

Overcoming adversity

“Vigour is a tool which allows drilling when the conditions are right.”

Varieties

Oilseed rape breeders continue to be busy behind the scenes exploring genetic traits to help growers overcome the many challenges associated with the crop. CPM looks at some of the latest varietal launches shared at press briefings and open days.

By Janine Adamson and Rob Jones

It's a crop which undoubtedly faces many challenges, from cabbage stem flea beetle and slugs to clubroot and sclerotinia, but the plant breeding sector continues to invest in oilseed rape in a bid to help growers to reap its benefits within rotations.

A theme of much of the OSR breeding pipeline appears to be performance under adverse conditions, which Sarah Hawthorne says DSV is aiming to address.

“Pod shatter resistance has become an increasingly sought after trait for OSR growers faced with challenging growing conditions and the necessity to maximise efficiency of production.

“Of the 31 varieties on the current Recommended List, 19 are identified by breeders as having pod shatter resistance including the DSV varieties Matrix CL,

Beatrix CL and Miraculix CL with our other popular varieties DSV Duke and Duplo also sharing the gene,” she explains.

Sarah says for several years, many growers have thought of pod shatter as an absolute, with varieties either having resistance to it or not. “But the latest thinking is that there are degrees of pod shatter resistance, with organisations such as the John Innes Centre suggesting many factors are at play in both the physiology of plants and how they react to external conditions.”

Seed loss

“In particular, temperature at both vernalisation of the seed and in the later stages of the plant's development can have a profound effect on whether seed is lost regardless of whether varieties have pod shatter genes or not,” she adds.

According to DSV UK managing director, Dr Alex Doering, loss of seed from pods to the surrounding environment is a natural behaviour of many plant species.

“But if this opening occurs too easily, seed can easily be lost during harvest leading to poor yields and increased volunteer pressure in the following crop.

“While high pod shatter resistance may reduce the losses before and at harvest, it can also increase the losses at harvest substantially because the pods can't be sufficiently threshed by the combine and seed will remain within the pod,” he points out.

Alex adds it's important to create a balance between pod opening for an easy harvest and the necessary pod shattering resistance, so not too much seed is lost at harvest. “Many factors affect how and when

an OSR pod shatters, including prevalence of stem diseases such as verticillium wilt, external weather conditions, the physical strength of pods, the evenness of them and mechanical damage through the growing season.”

Sarah says current DSV varieties address many of these potential impacts with features such as high tolerance to verticillium wilt, phoma stem canker resistance and tolerance to sclerotinia.

Furthermore, those varieties classed as having 'Powerful Pods' by the company boast three core characteristics — greater flexibility of the pod structure, improved function of the pod valves, and greater space around individual seeds.

“Increased flexibility, for example, gives pods a resilient 'rattle-proof' structure which makes them less friable and more able to absorb energy rather than break open in ▶



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► conditions with extremely high winds or hailstorms.

"This also allows pods to cope better with the uneven tensions produced from drying after rainfall, which can lead to seed pods splitting," comments Sarah.

Powerful Pod varieties also have a stronger valve margin — the mechanism at the base of the pod which controls the opening of the valves, effectively the sides of the pod containing the seeds, she says.

"This avoids early triggering of the opening process particularly when pods are stressed such as in adverse weather or when going through the combine header. More space in individual pods allows seeds to develop fully as they mature so a variety can reach its full yield potential, but it also stops growth stressing the pod which can again lead to premature failure."

Results from DSV's own trials and an AHDB analysis of pod shatter results have underlined DSV Dolphin's performance in respect of harvest performance, adds Sarah.

Seed retention tests

"In random impact tests (RIT) carried out at the DSV breeding station in Germany, where pods from different varieties are bombarded with steel ball bearings in controlled conditions, Dolphin achieved one of the best scores for seed retention."

Dolphin's agronomic package is also worthy of note, points out Sarah. "It's recommended for the East/West region on the current RL with a gross output of 106%, the joint highest on the list, and this is supported by features including a 46.6% oil content.

"With TuYV resistance and scores of 7 for stem canker, 8 for lodging and a 9 for stem

stiffness, Dolphin is a simple to grow OSR well suited to the current economic and environmental climate. It also has a 7 for flowering and a 4 for maturity," she says.

Consistent performance under tough conditions is a standout feature of the latest Dekalb hybrid OSR variety too, says Bayer. Launching at this year's Cereals Event, DK Excentric out-performed every other Dekalb hybrid bar one in two years of trials (2022 and 20233), delivering gross output-topping performances on the four most demanding sites.

Overall, it's the top-performing UK variety to emerge from Bayer's precision breeding programme, with an average gross output of 5.11t/ha in two years of NIAB and Scottish Agronomy trials, delivered by a combination of above-average yields and oil content in excess of 45%.

Excentric brings together a combination of agronomic characteristics and growth habit suitable for early planting, yet has the flexibility for sowing into September should soil, pest or weather conditions necessitate, says Bayer's Sarah Bebb.

"In our trials in Scotland and down into both the East and the West, its performance has been very consistent. It's performed equally as well as either the top-yielding

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variety or close to the top at almost every site," she explains.

Sarah Bebb says the variety's cross-the-board agronomic strengths include an 8 for stem stiffness and 9 for resistance to lodging while a stress tolerance package includes good resistance to light leaf spot, phoma stem canker and TuYV.

According to Limagrain's Liam Wilkinson, there's been a continuous flow of innovation within OSR breeding, which could be argued as in advance of any other crop species on farm. However, he believes there's an opportunity to make more of these advancements through optimised crop husbandry.

"An example being, unlike TuYV, there's no known genetic resistance to cabbage stem flea beetle. But our work has shown that drilling at higher seed rates isn't actually the way to go, because the thicker the crop at cotyledon stage, the more vulnerable it is to larval damage.

"Instead, vigour is what helps OSR to grow through potential damage. This doesn't mean it gets you out of trouble — vigour is a tool which allows drilling when the conditions are right, which could mean waiting and sowing a week later for example," he says.

Liam hopes that by redefining what's understood as vigour, growers will be better supported in achieving good OSR establishment. "It's not just

about how to get a crop out of the ground, it's about achieving winter biomass with a target of eight leaves, 8mm of collar diameter and 15cm for the taproot. The higher the seed rate, the more competition there is per plant, which prevents it from getting to that key stage.

"OSR thrives with a lower seed rate and having space. Achieving this optimum winter biomass means better tolerance of larval damage, improved weed suppression and increased winter hardiness.

"Understanding how a variety reaches this point, as well as 3-4 leave stage to withstand adult CSFB damage, puts growers and agronomists in a more informed position when it comes to managing a crop including sowing date," he stresses.

To illustrate, Liam says LG Aviron is a quick to establish hybrid OSR which continues to push through and achieve optimum winter biomass. As a result, he recommends Aviron for later sowing dates because of its flexibility.

In addition to this benefit, the variety offers a traits package including TuYV, pod shatter resistance, RLM7 phoma resistance, plus the N-Flex characteristic for improved NUE.

Otherwise, LG Ambassador also performs well in a later drilling scenario, as does LG Armada and LG Academic, advises Liam.

But ultimately, he argues that ▶



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► OSR is still a relatively new crop within the UK cropping landscape and there's still a lot to discover. "It's a learning process about how to best use traits and genetics within a practical on-farm scenario," says Liam.

Companion crop solution

Back to the topic of combatting CSFB, RAGT continues to focus on its new companion cropping approach which aims to protect OSR from two significant insect pests while supporting SFI applications.

Greenpack Gold companion crop mix contains fenugreek, buckwheat and berseem clover, which help protect small, vulnerable OSR plants from CSFB attack in the autumn. The mix also contains a very early flowering OSR variety to help reduce

pollen beetle damage in the commercial OSR crop the following spring.

"The repellent effect of the fenugreek and the camouflaging effect of the buckwheat and berseem clover create a defence against flea beetle," says RAGT managing director Lee Bennett. "This is likely to be more effective than spraying pyrethroids, which is now next to futile.

"In addition, the early flowering OSR variety which is included in the mix at about 10% of the normal sowing rate, blooms 7-12 days earlier than the main commercial variety," he adds.

Lee says the solution works because the beetles are 'addicted' to pollen and will go to the first available source. "Once there they'll stay put, leaving the later-flowering commercial variety to grow through the vulnerable bud stage unscathed. Beetles will only migrate back to it when it comes into flower, when they act as beneficial pollinators."

This two-pronged defence provides an excellent opportunity to claim a £45/ha SFI payment for growing a crop without insecticides (IPM4), says Lee.

Whereas Greenpack Gold also provides the usual companion crop benefits such as competing with weeds and conditioning soil to aid crop development. Growers can therefore claim an SFI payment worth £55/ha under the companion cropping option (IPM3) for sowing it alongside any commercial variety of their choice. "That will cover the seed cost and still leave £30-35/ha for their trouble," says Lee.

"Added together, this unique mix offers a total SFI payment of £100/ha in addition to the obvious benefits it delivers to both soil and crop." ■

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