my technical brief

frontier

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News and crop production advice from Frontier

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Pod sealants and desiccation timing in oilseed rape

Photo courtesy of De Sangosse

Preparing oilseed rape for harvest is an important final task in the crop's life cycle. Selecting the most appropriate method to suit the condition and end use of the crop will ease the harvesting process and maximise yield and oil content. Crop production specialist Paul Cartwright explores the options.

Pod sealants

As with other pod-bearing crops, oilseed rape can be vulnerable to losses as harvest approaches, especially during spells of unsettled weather. Applying a pod sealant as soon as pods are fully formed is a convenient way to protect against seed loss as crops dry out before and during harvest.

The best seed savings will be achieved by applying a product such as Podium (styrene-butadiene + surfactants) 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 it and it will be protected ahead of any subsequent passes to apply a chemical desiccant where used too.

The upper canopy is the target for application as these pods are exposed to wind and rain. Pods in the lower canopy are typically later to ripen and are at lower risk of splitting before harvest.

Desiccation

Desiccation options include chemical and non-chemical methods. Assess the evenness of crops and existing weed burdens in the canopy after pod formation is complete to help identify the most suitable chemical desiccant and correct application rates.

Where crops are even, standing well and generally free of weeds, direct combining following natural senescence can be a cost effective option, providing the later and potentially slower harvest does not affect the timely harvest of other crops. Pod sealants are a must because harvest date is less predictable and if crops do not ripen evenly, gross output is likely to be compromised.

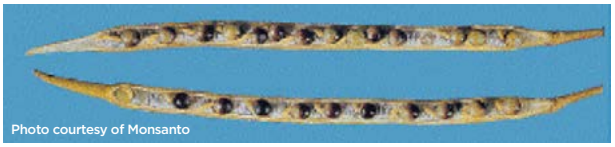


Photo courtesy of Monsanto

Check pods to determine correct timings

Glyphosate or diquat?

Using herbicides to desiccate oilseed rape is a popular option. Glyphosate is useful to help finish evenly ripening crops and where perennial weeds require treatment prior to harvest.

Plan to harvest 21 days after treatment, though crops may be ready to cut in around 14 days in the right conditions. This is the minimum harvest interval for all glyphosate products on oilseed rape.

Correct application timing is essential to avoid compromising yield and oil content. Crops should be sprayed within three to four days when seed taken from the middle of the main raceme is below 30% moisture content and a colour change from green to brown is evident in at least two thirds of seeds in three quarters of the pods.

Diquat will bring about the rapid dry-down of crops after application, even up ripening and bring forward the harvest date. With a later application timing than glyphosate, diquat can help ensure pod filling is complete and oil yields are maximised in slower finishing and patchy crops.

Diquat is also useful where difficult weeds remain uncontrolled in the upper canopy, particularly cleavers and thistles. Equally, where crops have lodged, diquat may be the preferred desiccant since glyphosate may not translocate properly where stems are kinked.

A water conditioner such as Aquascope should be included where hard water is used for spraying and if not previously applied, pod sealants should be co-applied with either glyphosate or diquat to help maintain pod integrity and preserve yield.

For expert advice on the best methods and timings for your crops, speak to your local Frontier advisor.

"Oilseed rape can be vulnerable to losses as harvest approaches, especially during unsettled weather. Careful management is essential to avoid compromising yield and oil content."

Paul Cartwright
Crop production specialist

CHAP: Re-establishing the UK as a world leader in agri technology, innovation and sustainability

Frontier has signed up as a core partner in the new national centre for Crop Health and Protection (CHAP) – a role which Frontier will use to ensure multi-million pound agricultural research funding is directed to the projects which provide the best opportunity to find practical solutions to real farming challenges facing growers in the UK and beyond. Commercial manager James Moldon explains how CHAP will make a difference and what Frontier's role will be.

The challenges facing agriculture are many and varied. Every three days, the global human population increases by 70,000 people. At the same time, farmers are dealing with decreasing choices of control options, resulting in an annual loss of crops of up to 40% due to pests, diseases and weeds. Global geopolitical instability is creating shortages of land, water and energy and pressure is being felt as climate change impacts on disease levels and our ability to implement controls.

UK agriculture has the ability and knowledge base to tailor and support the early development of innovative solutions to many of these challenges. Under the Government's new Agri-Tech strategy, Frontier recently signed an agreement with ten industry partners to form CHAP. This strategy has been developed in recognition of previous low levels of investment in agriculture, and is designed to make sure the knowledge and insight from the UK's world-leading science base are translated into benefits for society and the economy at home and abroad. The strategy was launched in July 2013, with £160 million of funding.

The solutions proposed by CHAP will make use of the latest technology

Achievement through collaboration

CHAP will establish the UK as a world-leader in agri-technology, innovation and sustainability. It will create an environment that encourages the exchange of leading edge knowledge, resulting in greater innovation and wider access to the best available technologies and solutions. By taking science to the farm, CHAP will help growers and the food industry to improve yields, reduce costs and meet the need for sustainable solutions to current and future challenges.

CHAP has secured £21.3 million of government investment over four years. Its headquarters will be at the National Agri-Food Innovation campus at Sand Hutton, near York. CHAP's consortium partners include Bayer CropScience, Farmcare, Frontier, Dow AgroSciences, Tesco, Stockbridge Technology and Unilever, alongside AHDB, CABI, Cranfield University, FERA Science Ltd, Newcastle University, ADAS, Met Office, Warwick University, Campden BRI and Rothamsted Research. CHAP will enable these organisations, alongside retailers, processors, agronomists and manufacturers, to share resources, optimise return on research and development costs, reduce waste and accelerate the registration process for new products.

CHAP has been formed to address the challenges faced by today's farmers

Grand Challenges

CHAP will invest in a range of new research, scale-up, demonstration and testing facilities to enable the centre to address specific areas which have been identified as 'Grand Challenges'. Each challenge has been broken down into smaller objectives as follows:

Early warning monitoring and surveillance

- Provide bespoke and timely advice to farmers to avoid losses in crop production caused by biotic crop threats
- Improve product stewardship by actively managing pesticide resistance in biotic crop threats
- Horizon-scan for new species and genetic variants of biotic crop threats.

Integrated novel control technologies

- Discover and deploy novel control technologies, such as biopesticides and new agrochemical actives, with minimal environmental impacts
- Develop the next generation of 'adaptable' resistant crop varieties
- Harness the potential of soils to contribute to crop health and protection.

Precision application/management

- Improve the application efficiency and formulation of control products
- Deploy variable rate approaches to control pests, pathogens and weeds with sub-field level precision.

Technology acceleration and incubation

- Convene national and international crop health and protection expertise from across the food chain to understand and solve sector issues
- Engage businesses to help drive new innovative crop health and protection products and services to market.

Regulation and outreach

- Create a proactive, independent and compelling voice on sustainable crop health and protection technologies
- Navigate the regulatory landscape for novel control approaches to pest, pathogen and weed control.

Knowledge exchange and skills development

- Maximise the scale and speed of technology uptake
- Develop innovative knowledge exchange solutions to share best practice across the industry
- Develop the skills base necessary to deploy new technologies to end user groups.

Steering research funding in the right direction

Frontier will use its role as a core partner of CHAP, its knowledge of agriculture, and its understanding of UK farmers to ensure that projects put forward for CHAP research funding are those which will provide the most benefit to agriculture and farmers.

Frontier's position as a core partner also allows us to advise and steer on key projects submitted by other industry partners and consortiums that will have an impact on the agricultural industry. The centre will:

- Improve collaboration between industry and academia to access the best and most sustainable technologies for the future
- Develop early stage diagnostics to enable timely advice and product targeting, helping farmers to improve crop performance
- Unite the latest technology to supply predictive tools, allowing the UK to respond swiftly to new and emerging threats in pests and diseases
- Work alongside manufacturers and researchers to better assess the latest product solutions and speed up registration of safer chemicals
- Harness expertise in novel control technologies delivering sustainable integrated pest strategies.

Frontier has identified four focus areas as critically important to growers and the future sustainability of farming:

1. Soil health, resilience and vitality
2. Plant health including biostimulants and micronutrition
3. Real time analysis of data including in-field diagnostics
4. Application technology for improved targeting and efficacy.

Over the coming months, Frontier will start to look at scoping out potential projects around soil health in conjunction with prospective partners that have the capability to deliver some viable solutions.

To find out more about CHAP, Frontier's role and how the centre's work will benefit UK agriculture, please contact james.moldon@frontierag.co.uk.

"By taking science to the farm, CHAP will help to improve yield, reduce costs and meet the need for sustainable solutions to present and future challenges."

James Moldon
Commercial manager

Hitting the quality requirements of milling wheat

With the significant increase in area of milling wheat in the ground, hitting the full quality specification will be essential to achieve premiums this year. For growers wanting to maximise the potential value of their group 1 and 2 crops and those with milling premiums on contract to protect, the focus now turns to hitting the 13% protein target. Edward Downing, national crop nutrition technical manager, describes the best approach.

The table below shows the average protein performance for all wheat samples analysed through Frontier labs over the last six years. The average milling group 1 protein is 12.85%, showing that over half of grain samples failed to hit the target. Yield performance has the biggest influence on these figures as the difference between 2013 and 2014 shows, with extra yield in 2014 diluting the protein by around 0.7%. The 2015 results are encouraging though, with yields similar to 2014 but proteins 0.2 to 0.4% higher.

	2015	2014	2013	2012	2011	2010
Group 1	12.7	12.3	13.0	13.3	13.0	12.8
Group 2	12.2	11.8	12.4	12.9	12.7	12.3
Group 3	11.0	10.8	11.5	12.1	11.3	10.9
Group 4	10.8	10.6	11.3	11.8	11.2	11.0

A cool, dry April 2015 meant crops took up more nitrogen later, but the key was that growers increased nitrogen rates having taken into account the previous low protein season and the condition of their crops. It wasn't enough to reach 13%, but it was a move in the right direction. The 8% increase in milling wheat area compared to last year (32% vs 24%) means you must aim to achieve over 13%, as opportunities to market sub 13% grain will be fewer this year.

Is your base nitrogen programme right?

A well timed late foliar nitrogen application is often essential to achieve high grain proteins, particularly in high yielding years, but they can only raise protein levels by around 0.5-0.75%, so appropriate base programmes are vital. Solid/UAN applications should be targeted to produce a protein of around 12.5%, with the foliar application then taking it over the 13% target. This means more nitrogen will be needed than the optimal dose for yield, as milling varieties tend to produce 12% protein at the optimum nitrogen rate for yield, versus 11% for feed varieties. To achieve 12.5% protein from the base programme, the influence of yield performance, soil nitrogen supply and the efficiency of fertiliser uptake need to be understood.

The table below shows the amount of nitrogen removed in the grain at 12.5% protein and total uptake required to achieve this. Each extra tonne requires the crop to take up nearly 30kgs/ha of nitrogen to maintain the protein level.

Yield performance (t/ha)	Grain N removal at 12.5% protein (kg N/ha)	Total N uptake at 12.5% protein (kg N/ha)
8	149	219
9	168	247
10	186	274
11	205	302
12	224	329

Total nitrogen uptake represents what the crop must take up, not the amount to apply. This is a combination of the nitrogen supplied by the soil and the proportion of the applied nitrogen that the crop actually takes up. Soil nitrogen levels can vary dramatically based on the previous crop, manure use, soil organic matter levels, winter rainfall and soil temperatures. Min N testing can help, but is often only useful when levels are above 120kgs N/ha. The efficiency of fertiliser nitrogen uptake by the crop is similarly variable; on average, we assume 60% efficiency, but it can be significantly higher in favourable situations, or considerably lower if soil and weather restrict rooting.

With all this potential variation, understanding your own situation is essential. Consider your yields, associated grain proteins and nitrogen rates over the last 5-10 years and then assess potential yield for this season. This isn't easy but monitoring crops in the key growth period, from early May to the end of June, will provide a steer. Reviewing canopy maps from SOYL can help to quantify this and coupled with tissue testing for nitrogen via lab analysis or using the Yara N-Tester, fertiliser applications can be fine tuned.

Multi N – 33% N 25% SO_3

- **Rate – 33 to 40lts/ha in 120-150lts of water**
- **Most efficient foliar nitrogen fertiliser**
- **Reduced risk of nitrogen (ammonia) loss**
- **Rainfast in 30 minutes**
- **Very low scorch risk.**

A four split programme is worth considering

Is there any difference between fertiliser products?

The choice of base fertiliser product can influence grain protein. Urea based programmes generally produce grain with lower protein than an equivalent ammonium nitrate (AN) programme. In Frontier trials in 2015, admittedly a high yielding year, the AN programme produced a protein 0.61% higher than urea. This is due to the higher nitrogen losses associated with urea from the volatilisation of ammonia as it hydrolyses. This won't always produce a significant yield loss, but will limit protein production by restricting the nitrogen available to the crop. Applying urea early to cool, wet soils can reduce volatilisation, but the only way to reduce it significantly is to use AN or KaN (Agrotain treated urea).

What are the benefits of sulphur?

As well as nitrogen, milling wheat crops must have enough sulphur. This helps crops to fully use the applied nitrogen to optimise yield and quality as, along with nitrogen, it is the main constituent of protein. Recent trials work has shown it reduces the risk of harmful acrylamide formation when bread is baked. Aim to apply at least 50kgs/ha SO_3.

How many nitrogen applications are needed?

Most milling wheat growers use a three split fertiliser programme and a foliar ear application. A four split programme offers a number of benefits though, especially in high yielding seasons. As well as an additional opportunity to evaluate seasonal conditions, it will reduce the nitrogen rate of the final application which can potentially be delayed until full flag leaf emergence for greater protein enhancement. It also allows the final application to be omitted if yield potential appears to be reducing and lowering the risk of grain protein dilution.

Choosing a foliar nitrogen product

A well timed foliar nitrogen application will give that final protein lift to reach the 13% target, but products should be chosen carefully. The protein lift from foliar urea, for example, can vary significantly with weather conditions, it is not very rainfast and scorch can be an issue. In contrast, Multi N has performed consistently. Its lower use rate, excellent rainfastness and low scorch risk has made it very popular on farm.

Understanding the NVZ Nmax rules

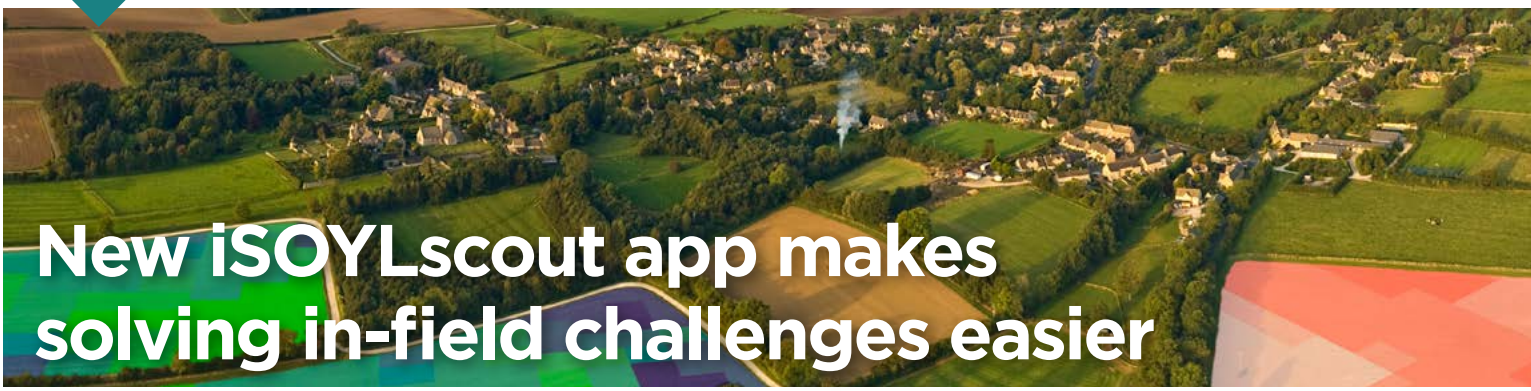
You must comply with Nmax limits within the NVZ rules. In England, the base Nmax for wheat is 220kgs N/ha for an 8t/ha yield. You can then add 20kgs/ha for each additional t/ha over this yield based on recent performance and an additional 40kgs N/ha for milling wheat varieties. Remember that the Nmax for wheat is the average across all fields, including milling and feed.

Yield (t/ha)	Base Nmax limit (kg N/ha)	Adjustment for yield (kg N/ha)	Adjustment for milling (kg N/ha)	Final Nmax limit (kg N/ha)
8	220	0	40	260
9	220	20	40	280
10	220	40	40	300
11	220	60	40	320
12	220	80	40	340

For specific advice on how to give your crops the best chance of reaching targets, speak to your local Frontier contact.

"To reach protein targets, the influence of yield performance, soil nitrogen supply and the efficiency of fertiliser uptake need to be understood."

Edward Downing
National crop nutrition technical manager



New iSOYLscout app makes solving in-field challenges easier

SOYL's digital services help growers to get the most out of precision techniques, allowing them to focus their efforts and ultimately save time and money. As a result of continued research, development and grower feedback, this digital offering will be expanded this month with the launch of another precision technology tool. SOYL's business development manager, Tom Parker, explains the features and benefits of their new app, iSOYLscout.

Feedback from growers has shown that the ability to seamlessly move information between field and office with an intuitive, clear interface and no need for cards or sticks is attractive and efficient. The MySOYL portal and the innovative iSOYL app, which allows farmers to use an iPad to control variable rate applications in-field, have been recognised in industry awards as well as being popular on farm.

This concept is furthered by the new app, iSOYLscout. While iSOYL allows farmers to record some observations in-field, iSOYLscout takes this approach to a new level. Both apps transfer information quickly and easily back to the central MySOYL portal, but iSOYLscout allow users to capture more detailed information while out in the field.

MySOYL is a web based tool that enables growers to manage their whole business from one source with a single log on. Features include full access to P, K, Mg and pH maps, access to SOYLseed data, an online calculator for variable rate fertiliser and seed rate plans and printable reports. To find out more, please contact SOYL on 01635 204190.

How does iSOYLscout work?

The app is not just for farmers. Access can be granted to anyone involved in the business, including on-farm staff and advisors such as the agronomist. It works on both iPads and iPhones and will be available for download from the Apple App Store.

iSOYLscout is built around the concept of projects which can be viewed as 'containers' that hold various polygons (areas) or points (single observations) related to an area of interest.

A user first sets up the area of interest which can be set at various scales to capture a single field, a section of the farm or the whole farm, for example, according to the information they want to record, from areas of weeds to tree locations. The app can record these areas by GPS trace, allowing the user to accurately map an area in the field, such as waterlogging, black-grass or game cover. There is also a manual drawing tool which can be used to remotely add a marker to a known point of interest from any location. In either case, the app will tell the user the measured area of the recording and provide the ability to edit it, so if it's being used for planning purposes and, for example, a wild bird seed area must be 1.0ha, the area can be edited anywhere, anytime.

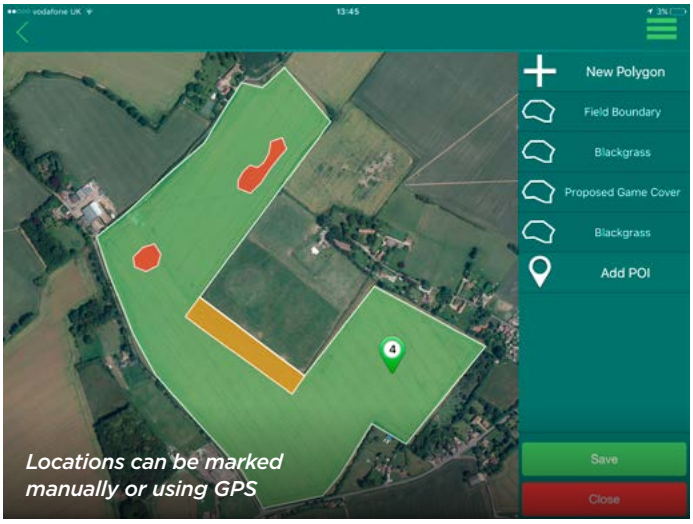
As well as areas of interest, information can be recorded at a specific point. Users can add and edit a list of points pertinent to their farm in the same way as in the iSOYL app, by GPS or by placing them manually. Free text edits of any length can be recorded and photos added too. This allows a visual record to be made of what was seen at the time, which is useful for an unknown weed, disease, plant growth or to count establishment of plants back in the warmth of the office.

Making use of the data

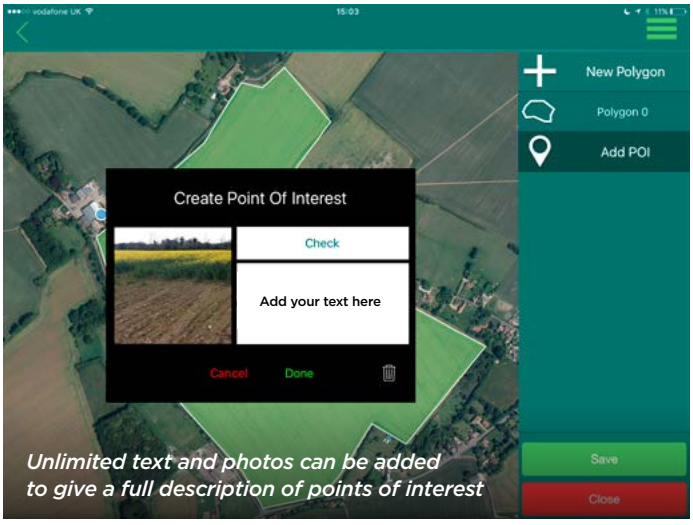
How the data is used is the crucial element. Though it is captured in the app out in the field, the real power of iSOYLscout lies in its use in a wider farm management context.

Once the user has connectivity, either by sim or on WiFi, the scouted data is uploaded to MySOYL. All those with permission to access the account can see the areas, points, comments and photos in MySOYL. This is especially useful where farmers want to share information with their agronomist and vice versa. MySOYL will only display information relevant to the field data held on the account. The recorded detail can be edited and deleted and visibility and order of display can be altered according to user preference and needs.

The information can also interact with other precision farming data. For example, SOYL sent out hundreds of quadrats for plant counting this spring and iSOYLscout is the ideal platform for a grower to use the quadrat to count plant establishment, record it with a photo and send the information back to MySOYL. The recorded information can then be used to edit the plant establishment layer, which drives variable rate seed plans, to improve the approach in future seasons, as well as keeping all observations on file for future reference.



Locations can be marked manually or using GPS



Unlimited text and photos can be added to give a full description of points of interest

iSOYLscout records complex observations straight from the field

The future

iSOYLscout is part of the MySOYL platform, providing a mobile element by enabling the collection of spatial data from the field. MySOYL's ability to deliver information to growers so efficiently would be impossible to implement offline and the system is set to go from strength to strength as SOYL continues to build on its functions to help growers to gain maximum value from precision farming data.

As an industry that is not generally office based, tools that make management on the go easier and more efficient are essential to farming. iSOYLscout is another example of SOYL's continued bid to develop and deliver innovative approaches to help boost growers' yields and profits. There are more in the pipeline, with features currently undergoing testing that will enable growers to see their SOYL data layers in the field too, with access to soil types, establishment layers and Leaf Area Index maps, a key component of SOYLsense..

All growers using MySOYL will have iSOYLscout connectivity and capabilities, with an annual charge associated with uploading data from the new app. To find out more about iSOYLscout and how it can help your business, speak to your local SOYL contact or call 01635 204190.

Using digital tools out in the field improves efficiency and is becoming increasingly popular with growers

"Though the data is captured out in the field, the real power of iSOYLscout lays in how that data is used in a wider farm management context."

Tom Parker
SOYL's business development manager

Don't overlook key compliance criteria

The application deadline of 15th May for the 2016 Basic Payment Scheme year is looming and as we all adapt to the new system, many are still getting to grips with requirements. MyCompliance and Kings technical advisor Charlotte Helliwell highlights some key areas that are often overlooked.

Common queries from growers include greening and how to meet ecological focus area requirements (EFAs), land use codes and ineligible features. However, it is the lesser known regulations and finer detail of the Statutory Management Requirements (SMRs) and Good Agricultural & Environmental Conditions (GAECs) that could catch growers out during inspection.

Soil Protection and GAEC 4 and 5

GAECs 4 and 5 have replaced the annual Soil Protection Review. Under these new requirements, farmers and land managers must take all reasonable steps to provide minimum soil cover, unless there is an agronomic justification for not doing so, and to minimise soil erosion by ensuring land management measures are in place to mitigate it. Growers are urged to keep written records of these justifications and have a farm policy for soil protection on their shelf.

GAEC 14: Hedges and watercourses

The destruction of the two metre cross compliance buffer zone is all too common. This should be two metres from the centre of the hedge or ditch and one metre from the top of the bank next to a watercourse. Farmers and land managers need to ensure that all staff members and contractors are fully aware of the regulation before undertaking any work.

To provide greater protection for farmland birds, hedge cutting restrictions extend the no cutting period to the end of August. If you're drilling early oilseed rape or sowing a temporary grass ley, an application for a derogation must be made to the Rural Payment Agency before cutting.

Claimants must not apply ditch dredging within one metre of the watercourse bank when clearing ditches and waterways.

For the latest guidance, click the links here:

England
- Greening rules
- Cross Compliance

Scotland
- Greening rules
- Cross Compliance

GAEC 19: No spread zones and SMR 4: Nitrate Vulnerable Zones (NVZs)

No spread zones and the location of manure heaps in relation to surface water is something all claimants should be aware of. This also relates to the working drains within that field. Temporary heaps of muck should not be left in the same place for more than 12 months and long sprawling heaps across a field are no longer acceptable.

Claimants in an NVZ should have a manure management plan with a risk map that shows where organic manures must not be spread. This applies even if no manures are spread and the only livestock on farm is a horse, or sheep on a grazing license. The plan should be updated within three months of any changes. Claimants outside NVZs that spread organic manures must also have a map showing all watercourses, which is often overlooked.

GAEC 1: Establishment of buffer strips along watercourses

From 1 January 2017, land parcels of 2 hectares or less next to watercourses will have to comply with the need to protect watercourses against pollution and run-off from agricultural sources by maintaining buffer strips.

To find out how the MyCompliance advisory service can help your business to meet mandatory regulations and voluntary scheme requirements, call 0333 0044 555 or email mycompliancehelpline@frontierag.co.uk.

"The lesser known regulations and finer detail of the SMRs and GAECs could catch growers out during inspection."

Charlotte Helliwell
MyCompliance and Kings technical advisor