MANAGEMENT OF FUNGICIDE RESISTANT WHEAT POWDERY MILDEW

RESEARCH SUMMARY

TC120

FAST FACTS

PROBLEM

Group 3 and 11 fungicide resistance is increasing rapidly in WPM, however there are few alternative modes of action available.

PROJECT

Strategic use of fungicides and planting more resistant varieties can reduce the impact, yield losses and input costs associated with WPM.

PARTICIPANTS

Trengove Consulting: Sam Trengove, Stuart Sherriff, Jordan Bruce, Joe Simpson, Nathan Jones, Kurt Ollwitz

Centre for Crop and Disease Management: Fran Lopez-Ruiz, Kejal Dodhia

SARDI: Tara Garrard, Hugh Wallwork

DATES

Start: 1 April 2020
Finish: 30 June 2022

Wheat powdery mildew (WPM) has been shown to cause yield losses of up to 25 per cent in Australia.

Cases of fungicide resistance to Group 11 fungicides and reduced sensitivity to Group 3 fungicides is increasing rapidly on the Yorke Peninsula.

This project explored whether the timing of Group 3 + 11 applications can be important for optimising control of WPM. It also demonstrated that changing to more resistant wheat varieties (moderately susceptible to susceptible (MSS) or better) reduced WPM incidence even more than two post-emergent fungicide application.

BACKGROUND

WPM with reduced sensitivity to Group 3 (DMI) fungicides and resistance to Group 11 (QoI) fungicides is a rapidly increasing problem on the Yorke Peninsula.

At the same time, there has been a tendency for growers to replace moderately susceptible to susceptible (MSS) varieties like Mace with the susceptible to very susceptible (SVS) variety Scepter, for its higher yield potential.

RESEARCH AIMS

The core objective of this project was to improve management of resistant WPM pathotypes using the interactions between fungicide products, application timings and varietal resistance.

IN THE FIELD

WPM fungicide resistance surveys were conducted across paddocks in the northern and central Yorke Peninsula and Mid North in 2019. Rates of reduced sensitivity to Group 3 fungicides ranged from 2.2 per cent to 99.5 per cent. Resistance to Group 11 QoIs was not detected in more than half of tested paddocks but peaked at 57.5 per cent in one paddock.

In 2021, QoI resistance was detected in all paddocks tested across the northern YP with the median rate increased from zero per cent in 2019 to 19 per cent in 2021.

A range of registered and unregistered Mode of Action group fungicides were tested in 2020 and 2021, with a fungicide sequencing trial included in both seasons. The conventional use sequence of Group 3, 7 and 11 fungicides was found to be very susceptible to the rates of resistance/ reduced sensitivity in the WPM population and only had a moderate effect on disease levels. However, including a Group 5, 13 or U6

fungicide lowered mildew levels significantly. This data has been shared with GRDC and fungicide suppliers to support fungicide registrations.

Fungicide timing was assessed with Elatus® Ace (Group 3 + 7) in 2020 and Amistar® Xtra (Group 3 + 11) in 2021. In 2020, WPM was detected at growth stage 14 (GS14) and trial assessments at GS45 showed sprays at GS14 and GS32 were needed to minimise infection. In 2021, WPM was not observed until later in stem elongation and applications at GS32 and GS39 provided the most effective control.

Seven wheat varieties were planted to assess the benefit of varietal resistance and its interaction with fungicide use. These were the widely planted Scepter (SVS) and Chief CL Plus (SVS), along with Kord CL Plus (MS,2020), Grenade CL Plus (MS, 2021), Mace (MSS), plus the new lines Calibre (RAC2721) rated S and Brumby (IGW6683) provisionally rated R.

RESULTS

Resistance to Group 3 and Group 11 fungicides was found to be increasing rapidly in the northern Yorke Peninsula. Meanwhile, Group 3 + 7 mixtures were found to perform no better than straight Group 3 products.

The project found fungicide timing should be linked to seasonal conditions and disease presence, and demonstrated the strong benefits of varietal resistance. Varieties rated MS had lower rates of WPM infection without spraying than Chief CL Plus and Scepter (both SVS) treated with fungicides.

In 2021, Scepter still incurred a 0.5t/ha yield loss after a single spray of fungicide and 0.2t/ha yield loss after two applications. In contrast, improving the variety rating from SVS to MS e.g. from Chief CL Plus to Grenade CL Plus, reduced the number of WPM pustules on the flag leaf by 96 per cent without fungicide.

VALUE FOR GROWERS

In 2022, WPM was observed across SA on soils not typically considered high risk.

This project has helped to identify management guidelines to help calculate yield potential of more resistant wheat varieties against the likely input costs, efficacy and residual yield loss of applying fungicides to popular SVS elite varieties.

Resistance surveys highlight the risks of repeated use of Group 3 and 11 fungicides and wheat cultivars with low varietal resistance.

MORE INFORMATION:

Sam Trengove, Trengove Consulting Trust

T: 0428 262 057

E: samtrenny34@hotmail.com