

AGRONOMY

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Paul Fogg

Restless mindset underpins agronomy improvement

Cropping patterns and land use are changing. Technology and scientifically proven agronomic techniques are required to deliver the outputs expected from modern farming, including quality food and biodiversity benefits. Crop production technical lead, Dr Paul Fogg, looks at how Frontier's wide overview of the supply chain helps to bring the best advice and innovation to growers.

"As a company, our default position is to adopt a 'technical first' mentality," says Paul.

"That means understanding not just the problem, but also what the best solution is to that problem. The same principles apply to all aspects of sustainable crop production, whether that's variety choice, crop nutrition, precision farming techniques or crop protection for example.

"We have a restless mindset and continually look at how we can do things better, or what the next agronomic advance might be. Agriculture is highly dynamic and if you do the same thing year-after-year, you will simply stand still."

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Identify and implement

Frontier works closely with stakeholders driving innovation across the whole industry – such as R&D companies, established agribusinesses and small disrupters – adopting a technology-neutral, evidence-led position and trialling and benchmarking new products and techniques over several seasons before commercial introduction.

“It’s about ensuring our customers get the best return on their agronomy investment.”

“It’s about ensuring our customers get the best return on their agronomy investment,” Paul continues.

“It’s not just about the next successful innovation, but quickly implementing it too. By adopting new technologies early, you gain the maximum benefit and our involvement early in the development process means we can iron out any issues before they reach our customers.

“It’s a dynamic process and we look at how new developments may be useful in different ways, such as the flexibility crop protection agronomy packs offer by being able to modify strategies from one season to the next or investigating new income opportunities through the Sustainable Farming Incentive and private funding.”



Supply chain collaboration

Other examples are how Frontier works with customers and breeders to identify which traits and varieties are most desirable to the end user, as well as developing appropriate agronomy where necessary.

“We screen more than 40 Group 1 wheat varieties a year. As well as looking at the agronomy, we’re putting samples into the supply chain to see which will perform best so we can fast-track solutions for all stakeholders,” comments Paul.

This cross-sector approach extends to other areas, such as crop nutrition where nutrient use efficiency is important for both economic sustainability and reducing the carbon footprint of crop outputs.

Such partnerships also extend into topics like cover crops, closed-transfer systems and weather stations, all of which can provide additional benefits such as improved nutrient availability, reduced product wastage and more targeted pest and disease control respectively.

“It is one thing to identify the best technologies and how to use them, but it’s also important to ensure they are available on farm,” Paul adds.

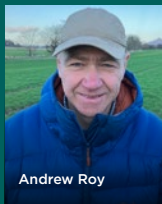
“With the right combination of flexibility and adaptability, we can keep driving change.”

“That’s why we continue to invest in infrastructure and logistics, such as our recently opened facility at Braintree in Essex. With the right combination of flexibility and adaptability, we can keep driving change.”





Environmental screening at Frontier's Haywold trial site



Andrew Roy

Environmental screening trials insights

As the uptake of environmental actions under the Sustainable Farming Incentive (SFI) increases, it's vital to understand how options such as cover crops, herbal leys, legume fallows and companion crops can affect broader land management.

There are clear benefits from extending species diversity within the rotation, but incorporation and ongoing management needs to be properly understood.

The initial aims of Frontier's screening trials were two-fold: to look at selectivity and the best ways of controlling the species in cover crop mixtures within a normal arable rotation. From this work, considerable data has been generated.



Crop selection and management are key

Species selection is increasingly important where companion crops are being grown alongside conventional cash crops, both for the use of single active substances and more complex tank mixes (where such applications are allowed under the SFI rules and within Health and Safety Executive (HSE) authorisations).

"We are having to learn fast, but our Kings Crops team has done a lot of work over recent years so we have a good pool of knowledge already," explains Frontier agronomist, Andrew Roy.

"With the SFI and the challenges of autumn 2023/24, we have seen large areas put into legume fallow or wild bird seed. With these decisions, it is important not to inadvertently create issues for future land use.



“A range of new species is being introduced but with that we need to remember that some may have an impact on wider cropping.”

Crop selectivity of a range of residual herbicide and tank mixes applied pre-emergence (02/10/23) and assessed 26 days after application

	Tataricum buckwheat	Common buckwheat	Phacelia	Winter linseed	True forage rye	Winter common oat	Black oats	Crimson clover	Alsike clover	Red clover	Subterranean clover	Berseem clover	Fenugreek	Standard forage rape	Jupiter turnip rape	White mustard	Sainfoin	Lucerne	Vetch	Defender radish	Stinger tillage radish	Avalon beans	Winter peas
Untreated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flufenacet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flufenacet + Diflufenican	0	0	0	0	0	0	0	20	20	20	0	60	0	0	0	0	0	0	0	0	0	0	0
Flufenacet + Pendimethalin	0	0	0	0	0	0	0	20	20	20	10	20	0	0	0	0	0	0	0	30	0	0	0
Flufenacet + Diflufenican + Metribuzin	0	50	80	0	0	0	0	20	20	20	20	30	0	80	50	30	0	0	0	30	0	0	0
Cinmethylin + Diflufenican	0	40	20	0	0	0	0	60	40	20	40	70	0	60	60	95	0	0	0	30	30	90	0
Coded	0	0	100	20	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	30	30	0	0
Flufenacet + Diflufenican + Chlorotoluron	0	20	90	0	0	0	0	100	100	100	90	100	0	70	20	90	0	0	0	100	100	0	0
Flufenacet + Diflufenican + Metribuzin + Aclonifen	0	30	95	0	0	0	0	100	100	60	20	60	0	100	10	70	30	0	30	90	90	0	0
Cinmethylin + Diflufenican + Pendimethalin	80	70	90	0	0	70	70	100	100	50	0	50	0	50	70	90	50	0	90	90	90	80	0
Flufenacet + Diflufenican + Metribuzin + Aclonifen + Tri-allate	70	95	99	0	0	100	100	100	100	70	30	50	0	100	80	100	0	0	0	100	100	0	0
Cinmethylin + Diflufenican + Pendimethalin + Tri-allate	80	80	100	0	0	100	100	100	100	95	30	30	0	100	30	90	0	0	80	90	80	95	70
Flufenacet + Diflufenican + Metribuzin + Aclonifen + Prosulfocarb	100	100	100	0	0	80	90	100	100	100	100	100	0	100	30	100	40	0	70	100	100	95	30
Cinmethylin + Diflufenican + Prosulfocarb	100	100	100	0	0	60	80	100	100	70	0	0	0	100	80	90	30	0	100	99	99	90	50

“A range of new species is being introduced but with that we need to remember that some may have an impact on wider cropping.”

Trials structure

The screening trials are carried out as a matrix, with plots of individual species treated with different products, such as residual cereal herbicides at key times including pre- and post-emergence. Assessments are then carried out through the season.

Over several years Frontier has screened a range of chemistry; work which is providing valuable insights in the wake of increased use of companion crops and understory planting for pest control, nutrient use efficiency and to protect the environment in crops such as maize.

“Some of it is about managing the companion within a particular crop, but it is also about managing tomorrow’s potential weeds,” says Andrew.

The use of Berseem clover, buckwheat and fenugreek as companions for oilseed rape is well established, but Andrew is seeing increased interest in companion cropping in wheat with legumes, although this requires considered thought for nutrition. Ongoing trials are looking at maize combined with beans as a way of increasing protein too.

Assessing risks and crop suitability

Within the trials, evidence is also being gleaned about the potential risks of new environmental plant species creating a green bridge to carry over pests and diseases from one year to the next, as well as adding to the inoculum load of soil-borne diseases.

Other research is looking at varieties suitable for direct drilling, or drilling into cover crops, as well as pest and disease tolerance and resistance. Options for inter-row hoeing where herbicides aren’t approved or are not crop safe are being investigated too.

For Frontier, the work is helping both advisors and customers become more aware of potential issues that may arise from changes to land management, and importantly how best to manage them.

Andrew explains: “We’re trying to pull as much information as possible to help ensure we have evidence-led recommendations to support our customers’ planning for the long-term.”

Post-harvest soil care



Emma Pudney-Fitnes

Soil underpins everything but is often taken for granted. Essex-based Frontier agronomist, Emma Pudney-Fitnes, highlights some of the actions to improve soil health post-harvest.

“Following such challenging winter and spring field conditions, we’ve seen compaction and less than ideal

seedbeds. This will affect soil conditions for the coming season, but the period after harvest is an ideal time to take stock and see what remedial actions are needed.”

Emma explains there is no substitute for going back-to-basics with a spade to assess soil condition and structure, after which it’s about using appropriate tillage to rectify any issues. “It’s important to work the soil as little as possible while achieving the necessary action, but if it needs moving, move it.”

Don’t forget nutrients

Emma continues, “It’s an ideal time to sample soils for P, K, Mg and pH levels as a minimum.” Under the Farming Rules for Water regulations (2018), it is mandatory to sample for P, K, Mg and lime at least every five years, as well as nitrogen (which can be estimated within a recognised software system).

This applies to all cultivated fields, including grassland.

“While annual analysis isn’t a requirement, indices change. If time has passed since you last sampled it’s worth revisiting to understand what nutrients your crops really need,” says Emma.

pH is one of the most important factors too and wet, acidic patches in the field mean other management efforts are likely to be futile. “It’s good to involve your liming contractor for extra precision as there can be differences not always picked up with standard W-pattern sampling.

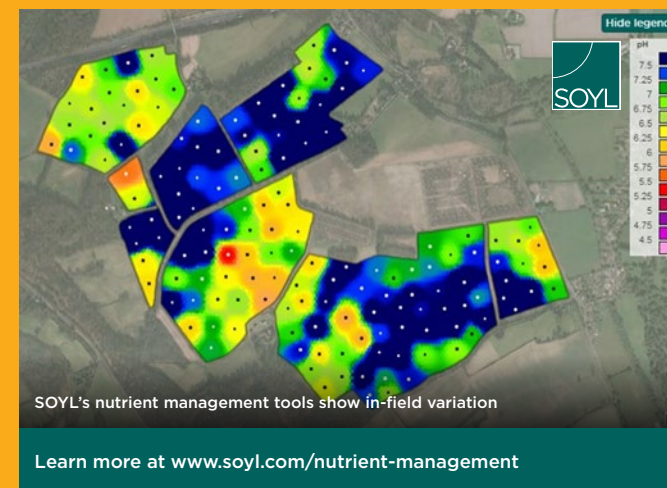
Precision nutrient mapping provides further analysis, giving a picture of variation within a field and allowing you to return to the same points to see how levels change.

“Using a tool like MySOYL aligns your environmental and crop production data together too, so you can take a holistic approach to ongoing assessments.”

Building organic matter

Farmyard manure and cover crops are important for boosting organic matter, but Emma stresses you need to know your starting point so you can see what actions make improvements. “It’s worth undertaking organic matter sampling at the same time as regular nutrient sampling; it avoids double visit costs and gives combined insights.

“Aim to ensure the same lab technique is used for consistency too, whether it be Dumas or loss on ignition (LOI).”



Cover crops can help increase organic matter, but they also improve plant biodiversity. “Consider them ahead of spring crops, as roots in the ground over the autumn and winter boost soil health.”

There is support available under the SFI for multi-species options, but selection of the right cover crops is key. Emma concludes: “Take as much care as you would with a cash crop to ensure establishment and achieve the maximum soil health benefits.”

For help with soil sampling, visit www.frontierag.co.uk/soilhealth



Fiona Spires

SFI soil, nutrition and IPM plans

Detailed assessments are important for those entered into SFI soil management (SAM1), nutrient (NUM1) and integrated pest management (IPM1) plans – but what’s required? MyCompliance technical lead and Frontier agronomist, Fiona Spires, explains.

Soil

“The goal of the soil management action is to understand current soil conditions and plan how to increase their long-term health, productivity and resilience. Those committed to the action must produce a written soil management plan within 12-months of starting, which covers all the land parcels entered into it. Evidence of testing organic matter levels within the last five years must also be included.

Nutrient

The aim of the nutrient management plan is to manage crop nutrient use more efficiently as well as optimise organic sources of nutrition.

A discussion about how best to increase nitrogen use efficiency and reduce the use of applied nitrogen is integral to this, running alongside a plan of action that also incorporates nutrients from manures and soil nutrient indices.

IPM

The SFI action for integrated pest management (IPM) seeks to understand the benefits, costs, impacts and risks of the current approach on farm to crop, pest, weed and disease management, and to plan what IPM methods are appropriate for the farm system.

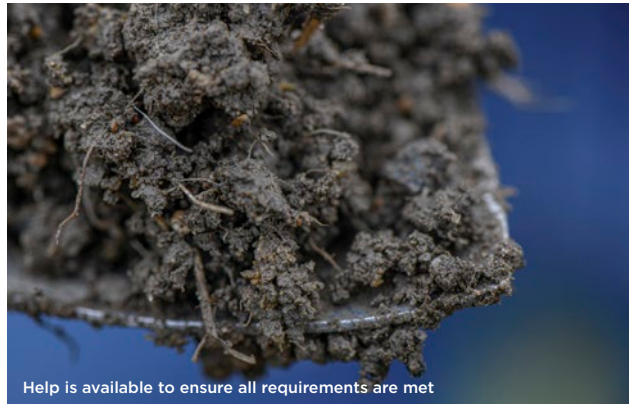
Support with your plans

Guidance for these actions is available from Defra, but our MyCompliance team can work with you to ensure all requirements are met.

For the soil management action, this includes an overall assessment alongside a plan to target any areas found to be at risk of erosion or which could cause water quality issues.

With nutrition management plans, our team can provide a written review which includes an assessment of current practices and outlines further areas for consideration. For the IPM action, we can produce a written assessment and plan which includes existing approaches together with a forward-looking strategy.”

For help visit www.frontierag.co.uk/compliance



Help is available to ensure all requirements are met



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Frontier has a UK-wide team of 130 BASIS qualified agronomists, including 44 Diploma holders and 70 experts on the environmental register, supporting growers with fully integrated agronomy advice on all aspects of profitable and sustainable crop production.

Find more technical news and advice from Frontier’s experts at www.frontierag.co.uk/blog

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