> *Growers will no longer have to choose between taking advantage of Clearfield technology and high yield potential.*

Technical
Insiders View

A new matrix...

Though yield has often been a downfall of Clearfield varieties, a breakthrough in breeding means a new candidate from DSV looks like it could change the game for growers. *CPM* reviews DSV Matrix CL.

By Charlotte Cunningham

Clearfield technology has been around for several years now, and while it undoubtedly serves a very important purpose, many have felt certain traits tend to lag behind their competitors.

But since their launch, breeding strategies and capabilities have developed somewhat, and now DSV claims it has a new oilseed rape variety in its portfolio which changes the game…

Meet Matrix CL — the firm's latest high yielding Clearfield OSR which is lined up to break through the former limitations of Clearfield varieties.

Dr Alexander Doering has been with DSV since 2012, working on oilseed development. "Matrix CL has been in the pipeline for quite some time. When we're breeding for hybrid winter OSR we have a timeline of 12 years — if we're going for Clearfield — which starts by making the very first crosses, before moving onto the development of the parental lines and then introducing it to a hybrid system and bringing it to official trials.

"So for Matrix CL, its journey to market started in around 2010 — it's a long-term development process."

Clearfield technology is based on a combination of imazamox herbicide and OSR varieties resistant to it and has proved highly beneficial to growers in recent years — offering effective control of pernicious brassica weeds. However, the benefits have often come at a cost yield-wise.

Problem weeds

"The system has provided reliable control of problem weeds such as charlock, runch and hedge mustard but has also opened up significant management opportunities for many growers in recent years, including reducing erucic acid levels at harvest," explains DSV's Michael Farr.

"The system's efficacy is such that even fields that have been out of production for many years due to large burdens of weeds, can be made suitable for OSR once more.

"Furthermore, many growers had identified the high cost of pre-emergence weed control from metazachlor-based products as being one of the most expensive elements of their establishment management."

Although varieties like DSV Plurax CL have tried to address the yield penalties associated with Clearfield varieties in recent years, it's still remained an issue for many growers," says Michael.

However, DSV believes that could all change with Matrix CL, due to its position as the first 'quad-layered' variety from the firm.

Unpeeling the term slightly, "quad-layered" describes Matrix's combination of pod shatter resistance, *Rlm7*, TuYV resistance and Clearfield technology — but what does this mean for growers?

"We have a variety of breeding targets and one of those is to be more stable in yield — seasons are becoming more and more unpredictable — so it's really important to have a variety that does well in a range of difference circumstances and conditions," explains Alexander. "But how do we achieve that? A number of factors contribute to this, like having healthy, disease-resistant plants, but the aim is to combine them to stabilise ▸

Matrix CL is lined up to break through the former limitations of Clearfield varieties.

CULTURAL CONTROL GUIDE

STARTING NEXT SEASON AHEAD OF COMBINING

Roundup®
Proven Effective Dependable

Positive management of OSR and cereals harvesting will pay dividends in making combining the most efficient 'first cultivation' for the cleanest, best and most-timely winter crop establishment.

1 MAKE TIME FOR STUBBLE MANAGEMENT

Prompt, efficient combining is vital to make time for the most effective weed and soil management ahead of autumn drilling.

2 TREAT CHALLENGING CROPS CAREFULLY

Heavily-waxed and uneven OSR, backward wheats, and thin, weedy spring crops will benefit most from careful treatment.

3 GET TREATMENT TIMING RIGHT

Spraying too early risks compromising yields and grain quality and will not bring combining forward.

4 AVOID LESS RELIABLE GLYPHOSATE FORMULATIONS

Modern Roundup formulations ensure the most reliable performance under challenging crop conditions and variable summer weather.

5 TAKE SUFFICIENT SPRAYING CARE

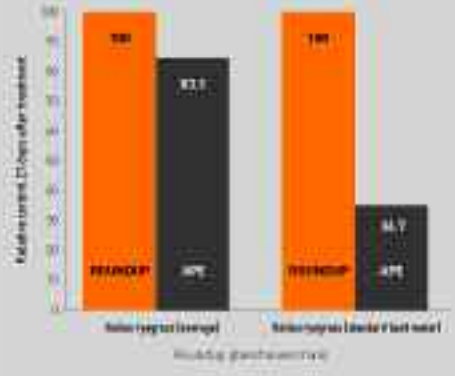
Particular care with glyphosate rates, nozzle choice, boom height and spraying speed is essential for the best results.

TOP TREATMENT TIPS

- Only spray when rapeseed & grain moisture levels fall below 30%
- Assess ripeness carefully across the whole field
- Match application rates to crop & weed burdens
- Employ medium-coarse sprays to maximise canopy penetration and minimise drift
- Spray early in the morning to improve glyphosate uptake and translocation
- Leave OSR for at least 14 days and cereals for 7 days before combining

PERFORMANCE WARNING

Lower levels of performance can be expected from Alkyl Phosphate Ester (APE) based generic formulations compared to modern Roundups with patented surfactant systems, especially under challenging conditions.



STEWARDSHIP

Seed crops should never be treated.

Statutory minimum intervals minimum spraying to combining intervals must be observed.

Pre-harvest and stubble treatments should be carefully integrated with best practice cultivations to support resistance management.

For further information, visit www.cropscience.bayer.co.uk/Roundup or call 0808 1969522 for technical enquiries.

Traditionally, the benefits of Clearfield have come at the cost of yield, says Michael Farr.

▸ the yield of the crop under a diverse range of conditions.

"The first Clearfield hybrids presented quite a standard trait package — including pod shatter and phoma resistance — but we wanted to develop this further."

As such, Matrix CL combines good phoma resistance — from the *Rlm7* gene — with Turnip Yellows Virus (TuYV) and verticillium tolerance. "Though issues with *Rlm7* aren't yet a problem for UK growers, we always try to protect its longevity by ensuring we have quantitative resistance as well as *Rlm7* itself. One parent carries the *Rlm7* gene, while the other provides quantitative resistance to ensure the variety presents good resistance that growers can be confident in."

Though verticillium isn't part of the "quad-layer" strategy, this was added due to the challenge it can pose for some UK growers, notes Alexander. "This makes for an overall good package. If you find yourself under high disease pressure, Matrix CL provides good, inherent, background protection."

But it's not only disease resistance that contributes to yield stability, and Matrix CL also boasts pod shatter resistance — which gives growers more flexibility at harvest, too, notes Alexander. "You have less risk of losing crop prior to harvest, which overall makes for a much more stable yield picture.

"As such, we believe Matrix CL marks a huge step forward in breeding innovation."

Aside from this the variety also boasts some decent production figures, adds Michael. "Matrix CL is one of a few varieties selected as a candidate for the whole of the UK making it suitable for growing in both the North, and East and West regions.

"But it has performed particularly well in the East/West region where it has achieved a

The value of TuYV

With TuYV resistance being part of the quad-layered strategy — and David touching on how much extra yield it could be driving — Sarah says it's essential to realise the value this trait could bring to growers.

"Where crops have suffered the added impact of CSFB larvae, TuYV burdens can really reduce the availability of nutrients for the plant which can make them really unwell — much like a common flu.

"We did some tests within our AD4PT trials and Matrix, Duplo and Dart all came back with 0% infection, whereas some of the non-resistant varieties came back with 100% infection — showing just how much the technology has developed."

Sarah says the issue often comes when anticipated visual symptoms are absent. "There's often a misconception that you get these big purple-edged leaves, but in the trials, we actually saw that some of the most infected plants had no symptoms."

View from the field

Down on the south coast, Andrew Gentle is trialing a 16ha plot of Matrix CL on his farm near Chichester.

"OSR continues to be a good break crop for us, and while we have seen flea beetle numbers stepping up, they are not significant enough yet to stop us growing it."

Where Andrew does face issues, however, is with weeds. "Charlock is a massive problem for us, so we've been keen for some time to grow a competitive Clearfield variety.

"We've dabbled in them in the past, and while they've been okay, the yield has often been quite disappointing. Our agronomist, Peter Cowlrick, recommended we look at Matrix, as on paper it looked to have much better yield potential, and so far we're really pleased with it."

Matrix CL is currently looking like the most forward variety on Andrew's farm.

Another pull for Andrew was Matrix's TuYV resistance. "Being on the south coast, aphids can be a real challenge, so a variety that has resistance is always an extra bonus."

And while CSFB isn't a major issue as of yet, Andrew says he's still actively looking to minimise the risk of impact by drilling later. "Therefore, we wanted a vigorous variety which could cope with being drilled a little later, and again, Matrix ticked that box."

The crop was drilled on 8 Sept — a little earlier than planned due to declining soil moisture levels — but otherwise into fairly good conditions. "Since drilling, the weather has obviously been a challenge across all crops, but I have to say, the Matrix is looking really well.

"We suffered with a little bit of pigeon damage, but the vigour in the spring really helped the crop to recover, and at the moment it's looking like our most forward variety — though the proof will be in the pudding."

Andrew's agronomist — Peter Cowlrick, AICC — says he's also been really impressed with the vigour demonstrated in Matrix.

Down on the south coast, Andrew Gentle is trialling a 16ha plot of Matrix CL this year.

"The score is slightly on the lower side for light leaf spot (5) so I would say that you should monitor that in the field and treat accordingly, but aside from that, it seems to be an exceptionally good variety," he says.

On the yield side of things, Peter says Matrix could be a game changer. "Clearfield offers a really good package when pernicious weeds like charlock and runch are an issue, but we know that protection has often cost growers in yield. However, Matrix looks like it could be a step-change for Clearfield varieties."

gross output of over 108% and an oil content of 46.0% overall.

"It's the highest yielding Clearfield variety currently available to UK growers."

As well as this, Matrix CL one of two varieties available UK variety in the Clearfield segment to offer TuYV protection and the only one to stack four complex traits adds Sarah Hawthorne, DSV's UK sales and marketing manager. "With improved vigour over even DSV Plurax CL — and mirroring the vigour profiles of the top performing hybrids in both autumn and early spring — Matrix CL has performed particularly well in our high-pressure flea beetle trials.

"One thing we've also really noticed is how good its tolerance to frost is," she adds. "Whereas a lot of varieties push back with frost — especially something like our older variety, Phoenix — Matrix really stood out when everything else took a hit."

Matrix CL is the first variety to stack four complex traits together, says Sarah Hawthorne.

DSV Matrix CL at a glance

Gross output (%)	
UK	103
East/West	108
Disease	
Light leaf spot	5
Stem canker	9
Turnip Yellows Virus (TuYV)	R
Agronomy	
Pod shatter resistance	R
Resistance to lodging	9
Stem stiffness	8
Earliness of flowering	5
Earliness of maturity	6
Height (cm)	148
Oil content (%)	46

Source: AHDB oilseed rape Candidate List (harvest 2021 trials)

Matrix CL also achieves top standing scores including a 9 for lodging and an 8 for stem stiffness with a medium flowering score of 5 and an early maturity score of 6, making it a pretty universal variety across the country for a wide range of growers, adds Sarah. "For us Matrix CL is a real step on from anything we've offered before."

Agrii's David Leaper has been looking at Matrix's performance within the company's own trials.

"We've had Matrix in our trials for a year, but we've been testing Clearfield varieties for as long as I can remember," he says. "I think it's fair to say that most of the varieties that were tested in the UK haven't been specifically bred for here — they've been pulled in from European programmes — meaning there has been some variability in their performance.

Official system

"As such, most of those varieties haven't gone through the official system, so the 'tried and tested' options for growers have been pretty limited. However, Matrix has come along and is one of the few varieties to go through the system and it think that's an important point because farmers have been exposed to a wide variety of materials — which haven't always been good.

"The data we've seen previously has often been for just Clearfield trials, so not directly comparable with what else is on the market."

According to David, Matrix's performance so far in National List trials is reflective of what they've seen in their own — particularly in terms of its yield potential. "Some of this will come down to the new genetics. We've probably had about 10 years of Clearfield varieties having a yield lag, but breeders seem to be starting to overcome this.

"We also believe the TuYV resistance will be contributing to Matrix's increased yield — adding about 8-10% — it's fair to say this is a leap in terms of yield and actually puts it on a level peg with other high-performance hybrids.

"Growers will no longer have to choose between taking advantage of Clearfield technology and high yield potential."

Matrix is short and stiff, which will be advantageous to growers, believes David, however he warns to be mindful that there haven't been significant lodging issues in official and Agrii's own trials over recent years.

If there is one weak spot, David says it is Matrix's light leaf spot resistance (5), though he stresses that this appears to be a downfall of most Clearfield varieties. "We believe there is a genetic link somewhere, because we can't seem to shake off low tolerance — though I would say this is the only slight weakness of Matrix."

Matrix CL's journey to market started in 2010, says Alexander Doering.

Trait wise, the *Rlm7* stem canker resistance and TuYV is also attractive, he says. "We've been able to show in our trials last year in Lincs that it has good verticillium tolerance too, which is only a good thing."

In terms of location suitability, while it has a UK recommendation, David says he'd advise Yorkshire is the northern limit for growing Matrix.

"As a reflection of the concerted effort made by DSV over the past 20 years to advance Clearfield technology, I think Matrix could become the go-to Clearfield variety — finally, that investment is reaping the rewards." ■

David Leaper reckons Matrix's TuYV tolerance could be adding 8-10% to its yield.