mycotoxins of concern are deoxynivalenol (DON) and zearalenone (ZON). There are legal limits for these mycotoxins in grain intended for human consumption. HT-2 and T-2 are also found in cereals.

A range of factors including the previous crop, location, crop residue, cultivation and the weather, particularly rainfall around flowering, have significant impact on the quality of milling wheat. But there are also plenty of agronomic measures that we can take to produce that all important grain sample.

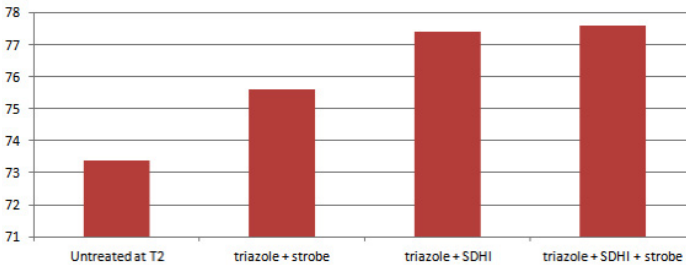
Fungicide use

Fungicides are not only important for optimising yield, but can also improve specific weight, the measure of quality used within the industry. Over the last 10 years the percentage of samples meeting the top specification for specific weight is just 66%, ranging massively from 9% in 2012 to 91% in 2011.

The inherent specific weight of a variety does vary, Skyfall, for example has an average specific weight of 78.1kg/hl, slightly higher than Gallant at 77.0kg/hl
(Source; 2015/16 Recommended List).

While late season fungicides on the ear have always been important for keeping the ear disease free and maintaining specific weight, the earlier T1 and T2 fungicides also contribute to specific weight. As can be seen in table 2 below, where a triazole + strobilurin fungicide was applied at T2 (flag leaf) there is a significant increase in specific weight from when no T2 fungicide was used. There was a further increase when SDHI + triazole was used.

Table 2 - Response to T2 fungicide Specific Weight kg/hl



Applying ear wash fungicide to wheat

Foliar Nitrogen

As wheat starts to flower, the only option left to influence grain protein and reach the 13% target is an application of a foliar nitrogen product. It is absolutely vital now to make a final assessment of your yield potential and the success of your base nitrogen programme to increase your chances of hitting 13% protein. The aim of your base programme should be to set the crop up to achieve approximately 12.5% protein, with the foliar application taking the crop over 13%. Table 3, below, shows the influence yield and soil nitrogen levels have on fertiliser nitrogen rates to achieve 12.5% protein;

Table 3

Yield (t/ha)	Crop uptake (kgs/ha) required for 12.5% protein	Fertiliser nitrogen rate (kgs/ha) at three soil nitrogen supply (SNS) levels		
		SNS 1, 70kg/ha	SNS 2, 90kg/ha	SNS 3, 110kg/ha
8	219	248	215	182
9	247	295	262	228
10	274	340	307	273

These fertiliser rates are based on the standard 60% efficiency; clearly the quality and depth of rooting, along with the weather conditions in the period of fertiliser application and uptake could make this efficiency better or worse. Hopefully these nitrogen rates will match up with your yield potential and it is now about getting the most out of you foliar nitrogen product.

All foliar nitrogen products work best if they are applied at the end of flowering, early milky ripe. Foliar urea products can be significantly influenced by weather conditions at application; scorch can be an issue as can rainfastness, so please try to take steps to minimise these when using such products. An alternative is to use our formulated Multi N product; with its higher concentration and low use rate (33-40lts/ha) the risk of scorch is greatly reduced and its formulation makes it rainfast in 30 minutes. This is why we've seen such consistent performance over a number of very different seasons.

Ear disease

The T3 fungicide, or ear spray, is vital for quality wheat. Fusarium species, especially graminearum and culmorum, produce mycotoxins whereas Microdochium species cause quality losses and germination issues. Research indicates that control of Fusarium and mycotoxin reduction requires applications at two separate timings. So for maximum effect the first application should be at early flower for fusarium control, followed by a second, 10 days later, for reduction in mycotoxins.

Product choice should be based around prothioconazole + tebuconazole or tebuconazole + prochloraz. For optimum activity, fungicide needs to be applied at three quarter rate. Timing should be early to mid flower and ideally before any rain events to ensure protectant activity. The dry spring of 2015 followed by a wetter spell in late May provided ideal conditions for fusarium spp.

The trial results below (table 4) show the effect of a T4 application of tebuconazole + prochloraz on DON levels. Treatments were applied on 6th and 16th June. The single early application had little effect on DON levels but the slightly later timing reduced them significantly.

Table 4 - Mycotoxin DON Reduction. (2014 season)

"Late season fungicides are not only important for controlling disease, they can also improve specific weight, bringing you one step closer to achieving the milling wheat premium."

Christine Lilly
Technical support manager

Green cover crops within and without the EFA

With the continued interest in cover crops the Kings team, working with the Frontier trials department, has extended their development work to gain further understanding of the benefits these crops can bring. Richard Barnes, national technical advisor for Kings considers how these crops can play a valuable role within and without EFA agreements.

A cover crop growing before a spring crop can have considerable economic and environmental benefits. In particular, valuable nitrogen losses can be minimised with associated improvement in ground and river water quality. There are also benefits to soil structure, a reduction in tillage need, soil vitality improvement with the added organic matter and a reduction of black-grass and some pest and diseases.

There are many possible cover crops that can be used. Each species has its own beneficial attributes but careful consideration and advice is required to ensure that the chosen cover crop fits in with the whole rotation and is best suited to the individual requirements of your farm. Over the autumn and winter period typical arable soils can lose between 60 and 90 kilograms of nitrogen per hectare. Catching this valuable resource, which has already been paid for, is the key target of most cover crops. There are considerable differences between the rooting depth and effectiveness of catching soil nitrogen between species.

Kings Oil Radish Mixture

The advent of the Basic Payment Scheme and the requirement for Ecological Focus Areas (EFA's) within Greening has contributed to the growing interest in green cover crops. With 1 hectare of cover crops accounting for 0.3 of a hectare in EFA, the weighting is lower than one would expect given the benefits such crops can bring. However, for many growers, especially in 2015, this option will be seen as a useful 'get out of jail' card for those who are striving to find a quick fix where they have an EFA shortfall. However, quite aside from this, we can see great value in this option for many growers, and expect there to be increasing interest going forward.

As such a few points are worth considering.

The list of EFA approved species provided in England specifically lists the following based on the requirement to have a mix of a cereal and a non-cereal;

Cereal	Non Cereal
Rye	Vetch
Barley	Phacelia
Oats	Mustard
Lucerne	

While in Scotland the requirement is a mix of two or more of the following;

Cereal	Non Cereal
Rye	Mustard
Vetch	Oats
Phacelia	Lucerne
Barley	Triticale

Please note that in both situations the inclusion of a seed which is not on the approved list has the potential to render the entire EFA area invalid, so if you are using catch crop or cover options in an EFA please ensure you use what is on the list and nothing more.

What constitutes a good EFA mix?

As highlighted earlier, a green cover crop has a principle aim of scavenging available nutrients by creating as much biomass as possible for the following crop. With this in mind, we strongly advise that a combination is selected which will give the best outcome for your rotation and the crops within it.

Mustard and barley in England, or oats and barley in Scotland, are both possible and valid combinations for an EFA mix, but will have limited delivery and could either exacerbate club root issues, through the mustard, or create a green bridge and bring limited break crop benefits when using a straight cereal mix in Scotland.

The preferred option in both instances, which will provide a good break crop, help improve soil structure and trap and retain nutrients, would be either oats or rye with vetch. Planted at a seed rate of between 40-50kg/ha by the end of August, such a combination combines varied rooting, effective nutrient scavenging and high biomass.

Rye with vetch provides a good break crop

This blend can be taken through into early March and then destroyed with an application of glyphosate. Frontier's green cover destruction trials, carried at three sites across the UK in February 2015, assessed a wide range of glyphosate application rates along with the addition of 2,4D in pre-formulated products. The combination of glyphosate and 2,4D in the pre-formulated products knocked down the crop more quickly, but allowing three weeks for the crop to break down then provides an excellent entry for the following crop. Care is needed with the 2,4D products when used before some spring crops including sugar beet, peas and beans, as there has to be a replanting interval. Ensure that you consult your agronomist for the correct advice for your farm and rotation.

"There can be major differences in rooting depth and nitrogen capture between different species. Make sure you choose a cover crop which matches the specific needs of your farm."

Richard Barnes
National technical advisor, Kings

Green Cover Crops Without The EFA

To provide the greatest flexibility we are encouraging growers to consider green cover options that are free of restrictions imposed by the EFA rulings. With the need to take a long term, rotational view of green cover crops it is of significant benefit to develop a plan free of legislative constraint. Straight crops such as oil radish can then be used and mixtures can be formulated to meet a specific need without fear of contravening rules and regulations.

Kings continues to build on their on-going trials and development programme, and has a wide range of data to support growers' requirements when considering the correct crop for their situation. Cover crops offer opportunity to develop an integrated strategy to support the control of soil borne pests and are an extra tool in the management of black-grass. Additionally they help to restore your soils to good order, so there is much there is much to consider when choosing the exact mix to use.

The Kings team

The Kings team works with each grower to guide them towards the correct options for each holding as we appreciate soil types, rotations and management systems vary from farm to farm. In many instances off the shelf options will meet specific needs but having the flexibility to develop a carefully formulated bespoke mix is a valuable opportunity to explore.

For further details and to learn how green cover crops can benefit your farming business please call Kings on 01379 658135, email kingscrops@frontierag.co.uk or speak to your usual Frontier contact.

Nitrogen choices; getting it right for your farm

Although many fertiliser decisions for next spring will be influenced by the price per kilogram of nitrogen, the effectiveness of the fertiliser should be the main consideration says Mike Slater, fertiliser technical development manager. Small differences in cost are greatly outweighed by crop response and final yields.

The most reliable source of nitrogen for crop production in the UK is ammonium nitrate, if available. There is still a large AN market because of its consistent performance. Urea treated with the urease inhibitor Agrotain has also performed well in UK trials. To achieve a good performance from urea, and not lose large quantities of nitrogen to the atmosphere through volatilization, urea applications should be made when soils are cool and moist; as soils warm up, the risk of nitrogen loss rapidly increases, particularly accentuated on high pH soils.

Reliable, even spreading is also vital for high crop yields. At wider bout widths, fewer products can be spread evenly. Three key parameters determine the evenness of application:

1. Bulk density

Most ammonium nitrate products weigh around 1kg/litre, whereas the best urea products are no more than 0.8kg/litre.

2. Size range

This, when coupled with the bulk density, gives a product the ballistic capability to travel to wide bout widths. A granule size of over 2.8mm is essential; Extran has a mean size of 3.6mm, whereas some prilled products have a mean size less than 2mm, significantly reducing the width where even spreading can be achieved.

3. Hardness of the product

Any product with a poor crush strength will break up on the discs during spreading. Make sure you choose a good quality granular ammonium nitrate product, such as Extran, which will spread evenly, ensuring optimum crop performance and yield.

To achieve the best gross margins, nitrogen efficiency is a key factor, so consideration should be given to the processes within the soil. When ammonium nitrate is applied and dissolves it is immediately available for crop uptake, AN prills need very little moisture to dissolve. Our crops can use both ammonium and nitrate nitrogen and we have all seen how rapidly crops respond to applied nitrate.

When urea is applied, it has to break down into ammonium nitrogen in the presence of the enzyme urease. In warm conditions this can be very rapid and some nitrogen will convert into ammonia gas and be lost. Agrotain treated urea (KAN) will significantly reduce these losses. When soil temperatures are over 6°C, the ammonium nitrogen is converted to nitrate by soil bacteria, although some nitrogen is lost as nitrous oxide. For nitrogen that is immediately available to crops ammonium nitrate is the ideal product.

The key measure of nitrogen use efficiency is the quantity of nitrogen taken up by the crop versus quantity that has been applied. Nitrogen taken up by crops comes either from soil reserves or fertilisers. Recent long term comparative trials show that often crops treated with urea perform similarly to ammonium nitrate in year one, however over a number of years soil nitrogen reserves fall following urea use resulting in poorer crops over the long term. For most situations, ammonium nitrate should be the product of choice, with Agrotain treated urea (KAN) an alternative.

"Reliable, even spreading is vital for high crop yields. To ensure optimum crop performance, choose a good quality granular ammonium nitrate product, which will spread evenly."

Mike Slater
Fertiliser technical development manager