



Cereal establishment: making the right decisions for your farm

In this issue

Variety choice affects every aspect of your crop, from drilling to management and marketing. It is essential to choose the best option for the needs of both land and business. Technical support manager, Christine Lilly, and seed commercial assistant Chris Piggott, discuss some of the factors to consider.

End markets should be the first consideration for variety selection; milling wheat growers must be close enough to a flour mill to benefit from the premiums without income being reduced by haulage costs. There are different quality requirements for malting barleys depending on whether they are destined for the brewing or whisky markets. In areas with emerging markets, such as bioethanol, typical markets may be affected by the pull into the larger consumers.

Sowing date is also important. Optimum drilling dates depend on seed bed conditions; however, there are some predefined windows in which certain varieties will perform at their best. These must be considered alongside other agronomic factors such as grass weed pressure, where delayed drilling can help achieve maximum yield.

Some wheat varieties, including Grafton or Revelation, suit early September drilling as they are slower to develop through the autumn and, particularly in the case of Revelation, have robust disease resistance, reducing the risk of early infection. However, any variety drilled in mid September will be more susceptible to foliar disease than the same variety drilled in early October.

When considering later drilling for reduction in black-grass or disease pressure, varieties such as Skyfall and KWS Santiago are more suitable as they move quickly in the autumn and have a higher tillering capacity, therefore harvest date isn't compromised, and crop cover is good going into the winter. Some newer varieties, including Leeds and Evolution, have high yield potential but can be late to mature so may be less suitable for later drilling.

Belepi gives the greatest flexibility for very late sowing. It is possible to drill from mid October to the end of March, removing the risk of being unable to drill due to poor weather. Once established it moves quickly in the spring, increasing competition with weeds. Conqueror has also performed well in this late slot.

Barley varieties follow a similar decision process, but are less suited to the wider drilling window offered by wheat. The low vernalisation requirement makes it less suited to sowing before mid September. Yield decline and tiller loss is higher in late drilled barley as it is more susceptible to over-winter plant loss. Later sown barley also passes through growth stages faster, so key stages for yield production are shortened. Hybrid varieties such as Volume and Bazooka are also options for feed growers; increased yield and taller straw improve gross margins without sacrificing straw stiffness or grain quality which has always been a problem with conventional 6-row barleys.

Seed treatments

Appropriate seed treatments can be the difference between the success and failure of a crop and should be considered from the outset rather than as an afterthought. Assisting development and alleviating the effects of disease and pests, they are a cost effective and targeted way of applying crop protection products.

Early and mid sown wheat will benefit from Redigo Deter. In the East and South of the UK seed treatments should be applied to all but the latest drillings and will provide some protection from BYDV infection without the resistance and buffer zone issues from foliar applications. A 2013 Frontier trial in Cambridgeshire showed the effects of BYDV; under high aphid pressure and with no follow up foliar application, infection was still seen in the Deter treated plots but at much lower levels. Yield was significantly higher from the Deter treatments.

	%	Vigour	Yield	HLW
	BYDV	1-5	T/ha	Kg/HLW
Redigo	38.3	2.7	7.35	65.3
Redigo Deter	17	4	9.84	70



Cereal establishment: making the right decisions for your farm (Cont.)

Seed rates

Thousand seed weight should always be taken into account when calculating seed rates. It can vary between seasons and between seed lots. If establishment is likely to be variable across a field, consider using variable seeding technology to even up the plant population.

Our Staunton 3D Thinking site demonstrated that where plant establishment was low, black-grass ear numbers were significantly higher than where higher seed rates were used. For later drillings on heavy land plant establishment could be as low as 50%.

Grass-weed control

Seed dormancy, soil moisture, historic seed bank and amount of newly shed seed all affect black-grass germination, meaning that what works one season may not be effective the next. There must be a realistic prospect that the black-grass population can be controlled through a combination of herbicides and cultural options; if this is not the case then the most economic solution may be to overwinter fallow and then spring crop.

When buried below 5cm, seed viability reduces by 70-80% every year. The table below shows how much black-grass seed is still in the seed bank from a starting black-grass population of 100 heads/m² (10,000 seeds/m² with 60% viability).

Year	Seed decline (70%/yr assuming no further seed return)
Year 1	6000 seeds
Year 2	1800 seeds
Year 3	540 seeds
Year 4	162 seeds
Year 5	48 seeds



“If there is not a realistic prospect of controlling black-grass, it may be most economical to overwinter fallow and follow with spring crops.”

Christine Lilly
Technical support manager

Black-grass trials at Staunton

At our Staunton trials site over the last 5 years an alternate wheat/fallow rotation has kept black-grass to a minimum. In autumn 2012, when other blocks in the field had a poor oilseed rape crop, this block was fallow, minimising black-grass seed return.

Historically, the site had not been ploughed for many years. It was then re-introduced and combined with spring cropping has reduced black-grass from over 500 heads/m² in 2014 to under 1/m² this year. The challenge for this block is to avoid bringing black-grass up through the profile in the coming season.



The block that has always been direct drilled is interesting. Part of the plot has a black-grass population of approximately 2 heads/m², whilst the other half has around 50 heads/m². Direct drilling relies on a good chit of the newly shed black-grass to reduce the seed bank for the next crop. At Staunton, control of black-grass within the rows is good, but the wider row spacing allows the black-grass between the rows to tiller as there is less crop competition. A similar effect was observed in another block where the drill bouts did not quite match up leaving a narrow strip of bare land. This narrow strip of black-grass has spoilt what is actually a relatively clean block by allowing a large amount of seed return. This shows that attention to detail is vital.

Delaying drilling from 3rd to 27th October reduced black-grass ear numbers in treated plots from 178/m² to 2/m². A further flush of black-grass was glyphosated off, leaving a much finer seed bed with higher soil moisture which improved herbicide activity over the early October drilling. For very delayed drilling, select a number of fields that can be drilled and herbicide applied within a short window. Wait for as long as possible before drilling, but don't allow the soil to become too wet to create a seed bed. The benefit of delaying drilling will be lost if herbicides cannot be applied.

Under shallow tillage systems to encourage black-grass germination, keep cultivations in the top 5cm. The low dormancy and good moisture should encourage a good chit. Glyphosate off and repeat before drilling.



Frontier moves to help growers manage risk

A favourable growing season, with less than favourable prices, has focused farmers' minds on risk management tools. These give the opportunity to secure a minimum price while maintaining the possibility of achieving a higher price later in the season. Andrew Hill, grain origination team leader, acknowledges that given the current volatility in the grain markets, many growers are cautious about selling, but also notes that they are aware that decisions will need to be made soon, as harvest progresses.

He suggests that one constructive and valuable option could be Frontier's wheat option contract. "This risk management tool allows growers to fix a minimum price for their wheat, yet still benefit from future improvement in the market."

He notes that UK feed wheat prices are very volatile at the moment and observes that there remains optimism that values will lift; however, he believes that it is difficult to say with certainty that prices will improve in the short-term, "The Wheat Option is an ideal tool in this sort of situation as it sets a minimum price and

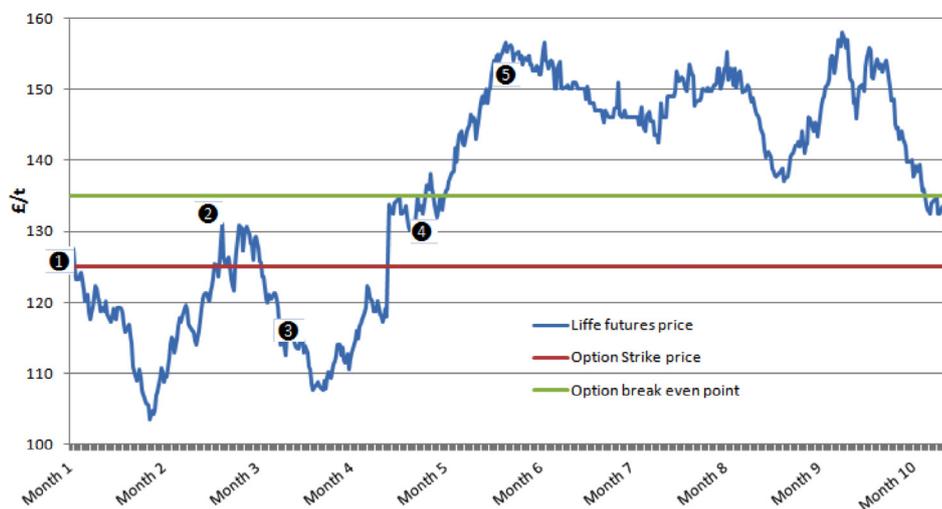
provides an opportunity to give some value back to the grower if the market improves."

The contract offers movement to suit the grower and prompt payment, improving cash-flow and eliminating logistical and financial pressures of storage. That is a particular benefit in a harvest where good yields may put pressure on farm storage space.

"An additional advantage of this contract is that it can be used against any grade of wheat, with quality premiums to be paid on the physical contract," says Andrew.

For more information about this and other risk management strategies across all grain types, please contact Andrew Hill on 01522 860240 or andrew.hill@frontierag.co.uk

1. The Farmer takes out a Frontier wheat option contract and buys an 'at the money' call option at £125/t
2. The cost of the option to the farmer is £10/t, therefore in order to break even, the market has to rise above £135/t
3. The market is below £125/t but the farmer can be safe in the knowledge that no matter which direction the market goes, they have locked into an agreed minimum wheat value
4. The farmer follows the market as it starts to rise. For every £/t that Liffe futures rise, the cost of the call option is being eroded
5. As the market rises above £135/t, the farmer has the opportunity to instruct Frontier to exercise their call option and take the profit.



"The wheat option contract provides harvest movement and payment, with the potential to benefit from a future price rise in the market."



Andrew Hill
Grain origination team leader



Improving soils to support higher yields

For many years, soils have been assessed to identify their ability to supply nutrients for crop production. The value of a good crop nutrient status is as important now as ever, but the physical properties and biological vibrancy of soils is equally important if crops are to thrive and deliver higher yields.

The soil texture and sand, silt and clay content is the starting point in understanding how different soils can be managed and how they will respond to cultivations and support crop growth. Each textural class has an ideal density; for example, light soils need adequate consolidation to enable sufficient root to soil contact, whereas clay soils which can pack down in wet conditions should be at lower soil densities so that roots can develop through the whole profile. Adequate pores in the soil are also needed at all times, with some filled with water to sustain root development and microbial activity. Target soil densities are 1.1 to 1.2 kg/l for clay soils and 1.4 to 1.5 kg/l for sandy soils.



Many soils are compacted and the depth of this compaction should be identified so that when conditions allow, sub soiling can be carried out to the correct depth. Attempting to sub soil when soils are too wet may allow standing water to be drained off but will do little to reduce compaction. Effective loosening requires the fracture of the soil to the surface, or the situation could be made worse. Thus effective loosening will only occur when soils are dry.

The risk of soils compacting further must be recognised and where this is likely, action should be taken to minimise the risk by using lower ground pressure tyres and reducing axle weights. Trailers are some of the worst culprits for damaging soils as they are often overloaded and running on hard cross ply tyres. Lower density soils will also allow better water infiltration, avoiding run off and the loss of soil particles and nutrients. Improving soil organic matter levels will help resist compaction. These measures of density, porosity and compaction vulnerability are all key measures in the Frontier soil report.

Organic matter levels in many of our arable soils have declined, reducing nutrient and water holding capacity. This means soils will compact more rapidly, increasing the horsepower requirement for cultivation. Remedying falling organic matter levels is a long term process and should be started as soon as possible. Along with a wide range of organic materials, different cover crops are available to contribute to increasing organic matter; deep rooting radishes, for example, will also help to open up compacted soils.

The microbial population in our soils depends on digestible organic matter as a feed stock. Without a good level of microbial activity, nutrient availability and uptake by crops will be markedly reduced. High carbon organic materials, such as straw and paper pulp, will require some nitrogen to enable the microbes to break them down which is usually drawn from soil reserves. However, if high carbon materials are applied in spring, they can use up nitrogen destined for crop growth and jeopardise yield. Compacted soils require less water to become waterlogged and when this happens, nitrogen will be lost to the atmosphere and microbial populations will be destroyed. When an ideal environment for microbial activity is achieved, populations will increase, nutrients become more easily available and uptake will improve through the symbiotic relationship between root hairs and fungi in the rhizosphere.

A good soil nutrient status has always been essential to optimise crop production but unless the soil is an aerobic vibrant growing medium, crop yields will not improve. Using the information provided on physical, chemical and biological factors in the new Frontier soil report, an action plan can be developed to improve soils and provide the ideal environment for our crops.





Improving soil vitality

A range of measures can improve organic matter levels. Improvements may be slow, but they will steadily boost soils and support higher yields. If straw needs to be removed, consider leaving a longer stubble, but chop and incorporate the straw if possible. There may also be opportunities to import compost or manures, but where this is difficult, the use of cover crops will contribute towards improving organic matter. In extreme cases, the addition of a three year grass ley could be appropriate, though this usually requires a change in farming policy.



The second challenge to soil vitality is a low soil pH. Soil acidity has a major impact on nutrient availability and microbial activity. The ideal pH for arable soils is around 6.5 and closer to 6.2 on grassland. Consider the appropriate source of lime to correct soil acidity. On soils with high magnesium levels, avoid using magnesium limestone and use calcium carbonate based liming products. If more than 5t/ha of lime is required, two applications should be made, 12 to 18 months apart.

With machinery getting heavier, soil compaction is becoming more common and restricting root development and yield. After harvest, check for compaction by digging inspection holes to identify how deep to set a cultivator to repair the damage when soils are dry enough to achieve the desired results. The tines should be set to run just below the compacted zone and create cracks to the soil surface. If this can't be achieved with one set of tines, two sets of tines at different depths will be needed, or two passes with the tines set at different levels. If pressure from a tine is applied, especially with wings, with no fracture to the surface, compaction will worsen.

Early autumn will soon be here, so efforts to remove compacted layers in the soil now will give the following crop every chance to establish and yield well.

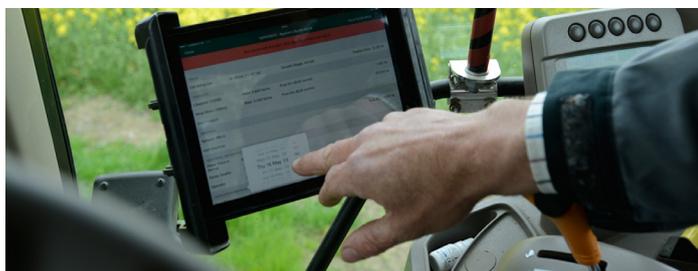


my farm - A crop records revolution

MyFarm enables growers to manage all aspects of their farm business in one place. As we look ahead to the new growing season, project development co-ordinator, Jim Knight describes how this innovative approach to farm and crop recording can offer tangible efficiency benefits to your farm.

As mobile technology takes an ever more prominent position within farm businesses, MyFarm now offers access to cropping information on the go and in the field via a range of apps for smartphones and tablets, meaning that you are no longer tied to one computer in the farm office. Instead, the responsibility for recording business and cropping information can now be spread across the whole farm team. Because MyFarm is web based, everyone from the farm manager and secretary, through to the sprayer operator and the agronomist can share and update crop records and precision farming data, allowing improved collaboration, and reducing the chance of important information or tasks being missed during busy times in the growing season.

Richard Duchesne, who farms near Bury St Edmunds in Suffolk, describes how the system has allowed his agronomist, Neil Leech, to tailor agrochemical plans based on the up-to-date information in MyFarm. "Neil knows right away if I have done something or not" explains Richard. "So, for example, if he has made a recommendation about a particular programme, but I haven't been able to follow that for some reason, perhaps I've been spraying for someone else and haven't been able to do my own fields, he can adjust for that. He doesn't come back to me with the next part of the programme assuming that I did it on time."



Through a partnership with Muddy Boots software, Frontier has integrated the Greenlight Grower Management system into MyFarm, offering growers a new and accessible alternative to traditional crop recording systems. The combination of increasing demands upon farmers' time, and the growing requirements for accurate and detailed record keeping, mean that creating a system that is simple to use and easy to update has been a key focus. Andrew Havergal, a senior agronomist working in Bedfordshire and Buckinghamshire, has introduced a number of his customers to MyFarm and is

impressed with results, "The ability to manage all farm data with one flexible, online solution is proving extremely valuable to growers" states Andrew. "By instantly sharing crop records with my customers, we are all able to work more efficiently. Moving to electronic records is also cutting down on a lot of the paper records that used to overflow from farm offices."



myRecs

Feature summary:

- Remote access to current and historic crop and application records
- Create and confirm agrochemical recommendations in the field
- Record field inspections, including photos of problems or diseases
- Store records throughout the day with no in-field internet connection required

Coming soon:

- Audit recommendations against key regulations such as dose rate, crop compatibility
- Receive crop nutrition plans and record fertiliser applications.

The MyRecs app is for iPad only.

If you are interested in the app or would like to know more please contact our MyFarm support team on 03330 141141 or at ITsupport@frontierag.co.uk.

Free trials of MyFarm are currently available.

If you would like to find out more about MyFarm, please **Speak to your usual Frontier contact**, or get in touch with the MyFarm support team on **03330 141141** or at **ITsupport@frontierag.co.uk**

Increasing efficiency through streamlined record keeping is now made even easier, with the addition of the MyRecs app for iPad. MyRecs automatically receives and stores agrochemical recommendations from MyFarm, which can then be accessed remotely by the operator in the field. Applications can be recorded straight into the app, instead of on handwritten paper sheets, and any new records will be automatically uploaded to the MyFarm website. By working entirely through electronic records, paperwork is removed from the system and time consuming double entry is avoided. Chris Papworth, one of Andrew's customers in Bedfordshire, used the MyRecs app to record all of his spray applications during spring 2015. He manages more than 600 hectares at Little Staughton Farms, and explains how he uses MyFarm, "When Andrew and I meet we can do the recommendation there and then in the field on his iPad. He sends it over to me and when I'm ready to go out I download the plan, do that application and then it's stored. It makes my office work so much more economical. It's also great from a compliance angle too."



Richard Duchesne has also been using the MyRecs app to help manage his busy contracting business, where he has seen particular improvements in his invoicing process, "When I'm working with paper, my sheets are sometimes left in the sprayer, or they are somewhere between the sprayer and the office, or I've left them in the kitchen and then I don't get round to producing the invoices very quickly. With MyFarm, I can print it straight off and do the invoice at the end of the month. It keeps me a bit more organised and I need as much help with that as possible." With work underway to include fertiliser applications and the ability to record field activities in the app, growers will soon be able to access and update a wide range of farm information without setting foot in the office, freeing up more time to concentrate on maximising the potential of their crops.

As well as Greenlight Grower Management and the MyRecs app, MyFarm contains a range of other online tools and access to all of Frontier's existing online services, including iTrac and market information.

myCrop Records

- Access crop records anywhere with Greenlight Grower Management
- Exchange data seamlessly with your whole farm team, agronomist and contractors

myRecs

- Improve efficiency and go paperless; receive, create and confirm applications in the field
- Automatically transfer application records back to the MyFarm website and your agronomist

myCalculator

- Control your budgets and track profitability with accurate forecasting and cost management
- Compare the potential returns on different cropping and rotations

myLibrary

- Access a range of technical information
- Keep up to date with the newest legislation

mySOYL

- Maximise efficiency with online access to precision farming data and tools
- Create your own variable rate maps when you are ready to go out drilling

myTrac

- Keep track of your Frontier account 24 hours a day with our established iTrac system
- View your latest sample results, load weights and delivery information.

"MyFarm helps growers significantly reduce their paperwork, giving them more time to concentrate on getting the best from their crops."



Jim Knight
Project development co-ordinator



How well do you really know your soils?

Soils are being recognised as one of the world's most important resources and against this background, the United Nations Food and Agriculture Organisation has declared 2015 the International Year of Soils. Among growers there is increasing recognition and emphasis on maintaining good soil health. SOYL's technical manager, Simon Griffin, is clear that the starting point has got to be a sound understanding of the soils in your fields.

An ever increasing world population means that a growing amount of food needs to be produced. However, soil is a finite resource and in the UK we have reached a yield plateau, with no significant increase in yield for more than ten years. To meet the rise in demand, we must make our soils more productive and the first step in achieving this is to understand them; what they are, whether they are in good health or not, what their true potential is and how to improve them.

While there is an increasing recognition of the importance of soils, many growers do not have an accurate record of their soils. Undertaking a soil survey is the best way to really understand the changing nature of soils across the farm.

Electrical conductivity survey

A high resolution electrical conductivity survey is the starting point for the SOYLscan soil survey process. Conductivity changes in relation to clay and moisture content, soil depth, stone content and other physical characteristics of the soil. The SOYLscan sensor is towed behind a quad bike and travels the field, taking shallow and deep conductivity readings simultaneously and logging the exact point at which each measurement is taken. Hundreds of data points are collected in every hectare. This data is then zoned to show where soil types change. The next step is for a soil surveyor to visit each zone and record the physical and visible soil attributes such as colour, depth to subsoil, texture, stone content and other pertinent characteristics. The result is a detailed and accurate soil map of the farm.

The conductivity maps can then form the starting point for soil management decisions. By identifying yield potential across all fields, management zones can be created and techniques can be targeted to the most appropriate areas to achieve yield



improvements. Management decisions such as seed rates, cultivation, nitrogen rates, slug management, irrigation and variety selection should all be related to how soil changes across the farm.

Risk assessment such as runoff and erosion risk is linked to soil type and field investigations should also be targeted based on this information.

To find out more about SOYLscan, speak to your usual Frontier or SOYL representative or call 01635 204190.

“Soil is the foundation of everything we do. Understanding the changing nature of soils across your farm is the starting point for improving productivity.”

Simon Griffin
SOYL's technical manager

