



MANAGING STRIPE RUST IN A HIGH-PRESSURE SEASON



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COVER: Varietal resistance is the most effective weapon against stripe rust.
PHOTO: Luise Sigel

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Introduction

What happened in 2022?

Perfect conditions

In 2022 wheat crops were placed under greater stripe rust pressure than had occurred for many years. As many growers discovered, a 'business as usual' approach was not sufficient to protect crops of susceptible varieties.

This epidemic was the result of a perfect storm of cool and wet conditions over several seasons and, new stripe rust pathotypes that had increased virulence to existing resistance genes within some varieties.

The new pathotypes included two recent exotic disease incursions that rendered several previously resistant wheat varieties – such as DS Bennett[®], Catapult[®], Vixen[®] and Rockstar[®] – more vulnerable to stripe rust.

Persistent cool and wet conditions across eastern Australia – late 2022 was declared Australia's third La Niña in a row – had enabled stripe rust spores to build up and survive during summer on volunteer wheat (the green bridge) over multiple years.

Stripe rust is highly mobile in wind, and high spore loads leading into 2022 quickly spread across the eastern states, infecting vast areas.

A higher-than-normal number of rain days meant the crop canopy was often wet, which was ideal for multiple infection events. Stripe rust likes cooler weather more than the other two wheat rust species that cause leaf and stem rust, and it continued to develop and re-infect crops as cooler conditions extended into spring.

The milder season also extended the time between crop growth stages. This meant there was more time between the growth stages where fungicide application is recommended, allowing some treatments to wear off before the next treatment was due.

Early infection

The green bridge of volunteer wheat plants between crops is a reservoir of the pathogen that drives inoculum development and earlier stripe rust epidemics within a cropping season. Early infection increases risk as there is more time for disease to develop.

The University of Sydney's Australian Cereal Rust Survey monitors rust pathotypes across Australia. In 2022, stripe rust was first detected on 20 May – approximately eight weeks earlier than the average detection date of 23 July. The 2021 season was also high risk, with stripe rust being detected on 25 May.

Genetic resistance based on Adult Plant Resistance (APR) – a minor gene resistance – is not effective until growth stage GS30–32 in varieties rated moderately resistant (MR) and later in varieties with lower resistance ratings. The early spread of stripe rust spores exerted pressure on wheat crops at the seedling stage before APR was active.

Wide sowing windows meant that later sown crops were exposed to high pressure from uncontrolled infection sources in some early sown crops, resulting in widespread seedling infections. This was a particular issue in areas where sowing programs were interrupted by wet conditions, resulting in split sowing times.

Some growers expressed concern that early infection in varieties with good resistance ratings indicated a breakdown of genetic resistance to stripe rust. However, this was not the case. Instead, crops were overcome by high pressure and the early onset of seedling infection before APR was effective.

Growers also reported increased levels of stripe rust head infections in 2022, leading to shrivelled grain and reduced grain numbers. In southern Australia this was likely due to the combination of stripe rust and wet conditions at flowering and grain fill and, occasionally, late infection by *Septoria tritici* blotch in some varieties. Fusarium head blight was also widespread across eastern Australia in 2022, which may have affected some crops.

TOP TIPS FOR MANAGING STRIPE RUST

- Choose a more resistant variety.
- Manage the green bridge to reduce the carryover of rust inoculum between seasons.
- Use seed or fertiliser-applied fungicide to provide early season control.
- Monitor crops to detect infection as early as possible.
- Do not expect to rely on fungicides for control, but do use them proactively as a protectant when stripe rust is first detected. Early control is important.
- Use the StripeRustWM App to plan fungicide applications.
- To support the whole industry, send samples of rust-infected leaves to the University of Sydney for pathotype identification: sydney.edu.au/science/our-research/research-areas/life-and-environmental-sciences/cereal-rust-research/rust-reports.html.



Stripe rust seedling infection.

Photo: Richard Daniel

What can you do to reduce the risk of stripe rust?

The high levels of inoculum and wet conditions in late 2022 mean that stripe rust risk will again be high in 2023, with an early epidemic likely.

As spores can easily spread over long distances, it is important to take an area-wide management approach to reducing rust inoculum. Practices such as growing resistant varieties and applying a seed or fertiliser fungicide can reduce risk across a district.

Grow more resistant varieties

SELECTING VARIETIES

Varietal resistance is the most effective weapon against stripe rust. Where possible, avoid susceptible varieties, those rated susceptible (S) or lower, as they can suffer yield loss of up to 50 per cent.

Susceptible varieties have multiple drawbacks. For the individual grower, susceptible varieties require more fungicide sprays and getting the application timing right is critical. This increases the grower's workload at a time when there are competing demands for spraying crops such as pulses and canola.

Growing a susceptible variety can also have impacts beyond the paddock. It increases the level of inoculum for all growers as well as the risk of disease carryover on volunteer crops. The increased use of fungicides also heightens the risk of development of fungicide resistance or reduced sensitivity across a range of foliar diseases.

Susceptible varieties should only be considered when trafficability, equipment and labour combine to guarantee well-timed foliar fungicide applications. This becomes even more important in conducive seasons with higher disease pressure. Pay attention to what is happening in other parts of the country to understand the level of rust risk for the coming season and stay abreast of in-season information, as management decisions are often dynamic.

UNDERSTANDING RESISTANCE

Resistance is not set in stone. It is vital to monitor all varieties for disease as mutations in rust populations can and do occur, or exotic pathotypes can be accidentally introduced.

Major gene resistance, known as All Stage Resistance, is effective throughout the life of the plant. This resistance will keep symptoms at a low level and crops should not require fungicide application.

However, many varieties rely on Adult Plant Resistance (APR), which is a minor gene resistance that only partially protects crops from rust. These varieties are vulnerable until APR becomes effective at around growth stage GS30–32 in varieties rated MR and later in varieties with lower resistance ratings. These varieties may require preventative fungicides to provide protection at earlier growth stages until APR becomes active.

The effectiveness of APR depends on seasonal conditions such as temperature and rainfall, disease pressure, time of sowing, the nitrogen status of the crop and the particular genetic source of the APR. It can be delayed by low temperatures or a higher nitrogen status.

Varieties rated S or worse have relatively weak levels of resistance that are generally of limited value in disease management.

CHECK DISEASE RATINGS

Always check the latest disease resistance ratings as they are updated in response to current pathotypes and can change each year. These are published in local crop variety guides and the NVT Disease Ratings tool.

The rate of new pathotype detection by the Cereal Rust Survey has increased in the past few years. The most recent pathotypes detected were 239 in 2017, 198 in 2018 and 238 in 2021. The pathotypes detected in 2017 and 2018 were exotic introductions. Given spores can remain viable for two weeks, they most likely entered Australia on the clothing of overseas travellers. However, the 238 pathotype, which increased rapidly in the 2022 season, arose locally.

The pathotype mix can vary within different regions between and within seasons depending on the genetic variation of the varieties grown, and the relative fitness of each pathotype and their distribution through wind currents during a season.

As part of the National Variety Trials program, varieties are assessed against multiple disease pathotypes to develop a consensus rating – the worst-case scenario. When a new pathotype emerges, it can take a season or two to collect sufficient evidence to accurately rate a variety, which is why it is important to check the latest varietal resistance ratings.

The number of different pathotypes and new incursions make it challenging to breed varieties with durable resistance.

Growers and advisers are encouraged to send infected leaf samples to the Cereal Rust Survey for pathotype analysis. This will help to understand the spread of different pathotypes across Australia, to revise resistance ratings and management advice, and to support the breeding of resistant varieties.

Control the green bridge

Stripe rust needs living tissue to survive. It cannot survive in seed, stubble or soil. Over summer, stripe rust survives on the green bridge. This is mainly wheat, triticale or barley grass, but other volunteer cereals and some grass weeds can be a host. When volunteer plants are more susceptible to stripe rust, the inoculum load and green bridge risk is greater.

Stripe rust management begins with post-harvest control of volunteer wheat plants and summer weeds. Ensure control has been achieved at least four weeks before sowing any wheat variety, including dual purpose crops.

Monitor for disease and use fungicides as a prevention tool

MONITORING

Monitoring is essential.

An untreated crop will show higher infection levels on the older leaves that have been exposed to the disease for longer, while treated crops may show higher infection levels on the newer, unprotected upper leaves that emerged after fungicide application.

Under optimal conditions it can take 10 to 14 days from when a spore infects a plant to when new spores are released. The optimal temperature range for stripe rust development is between 12°C and 20°C, and in early spring it is common for temperatures to be within this range for extended periods.

Check whether the infection is active or an old infection. An active infection is yellow and fluffy, and the spores can be wiped off. Stripe rust pustules turn more orange as they dry but are normally viable for two to three weeks depending on climatic conditions. Flecking within leaves (usually flag leaf) is a sign that APR is killing new infections to prevent the spread of infection, meaning fungicide application is not required.

If stripe rust is only evident on individual plants scattered across a paddock, rather than patchy across all plants in a hot spot (usually one metre or more in size), it is likely that the crop is not a pure line. The affected plants may be a variety that is more susceptible than the variety sown. Aim to source purer seed for future seasons.



Varieties rated 5 or lower can suffer yield loss of up to 50 per cent.

Photo: Brad Collis

FUNGICIDES

The best way to control infection is to prevent disease getting a hold in the first place.

The use of a fungicide is not always economical – it depends on disease pressure, growth stage, varietal resistance level, yield potential and seasonal conditions. If it does not pay, do not spray. Unnecessary sprays simply increase the chances of a range of foliar diseases developing fungicide resistance. Rotate and mix fungicide modes of action and active ingredients to reduce this risk.

Growers and advisers can also use the StripeRustWM App for iPads and tablets, which is designed to help them assess the economic value of spraying on a paddock basis.

In seasons with high pressure, timely fungicide application is essential to support good management. However, as the wet conditions in 2022 have shown, it is not always possible to spray on time due to issues with paddock or aerial application accessibility. Carefully consider risk versus reward before relying solely on fungicides to manage disease in susceptible varieties.

Fungicides typically provide three to four weeks of protection but this may be reduced under high disease pressure.

In a high-pressure season, seed or fertiliser applied fungicide is good insurance to protect varieties rated MR or lower from seedling infection. This will reduce the risk of early infection, help to protect other crops by reducing inoculum pressure and increase the flexibility of timing for foliar fungicide application. Later-sown crops may be particularly vulnerable to seedling infection as inoculum levels will be higher at earlier growth stages.

The recommended application timing for a two-spray strategy in varieties rated moderately susceptible (MS) or lower is foliar application at GS31–32 and GS39, or flutriafol at sowing and a foliar application at approximately GS39 if required.

The two-spray strategy may not be sufficient in cool seasons such as in 2022. These conditions can slow crop development, meaning that the time between GS31 and GS39 could extend out to five to eight weeks, with the result that crops are left unprotected after the fungicide wears off.

With head infections, the stripe rust fungus competes with the developing grain for resources, potentially reducing grain quality. To keep pustules out of the head, apply fungicide three weeks before flowering. Beware the risk of exceeding maximum residue levels (MRLs) as a sudden hot spell can mean the application may be too close to harvest. Chemical dilution stops once the grain stops filling.

Aerial application of fungicide generally does not achieve canopy coverage as effectively as application using a ground rig; for example, aerial application may be compromised by lower water rates or obstacles such as trees and powerlines. However, it is better than no application at all in susceptible varieties and during stripe rust-conducive seasons such as in 2022.

Please forward freshly collected rust samples in paper only to the Australian Cereal Rust Survey, University of Sydney, Australian Rust Survey, Reply Paid 88076, Narellan, New South Wales, 2567.

Disease resistance ratings

Standard disease ratings	
Rating	Alpha code
Resistant	R
Resistant to moderately resistant	RMR
Moderately resistant	MR
Moderately resistant to moderately susceptible	MRMS
Moderately susceptible	MS
Moderately susceptible to susceptible	MSS
Susceptible	S
Susceptible to very susceptible	SVS
Very susceptible	VS

More information:

NVT Harvest Reports: grdc.com.au/resources-and-publications/all-publications/nvt-harvest-reports

NVT Crop Sowing Guides: nvt.grdc.com.au/resources/crop-sowing-guides

NVT Disease Ratings tool: nvt.grdc.com.au/nvt-disease-ratings

GRDC Tips and Tactics: Stripe rust in wheat (2016): grdc.com.au/TT-WheatRust

StripeRustWM app: agric.wa.gov.au/apps/striperrustwm

GRDC Update webinar: Stripe rust update for spring 2022 – what's happening? (28 September 2022): grdc.com.au/events/past-events/2022/september/grdc-grains-research-update-online-stripe-rust-update-for-spring-2022

GRDC Podcast: Stripe Rust Disease Ratings with Dr Steven Simpfendorfer (1 February 2023): <https://grdc.com.au/news-and-media/podcasts/podcast/stripe-rust-disease-ratings>

NSW DPI Podcast Stripe Rust in wheat: the myth busters edition with Brad Baxter and Dr Steven Simpfendorfer (24 October 2022): soundcloud.com/user-889937785/stripe-rust-in-wheat-the-myth-busters-edition

Grant Hollaway, Hari Dadu, Mark McLean, Luise Fanning, Robert Park, GRDC Updates: Wheat disease update – rust and Septoria (21 February 2023): grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2023/02/wheat-disease-update-rust-and-septoria

Dr Steven Simpfendorfer, GRDC Updates, 2023: A TESTING year for cereal disease management! (22 February 2023): grdc.com.au/resources-and-publications/grdc-update-papers/tab-content/grdc-update-papers/2023/02/2023-a-testing-year-for-cereal-disease-management

University of Sydney Australian Cereal Rust Survey: reports and pathotype testing service: sydney.edu.au/science/our-research/research-areas/life-and-environmental-sciences/cereal-rust-research/rust-reports.html

Grower case studies



Andrew Freeth.

Photo: Kirsty Fisher

FREETH FAMILY VARIETY RESISTANCE PAYS OFF

Selecting varieties with a good resistance package is essential in case clay soils become too wet to access.

Andrew Freeth has always tried to steer clear of what he calls disease suckers – or varieties with a poor resistance rating – a strategy that proved its value in the wet conditions of 2022.

“The wheat diseases we are most concerned about are stripe rust, yellow leaf spot and Fusarium crown rot,” he says.

To manage stripe rust, the Freeth family select varieties that combine good yield with good resistance, usually RMR or better. They see variety resistance as essential because much of their cropping land is on clay soils that can readily become too wet to access with machinery.

The family try to maintain a clean chemical fallow to limit the green bridge. However, the wet summer in the lead-up to the 2022 season made that more challenging than usual with soils heavily waterlogged in March and April, in particular those at Collie.

SNAPSHOT

GROWERS: Andrew, David, Sue and Marc Freeth

LOCATION: Collie and Trangie, NSW

TOTAL FARM AREA: 5500 hectares (2500ha cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 500 millimetres

SOIL TYPES: grey cracking clay vertisols to red loam or clay

ENTERPRISES: cropping and livestock, mainly sheep

CROPS: wheat, canola, chickpeas, barley, plus oats and lucerne for grazing

WHEAT VARIETIES GROWN IN 2022:

- Sunchaser[®] (RMR)
- LRPB Stealth[®] (RMR)
- Sunmaster[®] (MRMS)

Sunmaster[®] (MRMS) at Trangie

In 2022, the Freeths planted Sunmaster[®] (MRMS) at Trangie because the variety has good upside potential yield and its flowering window added diversity to their wheat portfolio.

While the resistance rating for Sunmaster[®] is not as good as their usual RMR varieties, the sloping site with better drainage and trafficability gave them the confidence that they would be able to apply foliar fungicide under most conditions.

Scouting for disease was done by both the Freeth family and their agronomist, Jamie Taylor from Nutrien Ag, on an as-needed basis based on varietal and seasonal risk.

Despite seeing a few 'ute-sized' stripe rust hotspots, they were able to prevent crop damage with a fungicide application at flag leaf emergence. It was applied in combination with a broadleaf herbicide spray that had been somewhat delayed due to wet conditions.

The paddock yielded well at 3.7 tonnes per hectare of Australian Hard wheat at H2 quality.

"Quality was generally good, but stripe rust was not the only disease. There was some Fusarium head blight, which has not been an issue for us before, and some yellow leaf spot," Andrew says.

"We were a bit lucky that we were able to get that fungicide spray out given how wet the season was," he says, "but the Trangie ground had less subsoil moisture than Collie and better drainage.

"We don't really know whether another spray would have improved yield, but given the season it probably would have needed to be an aerial application, which may not have been as effective."

Sunchaser[®] (RMR) at Collie

The fungicide application to Sunchaser[®] (RMR) at Collie was more of a precautionary strategy in response to the high stripe rust pressure and ongoing wet conditions.

"We did not see any stripe rust in Sunchaser[®] but added fungicide opportunistically with our broadleaf spray as soon as we could get onto the paddock. The fungicide was probably a bit early at late tillering, but we were concerned that the cooler weather might delay Adult Plant Resistance (APR) in the later sown crop," Andrew says.

"We wouldn't normally spray Sunchaser[®] for stripe rust but because the disease was really taking off in the district, we took our agronomist's advice to spray, viewing fungicide as a cheap insurance.

"The Sunchaser[®] yielded 4.4t/ha of AH wheat at H2 quality, which is slightly above our average of 4.1t/ha."

Not just fungicides

"Good disease management is essential," Andrew says. "Wheat usually dominates our crop mix and, with the drier seasons from 2017 to 2019, we had become very heavy on the wheat rotation to try to build groundcover with a low-risk crop.

"There were some paddocks that were wheat on wheat on wheat but, given the high stubble loads heading into 2022, we chose to burn the heavier stubble just before sowing to improve seeding with our tyned system.

"While we certainly wouldn't advocate regular burning, a strategic burn of heavy stubble in some paddocks clearly reduced disease pressure from stubble-borne diseases such as yellow leaf spot and Fusarium crown rot."

The Freeth family will grow slightly more susceptible varieties when they fill a niche. For instance, they would consider LRPB Hellfire[®] (MRMS) if a late break called for a shorter-season variety.

"Going forward we're looking at discs to make sowing into retained stubble a bit easier and increasing our area of rotation crops to reduce the incidence of stubble-borne disease. We have been talking about trying faba beans for a while, so perhaps 2023 will be their year," Andrew says.

"While crop rotation may not reduce the risk of stripe rust, it will contribute to our overall disease management strategy to ensure we don't become too reliant on fungicides. We prefer to use fungicides when required or as a cheap insurance policy, provided the economics stack up."

MORE INFORMATION:

Andrew Freeth, 0407 205 503, adfreethe@gmail.com

Paddock snapshots.

Trangie paddock (lighter soil) Sunmaster [®] (MRMS), sown on time 29 May, yield 3.7t/ha, quality AH (H2)					
Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	None				
First foliar	200mL/ha Fitness [®] Fungicide	435g/L propiconazole	28 August	Flag leaf emergence (GS39) with broadleaf spray	3
Collie paddock (heavier soil) Sunchaser [®] (RMR), sown three weeks late 23 June, yield 4.4t/ha, quality AH (H2)					
Sowing	None				
First foliar	145mL/ha Fitness [®] Fungicide	435g/L propiconazole	4 September	Late tillering with broadleaf spray	3

Note:

- Ensure that all products are applied in accordance with individual label requirements including not exceeding: maximum rate, number of applications per crop, crop growth stage and withholding period.
- When applying products at a lower than label rate, efficacy is no longer assured by the manufacturer. Liability shifts to the individual making the recommendation.



(L–R) Travis, Cam and Ian Penny.

Photo: Katherine Holloway

PENNY FAMILY A PROACTIVE APPROACH TO DISEASE

Being organised and ready to act when needed keeps disease levels at bay in susceptible varieties.

The Penny family's approach to stripe rust was purely pre-emptive, almost to the point where they wondered whether they needed to spray at all.

They mainly grow Scepter[®] and Elmore CL Plus[®] wheat. Cam Penny says Scepter[®] is a proven variety that typically yields better than Elmore CL Plus[®] and will make Hard wheat if it can get the protein. Elmore CL Plus[®] has better stripe rust resistance than Scepter[®], and despite being an older variety it suits their environment well. They also value the Clearfield[®] technology for overcoming weed issues.

The main wheat diseases of concern to the Penny family in 2022 were stripe rust and Septoria.

"We saw very low levels of stripe rust before our first foliar fungicide application but importantly, despite the high-pressure season, we never felt like we were in big trouble," Cam says.

SNAPSHOT

GROWERS: Cam, Travis, Andrew and Ian Penny

LOCATION: Warracknabeal (and Nullawil), Victoria

TOTAL FARM AREA: 7700 hectares (all cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 370 millimetres

SOIL TYPES: Wimmera grey clay, Mallee loam

ENTERPRISES: cropping and sheep

CROPS: wheat, barley, canola, lentils and vetch

WHEAT VARIETIES GROWN IN 2022:

- Elmore CL Plus[®] (MR in 2022, MS in 2023)
- Scepter[®] (MSS)
- LRPB Kittyhawk[®] for grain and graze (MR)

Staying on top of disease

The 2022 season was the first time they have ever sprayed Scepter[®] three times.

“We didn’t use flutriafol in furrow in 2022,” Cam says. “On reflection, we were lucky that we got away with just foliar fungicides.

“It is only because our paddocks are trafficable – being able to get on the paddock in a timely manner takes the headaches out. But we had to be organised. There was often only a window of a day or two to spray – say 48 hours to get over everything. We have two boomsprays, so we have the capacity to do it.”

Cam believes that the timing of that first foliar fungicide was the single most important factor in managing disease in their area in 2022.

“That early broad-spectrum foliar spray may have stood us in good stead for more than just stripe rust. We had a big rain event just after our first foliar spray that coincided with a footy event. I remember a group of us comparing notes about whether we had managed to get the first foliar out. We had to go hard to get ours done in time.

“Over the next month you could really see who had got the spray out and who hadn’t. The paddocks with the preventative were really clean but anyone who missed it was chasing their tail for the rest of season.

“We listen to our agronomist Matt Bissett of ExceedAG for timing. When he says spray, we know he is on the money. He scouts at least fortnightly and has the region-wide intel to know what is happening. We check the paddocks as well, making sure we scout one of each variety.”

The Pennys do not tolerate summer weeds and get straight onto any green bridge to reduce disease carryover and conserve moisture.

Their Scepter[®] yielded very well at 5.9t/ha and, although the protein was bit low at around 10 per cent, it was still half APW and half ASW.

Cam says that the paddocks are a lot more trafficable than they were 30 years ago. They use controlled traffic for spraying, spreading and harvest, although their air seeder does not fully match, with every second line being fresh tracks.

“When we had wet conditions back in 1995–96, we couldn’t get on the paddock. All that cultivation made it so soft. Now we have enough of a foundation so that even when there is water lying on the ground we can get through.”

A cautious approach

The Pennys have decided to err on the side of caution and order their 2023 fertiliser with flutriafol for wheat and canola.

“We are now under pressure from other diseases, such as Septoria and a bit of powdery mildew, that haven’t been as much of an issue before now. We had a lot of Sclerotinia in canola in 2022 so the flutriafol will help there too,” Cam says.

“Obviously, you never know how the season will go. So far, the summer has been drier, but we don’t know what pressure will come down from northern Australia; it has been increasing each year. At \$10/ha the furrow application is cheap to put out and might help reduce our need for foliar sprays.

“We will maintain a proactive approach to all fungal diseases. We won’t change varieties as we are confident that we can manage them after last year.”

MORE INFORMATION:

Cam Penny, 0407 859 256, campenny71@gmail.com

Paddock snapshot.

Scepter[®] (MSS) sown on time 18 May, yield 5.9t/ha, quality half ASW and half APW

Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	None				
First foliar	350mL/ha Opus [®] 125	125g/L epoxiconazole	10 August	(GS31–32)	3
	+ 100mL/ha Mirador [®] 625	625g/L azoxystrobin			11
Second foliar	300mL/ha Prosaro [®] 420 SC	210g/L prothioconazole + 210g/L tebuconazole	5 September	Flagleaf emergence (GS39)	3
	+ 80mL/ha Mirador [®] 625	625g/L azoxystrobin			11
Third foliar	200mL/ha Prosaro [®] 420 SC	210g/L prothioconazole + 210g/L tebuconazole	4 October	Start of flowering (GS59–60)	3

Note:

- When applying products in a tank mix where they are not co-labelled physical compatibility cannot be assured.
- Ensure that all products are applied in accordance with individual label requirements including not exceeding: maximum rate, number of applications per crop, crop growth stage and withholding period.
- When applying products at a lower than label rate, efficacy is no longer assured by the manufacturer. Liability shifts to the individual making the recommendation.
- **DO NOT** apply tebuconazole to cereal crops more than once per season at a rate of 125 gai/ha or more than twice per season at a rate of 62.5 gai/ha. When applying multiple or mixed products containing tebuconazole **DO NOT** exceed a total rate per season of 125 gai/ha.



Farmhand William Middleton (left) and Charlie Baldry.

Photo: Nicole Baxter

CHARLIE BALDRY BEST LAID PLANS

Every season is different and implementing plans in a timely way is not always possible.

A disease management plan is essential, but sometimes conditions conspire to make that plan difficult to implement in a timely way.

Charlie Baldry has always taken a pre-emptive approach to disease management and believes it can be minimised to some extent with the right strategy. Yet, after the wet conditions of 2022, he realises he was lucky to get most of his sprays out on time.

“We know that we need to manage stripe rust in Coota[®] and Septoria in Beckom[®], but before 2022 that had not been a problem,” Charlie says. “Even with the huge disease pressure in 2022, I think we had some pretty reasonable results and good disease management advice was a big part of that.”

Charlie had some difficulty accessing paddocks due to waterlogging, which meant that some small areas missed one or more fungicide applications.

“It was a challenging year for disease and has certainly proved the value of using resistant varieties and flutriafol in-furrow, which we apply across the board with our MAP fertiliser,” he says.

“We graze our stubbles after harvest for a short period to pick up any lost grain then spray regularly as required to manage volunteers and weeds. This is important for soil moisture retention and to prevent the green bridge for disease management.”

SNAPSHOT

GROWERS: Charlie Baldry manages the cropping operations for Baldry and Sons family partnership

LOCATION: Wallendbeen, NSW

TOTAL FARM AREA: 5000 hectares (2000ha cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 680 millimetres

SOIL TYPES: red clay loam and sandy clay loam

ENTERPRISES: cropping and sheep

CROPS: wheat and canola, with some barley for own use

WHEAT VARIETIES GROWN IN 2022:

- Anapurna (RMR)
- LRPB Mustang[®] (RMR in 2022, MR in 2023)
- LRPB Raider[®] (RMR in 2022, MR in 2023) as a seed increase
- Illabo[®] (MRMS)
- Beckom[®] (MRMS)
- Coota[®] (MS in 2022, S in 2023)

Coota[®] (MS in 2022, S in 2023)

In 2021 Charlie bulked up 15 hectares of Coota[®] and sprayed it with fungicide twice, achieving good results. His plan was to do the same again in 2022, with applications at GS32 and GS39. However, as the season progressed his agronomist, Chris Duff from Delta Ag, recommended a third spray.

“While we had some concerns about whether Coota’s[®] stripe rust resistance was sufficient going into potentially a high-pressure season, we thought it should be okay with careful management,” Charlie says. “If we had known the disease pressure would be as bad as it was, we would not have grown Coota[®].”

Quite a bit of stripe rust emerged about a week after the second foliar fungicide application, indicating that the crop had been infected before spraying.

“In hindsight the GS39 spray should have gone out earlier. The spray worked and did halt it, but there was already some damage.

“Our logic was that if we went too early, we wouldn’t have the recommended gap of four weeks between the GS32 and GS39 sprays and the important flag leaf would not be fully out.”

“Stripe rust definitely cost a bit of yield in the Coota[®]. We were targeting 6t/ha with our nitrogen strategy, which should be achievable in a high-rainfall year with cool finish, but the disease caused a quicker finish with reduced yield but potentially increased protein. The average yield was 5t/ha (4.4 to 5.7t/ha range) and mostly 13 per cent plus protein, which is unusually high.”

While some waterlogged ground was left unsprayed as Charlie preferred to apply fungicides by ground at 100L/ha water to maximise coverage and penetration.

“The third spray at head emergence picked up those areas that were too waterlogged for the first two sprays, although the horse had already bolted for them. The combination of waterlogging and stripe rust reduced yield in these areas to about 2.5t/ha.

“Maybe it should have been sprayed every two weeks instead of every four – but what is economic? We won’t be growing Coota[®] again.”

Beckom[®] (MRMS)

In response to the wet conditions, the plan for Beckom[®] was two foliar applications at GS32 and GS39 and regular monitoring for disease. “Beckom[®] is better for stripe rust than Coota[®], but more susceptible to Septoria,” Charlie says.

“We were pretty comfortable that the timing was right with Beckom[®] and we did not need a third spray. The few wet areas that were left unsprayed yielded poorly at 2.5t/ha, but that could just as well have been due to waterlogging as Septoria. We were happy with the disease management and results so our strategy worked, but we knew of others who had not sprayed or had missed the GS32 spray and had disappointing results due mainly I understand to Septoria.

“It is possible that a third spray could have limited the Septoria we saw on the flag leaf. We didn’t stop all disease, but the results were pleasing with an average yield of 6.1t/ha of mainly H2 quality. Screenings were a bit high at 4 to 5 per cent, compared to 1.5 to 2 per cent you would expect in a good season with no disease.”

Chasing resistance

“The different disease challenges we experienced with Coota[®] and Beckom[®] in 2022 clearly shows the value of genetic resistance in a variety,” Charlie says.

In 2023, he is planning to replace Coota[®] and Beckom[®] with LRPB Raider[®] – a new variety with a better disease package, good yield potential and a slightly longer season. It was bulked up alongside Beckom[®] in 2022 and he says it had a much cleaner flag leaf and yielded one tonne better.

“Coota[®] is too susceptible to rust and while Beckom seemed okay until this year, we think the LRPB Raider[®] has a better package.

“We will still grow LRPB Mustang[®] with our undersown pasture and Anapurna for grazing. They both have a good disease package.”

MORE INFORMATION:

Charlie Baldry, 0428 432 611, charlie@baldryandsons.com

Paddock snapshots.					
Coota [®] (MS in 2022, S in 2023), sown on time 10 May, 5t/ha, quality APH2					
Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	200mL/ha Impact [®] Endure In-Furrow	500g/L flutriafol	10 May	At sowing	3
First foliar	200mL Bumper [®] 625 EC	625g/L propiconazole	21 August	Second node (GS32)	3
Second foliar	375mL/ha Epoxiconazole 125	125g/L epoxiconazole	20 September	Flag leaf emergence (GS39)	3
	+ 400mL/ha Accolade [®] 250EC	250g/L azoxystrobin			11
Third foliar	500mL/ha Epoxiconazole 125	125g/L epoxiconazole	8 October	Head emergence (GS51)	3
Beckom [®] (MRMS), sown on time 22 May, yield 6.1t/ha, quality AH (H2)					
Sowing	200mL/ha Impact [®] Endure In-Furrow	500g/L flutriafol	22 May	At sowing	3
First foliar	250mL/ha Epoxiconazole 125	125g/L epoxiconazole	30 August	Second node (GS32)	3
Second foliar	150mL Bumper [®] 625 EC	625g/L propiconazole	4 October	Flag leaf emergence (GS39)	3
	+ 400mL/ha Accolade [®] 250EC	250g/L azoxystrobin			11

- Note:**
- When applying products in a tank mix where they are not co-labelled physical compatibility cannot be assured.
 - Ensure that all products are applied in accordance with individual label requirements including not exceeding: maximum rate, number of applications per crop, crop growth stage and withholding period.
 - When applying products at a lower than label rate, efficacy is no longer assured by the manufacturer. Liability shifts to the individual making the recommendation.



Matt (seated) and Simon Schlitz.

Photo: Katherine Hollaway

SCHLITZ FAMILY RESPONDING TO THE SEASON

When a good season comes along, the Schlitz family work to maximise crop potential – and that means making sure nothing is left to chance.

The Schlitz family grow Scepter[®] wheat because it yields well and has good quality. They always use flutriafol at sowing to minimise disease risk, and apply it alongside trace elements with an in-furrow liquid-injection system.

“In our environment we budget on flutriafol and one foliar,” Simon Schlitz says. “Historically that works, and we were hoping one foliar would be enough in 2022 but we had to change the plan to respond to the high-pressure season.

“I must admit that I don’t keep up with the monitoring on my own property as much as I should, but as an agronomist I get to see what is happening around the area, so my clients are my barometer. We had to look hard to find it in our paddock before the first foliar spray; there were no hotspots.”

SNAPSHOT

GROWERS: Colin, Leanne, Simon, Luke and Matt Schlitz

LOCATION: Quambatook, Victoria

TOTAL FARM AREA: 5600 hectares (4000ha cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 360 millimetres

SOIL TYPES: heavy loam and red sandy loam

ENTERPRISES: cropping and sheep

CROPS: wheat, barley, canola, lentil, vetch and oaten hay

WHEAT VARIETIES GROWN IN 2022:

- Razor CL Plus[®] (MS)
- Scepter[®] (MSS)

The Schlitz family aimed to get the second foliar spray out four weeks after the first. Both sprays went out on time.

“We did make a little bit of a mess, but we didn’t have problems with trafficability,” Simon says. “We work hard at managing the green bridge, more to conserve moisture than limit disease. We keep well and truly on top of it, to the extent that we employ a contract sprayer for weed control at harvest so we can concentrate on getting the grain off.”

Reading the season

Simon spends a lot of time studying the season and believes that canopy management is crucial in a good spring.

“The Mallee is a traditionally low input low yield area,” Simon says. “But when a good season comes along it is an opportunity not to be missed. That is the time to put out the urea and the fungicide to capitalise on it.

“We have a lot of faith in our system, using a stripper front and stubble retention to conserve moisture received outside the growing season. If the season is approaching anywhere near average rain, we wind it up to the max.

“In 2022 we had an awesome yield for the Mallee at 4.8t/ha and were rapt with Australian Hard (H2) quality.”

They believe that applying flutriafol in-furrow was vital in protecting yield.

“There was one spot in the paddock where the flutriafol didn’t go out for about 25 metres on an 18-metre-wide planter. The strip without flutriafol was visually defoliated with very poor biomass – it was just a stick with a head.”

The missed strip was expected to yield about 2.5t/ha based on head counts and grain weight, while the rest of the paddock was expected to yield around 4.4t/ha. Missing the flutriafol reduced yield by about 2t/ha.

A proactive approach

“The Mallee is a harsh environment and stripe rust doesn’t usually have this sort of impact, but when it does timelines are key. You could see the pressure right across the region,” Simon says.

“Based on my experience as an agronomist who sees a lot of paddocks, I’d say the clients who are proactive on the fungicides, particularly the early foliar, had the best success. Those who got behind never caught up. I saw one case where a three-week delay reduced yields by 2.5 to 3t/ha.

“You could really see that stripe rust was a community-wide issue in 2022. How well a grower managed it impacted on the volume of spores blowing across paddocks. What was happening in one person’s paddock could make a difference to someone else’s yield and quality.

“We need to work together to reduce the risk.

“For 2023 we will keep doing what we were doing. We are confident we can get the sprays out when we need to. I’m telling my clients to use flutriafol up front to protect the crop in the early stages.

“Last year was one out of the box. We also had some issues with head disease. The heavier crops lost more grain.

“We will stick to the varieties we had in 2022 but aim to use grain from the 2021 harvest to reduce the potential carryover of head disease.”

MORE INFORMATION:

Simon Schlitz, 0427 384 284, simon.schlitz@nutrien.com.au

Paddock snapshot.

Scepter[®] (MSS), sown on time 6 May, yield 4.8t/ha, quality AH (H1)

Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	250-300mL/ha Genfarm Flutriafol Max in furrow and foliar Fungicide	500g/L Flutriafol	6 May	At sowing	3
First foliar	300mL/ha Genfarm Prothio T Fungicide	210g/L prothioconazole + 210g/L tebuconazole	29 August	Flagleaf emergence (GS38–39)	3 + 3
Second foliar	420mL/ha Radial [®]	75g/L azoxystrobin + 75g/L epoxiconazole	24 September	Not recorded	11 + 3

Note:

- Ensure that all products are applied in accordance with individual label requirements including not exceeding: maximum rate, number of applications per crop, crop growth stage and withholding period.
- When applying products at a lower than label rate, efficacy is no longer assured by the manufacturer. Liability shifts to the individual making the recommendation.
- **DO NOT** apply tebuconazole to cereal crops more than once per season at a rate of 125 gai/ha or more than twice per season at a rate of 62.5 gai/ha. When applying multiple or mixed products containing tebuconazole **DO NOT** exceed a total rate per season of 125 gai/ha.



Broden Holland.

Photo: Nicole Baxter

HOLLAND FAMILY TIMELY FUNGICIDE APPLICATION RIGHT FROM THE BEGINNING

Four years ago, Broden Holland would have questioned the value of fungicides, but since the run of dry seasons shifted to wet he is convinced they are worth it.

Getting the fungicide out on time is a key strategy for the Holland family. They farm a highly trafficable sandy clay loam, which enables them to spray as needed without having to worry about accessibility.

Broden Holland also swears by applying fungicide at sowing to protect the crop in the early stages. Flutriafol in-furrow is applied with MAP fertiliser to wheat regardless of the variety and its level of susceptibility to stripe rust.

This enables Broden to consider a range of attributes when selecting varieties. For him, Scepter[®] deserves a place in the program for its high yield and good protein, while good lodging resistance aids harvest.

SNAPSHOT

GROWERS: Chris, Broden and Kelly Holland

LOCATION: Young, NSW

TOTAL FARM AREA: 5000 hectares (4000ha cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 600 millimetres

SOIL TYPE: sandy clay loam

ENTERPRISES: cropping and sheep on lucerne pasture

CROPS: wheat and canola

WHEAT VARIETIES GROWN IN 2022:

- BigRed[®] (R in 2022, RMR in 2023)
- LRPB Lancer[®] (RMR)
- LRPB Raider[®] (RMR in 2022, MR in 2023)
- Beckom[®] (MRMS)
- Scepter[®] (MSS)
- DS Bennett[®] (S)

“Rust is Scepter’s[®] only downside,” he says. “We grow LRPB Lancer[®], which has a much better rust rating, but it usually yields around one tonne per hectare less than Scepter[®] and has other drawbacks, such as being harder to harvest and more prone to a low falling number.”

The Scepter[®] wheat was planted on time in mid-May with flutriafol in-furrow. The first foliar spray went out at GS38–39, just as the first few flag leaves were emerging.

“We typically monitor each week and saw a few stripe rust pustules in tiny patches, which tells us that rust had infected the crop about 14 days earlier. If we see it in one block, we spray that variety across the board,” Broden says.

The next spray was at early head emergence. The Hollands aim to keep the flag leaf clean with the first foliar spray and the head healthy and green with the second.

“That first foliar spray was probably a fraction later than ideal – maybe two days – but we wanted to hold it back so that we could time the head wash for a month later. It is a toss-up between too big a gap between the two foliar sprays and having to go to a third foliar spray. We’d like to avoid that if we can as it is a lot of work to get around all our wheat,” Broden notes.

“There was also a lot of Fusarium head blight around the district. We didn’t see a lot, but a slightly earlier spray might have saved us a bit. Our Beckom[®] was badly affected by Septoria which concerns us more than stripe rust.”

Responding to the wet

Despite farming in a high-rainfall area, the Hollands had not had too many problems with stripe rust in the past. The string of drier years before 2020 meant there was no need for fungicides.

However, the recent wetter seasons have been a real eye-opener. The 2022 season was exceptionally wet, with about 1000mm annual rainfall. It remained wet until about two weeks before harvest.

The family have used test strips and yield mapping to prove the value of preventative action. “When I run out of fungicide mid-row, I’ll leave it and see how it turns out,” Broden says.

In 2022, the Scepter[®] paddock had multiple test strips. The whole paddock was treated with flutriafol in-furrow and two foliar sprays and yielded about 6 to 7t/ha. Where either one of the foliar sprays was missed, that dropped to 4 to 5t/ha. When relying on flutriafol alone, yield dropped to 2t/ha.

“In 2021 we sprayed Scepter[®] twice for insurance although we didn’t see anything. In 2020 we only sprayed a head wash, but our test strips showed that was worth about 1t/ha in yield.”

Broden says that the test strips really help the family see the benefit of timely fungicide application. “You would think the test strips might put a lot of spore pressure on the crop, but these sprays really cleaned it up either side.”

In the more resistant LRPB Lancer[®], test strips showed that missing the second foliar spray reduced yield by around 0.5t/ha in 2022. Although they did see a bit of rust, it was much less than in Scepter[®].

“We are well and truly on board with fungicides now. If we see it, we spray it – it is that simple. When we are already spending \$800/ha to grow a crop, an extra \$30/ha to spray is cheap insurance. Preventing a 2t/ha or so loss is a no brainer.”

The Hollands sprayed their susceptible-rated DS Bennett[®] crop four times as well as the flutriafol in-furrow and are not planning to grow such a susceptible variety again.

“I’m pretty happy with how we went last year,” Broden says.

“If I had my time again, I might have gone for that third foliar spray in the Scepter[®]. Potentially it might have helped by somewhere between 0.2 and 0.5t/ha. Or we might try using a higher label rate to help the first foliar spray last a little longer. We have always used the lower rates, but it might be worth going a bit higher when the stripe rust pressure is so high.”

MORE INFORMATION:

Broden Holland, 0447 833 586, bghwr250@gmail.com

Paddock snapshot.					
Scepter [®] (MSS), sown on time 18 May, yield 6.2t/ha, quality AH (H1)					
Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	300mL/ha Impact [®] Endure	500g/L flutriafol	18 May	With MAP fertiliser at sowing	3
First foliar	500mL/ha Opus [®] 125	125g/L epoxiconazole	1 September	Just before flag leaf emergence (GS38–39)	3
Second foliar	400mL/ha Amistar [®] Xtra	200g/L azoxystrobin + 80g/L cyproconazole	30 September	Early head emergence (GS51–52)	3 + 11

- Note:**
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 - When applying products at a lower than label rate, efficacy is no longer assured by the manufacturer. Liability shifts to the individual making the recommendation.



Andrew Earle.

Photo: Melanie Jensen

ANDREW EARLE RESISTANCE RATINGS NOT SET IN STONE

It pays to keep an eye on variety resistance ratings as these can change depending on the prevailing stripe rust pathotypes.

When a useful variety's resistance rating drops two levels, it is time to look for something new.

Andrew Earle grows Coolah[®] for his early sowing window, with LRPB Reliant[®] and Sunblade CL Plus[®] for the main window. The Clearfield[®] technology provides more flexibility for summer and in-crop weed control. Andrew also grows Sunmax[®] as a super early-sown variety, although there are limited opportunities to plant this variety in his environment.

Both Coolah[®] and Sunblade CL Plus[®] were rated MRMS for stripe rust leading into 2022, but Andrew and his Elders agronomist Michael Brosnan felt that Coolah[®] had not held up as well as Sunblade CL Plus[®] against stripe rust in 2021.

Their suspicions were correct and in 2023 Coolah's[®] stripe rust resistance rating was dropped by two levels to MSS, while Sunblade CL Plus[®] remained at MRMS.

Andrew's experience shows that resistance ratings can change in response to changes in stripe rust pathotypes and demonstrates the importance of keeping up with the latest ratings.

SNAPSHOT

GROWERS: Andrew Earle for JA Livingstone and partners

LOCATION: Mungindi, Queensland

TOTAL FARM AREA: 25,000 hectares (16,000ha cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 500 millimetres

SOIL TYPE: grey vertosol (clay)

ENTERPRISES: cropping and sheep

CROPS: wheat, chickpeas, sorghum and cotton; evaluating mungbean

WHEAT VARIETIES GROWN IN 2022:

- Sunmax[®] (RMR)
- LRPB Reliant[®] (MR)
- Sunblade CL Plus[®] (MRMS)
- Coolah[®] (MRMS in 2022, MSS in 2023)

Coolah[®] (MRMS in 2022, MSS in 2023)

“Unfortunately, the Coolah[®] seemed to really fall apart in 2022. Usually, we apply one foliar fungicide to Coolah[®] due to concerns about its resistance, but in 2022 we needed two applications,” Andrew says.

Coolah[®] has traditionally yielded well for him, provided it is grown in paddocks that have had a disease break to minimise the risk of Fusarium crown rot.

“In 2022, it was a bit of a challenge to sow the Coolah[®]. We got halfway through the paddock and then had 150mm of rain. Parts of the paddock were so wet from rain and flood waters that we couldn’t finish sowing until 10 weeks later.”

The first foliar fungicide went out more or less on time based on the initial sowing date, if not a bit early, to combine with a grass-weed herbicide spray. Given the wet weather, they decided that a second foliar fungicide spray was worth the money, and put it out with the broadleaf herbicides.

“We will compromise a bit on timing if we can combine sprays – no one wants to spend any more time than they have to on the sprayer,” Andrew says.

“We kept an eye on the paddocks regularly for weeds and diseases. In the Coolah[®] you could see that the Adult Plant Resistance (APR) never really seemed to kick in, whereas in the Sunblade CL Plus[®] there was some stripe rust, but it wasn’t getting away.

“Overall, we achieved good stripe rust control.

“There was an area in the Coolah[®] paddock that missed out on the second fungicide. It really enabled us to see the benefit of the extra fungicide, not only for controlling the stripe rust, but also for limiting the inoculum spread into the rest of the crop.

“The half of the paddock that was sown on time yielded 3.2t/ha at APW quality, which was pretty good. Potentially the crop could have yielded better if we had put more nitrogen on, but we were a bit cautious because of the high fertiliser prices, so we are comfortable that we got what we expected.

“For the part of the paddock that was under water for a month, waterlogging was probably more of an issue for us than stripe rust because there was nothing we could do about it.”

Sunblade CL Plus[®] (MRMS)

The rain also delayed sowing of the Sunblade CL Plus[®] to six weeks later than normal. The paddock received one foliar fungicide application that went out with the broadleaf herbicides. As the ground was very wet, the application was at the end of the ideal window but was sufficient to prevent the stripe rust from spreading.

“We don’t have any concerns about Sunblade CL Plus[®] and although we observed a little stripe rust, it was clear that the APR was working. Normally it wouldn’t need any fungicide, but we were planning one application in 2022 due to the high disease pressure,” Andrew says.

“We haven’t always needed foliar fungicide and have not used a fungicide at sowing in the past. In future I expect we will probably see one foliar fungicide as our minimum regardless of the variety.

“We control the green bridge as quickly as we can to remove volunteers and weeds to conserve soil moisture. Soil moisture is everything for us.

“We’d like to replace Coolah[®] with something a bit more resistant to stripe rust, particularly if we have to spray it three or four times, but it currently out-yields the alternatives for that sowing window by five per cent so I guess we hold onto it until something with a better all-round package comes along.

“We don’t want to spray more than necessary. It is cheap insurance, but it is a lot of effort to physically get over the country. Even though it was very wet in 2022, we still favoured ground application for fungicides rather than air to get better crop coverage.”

MORE INFORMATION:

Andrew Earle, 0427 565 193, andrew@dingadee.com;

Mick Brosnan, 0428 532 143, michael.brosnan@elders.com.au

Paddock snapshots.

Coolah[®] (MRMS in 2022, MSS in 2023), half sown on time 7 May and half sown very late 15 July.
Yield 3.2t/ha, quality APW for the area planted on time.

Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	None				
First foliar	78g/ha Tebuconazole 800 WG	800g/L tebuconazole	28 July with grass herbicide	Mid tillering	3
Second foliar	78g/ha Tebuconazole 800 WG	800g/L tebuconazole	29 August with broadleaf herbicides	Late tillering	3
Sunblade CL Plus[®] (MRMS), sown six weeks late 27 June. Yield 2.85t/ha, quality APW.					
Sowing	None				
First foliar	78g/ha Tebuconazole 800 WG	800g/L tebuconazole	13 September with broadleaf herbicides	Late tillering	3

Note:

- Ensure that all products are applied in accordance with individual label requirements including not exceeding: maximum rate, number of applications per crop, crop growth stage and withholding period.
- When applying products at a lower than label rate, efficacy is no longer assured by the manufacturer. Liability shifts to the individual making the recommendation.
- **DO NOT** apply tebuconazole to cereal crops more than once per season at a rate of 125 gai/ha or more than twice per season at a rate of 62.5 gai/ha. When applying multiple or mixed products containing tebuconazole **DO NOT** exceed a total rate per season of 125 gai/ha.



Tim McClelland.

Photo: Katherine Hollaway

McCLELLAND FAMILY TIMELY FUNGICIDE APPLICATION A CHALLENGE

Getting the fungicide strategy right can be a challenge, particularly in an unusually wet season.

The high stripe rust pressure in 2022 combined with constantly showery conditions proved challenging for the McClelland family's Scepter[®] wheat.

"We know Scepter's[®] stripe rust rating is not great, but none of the top five yielding wheat varieties have better ratings," Tim McClelland says. "We would be happy to drop 10 per cent yield for a better resistance rating but not more. In the Mallee rust is not usually a big risk.

"We always try to stay on top of our summer weeds to keep the green bridge under control and maximise water retention. The sheep keep it under control as well."

The family's plan was to get the crop through to flag leaf emergence (GS39) and apply a low rate of epoxiconazole. They do not apply fungicide at sowing.

"In the Mallee this is usually enough," Tim says. "But given the high pressure expected for the 2022 season, we anticipated needing a second spray around half ear emergence (GS55)."

SNAPSHOT

GROWERS: Ian, Tim, Julie and Ros McClelland

LOCATION: Jil Jil, Victoria

TOTAL FARM AREA: 6500 hectares (5000ha cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 340 millimetres

SOIL TYPES: sandy clay loam to clay loam

ENTERPRISES: cropping and sheep

CROPS: wheat, barley, canola, lentil, field pea, vetch and oats

WHEAT VARIETIES GROWN IN 2022:

- Scepter[®] (MSS)
- Illabo[®] (MRMS)

Early infection

“Unfortunately, at GS32 we found severe leaf infection in patches on the wheel tracks,” Tim says. The McClellands sprayed a low rate of epoxiconazole but it was not enough to bring the infection under control.

A second foliar spray of epoxiconazole and azoxystrobin was applied two weeks later at around GS45 when the flag leaf was fully emerged. This got on top of the disease, preventing further progression of stripe rust.

However, Tim says that “while we did see some leaf repair, the damage had been done.

“There was definitely a yield penalty. Our result was a 4.1t/ha yield of Australian Hard (H2) wheat with an average protein of 12.3 per cent.

“The crop looked like a six-tonne crop, but being a Mallee farmer, I was hoping for five, which would have been a good result for us. There was a little bit of white grain that indicated head disease, which also affected yield.”

The family make all management decisions in consultation with their agronomists. “We also use Yield Prophet® to get a feel for yield potential and the StripeRustWM app, which recommended we spray when we did,” Tim adds.

“Between the family and our agronomists, we try to monitor weekly but, with 20 paddocks of wheat to cover that can push out to fortnightly, labour is a big issue.”

A learning experience

The extent of the damage was a real surprise.

“Looking back, I think we probably could have gone earlier on that first spray, maybe GS30, and with a higher rate to bring it under control,” Tim says.

“However, we did have logistical issues that probably meant we were a week later than we’d like to be. We were not limited by access to the paddock, but constant showery weather from August to October meant we just couldn’t spray at our usual pace.

“We’d normally put out four or five tanks a day, but were down to one or two, and often none. We were still finishing the canola and lentils when we should have been spraying the Scepter®.

“In hindsight we probably should have contracted out some of the spraying to our neighbour.”

After deep consideration, the McClellands have decided to order their urea treated with flutriafol for 2023.

“We have made the decision to err on the side of caution and get all our urea fertiliser treated and wear the extra cost. Even though we wouldn’t normally put Impact® on barley and canola I’d rather just have one batch and pull the truck under the augur and go. We are too short staffed to mess around trying to add it ourselves. It has to be easy.

“Assuming we return to a somewhat normal season (less wet), good early control might protect the crop in the early stages and get us through without the need for a foliar application. Realistically we still farm in the Mallee. As long as we keep our eyes and ears open, we can respond to the evolving season and make those decisions as we go along.”

MORE INFORMATION:

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Paddock snapshot.					
Scepter [®] (MSS), sown on time 29 April, yield 4.1t/ha, quality AH (H2)					
Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	None				
First foliar	65mL/ha Soprano [®] 500	500g/L epoxiconazole	16 August	Just before flagleaf (GS32)	3
Second foliar	120mL/ha Soprano [®] 500	500g/L epoxiconazole	31 August	Fully emerged flag leaf (GS45)	3
	+ 120mL/ha Accolade [®] 250 SC Fungicide	250g/L azoxystrobin			11

- Note:**
- When applying products in a tank mix where they are not co-labelled physical compatibility cannot be assured.
 - Ensure that all products are applied in accordance with individual label requirements including not exceeding: maximum rate, number of applications per crop, crop growth stage and withholding period.
 - When applying products at a lower than label rate, efficacy is no longer assured by the manufacturer. Liability shifts to the individual making the recommendation.



Kevin and Jon Kilby.

Photo: Kirsty Fischer

KILBY FAMILY SUSCEPTIBLE VARIETIES NOT WORTH THE PAIN

Excessively wet conditions highlight the value of genetic resistance to disease.

In 2022, the combination of a wet summer, a persistent green bridge and constant wet conditions throughout the season played havoc with the Kilby family's disease management strategies.

"There was just so much rain in 2022," Kevin Kilby says. "We had 940mm all up compared with our average annual of 580mm. It was wet until May, and we got half the crop in around the last week of May. Then it rained again, and the rest didn't go in until the end of June. From mid-August it barely stopped raining. I reckon 1998 was the last time it was this wet.

"Our wheat was hit with stripe rust, Septoria and yellow leaf spot. Quite frankly, we were lucky to get a crop at all."

In 2022 they grew Coota[®] and LRPB Hellfire[®], plus some LRPB Raider[®] to bulk up seed for planting in 2023. They have grown Sunflex[®] (unrated in 2022, MRMS in 2023) and LRPB Stealth[®] (RMR) in recent years, but it was too wet to get these early wheats in the ground at a suitable time. Kevin says that although Coota[®] is also an early wheat, they have found that they can be a bit more flexible with sowing times for Coota[®] than with Sunflex[®] or LRPB Stealth[®].

SNAPSHOT

GROWERS: Kevin, Jenny, Jon and Molly Kilby

LOCATION: Gilgandra, NSW

TOTAL FARM AREA: 2000 hectares (1000ha cropped)

AVERAGE ANNUAL RAINFALL (LONG TERM): 580 millimetres

SOIL TYPES: red clay loam and sandy loam

ENTERPRISES: cropping and grazing (sheep and cattle)

CROPS: wheat, barley, canola, lupins (albus and narrow leaf), chickpeas and faba beans, plus vetch, oats and triticale for grazing

WHEAT VARIETIES GROWN IN 2022:

- LRPB Raider[®] (RMR in 2022, MR in 2023) for seed
- LRPB Hellfire[®] (MR in 2022, MRMS in 2023)
- Coota[®] (MS in 2022, S in 2023)

Timing

"We don't use any fungicide at sowing – fertiliser is expensive enough and we prefer to play it by ear. Our standard practice is applying an early protective fungicide spray that goes out with our herbicides – usually ahead of a rain event. Then we monitor on a weekly basis and follow the advice of our agronomist," Kevin says.

While Coota[®] is more susceptible to stripe rust than their other varieties, they have generally managed it successfully with just one preventative fungicide spray early in the season. Even though 2021 was a relatively wet year, one spray was sufficient as the season was not constantly wet and most of the rain came around harvest.

This was not the case in 2022. Given the seasonal forecast, the Kilbys had planned a two-spray strategy with their agronomist Jamie Taylor of Nutrien Ag – one with the post-emergent herbicides and one at flag leaf emergence. But as the season progressed, it became obvious that a third fungicide spray would be necessary.

The Kilbys had some Coota[®] that had three applications of foliar fungicide and some that only had two. The paddock that only had two sprays was overtaken with stripe rust in September.

The two-spray paddock was sown late May, a couple of weeks later than ideal, and yielded 2.5t/ha. The three-spray paddock was sown a month later and yielded 3.5t/ha.

“When we put our herbicides out in mid-July, we added fungicide as a preventative strategy. For the two-spray paddock the crop was at early flag leaf emergence (GS39) and we thought that timing was ideal, so it would be one and done, but we had to go back in September at head emergence with a second fungicide application,” Kevin says.

The Coota[®] that was sprayed three times was only three weeks old when the first fungicide went out with the herbicide application. August was very wet and at the end of August the Kilbys found some hotspots in the crop at around flag leaf emergence (GS39). With rain coming, they sprayed it the same day. This paddock received a third foliar fungicide application in September.

“Our agronomist recommended the three sprays. We had been working on the theory that we shouldn’t need to spray after early flag leaf emergence (GS39), but we were definitely wrong there,” Kevin admits.

“You learn from your mistakes. We should have sprayed the two-spray paddock three times, but we didn’t think there was much stripe rust in that paddock. It looked cleaner than the one that we sprayed three times, but without the extra protection the two-spray paddock ended up so much worse. The two-spray crop was clearly stressed with black physiological patches on the stem – known as melanism (or false black chaff) – and looked terrible. Under the circumstances we were probably lucky it yielded as well as it did.”

Kevin was not the only grower in the region to struggle with stripe

rust. Reflecting on the season, Jamie says it was incredible how hard it was to put a stop to stripe rust. If he had his time again, he would consider recommending a stronger fungicide rate or a mix of fungicide actives.

Too susceptible

Wet weather did not just interfere with sowing; it also made it difficult to access paddocks and apply fungicides in a timely manner. Just as paddocks became dry enough to access with a ground sprayer, more rain would interrupt the Kilbys’ plans. The family have relatively small paddocks less suited to aerial application, particularly at a time when competition for aerial contractors was fierce.

The Kilbys’ disease management plan does not just rely on applying fungicide in-season.

“One of the big problems we had leading into 2022 was the green bridge,” Kevin says. “It was much harder to keep on top of it than usual. We had such a wet harvest in 2021 – 94mm in just one day – and probably lost 2.5t/ha to rain. There was volunteer wheat everywhere – some of it was a foot high – so that created a lot of disease pressure.

“We try to keep our varieties pure so that we don’t have heads of susceptible wheat mixed in with a more resistant variety. We don’t want the susceptible varieties to put more disease pressure on the resistant crops in case it might encourage resistance to break down.

“We aim to grow a range of varieties so that we don’t put all our eggs in one basket. If a new disease pathotype appears that can overcome resistance genetics in one variety, we’d like to think that some of our other varieties might hold up better.

“The disease resistance rating for Coota[®] has dropped and that means it is too susceptible to stripe rust for us. Going forward we intend to grow the more resistant varieties – LRPB Stealth[®], LRPB Raider[®] and Sunchaser[®] (RMR).”

MORE INFORMATION:

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Paddock snapshots.

Two-spray Coota[®] (MS in 2022, S in 2023), sown two weeks late 23 May, yield 2.5t/ha, quality APW1

Fungicide treatments	Application rate and product	Active ingredient	Date of application	Crop growth stage	Resistance group
Sowing	None				
First foliar	150mL/ha Fitness [®] Fungicide	435g/L propiconazole	11 July with herbicides	Early flag leaf emergence (GS39)	3
Second foliar	150mL/ha Fitness [®] Fungicide	435g/L propiconazole	12 September	Head emergence (GS51)	3

Three-spray Coota[®] (MS in 2022, S in 2023), sown six weeks late 23 June, yield 3.5t/ha, APW1

Sowing	None				
First foliar	150mL/ha Fitness [®] Fungicide	435g/L propiconazole	14 July with herbicides	Prior to flag leaf	3
Second foliar	150mL/ha Fitness [®] Fungicide	435g/L propiconazole	20 August	Early flag leaf emergence (GS39)	3
Third foliar	150mL/ha Fitness [®] Fungicide	435g/L propiconazole	25 September	Head emergence (GS51)	3

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