



## Seed selection for the new season

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At this time of year, the decision making process starts as to which crops and varieties should be included in the rotation. Many factors influence this, for example, end market potential, regional suitability, speed of maturity, position in the rotation, yield and disease resistance characteristics. One should also consider the wider agronomic aspects of growing the crop. For example, if drilling late as part of an integrated approach to manage black-grass, consider: speed of establishment, early vigour, which plant protection products can be used (particularly herbicides) and other relevant genetic traits such as Orange Wheat Blossom Midge (OWBM) resistance.

Seed commercial assistant, Chris Piggott, northern seed commercial manager, David Waite and seed production manager, Paul Lacey share their thoughts on the best varieties and seed treatments for the new season.

### Winter wheat

#### Group 1 (Key Group 1 varieties for the coming season on page 2)

There are four key Group 1 varieties for this season. Crusoe, now the lowest yielding, has become more disease susceptible and is likely to be confined to western areas where its septoria resistance is most useful. KWS Zyatt not only leads the yield table but has the desirable agronomic characteristic of stiff straw and the best all round disease resistance. It has the highest untreated yield of all current varieties. Flour produced from KWS Zyatt can be widely used in making a range of dough, from bread through to pizza bases and bagels. Skyfall remains the only OWBM resistant variety in this group.

#### Group 2 (Key Group 2 varieties for the coming season on page 2)

Although classified as a Group 2, KWS Siskin has the same yield as Reflection and Santiago but with the benefit of quality grain that meets a range of UK markets and export specifications. Siskin has excellent resistance to both yellow and brown rust and one of the best resistances to septoria tritici. Cordiale is becoming a niche end-market variety that is likely to be replaced by the higher yielding varieties KWS Lili and Group 1 KWS Zyatt. Lili is short and stiff strawed with high tillering capacity and can be drilled from the beginning of the planting window.



Choosing the right variety for your business will be influenced by a whole host of factors

“KWS Zyatt not only leads the yield table but has the desirable agronomic characteristic of stiff straw and the best all round disease resistance.”

Chris Piggott  
Seed commercial assistant





Wheat Varieties		United Kingdom (10.7 t/ha) Treated Yield	East region (10.8 t/ha) Treated Yield	West region (10.7 t/ha) Treated Yield	North region (9.9 t/ha) Treated Yield	Speed of Development	Tillering Capacity	Suitability for Early Drilling	Suitability for 2nd Wheat	Protein content (%) - Milling spec	Hagberg Falling Number	Specific weight (kg/hl)
Group 1	KWS Zyatt	102	102	103	[98]	Mod	High	No	Yes	13.0	273	77.7
	Skyfall	101	100	101	101	Fast	Low/Mod	No	Yes	13.1	291	77.9
	KWS Trinity	99	99	98	100	Fast	Moderate	Yes	Yes	12.9	342	76.9
	Crusoe	97	97	98	93	Mod/Slow	Moderate	Yes	Yes	13.8	262	77.3
Group 2	KWS Siskin	103	103	104	101	Fast	Mod/High	No	Yes	12.9	304	76.8
	KWS Lili	102	102	102	104	Mod	High	Yes	Yes	12.3	297	76.5
	Cordiale	96	97	96	94	Mod/Fast	Moderate	No	Yes	13.2	324	79.0
Group 3	KWS Barrel	103	102	102	109	Slow	High	Yes	Yes	10.9	212	76.4
	KWS Basset	100	101	99	101	Fast	Moderate	No	Yes	11.3	225	76.9
	Zulu	99	99	98	102	Mod/Slow	Mod/high	No	Yes	11.3	233	75.6
	Claire	96	96	96	[[97]]	Slow	High	Yes	Yes	11.5	260	76.0

Wheat Varieties		United Kingdom (10.7 t/ha) Treated Yield	Resistance to lodging without PGR (1-9)	Resistance to lodging with PGR (1-9)	Resistance to sprouting (1-9)	Mildew (1-9)	Yellow rust (1-9)	Brown rust (1-9)	Septoria tritici (1-9)	Eyespot (1-9)	Fusarium ear blight (1-9)	Orange wheat blossom midge
Group 1	KWS Zyatt	91	7	8	-	7	7	6	6.4	[7]@	6	-
	Skyfall	82	8	8	4	6	6	9	6.0	6@	7	R
	KWS Trinity	76	7	8	[7]	8	9	8	5.3	5	6	-
	Crusoe	77	7	8	6	7	9	3	6.7	4	6	-
Group 2	KWS Siskin	88	6	7	[5]	9	9	5	6.8	4	6	-
	KWS Lili	75	7	8	[7]	8	7	5	5.9	5	6	-
	Cordiale	64	8	8	6	6	4	4	4.8	5	5	-
Group 3	KWS Barrel	74	8	8	[6]	6	8	6	4.4	4	6	R
	KWS Basset	76	7	8	[6]	5	8	5	5.4	5	6	R
	Zulu	76	6	7	6	7	5	4	5.7	4	6	R
	Claire	70	[6]	8	[5]	[5]	5	5	5.3	5	6	-



“The new generation of hybrid barley varieties is raising the bar both for yield and grain quality.”

**David Waite**  
Northern seed commercial manager

**Group 3 (Key Group 3 varieties for the coming season on page 2)**

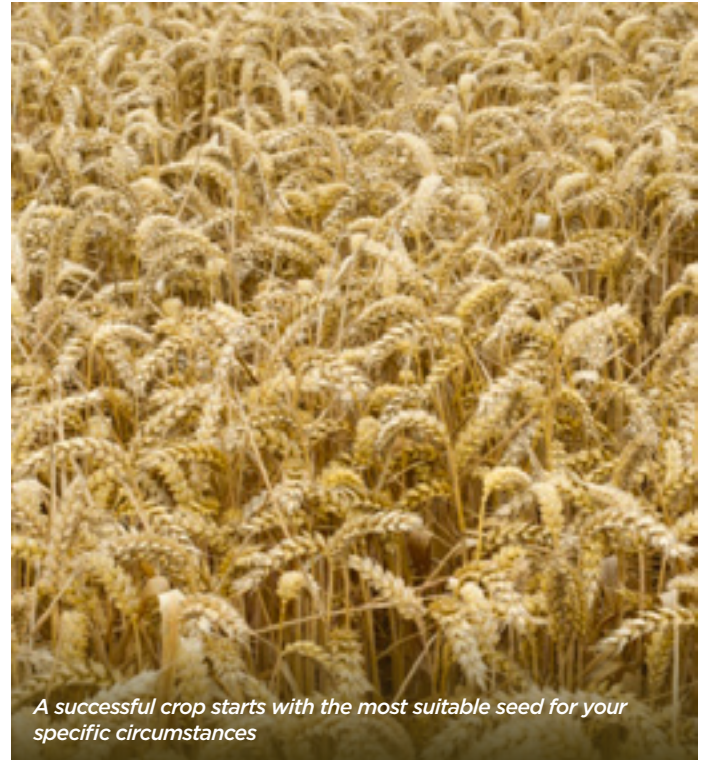
It is difficult to suggest growing any Group 3 variety other than KWS Barrel. It has the stiffest straw, the highest yield in all regions and is fully endorsed as a biscuit quality variety. Barrel has high tillering capacity and can be sown early, although not as early as Claire. As with other Group 3 varieties, Barrel has fairly poor resistance to septoria tritici.

**Group 4 (Key Group 4 varieties for the coming season below)**

There are now 26 feed varieties on the AHDB Recommended List. Some are seriously out-classed; Diego, for example, is now out-performed by Group 1s, 2s 3s and 20 other feed varieties. Others have major flaws, such as the weak straw of Silverstone. The table below details the best of the varieties, and others that have specific properties making them useful varieties to grow.

The two most important varieties are KWS Kerrin and Shabras. They lead the pack for yield, have fairly stiff straw and good disease resistance. Kerrin has midge resistance while Shabras has the better septoria tritici resistance.

Belgrade is a fast developing variety and should only be sown late, generally after late harvested crops such as potatoes or sugar beet. Graham, Costello and Revelation have good septoria tritici resistance, although Siskin from the Group 2s is higher yielding with better resistance. Costello has exceptional bushel weight.



Wheat Varieties		United Kingdom (10.7 t/ha) Treated Yield	East region (10.8 t/ha) Treated Yield	West region (10.7 t/ha) Treated Yield	North region (9.9 t/ha) Treated Yield	Speed of Development	Tillering Capacity	Suitability for Early Drilling	Suitability for 2nd Wheat	Endosperm texture	Hagberg Falling Number	Specific weight (kg/hl)
Group 4	KWS Kerrin	106	106	105	[110]	Moderate	High	No	Yes	Hard	135	75.7
	Shabras	106	105	106	[105]	Fast	High	No	Yes	Hard	200	75.5
	Belgrade	104	104	105	102	Fast	High	No	Yes	Hard	193	75.0
	Graham	104	103	106	100	Moderate	Moderate	Yes	Yes	Hard	275	76.1
	Evolution	102	102	101	104	Moderate	Low	Yes	Yes	Hard	195	74.2
	Costello	101	101	102	99	Moderate	Mod/High	Yes	Yes	Hard	326	80.1
	JB Diego	100	100	101	100	Moderate	Mod/High	No	Yes	Hard	309	77.4
	Grafton	99	99	99	[100]	Slow	Low	Yes	Yes	Hard	305	77.8
	Revelation	98	99	97	100	Slow	Moderate	Yes	Yes	Soft	246	75.9
Wheat Varieties		United Kingdom (10.7 t/ha) Treated Yield	Resistance to lodging without PGR (1-9)	Resistance to lodging with PGR (1-9)	Resistance to sprouting (1-9)	Mildew (1-9)	Yellow rust (1-9)	Brown rust (1-9)	Septoria tritici (1-9)	Eyespot (1-9)	Fusarium ear blight (1-9)	Orange wheat blossom midge
Group 4	KWS Kerrin	84	7	7	-	7	7	7	5.2	[5]	6	R
	Shabras	86	6	7	-	7	8	4	6.2	[5]	6	-
	Belgrade	88	6	6	[4]	9	6	5	6.1	3	5	-
	Graham	88	7	8	[7]	8	8	5	6.7	4	6	-
	Evolution	80	7	7	5	6	8	8	5.5	5	6	-
	Costello	85	7	8	[7]	8	9	5	6.0	5	6	-
	JB Diego	77	7	8	7	6	5	6	5.2	5	6	-
	Grafton	74	8	8	5	[6]	6	5	5.3	6@	5	-
	Revelation	81	7	8	5	6	9	8	6.4	8@	7	-



# Seed selection for the new season

## Winter barley

Winter barley is an important crop on many farms, providing an early entry for oilseed rape and grain and straw on livestock farms. Malting varieties should be at least provisionally approved by the Institute of Brewing & Distilling ([click here](#) for the latest list) to ensure acceptable quality, or grown on a named variety contract. Contracts usually specify certain criteria, including specific weight, nitrogen content, moisture and admixture.

It's important to check out your local malting market and regional suitability for winter barley. Does your soil type and rotation allow you to produce grain to the required specification?

For feed barley, a high yield would be an important requirement but in conjunction with a reasonable specific weight. Six row varieties have improved in this respect over the years with many now having the same specific weight as their two row counterparts. The new generation of hybrid barley varieties is raising the bar both for yield and grain quality. They now account for a sizeable percentage of the winter barley area in the UK. The aggressive nature of the hybrid plant allows the crop to compete better with grass weeds, such as black-grass, where this is an issue.

Bear in mind that regional performance of some varieties can be better than the national scores. KWS Creswell and Sunningdale are good examples of strong northern yield potential.

All varieties should have a good all round disease resistance. Resistance to barley mosaic virus is increasingly important and most varieties now have this trait. All [Recommended List varieties](#) have this feature unless otherwise stated. Short, stiff strawed varieties are beneficial where crops are being grown on heavier or more fertile soil.

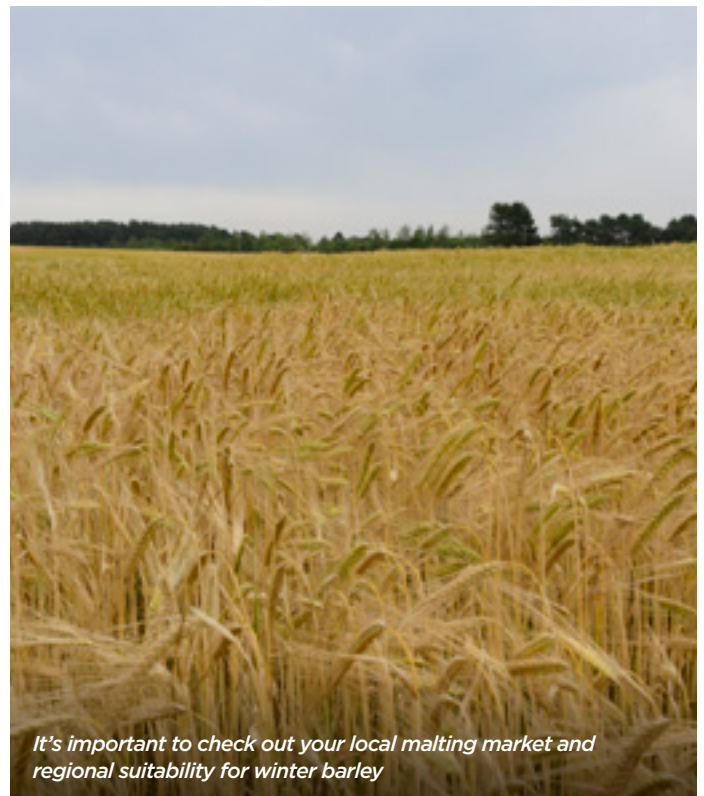


“Maximising crop output begins with the right choice of seed and the most appropriate seed treatment.”

**Paul Lacey**  
Seed production manager

## Seed treatments

Maximising crop output is essential and this begins with the right choice of seed and the most appropriate seed treatment. Good crop establishment with healthy clean roots will provide a strong platform to access improved yields. Healthy roots with increased biomass give the plant much greater potential to access nutrients and water and offer greater insurance in times of stress, whether as a result of environmental factors or attack from insect or disease pathogens. A strong healthy plant will be perfectly placed to maximise its photosynthetic potential and provide growers with a solid return on their initial investment.



*It's important to check out your local malting market and regional suitability for winter barley*

**To see how varieties are performing in current trials, visit your nearest 3D Thinking site open day this summer. For advice on the best options for your individual circumstances, speak to your local advisor.**

Seed treatments available for the 2017/18 season

Product	Active ingredient	For use on	Comments
Beret Gold	25g/l fludioxonil	Wheat Oats Rye Triticale	<ul style="list-style-type: none"> <li>• Robust single purpose treatment with good application and flowability characteristics</li> <li>• Wheat: Seedling blight and foot rot, common bunt, septoria seedling blight</li> <li>• Oats: Pyrenophora leaf stripe</li> <li>• Rye: Striped smut.</li> </ul>
Raxil Star	20g/l fluopyram + 100g/l prothioconazole + 60g/l tebuconazole	Winter barley	<ul style="list-style-type: none"> <li>• Robust single purpose treatment</li> <li>• Seedling blight and foot rot, seed borne net blotch, leaf stripe, covered smut and particularly loose smut</li> <li>• Good all round product, only product with loose smut retrieval.</li> </ul>
Vibrance Duo (new)	Sedexane + fludioxonil	Winter cereals: Wheat Rye Triticale	<ul style="list-style-type: none"> <li>• Robust added value single purpose seed treatment</li> <li>• Winter wheat: Snow mould, septoria nodorum, seed borne fusarium, common bunt, loose smut, moderate control of seed borne ear blight</li> <li>• Root development enhancement from SDHI element, but no activity on foliar disease</li> <li>• Uses new SDHI technology, specifically developed as a seed treatment with no impact on the use of foliar SDHIs</li> <li>• Gives good rooting benefits and potential yield benefits.</li> </ul>
Redigo Deter	50.0g/l prothioconazole + 250.0g/l clothianidin	Winter wheat Winter barley Winter oats	<ul style="list-style-type: none"> <li>• Good control of seed borne diseases, especially fusarium spp. Important starting point of mycotoxin reduction at the end of the season</li> <li>• Improved early season aphid control from Deter over imidacloprid which also gives a reduction in seed hollowing by slugs and wireworm damage</li> <li>• Minimum seed rate of 125kg/ha</li> <li>• Excellent product which gives targeted control exactly where it's required</li> <li>• Winter crops only - no drilling between 1st Jan and 30th June.</li> </ul>
Latitude	125.0g/l siltiofam	Wheat Winter barley	<ul style="list-style-type: none"> <li>• Second and third wheat situations</li> <li>• Winter barley following a cereal</li> <li>• Earlier drilled crops</li> <li>• First wheat after fallow or a spring cereal</li> <li>• Prevents take-all fungus from infecting new roots, allowing better establishment and rooting and reducing the level of take-all through to grain fill. By reducing root damage the product maintains root efficiency to absorb water and nutrients well into May/June</li> <li>• Only product available (seed treatment or spray) which gives protection against take-all.</li> </ul>
Austral Plus	10.0 g/l fludioxonil + 40.0g/l tefluthrin	Wheat Barley Oats	<ul style="list-style-type: none"> <li>• Fusarium spp, seed and soil borne bunt, septoria nodorum, covered smut, leaf spot, leaf stripe - barley (partial)</li> <li>• Wireworm and wheat bulb fly</li> <li>• Most persistent product available for the management of wheat bulb fly and wireworm.</li> </ul>
Prosper ST	N,P,K, Mg, Fe, Mn, Zn,Cu, Bo, Mo	Cereals Oilseed rape	<ul style="list-style-type: none"> <li>• Applying phosphite to the seed encourages root growth immediately after germination and establishment</li> <li>• Co applied with fungicide and pesticide seed treatments</li> <li>• Best responses seen on later drilled crops, slower developing cereal crops, cereals in light land sites</li> <li>• Increased shoot development, thicker crops during establishment</li> <li>• Strengthens resistance to fungal attack - positive effect against pithium</li> <li>• Offers root growth enhancement with the added benefit of significant nutrient and trace element availability.</li> </ul>
Mn-Tain	597gm/t Manganese in nitrate form	All cereals	<ul style="list-style-type: none"> <li>• High Mn concentration for use with all other seed treatments</li> <li>• Co applied with fungicide and pesticide seed treatments</li> <li>• Provides manganese right from germination</li> <li>• Ensures Mn supply in autumn when spraying may not be possible</li> <li>• Strengthens resistance to fungal attack</li> <li>• Provides a high, accessible source of manganese which is readily available to the plant</li> <li>• Low dust formulation.</li> </ul>
PolySeia 500R	Polymer	All cereals	<ul style="list-style-type: none"> <li>• High quality unique formulation polymer coating that positively impacts on germination in dry conditions</li> <li>• Provides even coverage of other treatments</li> <li>• Coloured to allow visibility in field to check drilling accuracy</li> <li>• Custom designed polymer which reduces dust, improves visual appearance without impacting emergence.</li> </ul>

# The value of phosphate and potash in supporting crop yields

Harvest is nearing once again and the yields of this year's hard work will be affected in part by the nutrients available to crops during the growing season. In advance of autumn drilling, fertiliser technical development manager, Mike Slater and SOYL technical manager, Simon Griffin emphasise the importance of adequate P and K levels and how to make sure future crops receive the nutrition they need.

## The purpose of P and K

The recent dry soil conditions experienced across the UK have highlighted the value of appropriate nutrition. Early root development and good establishment are key to crop success and this can only happen when adequate phosphate is available in the soil. Germinating crops need to access phosphate quickly and this is particularly important for oilseed rape as the small seed carries minimal phosphate reserves.

One of the main roles for potash is to maintain the turgor of the plant through osmotic pressure in the plant cells. If potash in the plant is inadequate, especially in the cells of the stomata on the underside of the leaves, more water will be lost from the plant than necessary, causing wilting. When this happens, photosynthesis declines and yields suffer. Many crops have been at risk of this in the last few weeks. It's in these situations that the full value of adequate potash will be seen.

## Levels required

To reduce the risk of crops failing to access adequate phosphate, the soil status should be maintained at index 2. This should provide adequate phosphate for the following crop, requiring only previous crop removals to be replaced. Below index 2, not only do crop removals need replacing but additional phosphate is needed to move the soil back to index 2.



"As we head towards harvest, identify fields where remedial action is needed to remove compaction and enable the next crop to establish well."

**Mike Slater**  
Fertiliser technical development manager

Crops can grow well at a lower soil status but if the soil is shallow or poorly structured, adequate phosphate uptake is much less likely. Phosphate hardly moves in soil and will only be accessed by crops as their roots grow through it. Compacted soils will inhibit root development and thus crop establishment.

In most situations some fresh phosphate applied just before or at drilling will provide the boost needed for good crop establishment. 150kg/ha of DAP (18.46.0) will deliver the nitrogen and phosphate needed for good oilseed rape establishment.

During the establishment phase, potash required by crops is low but where soil analysis has highlighted fields are below index 2, again potash removals need to be replaced and additional potash will be needed to help soils back to the target index 2.

Crops grown for anaerobic digesters or silage are harvested before they are fully ripe but will still have a high potash content, so large quantities of potash will be removed from the field which will need to be replaced via organic manures or fertilisers.

To give crops every chance to yield to their potential, make sure soils are maintained at target index 2 and not allowed to slip. It's in times of crop stress that the full value of a good soil status for both phosphate and potash will be seen.

As we head towards harvest, identify fields where remedial action is needed to remove compaction and enable the next crop to establish well. The best way to do this is to dig inspection holes across any field suspected of having poor soil structure.

Early autumn is the ideal time to check soil phosphate and potash status and it's a good idea to identify now which fields will need to be tested this autumn.

## Soil sampling

Standard soil analysis is the first step to correcting nutrition levels, but examining the potential for yield improvement by improving the vitality of soils will deliver improved returns. Frontier's Soil Life report is a valuable starting point. Examination of the physical, chemical and biological status of soils brings together the nutrient status, measuring density and porosity highlights the potential of the soil to support high yields and whether plants can adequately access any nutrients in the soil is assessed.

The easiest and best way to check if soils are at the correct index is to take a soil sample. Laboratory analysis will measure the amount of available P and K in the soil, which is reported in mg/l and can be

assigned to an index. Extracted values below index 2 are potentially yield limiting and additional fertiliser over and above crop offtake needs to be applied. If levels are above index 2, then less than crop offtake can be applied as inherent soil fertility can supply much of the required nutrients.

A traditional approach to soil sampling is to collect soil cores in a W pattern across a field, bulking them into a single bag. The aim is to give a result that is close to the average nutrient level of the field, which is used to calculate the fertiliser required.

Soil analysis data has shown that the majority of samples are not at index 2 and that less than 10% of soil samples analysed have both P and K at the correct level to optimise yields and inputs (Figures 1 and 2). In other words, up to 90% of fields risk either losing yield or wasting fertiliser and can be improved by correct measurement of nutrient levels. This data is based on W sampling. Due to the averaging nature of this approach, it can be assumed that this figure will actually be much greater. SOYL's own analysis of almost 100,000 samples supports this.

As a broad indication of soil levels, taking a sample on a W pattern may be a good starting point. However, it will not tell the whole story and indeed may be flawed.

		P Index		
K Index		< target	target	> target
< target		13	10	11
target		8	9	13
> target		7	10	19

Figure 1: Percentages of all samples in P and K indices (Source: PAAG 2016 report)

### A precise approach

For the field in figure 1, the W method gave a result of index 2+, the higher end of index 2 for plant available P. This suggests adequate levels of phosphate in the soil to reach optimum yield and that only a maintenance application of fertiliser would therefore be required.

When the same field was sampled by SOYL on an intensive 100m grid, each sample was analysed individually to identify any variations in nutrient availability across the field. The coloured map produced from this data (Figure 3) shows a range from very low indices (red) to very high (blue). About 10ha (red and orange) would be undersupplied with fertiliser if the average values were used to calculate the recommended P fertiliser rate and a yield loss could therefore follow. Conversely, about 7ha (dark blue) is well supplied with nutrients and a maintenance application would be an unnecessary waste of fertiliser, as well as risking P run off which could impact the environment.

As it would be in other fields, this variation was masked by the W pattern average approach to soil sampling. Since in reality, nutrient status will vary across almost every field, SOYL's nutrient mapping service offers a much more accurate approach, making it simpler to consistently maintain index 2 and optimise yields and inputs.

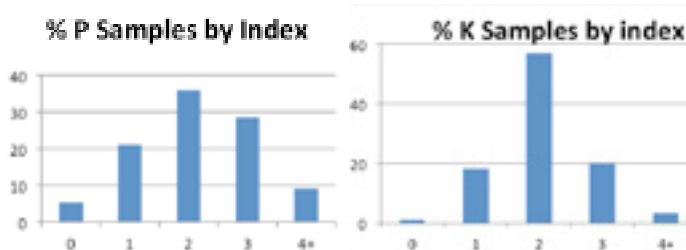


Figure 2: Percentage of SOYL samples at each index level for P and K.

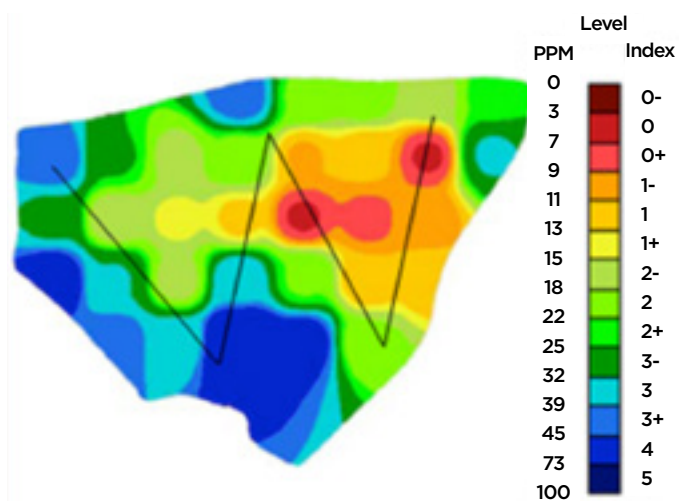


Figure 3: A field thought to be P index 2+ after taking samples by the traditional W method. Colours indicate the variation in P levels when sampled by SOYL.

To find out more about nutrient mapping and the status of your soils, speak to your local Frontier or SOYL contact.

“Less than 10% of soil samples analysed have both P and K at the correct level to optimise yields and inputs.”

**Simon Griffin**  
SOYL technical manager





# Have you considered liquid fertiliser?

Although May rainfall helped to alleviate dry conditions, the need for accurate and efficient fertiliser applications in unpredictable seasons remains clear. Where difficult conditions put pressure on yield potential, the marginal gains offered by liquid fertiliser are potentially even more valuable. With 2018 fertiliser purchasing underway, liquid fertiliser manager Bernie Zahra encourages growers to consider their crop nutrition system and highlights the advantages of liquids.

## Liquid benefits

Liquid fertiliser delivered via a sprayer gives an instant improvement in application accuracy. The full rate is applied across the full boom width, no matter the size, right to the field margin and around obstacles. Overlaps at the end of bouts are also reduced. Working accurately at wider bout widths means faster applications, saving time and money.

The result is more even crops, with less risk of lodging and higher overall yields as field margins receive the full rate of nutrient. Accuracy at the boundary also ensures that product is not applied into environmentally sensitive areas.

This accuracy has significant financial advantages. Yield loss has been recorded as high as 30% in the final 3 metres of crops whilst losses average 5% over the total headland. Over applying past the crop edge wastes up to an estimated 5% of total fertiliser applied, as well as risking environmental damage. In an 800ha crop over 50 fields, with 12% headland and tramlines of 24m, this could equate to yield losses of almost 50 tonnes and over £6000.

Liquid is less affected by the poor spreading days that can disrupt solid fertiliser programmes, so more application days are available. Fast fill pumps reduce loading times, there is no need for labour and equipment to unload deliveries or load the sprayer, no bags to dispose of and unused product can be returned to the tank. Table 1 illustrates the potential gain in efficiency when moving from solid to liquid.



“Liquid fertiliser can result in more even crops, with less risk of lodging and higher overall yields.”

**Bernie Zahra**  
Liquid fertiliser manager

		Solid	Liquid
Crop	Ha	800ha	800ha
Tank / hopper capacity	lt or kg	3000 kg	5000 lt
Application rate	lt or kg / Ha	200 kg/ha	200 lt/ha
Fill time	Min	5min	10min
Application speed	Kph	12kph	14kph
Boom width	M	24m	36m
Travel time to fill	Min	10mins	10mins
	Hectare / hour	21.6	33.6
	Total hours	37.0	23.8

**Table 1: Potential efficiency gains when switching from solid to liquid fertiliser**

## Nutrient supply

Liquid fertiliser products can be split into two groups; solution N, NS, NPK fertilisers, and suspension N PK S Mg plus trace element fertilisers. A full range of solution N and NS fertilisers is available to supply the nutrient requirements of different crops.

These homogenous solutions supply the full analysis in every litre of product. The nitrogen source is Urea Ammonium Nitrate which delivers a balanced nitrogen supply through nitrate, available for immediate uptake and slower ammonium and ureic forms which lengthen nitrogen availability and reduce leaching. Sulphur is immediately available as sulphate. Liquid fertiliser allows you to always apply some sulphur with the nitrogen, more closely matching how cereals and oilseeds use the two nutrients.

## Considerations

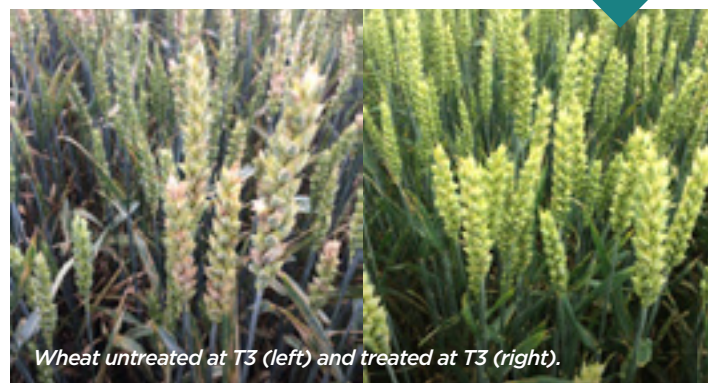
Leaf scorch risk must be taken into account. Warm, windy conditions before and after application have the biggest influence, but modern application equipment, such as dribble bars producing large droplets, significantly reduces the risk.

Correct storage capacity and siting of tanks is essential. Tanks should have capacity for a complete application and be placed to minimise refill time, although setting up a bowser to facilitate work at a greater distance is simple.

The fertiliser system you choose should provide the best agronomic solution for your business needs. Talk to the experts to find out more and discuss the best option for your specific situation.



# Preserving quality and yield at T3



Following debate over what to do at T2, most of the UK has now received some much needed rainfall. The majority of crops are responding well, although some second and third year cereals on lighter soils have lost some yield potential. Attention now swings towards the end of the disease control programme and how best to preserve quality and yield. Crop production technical lead, Dr Paul Fogg explains the importance of the T3 application.

## Ear disease

If the weather remains unsettled, the need to top-up protection against foliar disease will increase, as will the need to mitigate the effects of ear diseases. The ear blight complex comprises the fusarium species *avenaceum*, *culmorum*, *graminearum*, *poae* and *langsethiae*, for which *F. culmorum*, *F. graminearum* and *F. avenaceum* are the main mycotoxin forming species. There are also *Microdochium* species (*M. nivale* and *M. majus*), which can reduce yield and grain quality, with *Microdochium* also resulting in infected seed which leads to poor germination in the subsequent crop. Sooty moulds, for example *cladosporium*, can also be an issue later in the season. Last year, 80% of survey samples had Fusarium Ear Blight (FEB) symptoms (70% *Microdochium* and 20% *F. graminearum*).

The risk for this season is still to evolve. Levels of *Microdochium* and fusarium being isolated at the stem base are still relatively low and at a similar level to this time last year. The key factor will again be weather conditions at flowering and disease incidence could be high if, as last year, it's wet (Figure 1).

## Mycotoxins

Mycotoxins can result from fungi that develop in stored crops or from field-borne infections. For the mycotoxins Deoxynivalenol (DON) and Zearalenone (ZON), legal limits are in place for grain intended for human consumption and animal feedstuffs; see [AHDB's guidelines](#). It's the responsibility of the food producer (farmer, merchant and processor) to avoid placing any product on to the market that may exceed these legal limits, hence the need for the [risk assessment](#). Farmers have a key role to play as management of the crop at flowering can significantly impact fusarium infection levels and subsequent mycotoxin risk.

## Risk factors

- Region: DON and ZON tend to be highest in southern and eastern England, and coastal areas due to higher humidity
- Previous crop: Crop residues are a major source of infection. Risk increases after maize (grain and forage)

- Cultivation: Direct drilling increases risk. Plough and trash burial is most effective at reducing risk
- Variety: Fusarium resistance ratings are noted on the [AHDB Recommended List](#). Ratings 1-5 carry increased risk.
- T3 fungicides: [Active ingredient choice](#), for example prothioconazole, metconazole or tebuconazole and attention to detail at application, for example angling nozzles backwards.
- Resistance: Wide spread resistance in *Microdochium* Spp., to strobilurins. Strobilurins are considered largely ineffective against fusarium but can help retain green leaf area, fundamental during the key grain filling period as well adding to rust control
- Rainfall at flowering: BBCH 59- 69 and pre-harvest (BBCH 87 to harvest).

A range of factors contribute to the incidence of fusarium and *Microdochium* Spp., many of which we can influence little at this time of year. If weather conditions are conducive to infection of the ear at flowering, a fungicide is likely to be money well invested.

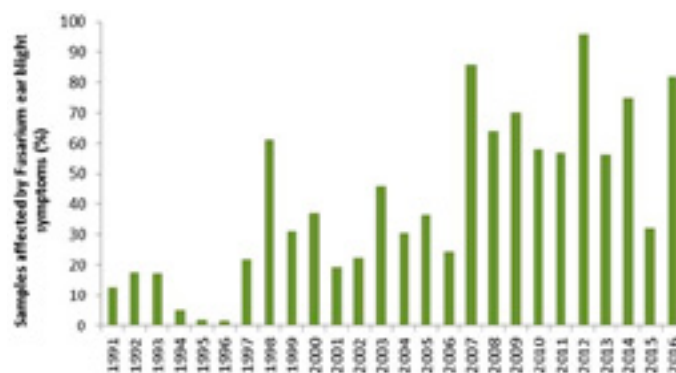


Figure 1: Samples affected by FEB 1991-2016  
(Source Dr P Jennings - FERA)

"It's the responsibility of the food producer to avoid placing any product on to the market that may exceed legal mycotoxin limits."

**Dr Paul Fogg**  
Crop production technical lead



# Pre-harvest management of oilseed rape

**After ten months of carefully maintaining the yield potential, preparing your oilseed rape crops for harvest is an important final task. It seems obvious that the more seed you can get into the front of the combine, the more you have in the barn to sell into an increasingly positive market. Investing in a pod sealant application and not being too hasty to desiccate crops will help maximise the yield and oil content captured. Crop production specialist Paul Cartwright considers the best approach to managing oilseed rape in its final few weeks.**

## Seed loss

OSR can be vulnerable to losses in the run-up to harvest, particularly during spells of unsettled weather. Applying a pod sealant as soon as pods are fully formed not only provides protection against premature seed loss but also gives confidence to hold off applying chemical desiccants for an extra few days if necessary to maximise oil yield.

The best seed savings will be made when a product such as Podium (styrene-butadiene + surfactants) is applied to full size pods when they are still green and rubbery. At this stage, the crop is less prone to mechanical damage from sprayers travelling through and is better protected ahead of any subsequent passes to apply a desiccant.

The target for application is the upper half of the canopy where pods are directly exposed to wind and rain. Pods in the lower canopy will typically be later to ripen and naturally at lower risk of splitting before harvest. Using lower water volumes (i.e. 100 l/ha) and alternating angled nozzles or twin caps delivers the most efficient coverage of the pods that require the most protection.

Frontier trials have shown benefits in varieties both with and without reduced pod-shatter characteristics. OSR seed saved using Podium can amount to 0.3-0.4t/ha, worth around £100 at current prices.

## Harvest date

Temperature is a key factor influencing the duration of OSR seed development. Crops are thought to require around 950 'day degrees' after the end of flowering to develop to their full potential. Day degrees are a measure of the difference between maximum and minimum temperatures in a 24 hour period. For example, if temperatures reach 13°C during an overcast day in late May and fall to 8°C during the night, then 10.5 day degrees will be accumulated. A brighter day with highs of 20°C and lows of 11°C will add 15.5 day degrees to the tally. Ideally, June will bring both warmer day and night time temperatures that will push up the average daily accumulation.

Growers in central and southern England, where crops have just finished flowering and are podding-up well, could typically expect to be harvesting by the third week of July. Further north and into Scotland, crops are still flowering and may take another week or two to finish, which could push the earliest harvest date into late July or early August.

A cooler than average June would mean crops require an extra few days to accumulate sufficient day degrees and maximise seed and oil development. In this situation, desiccating crops according to a desired early harvest date would impact final yield. Plan to apply desiccants after an assessment of the crop confirms plants are starting to dry down naturally and colour changes are evident in seeds.

## Desiccation

Assess the evenness of your crops and any weed burden in the canopy after pod formation is complete. Where crops are even, standing well and free of weeds, direct combining following natural senescence can be a cost effective option, providing the later and potentially slower harvest doesn't affect the timely harvest of other crops.

Pod sealants such as Podium are an essential input as harvest date is less predictable when left to ripen naturally. If crops do not ripen evenly, gross output will be compromised.



*A fully ripe oilseed rape pod at harvest*



*Applying a pod sealant as soon as pods are fully formed provides protection against premature seed loss*

### Glyphosate or diquat?

Pre-harvest glyphosate is a popular option for evenly ripening crops and if perennial weeds require treatment prior to harvest.

Assess the condition of the crop across the field. Seed taken from the middle of the main raceme should be below 30% moisture content and a colour change from green to brown evident in at least two thirds of the seeds in three quarters of the pods. If this is the case, glyphosate should be sprayed within three to four days.

Applications before this stage will not bring harvest date forward, rather it takes longer to work and the crop misses out on the final few days of valuable yield building. Plan to harvest 21 days after treatment. In the right conditions crops may be ready to cut after 14 days, which is the minimum harvest interval for all glyphosate products applied to oilseed rape.

The alternative herbicide option is diquat, which is applied at a later stage than glyphosate due to its rapid drying action. This later application timing can help ensure pod filling is complete and oil yields maximised in slower finishing or patchy crops.

Diquat is also useful where difficult weeds such as cleavers and thistles have made a late appearance. Equally, if patches have lodged, diquat may be the preferred desiccant since glyphosate may not translocate properly through kinked stems.

Where hard water is used for spraying, include a water conditioner such as Aquascope. Add to the spray tank first and allow it to mix with as much water as possible before loading in herbicides. If not previously applied, pod sealants should be co-applied with either glyphosate or diquat to help maintain pod integrity to preserve yield.



*Before desiccation, assess the evenness of crops and any weed burden in the canopy after pod formation*

**For advice on products, methods and timings to get the best yield from your crop this harvest, speak to your local Frontier advisor.**

“Pod sealants such as Podium are an essential input as harvest date is less predictable when left to ripen naturally. If crops do not ripen evenly, gross output will be compromised.”



**Paul Cartwright**  
Crop production specialist



# Considering summer sown cover crops

**Green cover crops are already recognised by many as an over-winter opportunity for improving soil health and capturing nutrients. However, there is also considerable benefit to establishing them during summer, before an autumn sown cash crop. Kings technical advisor in Scotland, Alan Johnson advises on the benefits and options available this summer.**

Summer cover crops aren't always easy to fit into a rotation when winter and spring cash crops are in the ground throughout the year, but knowing your options and planning ahead can help to take advantage of this approach.

## Benefits

Nutrient capture and soil structure improvement are the key objectives for summer sown cover crops, but carefully selecting varieties to meet your individual needs can bring additional benefits. These include fulfilment of stewardship and Ecological Focus Area needs, improved soil biota activity and grazing opportunities. Cover crops can also assist with control of soil borne pests and biofumigation - the growing of a crop to produce isothiocyanate gasses and mixing it into the soil immediately after chopping or macerating - works best with summer sowings ([see May's My Technical Brief](#)).

### Other benefits include:

- High biomass, as day length, sunlight and soil temperatures enable crops to harvest solar energy
- Significant expansion of soil biota as microbial life is very active and can reproduce rapidly on cover crop roots
- Increased soil vitality due to a large amount of biomass and root exudates
- Improved soil structure rather than ground left fallow. The resulting tilth after a cover crop can allow reduced cultivations before the next crop
- Green cover after carrots and vining peas avoids leaving ground bare before winter drilling, hence reducing wheat bulb fly risk.

### An example:

One of our customers in Brechin, Scotland established oil radish after carrots to avoid bare land before drilling winter wheat and reduce loss of nutrients left behind by the carrots. Drilled on 10th July 2016

with no fertiliser applied, figure 1 shows the growth after nine weeks. This also provided plenty of green manure for incorporation into the soil, improving soil vitality for the following crop.

## Choosing a crop

Some of the most popular summer sown crops include radish, for its fast growth, high biomass, deep roots and good nitrogen capture, and vetch and berseem clover, which are good at fixing nitrogen from the air and improving soil health. When planning for your crop, allow for at least eight weeks of growing time before crop destruction. Sow with low soil disturbance to avoid moisture loss and if flowering is a risk, choose slower growing varieties.

Consider the whole rotation to avoid a clash of species. For example, brassicas such as mustard and turnip rape should be avoided in oilseed rape rotations and in pea and bean rotations, care must be taken with legumes such as clovers and vetch.



Figure 1: Oil radish at drilling (left) and nine weeks later (right)

**For the best results, taking expert advice on varieties, establishment and management is essential.**

“Nutrient capture and soil structure improvement are the key objectives for summer sown cover crops. Careful variety selection can bring even more benefits.”

**Alan Johnson**  
Kings technical advisor in Scotland

