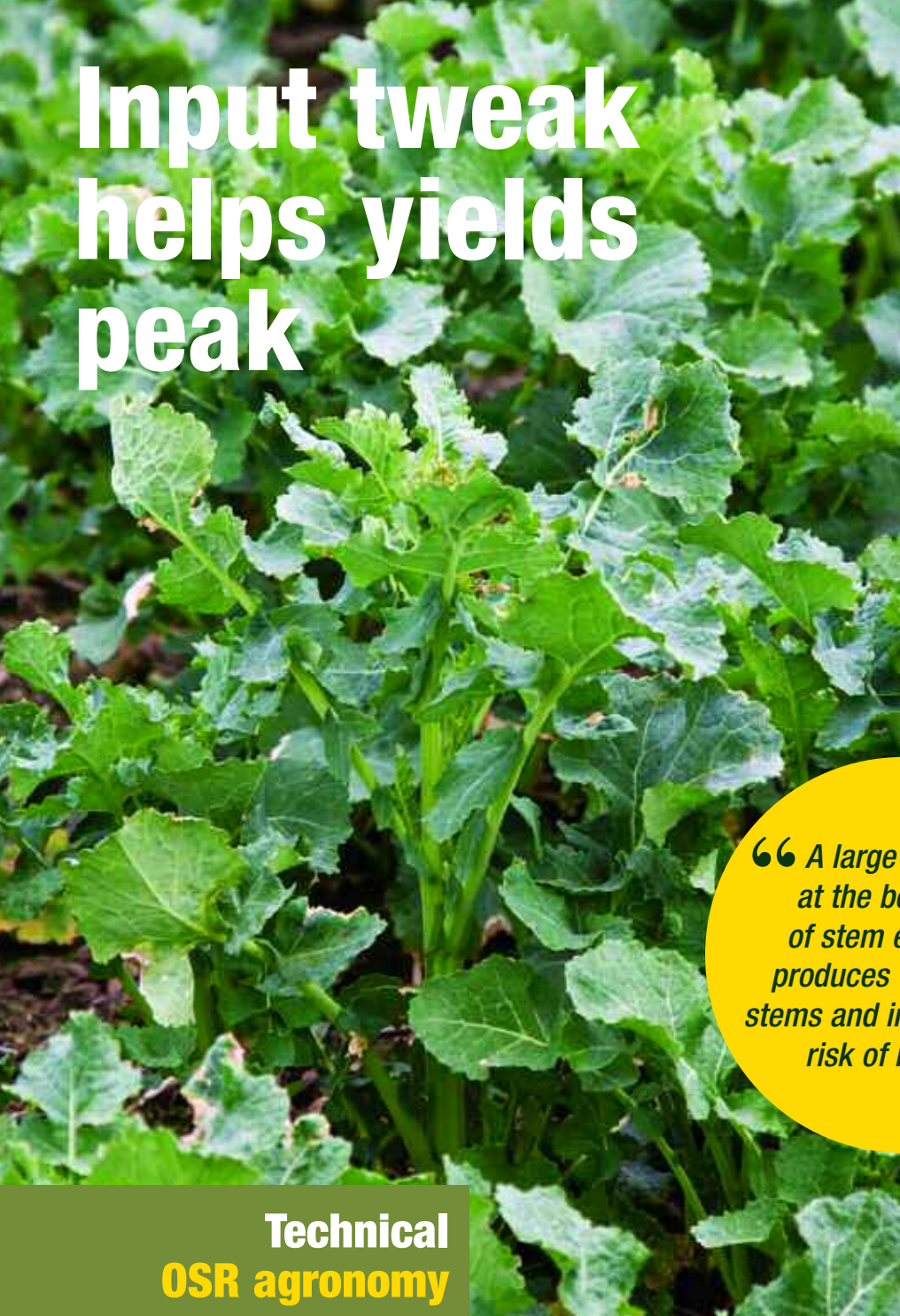


Input tweak helps yields peak



Most OSR crops established early have a big canopy coming out of the winter and will need careful attention, warns Pete Berry.

Technical OSR agronomy

With rapeseed prices looking remarkably unexciting, maximising yield and quality can make the difference between profit and loss. *CPM* looks at spring agronomy tweaks to potentially boost the bottom line.

By Lucy de la Pasture

Oilseed rape is a crop where trying to apply what is known about the crop, to the actual growing crop is difficult, reckons Frontier's OSR crop production specialist, Paul Cartwright.

“A large canopy at the beginning of stem extension produces thin, weak stems and increases the risk of lodging.”

“We know the optimum crop canopy for OSR is 3.5 GAI at flowering. The trouble is that when it comes to seed rates, the number one concern is getting the crop established. That means, especially when pest pressure is likely during establishment, that crops can end up being thicker than intended, resulting in many thin stems,” he explains.

With an unusually mild and wet period leading up to Christmas and an unseasonably warm Jan, crops can be forgiven for being a bit ahead of themselves. According to Dr Pete Berry of ADAS, most OSR crops established early have a big canopy coming out of the winter and will need careful attention when it comes to assessing actual canopy size.

“A large canopy at the beginning of

stem extension produces thin, weak stems and increases the risk of lodging. The best way to optimise the likelihood of getting the right size crop canopy is by not having too many plants in the first place,” says Pete Berry. Which, as Paul Cartwright has explained, is easier said than done.

If the canopy is also tall then there's a double whammy, with plants with thin stems also subject to increased leverage forces. ADAS work has shown lodging in OSR is widespread as frequently as every three years, with 35% of crop area affected in the worst seasons. With yield losses in the order of 25-50% in every ha where the crop is lodged, that's potentially costing growers a huge amount.

Serious problem

Lodging in OSR is a much more serious problem than in cereal crops, reckons NIAB TAG agronomist, Richard Overthrow. Many of his crops in the south west of the country have been sitting in wet soils with waterlogged roots for weeks on end over the winter period.

“Because the main anchorage in OSR is provided by a single tap root, it's possible that rooting has been restricted in some crops where the taproot has been under prolonged anaerobic conditions. It doesn't necessarily mean that it'll be a lodging year but this is a factor to bear in mind, depending on whether conditions in the ▶



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With a forward crop you don't want to be too quick out of the blocks with nitrogen applications.

► spring enable plant roots to compensate," he explains.

So what are the options if you have a very thick, forward-looking crop this spring? Finding out how much nitrogen is in the canopy and soil before even thinking of

getting the fertiliser spreader out is absolutely essential, agree all the experts.

Paul Cartwright points out that with a forward crop, you don't want to be too quick out of the blocks with nitrogen applications. "It's important to understand the nitrogen availability in the soil by N-Min testing, as well as how much nitrogen is already contained within the canopy, if you're going to get the best out the crop," he says.

High N-Min levels

According to CF Fertilisers agronomy specialist, Allison Grundy, the very early indications are that soil N-Min levels are higher than many expected. "These few results are all from the Eastern counties, which obviously haven't been so wet, and

there may well be regional differences as more samples go through the lab, but it's likely that soil temperatures have been sufficiently warm for nitrogen mineralisation to continue through the autumn to date."

Pete Berry adds that growers tailoring their spring nitrogen applications should bear in mind that the nitrogen available in the canopy of the crop and soil is 100% efficient, whereas nitrogen applied as a fertiliser is only 60% efficient in terms of its uptake by the plant.

There are a number of ways to assess the canopy GAI, explains Pete Berry. "One method is to cut a metre square of crop and weigh it. The fresh weight in kg within a metre square multiplied by 0.8 will give you the GAI of the canopy. Each unit of GAI is equal to 50kg of nitrogen, so it's

Keep an eye out for clubroot

Clubroot causes thousands of hectares of damage each year in brassica and oilseed rape crops, and according to AHDB, can account for losses exceeding 50% yield potential. With this year's mild and wet autumn, as well as recent flooding in many parts of the country, growers may want to keep an eye out for the disease this season, warns Carol Norris, Seed Development Manager at Bayer.

Having recently visited a grower who had never seen clubroot in his field before, she says that farmers now more than ever, need to be aware of the many ways clubroot can be spread into the soil, to avoid significant yield losses and further infection.

"While out visiting one of our variety trials in Kent, we found the field was completely infected with clubroot, except for our trial site, despite there being no known clubroot resistance in the

Once infected with clubroot, galls form on the roots which affect normal root function, reducing water and nutrient uptake.



OSR varieties present in the trial," she says.

"We believe the reason for this is that the trial was drilled in dry conditions, while the rest of the field was drilled in wet conditions one week earlier. The earlier drilling of the crop into wet conditions will have facilitated the clubroot spores to disperse, infecting the crop, but the drier conditions when we drilled our trial, meant that the infection was unable to spread further."

Clubroot is becoming an increasing problem in OSR, exacerbated by short crop rotations. Once infected, galls form on the roots which affect normal root function, reducing water and nutrient uptake. Clubroot spores will survive in the soil for up to 15 years, so risk of contamination should be kept as low as possible.

"As well as spreading through water, spores can be inadvertently transferred via machinery, through dumping infected vegetables, or spreading manure from animals fed on infected produce," explains Carol Norris. "It's therefore important to avoid transfer of contaminated soil on machinery and even footwear if you walk into an infected field."

Lengthening rotations to beyond five years is a common strategy for managing clubroot. Acidic soil is more prone to clubroot infection and altering soil conditions has been an alternative approach. However, adjusting soil pH can have long lasting effects on other crops in the rotation, and should be considered carefully before implementation.

More long-term strategies should also be considered, recommends Carol Norris. This includes considering longer rotations in infected fields, rather than shorter rotations susceptible to high yield losses. "It's encouraging to see a



The earlier drilling of the OSR crop into wet conditions around the Bayer trials site in Kent have helped the clubroot spores to disperse, says Carol Norris.

number of clubroot resistant varieties developed and present on the AHDB Recommended List," she comments.

"The presence of clubroot resistant varieties such as Cracker and Mentor shows that breeders are aware of the effect this disease has on UK growers. Cracker has significant yield penalties in the absence of clubroot and although Mentor is a little more competitive on yield, its resistance is thought to be single gene, making it vulnerable to breakdown of resistance.

"Clearly there's a need to develop better yielding, more robust clubroot-resistant OSR varieties, and this is certainly on Bayer's breeding agenda for the UK. By having access to natural infection sites, like the one in Kent, we are able to send samples to our breeding experts. These samples will inform our breeding team on the exact pathogen behaviour in the UK, and this can help us tailor our R&D programme accordingly."

possible to work out the nitrogen in the canopy once the GAI is known.”

Getting the smart phone out and taking a photo is another way of finding out GAI, advises Paul Cartwright. “You can then use the online GAI (Green Area Index) tool or app from BASF or Yara’s ImageIT to provide you with crop biomass and the nitrogen it’s holding on to.”

Where crops are forward and this information is to hand, then nitrogen applications can be delayed and rates



It may be another season where growers are playing catch up with light leaf spot control after the unseasonably warm winter.

reduced, he explains. “The important thing is to assess each crop on a case-by-case basis before planning nitrogen and PGR applications. All crops will require nitrogen but not all will require growth regulation, though the thick, thin-stemmed crops will merit an early application at the start of stem extension to shorten the height and thicken stems,” he explains.

Sulphur requirements

Richard Overthrow urges growers to bear sulphur in mind when considering delaying early nitrogen which is compounded with sulphur. “Most crops need sulphur in early spring so it’s important not to delay nitrogen too long if it’s going to affect sulphur application, but the overall dose of nitrogen still needs to be reduced where canopies are large.”

A change of strategy may be advisable where canopies are over large — sulphur can be applied as a straight as a means of getting it on the crop, which means the nitrogen can be withheld to hold the canopy back, he suggests.

Allison Grundy advises not to panic if you’re applying a nitrogen sulphur-based product and need to hold back with the early application. “Where canopies



Allison Grundy advises there’s no yield penalty from applying sulphur at the second application timing where canopies are large.

are large, they’re likely to have had access to enough sulphur thus far. Our trials suggest there’s no yield penalty from applying sulphur at the second application timing.

“Fertiliser products with ammonium sulphate as the sulphur source contain the most readily available form of sulphur,” she explains. “There’s always a risk that elemental based sulphur products may ▶

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In Frontier trials, later PGRs applied to manipulate the structure of the canopy produced positive yield advantages, says Paul Cartwright.

▶ not release enough sulphur to satisfy the demand of the crop in that season.”

The surest way to determine whether the crop has an immediate need for sulphur is to send tissue samples for a malate sulphate test, she suggests. “It’s important to sample the youngest leaves and to make sure that the crop is actively growing at the time of sampling. If the crop isn’t growing, then it won’t be utilising sulphur because there’s no demand for it and results can be misleading, showing a transient deficiency.”

Boron deficiency often shows up in seasons where there has been rapid, forward growth resulting in crops with big canopies, warns Richard Overthrow. “In our trials, we aren’t seeing any crop response to boron application in the absence of a deficiency, so there’s no point in spraying boron routinely,” he explains. “It’s advisable to tissue test crops to assess whether boron is required and treat in early spring if needed.”

Paul Cartwright believes that meeting the boron needs of crops can be the key for success in some situations. “Where boron is deficient, crops should have 600-900g applied over the course of the season, with a third applied in the autumn and the remainder in spring. Keeping a crop stress-free makes everything else you do more predictable and in the case of PGRs, more efficient.

“In our 2015 Frontier trials work in Yorks and Peterborough, some of the early robust applications of PGRs didn’t appear

to be helping. The crop was shortened but in the absence of any lodging there was no clear benefit from the application. Later PGR, applied to manipulate the structure of the canopy, did produce positive yield advantages. If the variety has good standing power and established well, then it’s possible to skip an early PGR.”

It’s important to bear in mind the growth regulatory effect of any azole fungicides when planning light leaf spot sprays, reminds Paul Cartwright. “LLS will cycle quicker under warm conditions and it’s likely there’ll potentially be some pre-stem extension applications made this spring. If the crop is backward and you don’t want a growth regulatory effect, then don’t use a fungicide that has PGR activity.

Alternating fungicides

“All fungicides with approval for LLS will do a job and alternating fungicides with a different mode of action is good resistance management. Refinzar (penthiopyrad+ picoxystrobin) is a useful non-azole option which has useful activity on LLS.”

Richard Overthrow agrees that it may be another season where we’re playing catch-up with LLS control after the unseasonably warm winter. The start of the spring LLS campaign is likely to be governed by the timing of any autumn fungicide treatments.

“Crops aren’t showing much sign of LLS at the moment but any autumn fungicide treatments applied from late Oct will still be holding its development. Any crops treated earlier than this for phoma or stem canker will be the first to need a spring treatment, probably before the correct timing for a PGR application,” he believes. “It’s important to ring the changes with chemistry with further sprays likely to be needed at the beginning of stem extension.”



Applying a PGR at stem extension would be most appropriate for varieties and fields that are more susceptible to lodging.



ADAS work has shown that in crops with a GAI of more than 0.8, there’ll be a likely positive response if a PGR is applied.

AHDB Cereals and Oilseeds work shows prothioconazole to be the most effective of the triazoles for LLS control, closely followed by tebuconazole. “If you’ve assessed your crop to be at risk of lodging and have gone down the route of applying one of the better PGRs — Caryx (mepiquat chloride+ metconazole) or Toprex (difenoconazole+ paclobutrazol) — then you’ll need to add another azole to get best results if you’re targeting LLS at the same timing,” advises Richard Overthrow.

In ADAS trials, lodging was reduced by 20% for every 10cm reduction in crop height. According to Pete Berry, Syngenta’s new product Toprex has looked very promising in ADAS trials, producing a crop height reduction of up to 12cm.

Syngenta’s Simon Roberts agrees that where there’s pressure from LLS an early fungicide application as soon as ground conditions allow may be necessary. “If you’re planning a PGR treatment, it’s vital not to be tempted to compromise on timing to kill two birds with one stone and end up going in too early with the PGR,” he warns.

“In French trials work, Toprex gave equivalent levels of LLS control as a tebuconazole+ prothioconazole mixture, so in many cases will prove to be a sufficient holding treatment when applied as a PGR at early stem extension, though it can be tank mixed with an additional fungicide if required,” adds Simon Roberts.

But applying an azole, which also has a growth regulatory effect, in combination with a stand-alone PGR treatment, such as Caryx or Toprex, could have implications. So is there a risk of over-regulating growth?

BASF’s Clare Tucker says it’s not an issue with Caryx. “Adding 0.25-0.5 l/ha tebuconazole to top up the metconazole



Making applications of PGRs later in the season, at late green bud, is a useful way to manipulate the architecture of the canopy to allow more light penetration.

in the standard Caryx rates of 0.7-1.0 l/ha won't over-regulate. Tebuconazole provides only weak PGR effects at half rate.

"In ADAS trials we've established the GAI = 0.8 treatment threshold using the full rate Caryx 1.4 l/ha, so there's flexibility to mix at lower rates. A triazole top up is unlikely to be required at 1.4 l/ha Caryx, given it contains 60% metconazole dose."

Light penetration

Making applications of PGRs later in the season, at late green bud, is a useful way to manipulate the architecture of the canopy to allow more light penetration. Pete Berry explains that applications at this time will have an effect on branching and in trials, metconazole and Caryx both increased the number of secondary branches. What's more, where metconazole was applied, the number of lower order primary branches was also increased.

In thick crops the main raceme is dominant and its flowers will absorb most of the light, as well as reflecting light away from the shaded lower branches and ultimately reducing the seed produced per m².

Clare Tucker stresses the benefit an open crop canopy can bring in terms of increased yields. "A typical farm crop will have a flower cover at mid-canopy of approximately 60%. In maximum yielding crops,

flower cover is 38% which allows 25% more light to penetrate to the lower branches in the canopy," she explains. "This corresponds to a yield of 130,000 seeds/m², compared with 80,000 seeds/m² in average crops."

An economic threshold has been developed for the use of Caryx to help growers in their decision-making process. Pete Berry explains that their ADAS work has shown that in crops with a GAI of more than 0.8, there'll be a likely positive response in terms of yield of up to 0.4t/ha after PGR is applied.

Simon Roberts reckons that the effects Toprex has on the canopy translate into greater yields, a claim the ADAS trials work supports in crops with large post-winter canopies. "The strong PGR effect combats the apical dominance of the main raceme, evening up the branches and providing a more compact flowering period with better light penetration through the canopy."

One interesting finding to come out of the BASF-funded ADAS trials was that crops which are leaning at a just 22.5° — sometimes regarded as being a positive attribute — showed significant yield losses. "It seems that any angle of lean has an adverse effect on yield so the crop needs to be kept as upright as possible, which also makes harvesting easier," concludes Clare Tucker. ■

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