Agrii Journal

Spring 2025

Agri intelligence

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Huntapac's parsnip crop, grown without human machinery operation, used Skippy Scout drone monitoring operated by Agrii's technical experts in the world's first instance of entirely autonomous vegetable agronomy and production.

Huntapac, in collaboration with Autonomous Agri Solutions, AutoSpray Systems and Agrii, funded by the Marks and Spencer Plan A Accelerator Fund, successfully grew a crop of parsnips autonomously. This achievement is believed to be a world first.

The field-scale trial is the most recent step in a series of trials investigating how to improve the sustainability of Huntapac's carrot and parsnip production, says Stephen Shields, technical and sustainability director at Huntapac.

"We have done a lot of work looking at low-carbon fertilisers. We started doing 80 acres and have expanded that to 1,700 acres this year."

This work has been combined with an autonomous field concept, which is when Agrii and the other partners became involved. It coincided with Marks and Spencer launching the Accelerator Fund to discover innovative technologies that will enable its rapid progress towards becoming a net zero business across its supply chain by 2040.

To prepare the field, an AgXeed electric drive autonomous tractor was used for primary and secondary cultivation, says Tom Beach of Autonomous Agri Solutions.

"That was able to do the subsoiling operations and ploughing, which was the first case of autonomous ploughing in the UK. Finally, it did the bed tilling.

"A Robotti was utilised for the following lighter operations. We use this because it has a standard three-point hitch to use conventional agricultural implements, but it is substantially lighter and more accurate than a tractor."

The crop was drilled using a single-bed Stanhay X-Series drill, comparable to what is used in a conventional tractor pulled triple-bed drill. Tom believes that the longer work hours possible using autonomous technology means that smaller-width implements will deliver at least the same efficiency as larger human-operated ones.

The Robotti was responsible for the weed control, spraying the pre-emergence herbicide across the entire bed width. Subsequent applications were made post-emergence using a band sprayer on the rows and an inter-row hoe between them.

The project called on AutoSpray Systems' expertise in drone spraying for variable rate and selective biopesticide and fertiliser applications. Robert Pearson, CEO of AutoSpray Systems, explains that the technology is well-equipped for the precise application of pesticides.

However, what drones can apply is limited by regulation because plant protection products approved for use in parsnips need specific approval for aerial application. Most biopesticides and fertilisers can be applied through the drone system, says Robert.

Autonomous vegetable agronomy

To monitor the crop and guide the precise application of plant protection products, Agrii used a drone equipped with Skippy Scout to do the agronomy.

Skippy Scout is a software system that will automatically fly a drone to selected points in a field and send high-resolution, leaf-level images to aid with decision-making. The system analyses the captured images and sends a field report, explains Jonathan Trotter, technology trials manager for Agrii.

He used a drone to collect data from the field every few weeks. Parsnips were not a crop that Skippy Scout was working with before the project. "That's a really nice element of the project; we're developing the AI in the background to use Skippy Scout in parsnips going forward.

"We've reported back to the group every time we have surveyed the field. The idea is that we can then deploy the other technologies accordingly," explains Jonathan.

"Skippy Scout helps identify the areas to be treated, which can be inputted into our app to treat those areas specifically," says Robert. "We've been asked if our (spray) drones can do the same level of crop monitoring, and our response is absolutely not. That's where Skippy Scout is a perfect solution.

"We believe this method will allow conventional chemistry to remain on the market for longer because you apply much less of it using our precise process. At the same time, it allows us to apply more novel products much more easily."

Robert used the drone to apply bio-fungicides to the crop for disease prevention. This is a task a drone is especially well-suited to because the airflow from the propellers agitates the canopy, giving excellent leaf coverage for the bio-fungicide.

Scaling digital interoperability

The successful field-scale trial has demonstrated a 46% reduction in carbon emissions and significant labour and input savings. Naturally, thoughts move to how the system developed by the group can be rolled out on a larger scale.

Interoperability between the systems controlling the decision support tools and machinery is a crucial milestone. This is a challenge Agrii has already begun working on.

"We are integrating Skippy Scout with our digital platform, Contour," says Jonathan. "This can then be linked to soil mapping through Rhiza, and further into the future, it could export treatment recommendations to the other technologies used within this very project."

Tom Beach says the sprayer on the Robotti is already equipped and ready to do this. "It has the standard Topcon ISOBUS, giving us full variable rate capability. We can input field maps or shape files, whatever the source is."

The data could originate from an agronomist or decision support system like Contour. As well as applying variable rates across the sprayer's width, Robotti can be programmed only to treat specific areas and return 'as-applied' data through its Crop Eye camera.

More precise digital record-keeping will benefit Huntapac's relationship with its suppliers, says Stephen Shields. "The request from our customers is to have full electronic traceability throughout the process. For some, that's from 2025."

Tom concludes by saying that regardless of the ag tech's sophistication, external factors like the weather and soil conditions will still dictate how the crop is grown.

"As much as we can automate the sensing and recommendations, we are a long way from removing a human from the decision-making process.

"Robots will do whatever you tell them, but knowing what to tell them still requires a huge amount of skill."

What is involved in growing a parsnip crop autonomously?

Autonomous tool	Action
AgXeed AgBot T2	Subsoiling
	Ploughing
	Bed tilling
Agrointelli ROBOTTI	Drilling and Nemguard (garlic extract) application
	Pre-emergence herbicide spraying
	Granular nitrogen placement
	Band spraying (herbicide, insecticide and trace elements)
	Inter-row hoeing
Skippy Scout powered drone (Mavic 3 Multispectral)	Crop monitoring, data analysis and decision support
XAG P100 Pro	Drone bio-fungicide application

STOW LONGA DELIVERS VITAL INSIGHTS INTO CARBON AND NITROGEN EFFICIENCY

Agrii's Stow Longa site near Huntingdon continues to provide new crop production insights as its current trials programme enters its tenth year. Some of the latest findings are the carbon footprint implications of different cultivation methods and just how much blackgrass can reduce the efficiency of nitrogen applications.

With the need to use inputs as effectively as possible in modern crop production, the impact of cultivation choice and blackgrass control method can have a major effect not just on the profitability of a farming business, but also its carbon footprint.

"Over the years at Stow Longa, we've learned a huge amount about rotations, crop establishment and blackgrass control, with the sustainability agenda increasingly affecting the way we look at our cropping," says Agrii seed technical manager John Miles.

"But one thing it is impossible to get away from is the importance of yield in the equation and this is very much the case when looking at nitrogen use efficiency (NUE) and carbon.

"While it's often assumed reduced cultivations will result in less fuel consumed and a correspondingly lower carbon footprint than a plough-based approach, making a direct drill system work effectively means this is not always the case.

"They can be much closer than many think and this was certainly the case on Stow Longa's heavy soils when several passes of a straw rake, combined with a low-disturbance sub soiler, were factored in.

"Using information supplied by equipment manufacturers, diesel use estimates were 25litres/ha for ploughing and 17 litres/ha for direct drilling using an LD leg and straw rake, with fuel for drilling on top of this."

Importance of yield

The results become more interesting when looking at yields and CO2 emissions per tonne of production, he points out.

"We used greenhouse gas figures from ADAS Yen Zero, which pitches the ploughing option as the worst in terms of greenhouse gases per hectare at around 1350 kg/ha compared to direct drilling at 372 kg/ha – which is a big difference.

"But with a spring barley yield of 9t/ha for ploughing, for example, the carbon is 155 kg/t whilst it is 176 kg/t for the direct drilling approach with its lower yield of 6.5t/ha – much closer and much more relevant when it comes to grain marketing options.

"Early results from 2024, however, suggest use of the low disturbance subsoiler, used in good conditions, with a stubble rake and a more successful cover crop, have reduced the yield difference between ploughing and direct drill approaches to around 0.4t/ha.

"So, it will be interesting to see how this affects the carbon footprints – we've closed the yield gap but we've used more diesel, too."

There are many lessons still to be learned from Stow Longa and it remains an invaluable tool in the company's R&D armoury for the future, John Miles believes.

"With nitrogen being such a large component of both the cost and carbon footprint of crop production, Stow Longa's findings of the effects of blackgrass on NUE, for example, are extremely compelling.

"We know every 100 ears/sq m of blackgrass results in a yield loss of 1t/ha, so it's a double whammy to realise your costly nitrogen applications are feeding this, too.

"In spring barley crops with little blackgrass we've seen yields at Stow Longa of 9t/ha from about 120kg N/ha which equates to an NUE of over 90%.

"Others with higher blackgrass levels, but the same level of nitrogen application, have produced a yield of 6t/ha resulting in an NUE of little over 60%.

"So, the bottom line is whether it is optimising profitability, carbon footprint or NUE, achieving high yields is still an incredibly important objective."

iFarm Events
Come along to our Summer 2025 iFarm and Technology Centre Tours. Scan here to register your interest:

SPRING SEED YEARBOOK 2025

We are pleased to present the Masterseeds Spring Yearbook 2025, offering insights into spring seed options across various species. Agrii's Masterseeds standards surpass the industry's Higher Voluntary Standard (HVS), with features like a higher germination threshold and a 'blackgrass-free' guarantee.

Ergot contamination, a concern from Harvest 2024, is addressed with our advanced standards, using colour-sorting technology and treatments to minimise contamination. Our mobile bulk cleaning service also helps ensure a marketable crop.

Agrii's seed choices are rigorously assessed through R&D trials to ensure proven agronomic strengths. The yearbook also covers Masterleys and Cover Crop solutions, as well as guidance on the complex Sustainable Farming Initiative (SFI) options.

We don't set out to save you money – we set out to make you money! Read that again...

Scan to see our new Spring Seed Yearbook Microsite:

Over the last few weeks, there has been a lot of interest and speculation on the impact on fertiliser prices of the Carbon Border Adjustment Mechanism (CBAM).

This followed the Budget Day publication of the response to a 12-week consultation that confirmed:

1. A UK CBAM would be introduced on 1 January 2027, placing a carbon price on goods deemed at risk of 'carbon leakage'. The aim is to stop production shifting to countries with less stringent carbon regulations, undermining global decarbonisation efforts.

2. Initially, CBAM will apply to high-emission sectors, including imports of nitric acid and ammonia – raw materials of nitrogen fertilisers - along with straight nitrogen, NS, NPKs, NP and NK fertilisers. Other sectors covered are aluminium, cement, hydrogen, iron and steel.

Fertiliser importers will be responsible for paying the CBAM tax liability when the product arrives at a UK port. The cost of the tax will be calculated using actual emissions data from primary nitrogen producers or default values, set by the government based on global average emissions.

The EU is currently phasing in a similar CBAM scheme based on credits with the aim to encourage lower carbon production in non-EU countries.

There has been speculation about the impact on fertiliser pricing post-January 2027 in the UK – with views ranging from an increase of £10 to £40 per tonne due to a CBAM levy on a tonne of urea. The actual costs will vary in line with the value of carbon at the time.

AIC, the UK's leading trade association in the agricultural supply industry, is awaiting further clarity from HMRC to understand a more definitive impact on the price of imported nitrogen-based products.

Agrii will keep you informed on any further changes to CBAM as and when they arise. If you have any questions relating to this article, please email info@agrii.co.uk

SPRING BARLEY VARIETY DEVELOPMENTS

2025 is set to be an important year for Agrii's long-standing collaborations with two key European barley breeders, Nordic Seeds and Secobra Research. This spring is the culmination of many years of work to identify, test and bring to market those varieties that will lead the market over the next five years or more.

Malting remains the largest barley market segment. In England, before 2013 most spring barley was grown on lighter land as this was best suited to achieving the low grain-nitrogen levels then required by end users. It has since been grown more widely, in part for the opportunity provided to combat black-grass or because land is otherwise unfit for autumn drilling. Changes in the brewing markets also meant that grain with a higher nitrogen content found acceptance. When combined, these factors have helped to ensure the success of spring barley with it proving a resilient crop, in spite of some challenging growing conditions since.

There are 19 spring barley varieties listed on the AHDB Recommended List but only a small number enjoy broad market acceptance and are therefore grown on a significant scale. The market is divided into two with grain for brewing dominating in the south of Great Britain while grain for distilling dominates in the north. RGT Planet and Laureate take the lions-share of the former while Laureate is the most significant variety for distilling by a considerable margin.

The Maltsters' Association of Great Britain (MAGB) represents the interests of the UK malting industry which purchases about 2 Mt of UK malting barley annually. It runs the Malting Barley Committee (MBC), a body that evaluates and approves malting barley varieties alongside the AHDB trials. Each year they produce a list to show variety approval status.

Skyway – brewing (Agrii/Nordic Seeds)

Skyway gained full approval last May and achieved a significant contract tonnage through Agrii's grain-partner Viterra. The market feedback was excellent and the variety will be broadly available this spring through Agrii and most other seed merchants. It offers significantly higher yields than RGT Planet (see Fig. 1) and bolder grain than both RGT Planet and Laureate combined with low screening losses.

Skyway is suitable for all regions and soil types with excellent agronomic characteristics including medium height, reasonably stiff straw, average lodging, good brackling resistance and medium maturity. It has a robust disease resistance package with high untreated yields in both Agrii and official results.

It has also proven itself in Agrii direct drilling trials where it consistently out-performed RGT Planet.

Diviner – distilling (Agrii/Secobra Research)

Diviner is the next malt-distilling variety from Agrii's partnership with Secobra, an industry-owned business that counts Soufflet, Malteurop and the Carlsberg Group and the Maltsters & Brewers Associations of France among its partners. The relationship between Agrii and Secobra Research goes back more than 30 years.

Although at the Provisional P2-stage it is expected to be fully approved in May 2025. It is a specialist distilling variety that has many attributes important to all aspects of the whisky industry. It has very high yields and a higher hot water extract and predicted spirit yield than controls and good fermentability and suitable for pot still malt distilling. Agronomically, it offers early maturing, low skinning levels, good standing, excellent brackling resistance and good disease resistance.

Belter – dual purpose (Agrii/Secobra Research)

Belter's progression is a year behind Diviner but Belter looks well-placed to become a true dual-purpose variety within the next couple of years. It has shown exceptional yields in both Agrii and official trials and it appears more widely adapted than Laureate with high extract and spirit yield, better fermentability together with good enzyme levels for brewing and export potential. Agronomically, it has stiffer straw, better brackling resistance and higher specific weight than Laureate and low skinning and very low screening losses.

Belter has given the highest untreated yields in both Agrii and AHDB trials, a reflection of its good disease resistance against mildew, brown rust and Rhynchosporium.

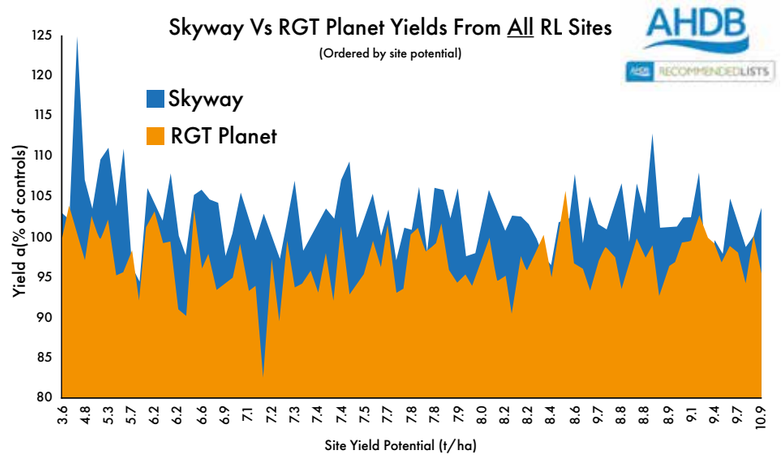
Specialist feed

Not all spring barley varieties are destined for malting end-markets and many crops are simply grown as animal feed and for their straw.

Hurler – feed (Agrii/Secobra Research)

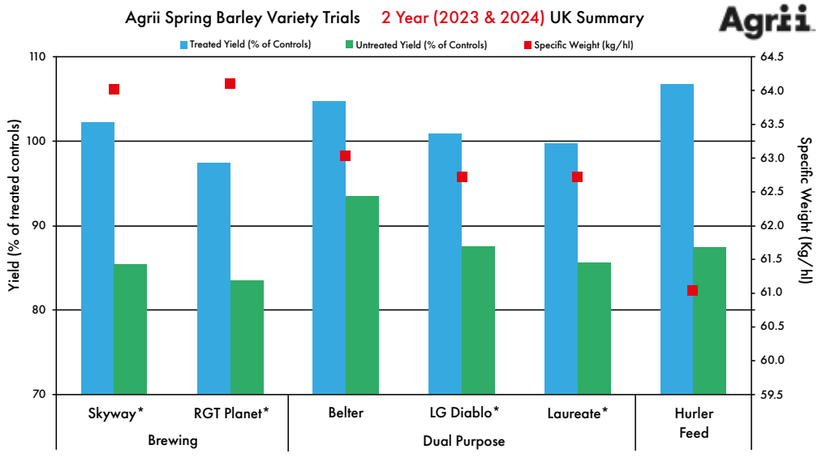
Hurler has one of the highest yields of any variety on the Recommended List and is one of only two specifically recommended by AHDB for feed. It is a variety ideally suited to mixed farms with fertile land where it can be pushed for yield because of its exceptionally good straw characteristics. Grain specific weight is one point below that of Laureate and its screenings are in line with most other varieties.

It is very straightforward to manage with relatively short, very stiff straw, outstanding brackling resistance and good all-round disease resistance. It is ideal for the non-specialist spring barley grower who is not looking for malting premiums.



Source: AHDB UK Recommended List Harvest Results 2024 and Archive. All 91 trials over the past 5 years.
Partial extraction but the full data set are available from www.ahdb.org.uk

Fig. 1: The yield performance of Skyway (blue) and RGT Planet (orange)



Source: Mean of Ten trials (Wilts, Cambs, Lincs, Moray and Angus). Mean yield of controls* = 7.4 t/ha

Fig. 2: Spring barley variety specific weight and yield performance across two years

SPRING BARLEY SEED TREATMENTS FOR 2025

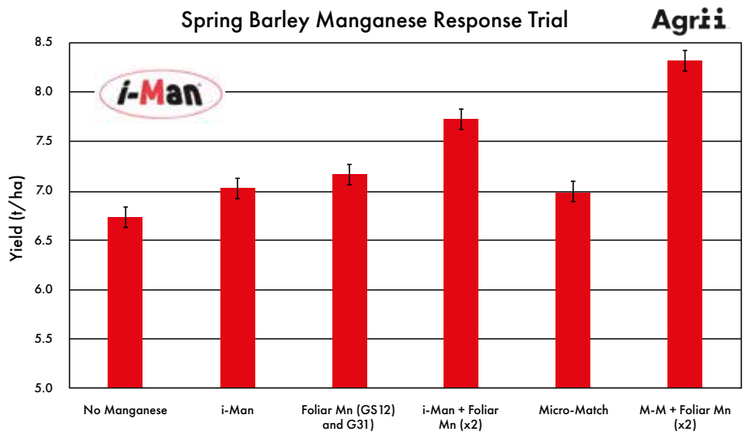
Spring barley has traditionally been a key crop for many areas of the UK, but over the last 10 years, it is grown more extensively due to black-grass issues or as a consequence of poor autumn drilling conditions.

Malting end-uses continue to attract premiums for brewing and distilling while some farmers grow it for feed and straw. Seed treatments provide a valuable tool to cope with disease and either cool or dry conditions that often pose a challenge for the crop, especially on heavier soils.

Here is an overview of the seed treatment options available to spring barley growers.

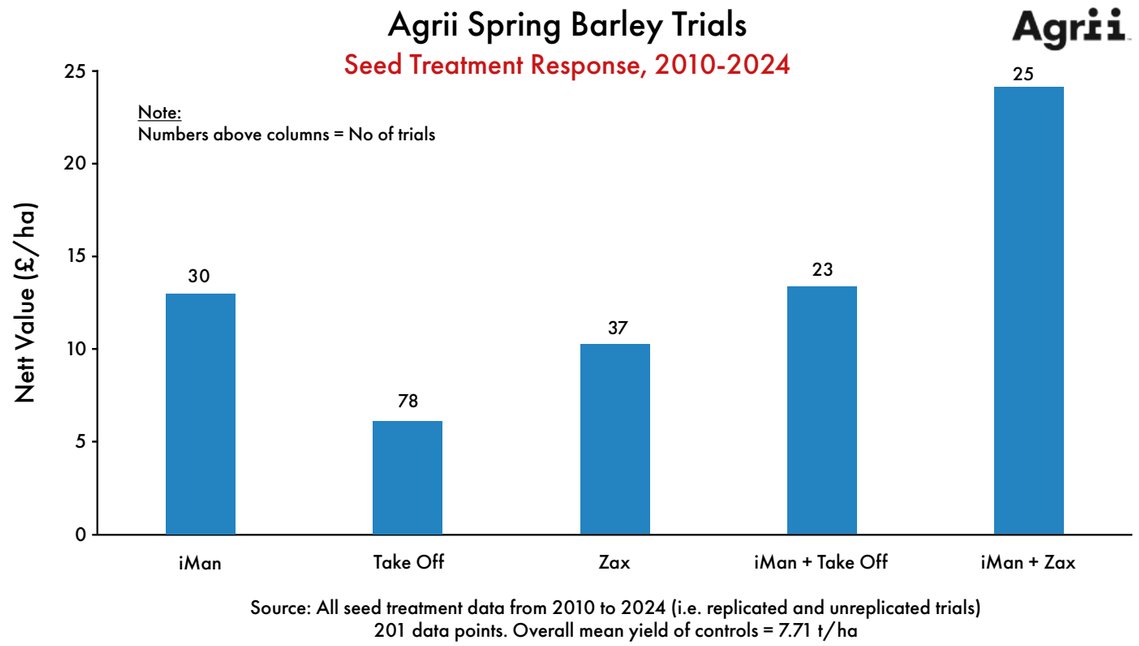
Base fungicides

Almost all certified seed receives a base fungicide to control seed-borne diseases, including loose smut, which is endemic but maintained at low levels using seed certification and routine seed treatment. Rancona iMix is Agrii's preferred treatment as it combines the best loose smut activity while conferring good control of leaf stripe and seed-borne net blotch.



Trial 14201. Throws Farm Essex. All treatments had 10:15:21 applied at 375 kg/ha to the seedbed. Variety: Propino

Figure 1: iMan and Micro-Match Mn provide the basis for conventional foliar Mn applications



Source: All seed treatment data from 2010 to 2024 (i.e. replicated and unreplicated trials)
201 data points. Overall mean yield of controls = 7.71 t/ha

Figure 2: iMan alone is good, iMan + Zax is even better

Where seed is to be sown without a base treatment, as is sometimes the case with farm-saved seed, it should first be tested to establish its status. Seed found to be carrying disease above threshold levels should not be drilled without a base treatment.

Nutritional seed treatments

Manganese deficiency and low soil availability are significant constraints on early growth. Soil pH, poor drainage, unconsolidated seedbeds, high phosphate concentrations and generally poor growing conditions can all negatively impact performance. Manganese uptake can also be compromised by limited root growth, wet soils, low temperatures and nitrogen deficiency.

Agrii offers iMan, a high-load formulation delivering 450 g Mn/tonne. Unlike other formulations, it is taken up through both the seed coat and the roots and is co-formulated with a chelating agent to prevent the manganese from being locked up by cations in the soil.

The use of iMan has delivered consistent yield benefits across all soils over the past nine years, to the extent that the data indicates iMan should be applied as standard as it routinely delivers a positive return on spend.

Seed treatments are not the only means of supplying manganese to the young crop. Starter fertilisers, such as Micro-Match Mn, help to bridge the four- to six-week 'Hunger-gap' between the emergence and later application of foliar nutrients. Evidence from Agrii trials shows that iMan and Micro-Match Mn perform similarly and are a worthwhile complement to foliar applications (Figure 1).

For the past eight years, Agrii has sold other nutritional seed treatments, including Zax (high-load zinc) and Fielder Copper (high-load copper), and while beneficial, these are less widely applied to spring barley than iMan. When used in combination, the benefits are amplified (Figure 2). Copper tends to be more responsive in Scottish soils.

Biostimulants

Agrii has sold Take Off PGA ST since 2011. The combination of stabilised phosphite and pyro-glutamic acid boosts germination and early crop establishment. Responses have been particularly good on drought-prone soils.

Vibrance Duo can be used instead of Rancona iMix to control seed-borne diseases with the benefit that it is a biostimulant that improves establishment, root and shoot biomass, and tillering. It is helpful in delayed drilling situations or on lighter, more drought-prone soils.

In summary

The case remains strong for the routine use of fungicide and nutrient seed treatments in spring-sown crops, especially manganese.

Only 20% of spring barley seed supplied by Agrii is treated with manganese, which suggests a missed opportunity for many growers to improve yield at minimal cost. Spring barley is routinely treated with a two-spray foliar manganese programme, but the overwhelming evidence suggests that early manganese applied is complementary and either as a seed treatment or starter fertiliser more than covers its costs.

To view the yield response results to iMan seed treatments in Agrii spring barley trials across 2015-2024, head to our spring seed microsite!

Listen to our Tramlines podcast on Brewing Sustainable Change with Malting Barley

WINTER WHEAT PREVIEW FOR 2025

Last year was a particularly challenging time for the plant breeders, with the main foliar diseases of *Septoria tritici*, yellow rust and brown rust all presenting enormous pressure on crops. Cracks are starting to appear in some mainstream UK varieties, and as 'parents', this is evident in the lower disease scores seen in some of the new introductions.

The autumn seems some way away. However, considering the changes in performance, it is worth reviewing some new varieties you might like to consider. Agrii tested almost all of the latest varieties in its national network of trials. Based on this information and performance in AHDB trials, the following varieties look the most promising, both in terms of yield and their all-around agronomic characteristics.

KWS Solitaire

Group 3 Biscuit, Potential Distilling and Export
Parentage: LG Sundance x Shabras

The highest-yielding biscuit-wheat, being just ahead of Bamford in yield. At this stage, it is classed as 'High' for distilling and is of a quality that has export potential too. The grain is not quite as bold as Bamford, and its Hagberg is not as high as other biscuit types, so these factors could sway uptake of the variety. However, its disease resistance looks strong with good scores for *Septoria tritici* and yellow rust, but average brown rust and eyespot will need attention, especially if sown as a second cereal.

It has Skyscraper-type straw strength, so a robust fungicide programme will be required, especially on more fertile sites. Unlike Bamford, it has orange wheat blossom midge resistance, which many growers will welcome.

RGT Hexton

Group 4 Soft Feed, Potential Distilling and Export
Parentage: Graham x RGT Universe

RGT Hexton is a high-yielding soft wheat with excellent performance across the UK, especially in the North. As a Graham-type plant, it has shown good potential for early drilling, albeit based on limited AHDB data. It is rated 'Medium' for distilling, has export potential and reasonable physical grain quality with a high Hagberg.

Like Graham, it shows strong Septoria resistance but suffers the same weakness against yellow rust. Its brown rust is a bit weak but better than Champion and LG Beowulf. Eyespot needs to be considered in second wheat situations. It has reasonable straw characteristics and similar maturity to others in the group.

KWS Vibe

Group 1 Bread-type
Parentage: Bernstein x Zyatt

KWS Vibe offers a significant improvement in overall disease resistance, especially against yellow rust, albeit its yields are between those of KWS Zyatt and Skyfall. It is welcome news for milling-wheat growers who are currently battling to control foliar diseases, and it brings improved eyespot resistance, important in second wheat situations, compared with SY Cheer. It appears consistent across soil types, drilling dates and regions.

Like all good milling wheats, it has a bold grain and high Hagberg. It is also a step up in quality compared with either KWS Zyatt or Skyfall, with grain protein content similar to Crusoe and consistently exceeding the 13.2% target. Its straw characteristics are good too, with a medium rating for maturity. With good all-round disease resistance, it has the highest untreated yield of any group 1 variety.

RGT Goldfinch

Group 2 Potential
Parentage: (Arezzo x Rubisko sib) x RGT Illustrious BC2

A BYDV and midge-resistant variety that offers insecticide-free opportunities for growers under the Sustainable Farming Initiative. While it comes with a 10% yield penalty against KWS Extase, it has good bold grain and achieves the target of 13% protein in milling wheat trials. The Group 2 market is more fragmented, but buy-backs may be available from some end-users.

It is a clean variety with good disease scores and high untreated yields, so it may also attract farmers who want to reduce their fungicide inputs. However, eyespot needs attention when grown as a second wheat. It also has weak straw but remains very responsive to growth regulators, so it should receive a highly robust programme.

LIQUI-SAFE CUTS LOSSES WHILE INCREASING YIELDS AND MARGIN

Liqui-Safe delivers a range of technical and practical benefits but the savings in nitrogen are likely to be of greatest interest to growers. Tom Land explains what makes it a compelling proposition.

Liqui-Safe is a urease and nitrification inhibitor containing NutriSphere-NL, an organic polymer that acts as a complexing agent to prevent metal ions in the soil from degrading the applied nitrogen. It is added to the sprayer tank via the induction hopper at the time of filling and is compatible with all nitrogen and nitrogen-sulphur blends of liquid fertiliser. There are similar products on the market, but they are typically either a urease or nitrification inhibitor, not both and none have the environmental or operator safety profile to match Liqui-Safe.

Liqui-Safe is effective at all application timings. It can be added to early spring applications, i.e. before 31st March, when the risk of nitrate leaching means growers would either make a light application or delay it until a later date. The nitrification inhibitor in Liqui-Safe not only enables applications at this early timing, but also reduces leaching and allows for higher rates. This means the number of split applications needed to deliver the full rate can be reduced.

The use of Liqui-Safe has been shown to improve the nitrogen use efficiency of urea ammonium nitrate (UAN) by up to 15%. By keeping the fertiliser where it is needed for longer, crop yields and quality are improved. In three years of trials spanning six different crops, yields increased by 4% on average compared with untreated UAN.

For applications after 31st March the urease inhibitor serves to reduce ammonia losses that occur through volatilisation making Liqui-Safe Red Tractor compliant. Liqui-Safe blocks three of the mechanisms that promote volatilisation within the nitrogen cycle to reduce ammonia losses by up to 86%.

A benefit of Liqui-Safe is the ease at which it can be handled. It is available in 20-litre cans and IBC's with a full inclusion rate of 0.5% or 5 litres per 1000 litres of liquid. By adding to the sprayer tank at the time of application its properties are not impacted by sitting in solution with sulphur-containing fertilisers which has been found to degrade the performance of some inhibitors.

In addition to full product compatibility, it is completely crop, soil and water safe. Over time, it breaks down into nothing more than carbon, hydrogen and oxygen molecules. It has been shown to support the soil biome through increased Mycorrhizal activity. Work by academics in Europe found that 69 days post-application, there was a 74% increase in soil microorganisms compared with land that received untreated UAN.

By using Liqui-Safe growers can cut the overall application rate applied and the number of passes needed to satisfy crop requirements. Trials indicate that a two-split programme with Liqui-Safe used at both timings delivers yields broadly the same as that achieved with a conventional programme based on three splits – see Fig. 1.

Alternatively, a conventional three-split programme comprising 70 kg N/ha; 86 kg N/ha; 80 kg N/ha and featuring Liqui-Safe will improve yield potential – see Fig. 2.

The practical and technical benefits of Liqui-Safe combine to support improved enterprise performance. Based on the full-rate 0.5% inclusion, the product costs are modest at roughly £10/ha. Where application rates are reduced in response to less losses, we see average savings of up to £24/ha. This is increased further where the savings in application costs are considered.

Liqui-Safe advantages

- Less nitrogen losses
- Lower ammonia emissions
- Fewer split applications
- Improved yield potential
- Easy to handle and mix
- Improved nitrogen use efficiency
- Red Tractor compliant
- Increased in soil mycorrhizal activity post-application
- Backed by independent trials and data

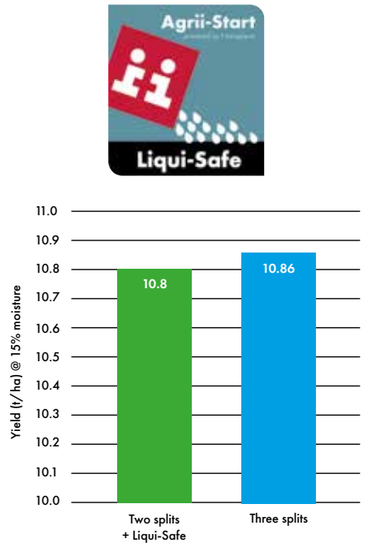


Fig. 1: Liqui-Safe supports the same yield but from fewer split applications

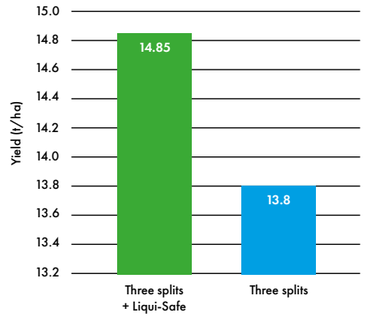


Fig. 2: Liqui-Safe improves the yield potential of a conventional programme

Better nitrogen retention, better surface water quality

UAN + Liqui-Safe applied in a crop of fodder maize significantly reduced the movement of soil mineral nitrogen (SMN) through the soil profile over a 5-month period post-fertiliser application. Liqui-Safe maintained SMN in the upper soil levels and reduced SMN by 34% at a depth of 90cm compared with a standard UAN treatment.
Wessex Water, 2019

Liqui-Safe reduced nitrate losses across the soil profile even under heavy rainfall conditions. Compared with UAN alone the combination of UAN + Liqui-Safe demonstrated a 54% reduction in nitrate levels. This effect was observed four days after fertiliser application to a depth of 60cm, meaning nitrogen was retained in a more usable stable form closer to the root zone.
John Innes Centre, 2019

In a field tile drain over a three-month period in winter wheat in Norfolk, UAN + Liqui-Safe treatment compared to standard UAN application reduced the detectable nitrate levels in the outflow from the field tile drains into a water course consistently by 14% and a reduction up to 24% was recorded.
NIABTAG, 2020

LONG-TERM FALL IN PHOSPHATE USE RAISES CONCERNS

The development of soil-release agents and protected forms of phosphate means growers can meet crop needs without having to apply large quantities of TSP, SSP or rock phosphate.

Disincentivised by higher prices for phosphate (P) fertiliser, Britain's growers have gradually reduced application rates to the extent that many soils now contain worryingly low levels of this essential macronutrient.

Data from the British Survey of Fertiliser Practice (BSFP) revels how, at the national level, phosphate use has fallen by 68% since 1983 and by 62% for potash (K) (see Fig. 1).

This implies that growers have relied on soil reserves to meet crop needs, but the extent of this drawdown means that the soil nutrient balance – the difference between what is applied and what is taken off by the crop – has fallen to a historical low.

According to DEFRA data, the overall phosphorus balance of UK soils in 2023 was a surplus of 2.9 kg/ha, only a small increase of 0.1 kg/ha on 2022 when the balance reached its lowest level since the UK annual time series began in 2000. The dominance of arable agriculture in England explains most of the downward trend. In 2023, the phosphorous balance for soils in England was just 1 kg/ha, a small increase from the 0 kg/ha in 2022 but still only a mere 9.5% of the level in 2000 (see Fig. 2).

This aggregated data, however, hides the wide variations seen in soil analysis. Of the roughly 30,000 samples collected nationally by Agrii and RHIZA in 2022, more than a fifth (21%) fell below index 2 for phosphate, while more than a quarter (26%) were below index 2 for potassium. Crops grown on these soils would require large applications of both nutrients (see Table 1).

Conversely, 16.1% of phosphate samples analysed were at an index 4 or higher, while 24% of potassium samples were at an index 3 or higher. In both cases, growers could continue to save on the seasonal application, a so-called 'P & K holiday'.

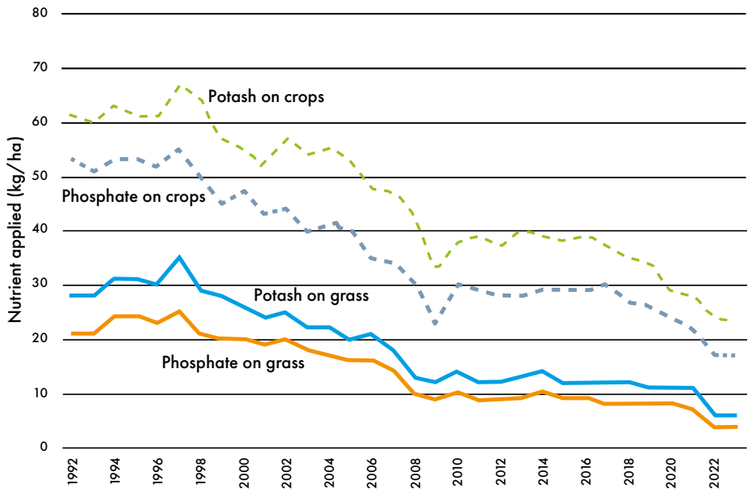


Fig. 1: Overall application rates (kg/ha) for phosphate and potash on crops and grassland in Great Britain between 1984 and 2023. Source: BSFP; July 2024.

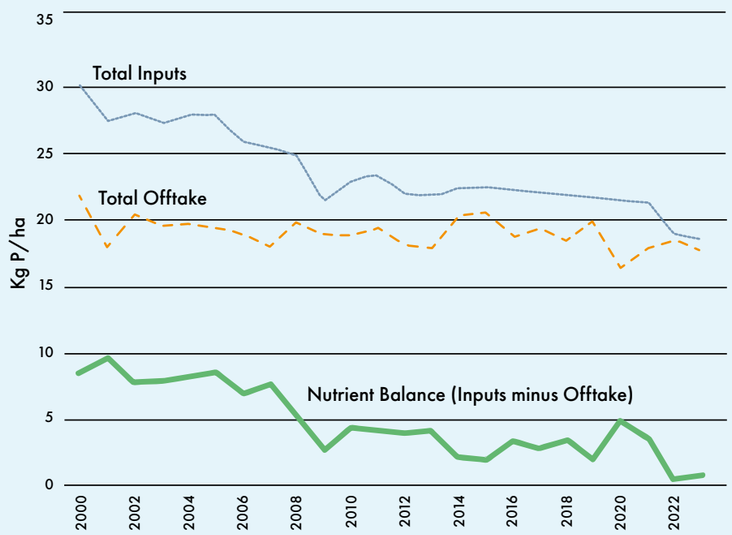


Fig. 2: England's soil phosphorous balance, kg/ha. Source: Defra, Soil nutrient balances; December 2024.

	P or K Index			
	0	**1**	**2**	**3+**
Straw incorporated				
Winter wheat/winter barley (8t/ha)				
Phosphate	120	90	60	0
Potash	105	75	45 (2-) 20 (2+)	0
Spring wheat, spring barley (6t/ha)				
Phosphate	105	75	45	0
Potash	95	65	35 (2-) 0 (2+)	0
Straw removed				
Winter wheat/winter barley (8t/ha)				
Phosphate	125	95	65	0
Potash	145	115	85 (2-) 55 (2+)	0
Spring wheat, spring barley (6t/ha)				
Phosphate	110	80	50	0
Potash	145	115	85 (2-) 55 (2+)	0

Table 1: Phosphate (P_2O_5) and potash (K_2O) recommendations (kg/ha) for wheat and barley†

Source: Adapted from the Nutrient Management Guide, RB209 Section 4 Arable Crops; AHDB.
†Application rates can be adjusted if yields are likely to be more or less than those shown above.

Avoid the 'hunger gap'

For Ben Wainwright, Agrii fertiliser product manager, the downward trend in phosphate use is concerning. Growers are only likely to see a visible deficiency if it is severe. There may be a shortfall, only seen in harvested yield, which goes unaddressed.

"For it to be visibly apparent, such as in the form of purple stems or leaves, the deficiency has to be severe," Mr Wainwright says.

"In these situations, an application high in P_2O_5, such as Triple Super Phosphate, is the best course of action, although it is best applied preventatively rather than as a cure.

"The optimal approach would be to apply a product with a protective coating such as Agrii Protected Phosphate (APP). This is a coating on TSP or DAP granules that reduces lock-up in the soil by calcium (Ca), aluminium (Al), iron (Fe) and magnesium (Mg) and increases the quantity of phosphate that is biologically available to the crop. Trials indicate that application rates can be cut by up to 20% depending on the soil index," he adds.

Advisers often talk about the 'hunger gap', which is the difference between optimum availability and visible deficiencies, but it is hard to detect and is often masked by other, often related conditions.

Release P reserves

For those growers with good soil reserves, typically Index 2 or better, an application of Agrii-Start Release as a spray to the soil surface at either the pre- or post-emergence timing up to growth stage 30, will increase the quantity of soil available phosphate 60-days after application.

"Agrii-Start Release is a unique soil phosphorous activator for all soils with less than 30% organic matter. It can be used on high or low pH soils and increases the availability of other nutrients, including zinc, manganese, boron and copper."

Widely trialled across most crops and soil types, Agrii-Start Release has consistently given a positive response (see Table 2).

"The yield gains in winter wheat and spring barley have been impressive. Across a range of soil indices, its application has consistently delivered a positive return on investment," Mr Wainwright says.

To make efficient use of all sources of crop nutrition first requires an understanding of what is already available in the soil if unnecessary applications are to be avoided. The introduction of the CSAM1 nutrient management action as part of the Sustainable Farming Incentive (SFI) has helped to increase the area of soils analysed annually.

"The CSAM1 action offers a payment of £6/ha to encourage growers to test soils. This is roughly equivalent to a broad-spectrum soil test so can cover the expense while delivering the benefit of a wider analysis beyond the requirements of CASM1," Mr Wainwright says.

"Good data is the basis of an informed decision. Knowing your exact growing conditions aids your ability to tailor applications and optimise production," he adds.

For any questions about this article, please email Ben at ben.wainwright@agrii.co.uk

Crop	Soil pH	Soil P index	Yield response (t/ha)	Margin over input cost (£/ha)
WW	6.9	4.1	+0.7	+102
WW	7.9	1.1	+0.6	+84
WW	7.8	2	+0.5	+63
Spr. Bly	6.1	5.8	+0.45	+40

Table 2: Yield response from a single application of Agrii-Start Release
Reference: Agrii. Assumes winter wheat at £180/t and spring barley at £150/t.

NEW: SUSTAINABLE WHEAT CONTRACT

Agrii, in partnership with Viterra and Whitworths, has developed a new sustainable wheat programme for harvest 2025. The programme aims to quantify the emissions associated with growing a wheat crop, with the ambition to reduce emissions per tonne in the future.

Farmers on this programme will be rewarded a guaranteed premium of £5/t for inputting field data into Contour and the Cool Farm Tool, with the ability to increase to £10/t by adopting optional practices which can help further reduce emissions. Farmers must use Agrii's Contour platform to be eligible for this programme.

Optional practices are encouraged and rewarded according to their environmental impact and complexity to adopt. This is reflected through a points-based system, where actions are aligned with the aims of the sustainable farming incentive.

Find your local agronomist:

Given that tillage, soil health, and nutrition are the main factors influencing crop emissions, the programme focuses on rewarding against these categories. For example, more points are allocated for a crop established by no-till than by deep cultivation, and similarly with drilling a diverse cover crop mixture versus none at all. Using this points-based system means farmers have the flexibility to work this programme around the most effective system for their farm.

The same approach has been used to improve nutrition efficiency. The programme provides a list of practices for a grower to choose from. The more practices they adopt, the more points they earn.

At the end of the year, those with more points can earn up to £10/t (including the guaranteed £5/t). Over time, we expect that the emissions per tonne of wheat will be reduced by adopting these practices. Given the desire to monitor this trend, farmers are expected to engage in the programme for a minimum of 3 years, with the ability to alter their hectarage annually.

We see these types of programmes playing an important role in future farm income, where benefits can be stacked alongside each other to help improve farm resilience. We hope to continue providing more opportunities like this through our close relationships with Viterra and GB Seeds.

Please speak to your Agrii agronomist if you are interested in signing up for Harvest 2025.

> *"Farmers will be rewarded a guaranteed premium of £5/t for inputting field data into Contour and the Cool Farm Tool, with the ability to increase to £10/t by adopting optional practices which can help further reduce emissions."*

AGRII'S NEW GLASSHOUSE FACILITIES TO PROMOTE BETTER RESEARCH

Don Pendergrast
Technical Manager for Non-Combinable Crops

Don Pendergrast, Agrii technical manager for non-combinable crops, explains why Agrii is investing almost a million pounds in a new glasshouse.

Agrii is nearing the completion of a 480m² glasshouse that will extend our research capacity and enhance our advice to customers.

At a cost of almost £1 million, the glasshouse and adjoining polytunnels will also support the creation of two new roles, those of a glasshouse manager and technician.

The investment serves several purposes. First, utilising the highly controlled environment of the glasshouse to extend the season means we can fast-track the process of evaluating new products and technologies or changes in application practice. This 'fail fast' approach of gathering feedback at the early stages and adapting quickly allows Agrii to take only those products or practices that are worthwhile to the polytunnel or field for commercial assessment.

An advantage of having this capacity in-house is that we can assess these new products or techniques under regimes we believe will be conducive to performance, reflect industry practice or align with future regulations or consumer demands. We can also consider products as part of a programme and on crops beyond the often-short list for which they are authorised. The ability to do this in-house rather than contracting an institute or university makes Agrii unique among its peers.

Second, the research arena is awash with promising new products, often with grand claims to performance, but usually based on limited data and niche crops.

One of this investment's most exciting opportunities is looking beyond these claims and considering the 'what if' scenarios. We often see products with potential outside the crops or pests the scientists envisage. Having the capacity to explore these applications in a timely and reasonably inexpensive manner is nothing short of liberating.

This is especially pertinent with biological crop protection products. We have come to understand that external factors often determine the performance of products containing live bacteria, endophytes or fatty acids.

To our frustration, we have found that few others have the capability to fully consider the influence of environmental conditions or the method and timing of application in identifying how to get the best from these products. It is, therefore, not uncommon to lose a season or more because of this poor understanding or lack of flexibility. Identifying the parameters that shape how we manage crop threats or support crop health at an early stage will be integral to refining the systems that sustain a productive and profitable industry.

Third, the investment will support targeted research and trials and the need to present the findings more demonstrably. This is especially valuable with mode of action and efficacy work.

To enable this, the investment also considers several novel pieces of technology. Among these is a crop scanner with the capability to look below the soil surface to see what is happening within the rhizosphere of the roots and a spray rig for precision application techniques.

This highly specialised work is hard to perform in the field but essential to promoting understanding among agronomists, regulators and academics. It is also fundamental to our proposition. We test everything we sell, from products to programmes to systems; doing it properly can involve specialist capabilities. We see this as essential to supporting our customers: agriculture and horticulture face many challenges from market volatility, a changing climate with erratic weather and policies to promote the environment. This investment is part of our efforts to help growers mitigate these issues while remaining profitable.

Finally, it means we can engage in conversations on our industry's future shape and direction.

We are already at a level where we can undertake work to support the implementation of the European Union's biostimulant directive, but we have greater aspirations. At some point, the UK will address the policy gaps inherited from the EU, especially in the case of biologicals. At the same time, new regulations will be required for the commercialisation of gene-edited crops. We want to contribute – and be seen to do so meaningfully – to that policy forum.

Where appropriate, we will share what we have learned from our work with others by seeking publication in a suitable peer-reviewed journal. We are well-placed to develop findings from the glasshouse and apply them to the commercial and environmental realities of the field. The scope of our research focus is broad, with the first horticultural crop trials scheduled for early 2025, while the arable trials will commence in the spring. This is no small venture and far more than just another greenhouse.

Throws iFarm event

Come along to our Throws Farm event to see the new glasshouse on 10th June.
Scan here to register your interest:

NEW AGRII SERVICE BRINGS THE BENEFITS

OF THE CARBON ECONOMY TO CUSTOMERS IN A SIMPLE AND HIGHLY EFFECTIVE PACKAGE

Agrii has teamed up with carbon farming innovators Agreena to offer a bespoke service focused on helping its customers make full use of individual farm resources and maximise opportunities from the carbon economy.

The new partnership will help producers understand carbon farming better while allowing them to build a revenue stream from their own implementation of low-carbon practices, says Agrii sustainability and environmental services manager Amy Watkins.

"Continuously evolving, we have been looking at how we can really make the carbon economy work for our customers for some time now and have carried out in-depth analysis of what people want to achieve from this exciting new area and the options open to them.

"Fundamentally, we did not just want to provide a service already offered by others but instead form a strategic partnership with a like-minded business that would allow us to develop a unique solution based on customer needs.

"After talking to various organisations, we decided Agreena best matched our requirements, not just because of their specialist knowledge in the area and what they can bring to customers but also because they best aligned with our vision for the future of agriculture and where carbon fits in with this.

"Furthermore, we feel both organisations can combine skills and insights in the future to deliver a specific solution to Agrii customers that really homes in on what they need."

Generating farm income

Essentially, the new Agrii/Agreena carbon offer is designed to help farmers understand the potential value of their carbon, earn carbon credits from implementing low-carbon systems, and ultimately generate an income from these credits, Amy explains.

"The idea is to offer a simple to understand system underpinned by a strong scientific background which offers competitive financial benefits to farmers in an exceptionally flexible package with several options as to how they can get started."

The major benefit of the Agreena programme is there is no commitment required to get a simple estimation of your farm's carbon value. Farmers can then decide their level of commitment after receiving an estimation. Looking at 'what if' scenarios using Agreena's tools can also help with planning a farm's crop rotation.

"So, for example, the scheme will reward practices such as minimising soil disturbance, putting cover crops in, improving the efficient use of fertilisers and optimising the management of soil residues.

"If you decide to go further than a simple estimation, carbon credits are issued to growers who adopt one or more of these regenerative practices. You decide what to do with the credits you earn: keep them to offset your farm's own emissions, sell them to your own buyers, trade them alongside your crop, or have Agreena help you find the best price. In a time where there are new opportunities constantly arising in agriculture, we see having the flexibility and choice over what you do with your credits as vital."

For maximum flexibility, the programme is stackable with the sustainable farming incentive, and also offers both insetting and offsetting options, she explains.

"Insetting is where companies invest in projects that are related to their products such as a miller rewarding for carbon friendly practices to grow their ingredients, while offsetting is when such investments are not related to the product as is the case if an airline were to buy them.

"The benefit of offering both options means that producers have an increased opportunity to sell the credits, as the number of buyers and demand increases. Agreena partners with companies outside of the agricultural supply chain to deliver nature-based solutions, and companies inside the agricultural supply chain, such as Mars Incorporated.

"Some farmers see insetting as the lower risk option. If a farmer wants to sell credits to the processor/food company with their crop, then the platform will allow the farmer to keep their credits to sell themselves. Agrii is also working closely with the supply chain to offer grain insetting contracts within the supply chain."

Achieving results for individuals

Thomas Gent, Agreena UK Market Lead, says the company shares Agrii's farmer-centric focus and sees the partnership delivering benefits above and beyond simple carbon trading.

"Headquartered in Copenhagen with an office in London, Agreena works with thousands of farmers to actively transition 4.5 million hectares of cropland across 20 European markets. That makes us Europe's largest soil carbon programme," he explains.

"We work with third-party validation and verification bodies to ensure we align to the strictest market standards and leverage advanced measurement and reporting capabilities to measure real impact from the ground up.

"We believe our farmers are the influencers, pioneers and enablers of a modern agriculture and our aim is to help farmers transition from conventional ways to more sustainable methods of production in whatever way is right for them in the long-run.

"This modern agriculture is a growing movement and there is significant need for the industry to work alongside farmers and support these market enablers.

"We are delighted to be working in partnership with Agrii and see their knowledge-based and research-driven approach to improving the science of agricultural production complementing our equally forward-thinking aspirations."

> *"As farming incomes come under pressure, we need to ensure we are looking at all opportunities available for our customers to continue to farm profitably. Agreena Carbon gives farmers access to carbon finance to support the adoption of climate-friendly farming. A healthy, resilient soil will play a significant role in the future of farming businesses, and carbon programmes like Agreena's can offer short-term financial benefits from adopting sustainable soil management practices."*
>
> Amy Watkins - Agrii Sustainability and Environmental Services Manager

Want to find out more?

In the weeks and months ahead, we'll be telling you a lot more about this exciting development, including the staging of several events, developing case studies, and releasing podcasts.

To get your free estimation today, please register by scanning the QR code.

LIVING UP TO THE SFI AND ITS ACTIONS

THE SFI OFFERS FINANCIAL PAYMENTS TO THOSE WHO ADOPT VARIABLE RATE APPLICATIONS, BUT DEMONSTRATING COMPLIANCE IS MORE THAN A TICK-BOX EXERCISE, EXPLAINS RHIZA PRODUCT MANAGER BEN FOSTER

The Sustainable Farming Incentive (SFI) has much to offer growers. With 102 actions available across a multitude of activities, the SFI has something for every farm and with a defined payment schedule, participants can plan with confidence.

A core pillar of the SFI is the module on soils and the actions to help you "increase the long-term health, productivity and resilience of your soil". Who could object to that? The complementary nature of the three soil actions – SAM1, SAM2 and SAM3 – broadly support the same objective but offer different levels of participation depending on the interest of the land manager. The actions for nutrient management – NUM1, NUM2 and NUM3 – have similar objectives but with a specific focus on "increasing nutrient management knowledge, supporting more efficient use of nutrients and encouraging more effective use of organic sources of nutrition". Again, who could object?

At its core, the SFI offers payment for actions that many consider good farming practice, such as maintaining desirable landscape features or demonstrating adherence to an Integrated Pest Management (IPM) plan. There are some that the land manager can complete themselves and there are others, such as the soil and nutrient management actions, which need to be demonstrated in the form of a plan produced by a suitably qualified person, such as FACTS registered adviser. Fortunately, Agrii's team of FACTS-qualified crop input specialists and agronomists are trained in the finer details, so are well-placed to help.

Soil pH

Central to both the soil and nutrient management actions is the requirement to maintain the long-term health of the soil and support the wider environment such as surface water and air quality. Although not a specific action, soil acidity (pH) and its role in supporting a functioning soil is widely recognised through these modules.

Data from the 2023 British Survey of Fertiliser Practice reveals that soil pH has been in long term decline – see Fig. 1. pH is only one measure of a soil's ability to function properly, but it is a useful proxy for overall soil health.

The acidity of our soils needs to be addressed. As values fall closer to 6, essential nutrients such as phosphorous and calcium and micro-nutrients such as magnesium and molybdenum are rendered increasingly unavailable to the growing crop – see Fig. 2.

Soil pH also has an influence on nutrient utilisation, applied as either organic manures and wastes or as mineral fertilisers – see Table 1.

The RHIZA Lime Planner

Restoring soil pH is a straightforward task. The SAM1 action under SFI more than covers the cost of basic nutrient analysis (P,K, Mg, pH) so long as an organic matter result is included with the analysis package, something RHIZA can also offer. As part of the farm assurance scheme all farms should be conducting soil analysis on every field on a five-year rotation, why not enhance this process by lining up soil sampling with liming rotation to make use of the most up to date field information? This data can be imported easily into RHIZA's Contour platform to give a digital record, visualise nutrient maps and use the data in RHIZA's suite of planning tools, such as the Lime Planner tool.

Once the soil sampling data has been uploaded to the Lime Planner module, the user can set a target pH value to create a job sheet report and an application file (in shapefile format) for either variable rate or flat-rate application. This can then be sent to the machinery controller.

Satisfying the PRF1 requirement

The use of data from soil analysis performed in previous seasons is sufficient for variable rate lime and P&K application because the pH value and soil indices won't change significantly during the season. This is not the case for variable rate nitrogen. How much nitrogen to be applied will depend directly on the crop situation and available soil reserves coming out of the winter. It is for this reason that the PFR1 action requires that where remote sensing is used to calculate the nitrogen requirement it is carried no more than 14 days before application. Those relying on optical imagery derived from the Sentinel-2 satellites struggled to secure images of sufficient value to meet the PRF1 action. Roughly 80% of the imagery produced was rejected.

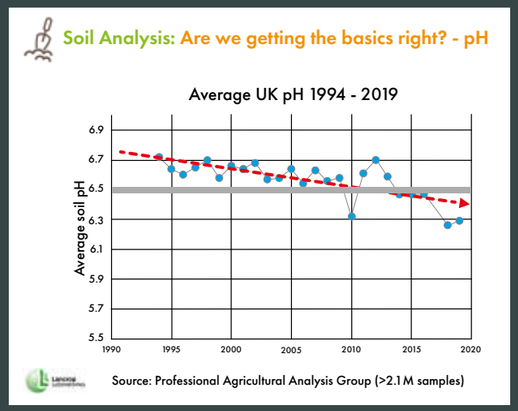


Fig. 1: The average pH of UK soils has fallen below the optimal score of 6.5

ClearSky

The only source of guaranteed cloud-free imagery able to meet the requirements of the PRF1 action is from ClearSky. It delivers unparalleled accuracy and consistency when the more traditional optical imagery isn't available through the use of cloud penetrating synthetic aperture radar (SAR). This system delivers a fresh biomass map of the field on a weekly basis, something that is unique to RHIZA – see Fig. 4.

Unlike other 'cloud-free' derivatives, ClearSky does not rely on intermittent clear optical imagery to calibrate predicted changes. This enables a greater degree of confidence in the data supplied to customers.

Analysis by Agrii on 900,000 hectares reveals that the Sentinel-2 system produced, on average, roughly 13.3 clear images per farm in 2023. Using the ClearSky platform increased this to 60.8. This number is improved further if the cloud-free images captured by Sentinel-2 are included.

The adoption of technology that improves the performance and resilience of agriculture is an objective of the SFI. Being able to demonstrate adherence with its actions is more than a tick-box exercise. Participants are expected to demonstrate that they are fulfilling the actions on demand. In some cases, this means producing a report while in others it means producing the actual data employed in the fulfilment of the task. ClearSky ensures that variable rate applications are consistent with crop requirements while making it easy to demonstrate compliance with the PRF1 action.

PRF1: what you must do to get paid and how to do it

PRF1 is the action for the variable rate application (VRA) of nutrients. It is a three-year agreement for which the recipient will receive £27 per hectare per year. There are specific eligibility criteria, mainly relating to land type, but to comply, all major nutrients (N, P, K and Mg) must be applied using VRA equipment pre-programmed with a VRA file using data from zonal soil or crop testing and analysis or remote sensing. The VRA equipment must be connected to a tractor- or sprayer-mounted crop reflectance sensor. The PRF1 does not cover micro-nutrients or lime. The data informing the VRA file must cover a minimum of P, K, Mg and pH. If the data is from zonal soil testing analysis, it must meet the action's requirements and be less than five years old. For nitrogen, the VRA file must use data from crop testing and analysis or remote sensing of crop reflectance taken no more than 14 days prior to application.

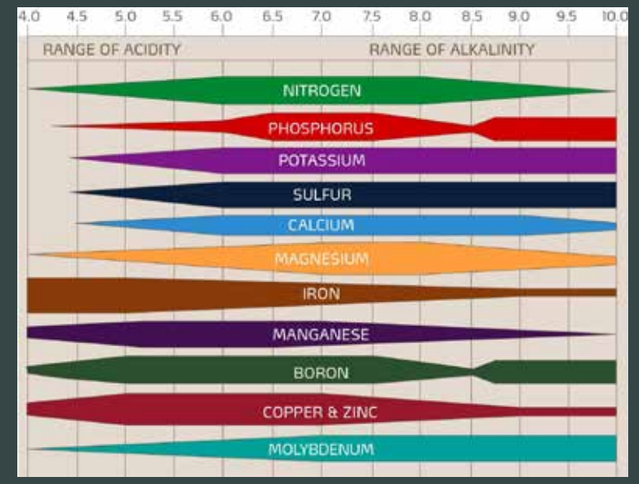


Fig. 2: The influence of soil pH on nutrient availability

Soil pH	N	P_2O_5	K_2O
4.5	30%	23%	33%
5.0	53%	34%	52%
5.5	77%	48%	77%
6.0	89%	52%	100%
Optimum	100%	100%	100%

Table 1: The impact of soil pH on NPK utilisation

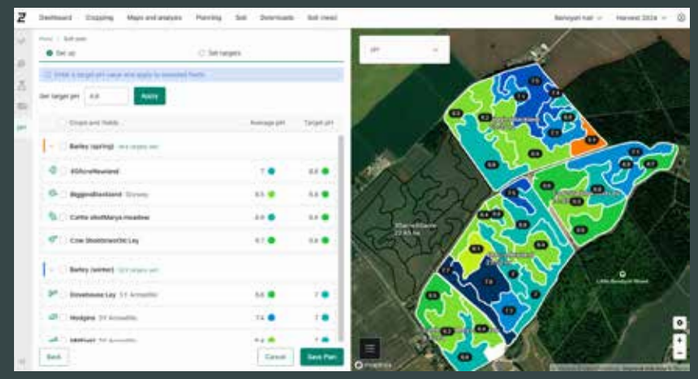


Fig. 3: Soil pH values can be displayed as a list and as a colour-coded map in RHIZA Lime Planner

Fig. 4: A ClearSky image showing NDVI values needed to support a variable rate application file

SEIZE THE SFI OPPORTUNITY

Emma Smith, an Agrii agronomist specialising in fruit production, explains why the Sustainable Farming Incentive is an easy win for vineyards and other horticulture businesses.

Like many horticultural businesses, Vineyards are well-placed to capitalise on the Sustainable Farming Incentive (SFI). It does not offer payments on a scale with those of the Basic Payment Scheme (BPS), but as L. P. Hartley wrote in his society novel, The Go-Between, "The past is a foreign country; they do things differently there". Instead, the SFI offers payments for actions that many consider good farming practices, including soil organic matter tests, integrated pest management (IPM) plans and variable rate application.

IPM is already widely practised by many businesses, but it has gained prominence since becoming a condition of the SFI. Including an IPM Plan with your SFI application is worth about £1,200, making it a worthwhile exercise.

With every plan, it is important to reflect and review, and for IPM, this is not just good practice but a statutory requirement. Your records will need to demonstrate evidence of a review with consideration given to what worked well and what could be done better to deliver an IPM strategy fit for future seasons. Your Agrii BASIS registered agronomist can help or fully undertake this for you.

Easy wins

Landscape features such as hedgerows, ditches and watercourses are often seen as an asset to vineyards, not the encumbrance they can be on a broadacre arable farm. As a result, many businesses actively manage these assets because they are intrinsic to supporting the biodiversity needed to deliver a healthy environment.

The hedgerow actions (HRW1, HRW2 and HRW3) offer payment for doing what, in many cases, is already being done to protect vines from harsh weather and as part of an IPM plan. Where more labour-intensive management is required, such as hedgerow laying (BN5), coppicing (BN7) or gapping up (BN7), there are capital grants available to help with the cost. The buffer strip action AHL4 pays for 4-metre or 12-metre grass strips to provide a habitat for wildlife, prevent pollution from leaching and support the broader objectives of an IPM plan. The wildlife actions are equally appealing, with options for pollen and nectar mixes (AHL1), winter bird food (AHL2) and grassy field corners and blocks (AHL3).

As with much of the SFI, being paid to maintain landscape features, sow seed mixtures that support birds and mammals or establish cover crop strips between rows of vines are easy wins for the land manager. It's not onerous or complex, and it is designed to work alongside the farm's core activities. Many agreements have a variable period of commitment (one to three years), and some are movable, meaning they can be delivered on the same area of eligible land or rotated as desired.

Some actions, such as cover crops and wildflower strips, require a little more consideration, mainly around the species mix. The good news is much of the thinking has already been done for you.

The Agrii Viti Master Mix, for example, is a specialist cover crop mixture that was developed in partnership with a vineyard customer near Cirencester. It is designed to be both practical and agronomically suited to UK vineyards. The blend contains a high proportion of dense grasses that give excellent ground cover and outcompete most weeds while providing good traction for vehicles.

The broadleaved plants provide an array of flowers all season – producing pollen and nectar for pollinating insects and beneficial predators. Including complementary nitrogen-fixing species (red clover, white clover, bird's-foot trefoil) helps support the mix and ensures it has the nitrogen to meet its needs through the season.

While equally rewarding, other actions, such as soil and nutrient management plans, need to be demonstrated as a report produced by a suitably qualified person such as a FACTS registered adviser. Again, much of the hard work has been done for you. Agrii's team of FACTS-qualified crop input specialists and agronomists are trained in the finer details of a nutrient management plan. They will be able to balance the use of bagged fertiliser with lime, soil-applied iron, organic soil improvers and novel micronutrient products.

RHIZA, Agrii's precision farming service, can produce the variable rate data files and work plans needed to fulfil the PRF1 action while also saving the grower unnecessary expense by ensuring only what is required is applied (see 'Living up to the SFI and its actions').

Emma Smith
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BASIS TRIAL

Jonathan Garratt, a new member of the fruit team, completed his BASIS Certificate in Crop Protection and IPM. (Commercial Horticulture) in 2024. As part of his BASIS project, he investigated methods of woolly apple aphid control suitable for commercial apple orchards.

Batavia (spirotetramat) is the current industry standard plant protection product for woolly apple aphid control but, in preparation for the eventual withdrawal of this active substance, alternative forms of control need to be identified and assessed. Similar trials are also underway to find a replacement for Movento, also spirotetramat, which is the equivalent product used for aphid management in the field veg sector, where they are a prolific pest and virus vector.

At Agrii, we pride ourselves on staying abreast of the changes occurring in our industry, including how the withdrawal of established products or the introduction of new active substances is likely to impact crop production systems and our customers. Jonathan's project formed part of this process while also serving as a valuable opportunity to deliver employee training. Such trials are essential to ensuring the advice we offer is the best growers receive. With the support of our agronomy team and the Agrii trials team, a protocol was developed to screen multiple products, both those already available and those yet to gain authorisation, as stand-alone treatments and in combination with suitable adjuvants. The results observed and the conclusions drawn from this trail, carried out at NIAB East Malling, will support the advice delivered in future seasons.

This is just one example of the work the R&D team performs as part of our commitment to ensuring the Agrii team is the most informed in the industry. The construction of a new glasshouse at Throws Farm (see page 14) will allow them to undertake further trials in support of this commitment.

THE POTATO PARTNERSHIP REGIONAL MEETINGS – HAVE YOU BOOKED YOUR PLACE?

The Potato Partnership (TPP) are holding 4 events during February 2025 across Hereford, Essex, York and Scotland to showcase the results and findings from our 2024 trials.

Covering:

+ Solutions for wireworm control
+ New approaches to PCN management
+ Integrated PCN control
+ New materials for aphid and virus control and companion cropping
+ Novel approaches to late blight control
+ Discussion on biostimulant efficacy

Book your place on our website!
Visit thepotatopartnership.co.uk/events to reserve yours. Places on a first-come, first-served basis.

PREGNANCY AND PARASITES: WHY WORMING EWES IS CRUCIAL BEFORE LAMBING

Agrii animal health expert David Pryce summarises the latest guidance on worming ewes at lambing from SCOPS (Sustainable Control of Parasites).

A sometimes overlooked but essential aspect of pre-lambing care is worming pregnant ewes. This preventative step supports ewe health and safeguards their lambs' early development.

The key factor behind this necessity is the peri-parturient relaxation of immunity (PPRI). During late pregnancy and early lactation, a ewe's immune system naturally lowers its defences to prioritise the demands of growing and feeding her lambs. While this adaptation is vital for reproduction, it leaves the ewe vulnerable to parasitic infections.

If left unchecked, this can lead to higher worm burdens in ewes, which can result in poor condition and reduced milk production. The ewe's gut produces more eggs, infecting pastures and increasing the risk of spreading parasites to newborn lambs. Lambs are particularly susceptible to parasites in their early weeks, making it crucial to minimise their exposure.

Worming pregnant ewes strategically during the peri-parturient period breaks this cycle. Timing and treatment choice are essential to get the best results from a worming programme and reduce the risk of anthelmintic resistance (AR).

The timing and choice of treatment

The PPRI period typically lasts about two weeks before lambing until six weeks after. Treating early on is advisable. However, if ewes are still within their PPRI period when the effects of a worming treatment wear off, they will be reinfected quickly.

To solve this issue, repeat anthelmintic treatments have traditionally been used for the entire PPRI period. However, this means an extended period before the ewe is reinfected with susceptible nematodes from the general population, which strongly selects for AR worms.

The advent of the much more persistent anthelmintic moxidectin helps to solve this challenge, but concerns about its resistance have emerged. To help give clear recommendations to farmers, SCOPS and Zoetis produced a guide on the best practices for using moxidectin.

Balancing parasite control and anthelmintic resistance

The decision on which ewes to treat around lambing involves balancing parasite control with avoiding unnecessary treatments to minimise the risk of AR.

Historically, advice centred on treating ewes based on litter size, with single-bearers often left untreated. This was linked to the strain multiple lambs placed on a ewe's immune system and the role of dietary protein in supporting immunity. However, more recent evidence suggests body condition score (BCS) is a more reliable indicator of the PPRI.

The focus has shifted to targeting treatments for younger, leaner animals and those in poorer condition rather than blanket treating all multiples or leaving all singles untreated.

Current advice still emphasises leaving a portion of the flock untreated (traditionally 10-20%) to maintain diverse worm populations and reduce AR risk. However, this untreated proportion can be increased in flocks with good overall condition and adequate nutrition.

Monitoring faecal egg counts (FEC) and assessing BCS provide practical tools for tailoring treatment strategies to the needs of individual flocks, ensuring effective parasite control without overusing treatments.

Combining best practice use of anthelmintics with good pasture management should set the stage for a successful lambing season.

The complete SCOPS guidance and referenced scientific studies can be found on its website or by scanning this QR code.

DON'T BE TEMPTED TO TAKE SHORTCUTS WITH HERBAL LEYS

Thinking more about the role of SAM3 herbal leys and choosing the best option for your own individual farming set-up could deliver benefits far beyond those resulting from the SFI payment alone.

Not all SAM3 herbal leys are the same. Producers choosing the least cost seed simply to tick the SFI box required for the payment could be losing out on many of the real benefits associated with them, says Agrii grass, roots and environmental seeds manager Adam Simper.

Make the right choices, and not only will you be adding highly valuable diversity to forage security throughout the year, but you'll also see improvements in soil health, organic content and structure, as well as long-term productivity gains, he believes.

"Herbal leys are definitely growing in popularity largely as a result of government funding under the Sustainable Farming Incentive (SFI) and a growing awareness of their environmental benefits.

"But for many tempted to start using them, it's a completely new area of management and one which is further confused by an ever-growing range of mixes on offer together with a variety of claims made for these.

"It's far from a 'one size fits all' situation and while there are significant opportunities for improving livestock health and performance alongside soil health, carbon capture and biodiversity benefits, this does depend on their successful integration into existing systems."

Understanding the different options

The starting point for this is to make sure you understand the different options open to you and the merits of the various approaches available, he stresses.

"Herbal leys can be made up of a wide mixture of grasses, legumes and herbs, with their strength lying in this diversity.

"The right mixture of species can create a varied and nutrient-rich diet for livestock due to deep rooted species mining minerals from the soil's depth and making them available via the forage.

"Furthermore, this can be either be as grazing in the summer months or as a silage that can be fed to livestock year-round.

"When it comes to soil improvement, a carefully prepared mixture of species can ensure roots penetrate to different levels, dramatically improving soil structure, and helping prevent leaching, while increasing moisture and nutrient retention.

"This in turn helps capture carbon, improves organic matter content and boosts the health of your soil. The legumes in herbal leys also fix nitrogen, which increases the nutrient value of the soil, helping to reduce costly fertiliser applications."

If this is not enough, the correctly specified herbal ley mixture can increase biodiversity, support a wide range of beneficial insects and wildlife, and improve the whole farm's ecosystem, Adam Simper points out.

"The diversity of swards from multiple plant species can bring strength and improve pest resistance by disrupting pest life cycles.

"But to enjoy all these benefits you must make sure the mixture you choose is suited to your livestock and your land."

To get the widest range of benefits, producers should select something with a diverse mix of grasses, legumes, and herbs suited to your whole farm enterprise, he urges.

"Under the 2023 SFI scheme, the voluntary guidance for SAM3 asked farmers to include five grass species, three legume species and five herbs, whereas the 2024 CSAM3 mix requires a minimum of one grass, two legumes and two herbs.

"It also stipulates you must minimise the use of inorganic fertilisers containing nitrogen, which is usually set at no more than around 40kg N/ha in any year.

"Common species in herbal leys include Ryegrass, Timothy, Fescues, Cocksfoot, Festulolium, Red and White clover, Birdsfoot Trefoil, Chicory, Plantain, Sheeps Burnet, Sheeps Parsley, and Yarrow."

A wide range of options

Agrii has a range of mixes designed to fit SFI requirements, ranging from those aimed at delivering maximum forage production for livestock to others specifically created for overseeding to increase the diversity of the sward, he explains.

"Each farm's management regime will be different so it's a good idea to speak to an Agrii specialist who can advise you on which mix will best suit your specific needs.

> *"The aim of SAM3 is to establish a new herbal ley. However, you can apply for SAM3 to maintain an existing herbal ley, but only if it is not already being paid for under another environmental land management scheme option.*

"Agrii SFI SAM3 Grazing, for example, has been designed to produce high yields of good quality forage for all livestock.

"The inclusion of AberZeus Intermediate Diploid helps to create a dense sward, and along with the legumes and herbs, provides a resilient, valuable, and nutrient-rich forage during periods of dry weather.

"Then there's Agrii SFI SAM3 Cutting, which produces large cuts of quality silage, providing a highly palatable forage with variety when fed.

"As Chicory can become woody and cause fermentation issues when baled and wrapped with woody stems easily piercing film, this cutting-based mix does not include Chicory.

"Agrii SFI SAM3 No Red Clover has been formulated for the grazing of livestock to avoid potential bloat in cattle when grazed and fertility issues in breeding ewes resulting from the inclusion of red clover.

"In particular, the varied species within the formulation provide a resilient, valuable, and nutrient-rich forage during periods of dry weather."

Agrii SFI SAM3 Overseeding can be drilled into existing pastures where the objective is to increase the population of grass, legumes, and herb species within the sward, Adam Simper points out.

"As with all overseeding, any thatch in the base of the existing sward should be removed to allow good seed-to-soil contact and to also enhance light penetration.

"The Agrii Legume and Herb Overseeding Pack will also increase the legume and herb content in any existing sward.

"Again, all thatch should be removed to allow good seed-to-soil contact and light penetration and it is not advised to apply nitrogen until the newly sown species are established as this will only increase competition from the existing grasses."

Understanding SAM3 requirements

The SFI scheme has proven particularly attractive as it can run alongside other Government programmes, ensuring producers can extract more value from their land, Adam Simper points out.

"The objective of the SAM3 option is focused on improving soil structure and helping to increase carbon capture while boosting soil biology and fertility.

"Under the scheme, you can claim £382 per hectare and eligible land includes arable land along with temporary and permanent grassland.

The aim of SAM3 is to establish a new herbal ley. However, you can apply for SAM3 to maintain an existing herbal ley, but only if it is not already being paid for under another environmental land management scheme option.

"The CSAM3 option differs slightly in that its aim is to establish a herbal ley with a mixture of grasses, legumes and herbs or wildflowers that will produce a high volume of forage with minimal use of inorganic fertiliser.

"The scheme also aims to help make land more drought resilient while improving and maintaining the soil's structure, carbon, biology and fertility.

"Under CSAM3, the minimum number of species you can include to meet the requirements of the scheme are one grass species, two legumes and two herbs, but you will get greater diversity by adding more species.

"Again, you can claim £382 per hectare and eligible land includes arable land, arable land lying fallow and temporary and permanent grassland.

"With the CSAM3 option, you are required to establish the herbal ley by early autumn, within 12 months of this action's start date, and it must then be carefully maintained at the same location until the objectives of the action can be achieved.

"The guidance suggests this would be the end of the second summer after sowing. After this time, you do have the option to rotate the herbal ley to another part of the farm.

"You are also expected to re-establish the herbal ley by early autumn (either at the same location or a different location) and maintain it until the action's end date."

Scheme requirements

The SFI scheme has several key requirements, including keeping records and evidence, such as receipts for your seed mix and any other relevant documentation, to show that you are performing the required actions, he explains.

"Under both options, you must maintain the ley and this can be done by grazing or cutting. It is also advised that you leave leys untouched for at least five consecutive weeks between early May and late July to provide pollen and nectar for insects.

'While rotation is an option, it's also important to ensure the herbal ley achieves the objective of improving soil health, so make sure the soil structure has benefited from the herbal ley before moving on and be prepared to overseed if any area fails."

Under CSAM3, there are also strict restrictions on the amount of inorganic fertilisers you can use, with guidance saying no more than 40kg N/ha should be applied in any one year, he points out.

"With both options, the use of herbicides and pesticides is also restricted with herbicides only being used to weed wipe or spot treat injurious weeds, invasive non-native species, nettles or bracken."

Even without Government funding, herbal leys are a valuable addition to a farming operation, Adam Simper stresses.

"They can create a nutrient-rich and balanced diet that will improve livestock health and performance while also helping to improve soil and biodiversity and cutting fertiliser inputs.

"So, spend the time to find out what approach to herbal leys is going to work best in your own farming situation, learn about their management and talk to your Agrii specialist to work out the best mix to help you achieve your objectives."

CASE STUDY: Maintaining forage production whilst embracing SFI opportunities

Many growers across England have engaged with SFI and have already begun the process of stitching many of the new schemes into their existing farming practices.

One such farmer is Andrew Griffiths of Bulls Green Farm, Cheshire who runs a fully robotic system milking 390 cows and averaging 38.5 litres per day.

"They have slotted in well within our system, yielded as well as our existing Multi Master swards and the diversity within them is great to see and should give us more future resilience during periods of dry weather. We have recently started feeding Silage produced from our Agrii SAM3 Cutting leys which has returned at 19% Protein on analysis and milk yields have increased two litres per cow per day," Andrew concludes.

"For our grass silage production, we run a multi-cut system and aim to be cutting every 28 days throughout the season," says Andrew. "Quite early on, we took the decision to sign up to the most relevant SFI schemes and to those we felt would complement our existing system – for our grassland that was the SAM3, Multi Species Swards."

Although there is a financial benefit for farmers to engage with SFI schemes, growers still need to ensure that production and quality are not compromised during the process. "We have grown Red Clover leys on a percentage of our silage ground previously, and we wanted to try and achieve the same principles, but without overcomplicating our swards with SAM3.

"The newly developed MasterLeys SFI range and the varying options of SAM3 Mixtures that Agrii had to offer made our transition simple. Agrii SAM3 Cutting was utilised for reseeds being sown in the Spring of 2024, and we selected Agrii SAM3 Overseeding for our existing swards of Multi Master.

"The simplicity of being able to fully meet the aims of the scheme with a high-quality mixture, but without species that wouldn't work for us, such as Chicory, has been a massive benefit," explains Andrew.

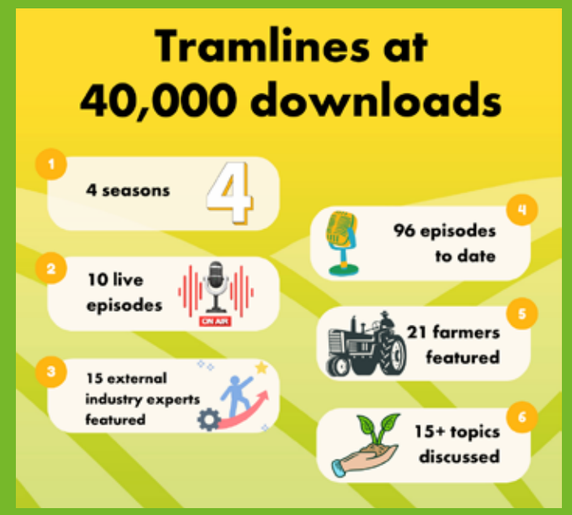
Weather patterns during 2024 have had an impact on forage production and harvesting conditions across the UK, but Andrew has still seen the benefits of his Agrii SAM3 Cutting leys.

"Due to the wet conditions, our new SAM3 Cutting reseeds were drilled late spring, but we have still had three good cuts off them this season. They have slotted in well within our system, yielded as well as our existing Multi Master swards, and the diversity within them is great to see and should give us more future resilience during periods of dry weather," Andrew concludes.

Andrew Griffiths (left) and Dave Hastings, Herd Manager (right)

We're excited to announce that Tramlines, Agrii's go-to podcast for growers looking to enhance environmental performance and maximise farm profitability, has reached an incredible milestone of 40,000 downloads!

Scan to listen now.



PASTURE READY: BEST PRACTICES FOR TURNING OUT LIVESTOCK THIS SPRING

David Thornton, Nutritionist, gives his advice to livestock farmers ahead of spring turnout.

Grazed grass is the highest-quality and cheapest feed on the farm in spring, better than silage and equivalent to concentrates. In fact, offering concentrates to livestock on spring grass will substitute intake, cost approximately ten times more and not affect performance!

Early spring grazing stimulates the grass to start growing earlier. A further 1-1.5 tonnes of dry matter is expected to be produced (AHDB) when compared with later turnout. More importantly, it creates a reserve of grass in front of the animals at different heights that may or may not be required later. This means it is easier to control, and silage fields can be removed from the grazing acreage as grass growth increases.

The first spring rotation should be around 40-50 days, starting from February and continuing until mid-April. The target is to graze around 30-40% of the grazing paddocks first to allow regrowth to accumulate for the start of the second rotation; this could include silage ground. This varies from farm to farm, but the overriding aspect of grazing management is to make good use of spring grass. Silage supply should not be used as a target for turnout.

Spring grazing heights of 3.5-4cm (1500kg DM) should be targeted during the first grazing rotation.

Turnout of animals should take place during periods of dry weather, with good underfoot conditions and with full bellies – this will allow animals to settle and start grazing properly. Animals may need to be removed during periods of heavy rainfall or if soil conditions deteriorate.

Not all animals need to be turned out at the same time. Prioritise those groups likely to benefit from a high-nutrient diet, such as lactating cows and sheep or finishing cattle.

Cattle turned out early to grass have 6% (+23kg) higher carcass weight than animals turned out later in spring. This could equate to close to £80/head, according to Teagasc research.

> *“Research has shown that achieving an extra day at grass for a 100-suckler-cow herd is worth, on average, £125 per day (AHDB).”*

> *“The increasing emergence of herbal leys, mixed composition swards, deeper rooting plants and strips, and field corners and margins left to satisfy SFI requirements should eventually improve the mineral and trace element supply in the diet of grazing stock compared with straight ryegrass swards.”*

Make sure you start the first rotation on time. If not, it will finish later than mid-April, leading to too much grass being on farm. Too much grass gets trampled, leading to poor utilisation, more work, and potential cost (topping) to get the grass back under control.

Whilst spring grass is digestible and energy and protein-rich, it is potentially a poor source of minerals. The grass does not take up these essential elements well whilst soil temperature remains low. Therefore, supplementation, particularly magnesium for lactating animals, will be necessary to maintain good health and performance. This is most conveniently achieved with free-access mineral-vitamin licks, initially placed close to the water supply to establish an intake and then managed thereafter.

On farms where grazing is improved with over-seeding, fertiliser applications, clover-rich pastures, etc., more emphasis should be placed on mineral supplementation compared with meadow grazing. The increasing emergence of herbal leys, mixed composition swards, deeper rooting plants and strips, and field corners and margins left to satisfy SFI requirements should eventually improve the mineral and trace element supply in the diet of grazing stock compared with straight ryegrass swards.

In general terms, the mineral nutrition of suckler cows should be supplemented with a high magnesium lick all year round. Staggers can strike unexpectedly, especially for cows with a calf at foot; it just needs a trigger factor like a thunderstorm or late frost to cause a break in grazing.

Likewise, for ewes, especially those rearing twin lambs, at peak milk output for the first 6 weeks after turnout. Even growing cattle and dairy youngstock are at risk initially after turnout. Thereafter, grazing generally requires supplementation with trace elements, especially copper, cobalt, selenium, and, in some parts of the country, iodine.

A forage mineral analysis can determine what’s missing from your pastures, enabling you to make better-informed decisions about the most appropriate supplement – licks, bolus, drench, minerals, etc.

Our livestock team will be at NSA on Wednesday 21st May 2025 at Tregoed Farm Brecon, LD3 0SP

HOW A NEW BIOSTIMULANT HELPS CROPS FIGHT OFF DISEASE

A NEW CLASS OF BIOSTIMULANT ENERGISES THE PLANT'S METABOLIC PROCESSES TO FIGHT OFF PATHOGENS BY TRIGGERING A HYPERSENSITIVE RESPONSE. IT LOOKS SET TO FIND ITS WAY INTO EARLY-SEASON SPRAY PROGRAMMES THIS SPRING.

A new type of biostimulant has emerged that works hand-in-hand with conventional crop protection programmes by boosting plant health to help combat disease threats. These stimulate metabolic processes linked to fighting off pathogens, such as when humans take vitamins to fight a cold.

Agrii has been trialling one of these products across a range of crops, and the team is excited by its potential, explains Jodie Littleford, Agrii technical manager for combinable crop trials.

Called Innocul8, the active ingredient is PHC101, which is a peptide. This is combined with manganese and zinc, both crucial components in many plant enzymes.

"We are quite familiar with what amino acids are," says Jodie. "They are the individual building blocks that go on to form more complex structures like proteins. The plant can utilise them in whatever way it needs.

"Peptides are a step on from that. They're strings of amino acids designed for specific purposes. They are far more targeted within the plant."

Like a flu vaccine in humans, peptides trigger a hypersensitive response within plants. This is well-researched and documented in scientific literature, which was first published in the early 1990s.

Innocul8 sets off an immune response by being designed to mimic the effects of a pathogen damaging nearby cell walls. This then stimulates metabolic pathways synonymous with the plant defending itself from a pathogen attack, explains Jodie.

Jodie has been examining Innocul8 in wheat trials to determine the best time to apply the biostimulant and whether variety disease resistance is a factor. Due to its role in stimulating the plant's metabolic processes, she has mainly focused on early spring timings, at or before T0.

"We tended to see a significant response of almost a third of a tonne per hectare (0.34 t/Ha) if we applied Innocul8 early in the season, pre-T0, to trigger the hypersensitive response before disease onset," says Jodie.

"When you look at those treatments in the trials, you notice the plant is visibly greener and healthier," adds Tim Horton, combinable crops technical manager for Agrii. "We are seeing a more resilient plant, which is helping it to overcome stress factors."

Results show that there is flexibility in when Innocul8 can be applied to the crop without compromising its plant health effects. This is a bonus for farmers who often have a queue of jobs for their sprayers in February and March.

"The great advantage with a product like Innocul8 is that you are switching on the plant's metabolic responses, so you don't have to aim for a particular leaf layer. Once you have the response from the plant, you have achieved your aim," explains Tim.

Additionally, Tim says that they have not experienced any issues with tank mix compatibility, meaning farmers could opt to include it with their spring grass weed sprays.

"We haven't found anything it won't mix with, so we are quite happy to include it within any tank mix," he says.

Last spring, Agrii agronomist Peter Gould recommended Innocul8. He is based on the south coast where milling wheats dominate the variety mix.

"We principally used it in KWS Palladium because it is a variety with a good disease package," says Peter. "Innocul8 was applied as a pre-T0. We then missed out the T0 fungicide, did a reduced rate T1, and hit it hard at T2 with Inatreq (fenpicoxamid)."

> *"When you look at those treatments in the trials, you notice the plant is visibly greener and healthier," adds Tim Horton, combinable crops technical manager for Agrii. "We are seeing a more resilient plant, which is helping it to overcome stress factors."*

"It fitted in very well when we were going through with Pacifica (mesosulfuron, iodosulfuron) or Avocet (pyroxsulam) to tidy up bromes and other grassweeds."

Peter echoes Tim's thoughts regarding Innocul8's tank mix compatibility. He saw no issues when it was included in tank mixes, and grass weed control wasn't compromised. Indeed, Peter adds that the timing for contact graminicides was well-suited to when he planned to apply Innocul8 at pre-T0.

For more information on this article or Innocul8, please email info@agrii.co.uk