

Disease Management in wheat (2024)

Issue 3 of 'InGRAINed' should be read in conjunction with issues 4 and 5, to be released over the next two weeks. These will cover fungicides and products for particular strategies outlined in this issue.

National overview and key points

Although some regions of Australia has received average or above average rainfall (Figure 1), the majority of arable regions have experienced an exceptionally dry autumn and winter. This has resulted in two key differences that we need to consider in 2024 disease management strategies for wheat.

- ***As a general rule of thumb (with the exception of parts of NSW and QLD), the dry autumn has resulted in later sown and later emerged cereal crops across our national acreage.***
- ***Later emerging crops invariably have less need for fungicide input than earlier emerged crops.***
- ***Drier winter conditions combined with later sowing are likely to reduce the levels of foliar disease in cereal crops this spring (less cycles of the disease pathogens).***
- ***However, as 2023 illustrated, disease management input is still likely to be heavily influenced by environmental conditions occurring during stem elongation (GS30-GS59), not necessarily dry autumn conditions.***
- ***Stripe rust is “public enemy number one” for susceptible varieties grown in the eastern states this season. Epoxiconazole (Group 3 DMI fungicide) is still very effective at giving control of this pathogen if the disease is evident late tillering – first node (GS24-GS31).***
- ***Although protection from fungicides is good, don’t bank on much more than 7 days curative activity following an infection event of stripe rust. Curative control over 7 days after an infection event will result in “scarring” becoming evident in the crop, even if pustules are not evident (see next issue for more detail).***
- ***Levels of stubble borne diseases such as Septoria tritici blotch (STB) in the eastern states are unlikely to be as high as those experienced at the start of 2023 (a result of generally drier weather last season reducing crop infection).***
- ***Remember it’s the presence of the disease in the crop at GS30-32 and the weather patterns from GS31 onwards that will dictate the likelihood of fungicide response to STB. Make sure you monitor rainfall events of more than 5mm during the period (GS31-GS39) when the “money leaves” (flag-3, flag-2, flag-1 and flag) emerge, as these are the most important leaves for grain fill.***
- ***The best fungicide for STB control is dry weather during stem elongation!***
- ***In WA fungicide responses in wheat continue to be lower than those observed in the eastern states when comparing susceptible varieties such as Scepter.***
- ***See InGRAINed Issue 4 on fungicide timings GS30-GS33 and product choice.***

There are a number of factors to consider as we think about our foliar fungicide management plan for wheat crops this spring.

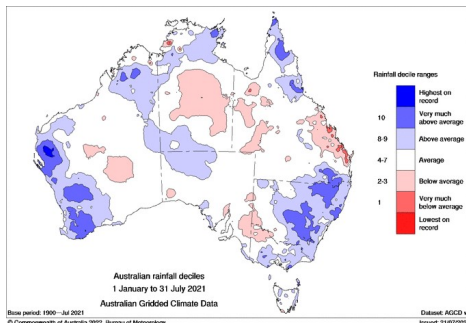
- The APVMA permits for the three mildewicides (Metrafenone, Quinoxifen and Proquinazid) introduced in the 2023 season have been extended until 31st May 2027, meaning that these (primarily protectant) products are currently available for mildew control in wheat.
- **But**, remember these mildewicides are not broad-spectrum fungicides and therefore need to be mixed with other fungicides, thus making disease management strategies more expensive where mildew occurs in combination with other diseases. Metrafenone is the only option that can be applied to the head with a cut off at GS61.
- Fungicide resistance continues to threaten our future disease management strategies, therefore please observe the Fungicide Resistance 5 (FR5) guidelines. 1. Avoid susceptible crop varieties; 2. Rotate crops; 3. Use non-chemical methods to reduce disease pressure; 4. Spray only if necessary and apply fungicides strategically; and 5. Rotate and mix fungicides/mode of action. Checkout the Australian Fungicide Resistance Extension Network (AFREN) Fungicide Resistance Management guide at grdc.com.au/AFREN, or bring yourself up to date at AFREN2 workshops being held around the country.

The strategy approaches outlined below are pointers to assist with decision making, and due to the nature of the HRZ & MRZ must not be taken as a recommendation, since individual regional paddock scenarios must be determined by visual inspection of the crop, and knowledge of the pathogen in that region. In addition, it is important to note that climate variability across seasons and regions makes it important to **use your own crops' disease pressure** as the principal “barometer” of your fungicide strategy, along with environmental conditions (see initial seven-month rainfall data below).

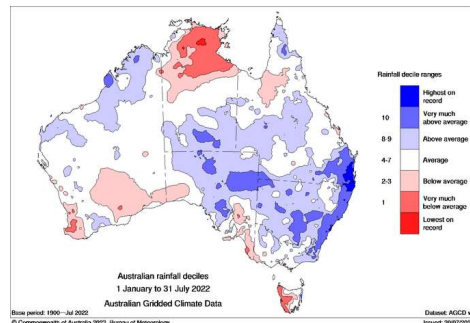
Rainfall patterns for the first six months of the year 2021 – 2024

Some regions of NSW and Queensland have had much better starts than the traditional southern Australian HRZ regions as the following rainfall charts for the last four years illustrate. Graphs courtesy of the Bureau of Meteorology (rainfall deciles for 1 January to 31 July).

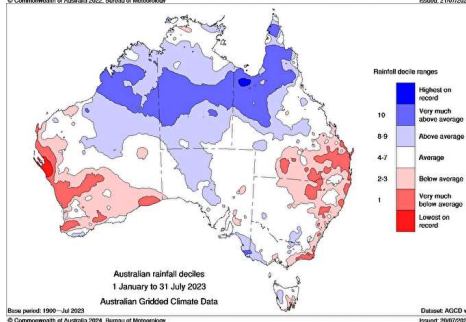
2021



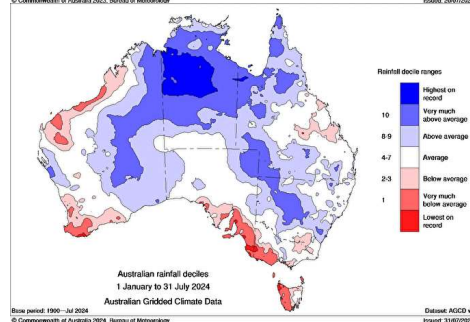
2022



2023



2024

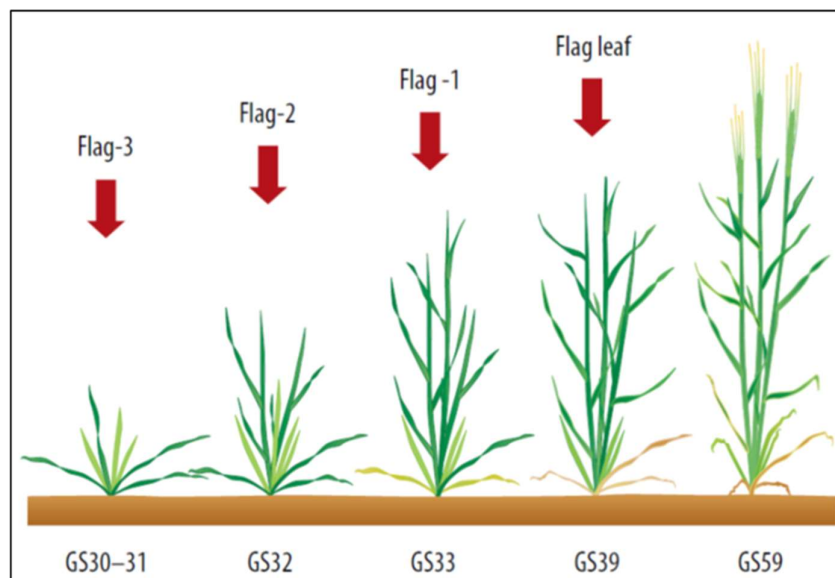


Strategy summary

Start with some fundamental questions about your crop and its disease levels and/or expected disease levels (what is my variety susceptible to?). Always start with the visual inspection of the crop at specific development stages as the primary prerequisite to determining fungicide application. For more background details on a checklist for fungicide strategy (see InGRAINED Issue 1 released 3 August 2023, (https://faraustralia.com.au/wp-content/uploads/2023/08/230803_Issue-1_Disease-Management-in-Wheat.pdf))

Money leaves – which, when and why?

Fungicide strategies for wheat and other cereal crops need to be based on the principle of protecting the “money leaves”. These are those leaves primarily responsible for producing the carbohydrate that eventually fills the grain and are the most profitable to protect, hence the name **“Money Leaves”**. As the graphic below illustrates these leaves emerge during stem elongation. Early foliar fungicide applications during GS30-32 target the lower less important money leaves (F-3 and F-2), whilst at GS33 one applies fungicide to F-1, or if at GS39 then flag leaf and F-1 receive the majority of the fungicide.



Strategies for control of foliar disease in wheat

1 spray approach (GS39) – most appropriate in seasons with low disease pressure as result of resistant cultivar, later sowings or flutriafol at sowing.

1 spray approach (GS31/32) most appropriate in seasons where disease is present in the crop requiring action at GS31, but in the following 3-4 weeks a spring drought occurs and dry weather acts as the second fungicide. Most likely in lower rainfall regions rather than HRZ.

2 spray strategy (GS31/32 & GS39) – Typical for many scenarios where disease is present in the crop during stem elongation and variety susceptibility increases disease risks. Don't stretch the gap between sprays (Mind the Gap!).

2 spray “straddle programme” (GS33 & GS55/59) – This is where the timing of two fungicides either side of flag leaf replace the application of three fungicides. It requires better

disease resistance or seasons with less disease to allow a delay in the first spray or the use of flutriafol at seeding (which has been effective on disease).

3 spray strategy (GS31/32, GS39 & GS59/61) – *“Belt and braces” approach in a season with better yield potential and high disease pressure due to region, variety, and earlier sowing date.*

4-unit strategy (Sowing, GS31/32, GS39 & GS59/61) – *“Belt and braces” approach with additional stripe rust protection in the period leading up to stem elongation provided by flutriafol. Where no flutriafol applied consider a fourth foliar spray at GS30, but only if stripe rust or severe WPM is present. 4-unit approaches should only be needed in the HRZ in very good seasons in very susceptible varieties.*

This cropping strategy is offered by Field Applied Research (FAR) Australia solely to provide information. While all due care has been taken in compiling the information FAR Australia and employees take no responsibility for any person relying on the information and disclaims all liability for any errors or omissions in the publication.

Field Applied Research (FAR) Australia gratefully acknowledges GRDC investment for the historical fungicide evaluation under controlled conditions.

It would also like to acknowledge the support of breeders with Germplasm Evaluation Network trials across Australia and industry manufacturers for entries into Fungicide Fingerprinting trials. These are FAR Australia’s independent research evaluations where control varieties and treatments are funded by FAR Australia.