Developing a fungicide strategy to control SFNB in Gairdner barley

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The aim of this replicated trial was to establish a fungicide strategy to control Spot Form of Net Blotch in Gairdner barley.

Summary
Spot Form of Net Blotch (SFNB) is a foliar disease of barley threatening production of the susceptible variety Gairdner. Fungicides may play an important role in achieving control over this disease.

Disease severity was monitored through the season but was only ever recorded at low levels (<5%). The lack of yield or grain quality response to fungicide treatments may be attributed to this low disease pressure.

In this trial, seed -, fertiliser - and foliar-applied fungicides had no significant effect on Gairdner barley yield or grain quality at either site – Rupanyup: yield 4.9 t/ha, screenings 30.5% and protein 8.2%; Birchip: yield 2.1 t/ha, screenings 18.6% and protein 8.8%.

Background

Over the past two seasons in the Wimmera and Southern Mallee the area planted to the malt barley variety Gairdner has increased dramatically (approx production 80,000mt in 2000 to 250,000mt in 2001). Gairdner is susceptible to Spot Form of Net Blotch (SFNB) which threatens further increases in production. SFNB has become a major disease of barley in WA and its importance in Victoria is increasing. This trial addresses the role that fungicides may play in achieving control over this disease.

Methods

This trial was conducted using a fully replicated randomised block design.

The trial was dry sown on 15 May 2001 at the Birchip site (sown at 65 kg/ha) and 4 June 2001 at the Rupanyup site (sown at 90 kg/ha). All treatments were fertilised with 80 kg/ha Mallee Mix 1 and Urea was pre-drilled at 40 and 50 kg/ha for Birchip and Rupanyup respectively.

Post emergent weed control was conducted with normal applications of registered products.

The level of leaf area infected with SFNB was monitored at the 5-leaf stage and again at anthesis. All plots were harvest for yield and grain quality results.

The fungicide treatments applied were as follows.

Timing	Product	Active Ingredient	Rate
Seed	Premis (control)	*triticonazole*	100mL/100kg seed
Seed	Real	*triticonazole*	150mL/100kg seed
Seed	Armour	*flutriafol*	100mL/100kg seed
Seed	Premis + Thiraflo	*thiram*	100mL + 200mL/100kg seed
Fertiliser	Impact in Furrow	*flutriafol*	400mL/ha
Fertiliser	Accord in Furrow	*triadimefon*	800mL/ha
Foliar	BTH	*benzothiadiazole*	30g/ha
Foliar	Amistar	*azoxystrobin*	200g/ha
Foliar	Chorus	*cyprodinil*	1.2kg/ha
Foliar	Flint	*trifloxystrobin*	500g/ha
Foliar	Tilt	*propiconazole*	250mL/ha
Foliar	Accord	*triadimefon*	500mL/ha

Results

Seed -, fertiliser - and foliar-applied fungicide treatments had no significant effect on Gairdner barley yield at Rupanyup (Figure 1 & 2). Grain quality was not significantly effected by fungicide treatment - screenings 30.5% (Malt 1 screenings max.30%) and protein 8.2% (Malt 1 protein min. 9 %).

These results were consistent with those obtained at the Birchip site. At the Birchip site the average yield was 2.1 t/ha, screenings 18.6 % and protein 8.8%.

Disease severity was monitored at the 5-leaf stage and again at anthesis but no significant difference was seen between the fungicide treatments. Very low levels of Spot Form of Net Blotch were recorded (<5%).

Figure 1: Gairdner barley yields when treated with six different seed- and fertiliser-applied fungicides at the Rupanyup site. LSD 5% = 0.3.

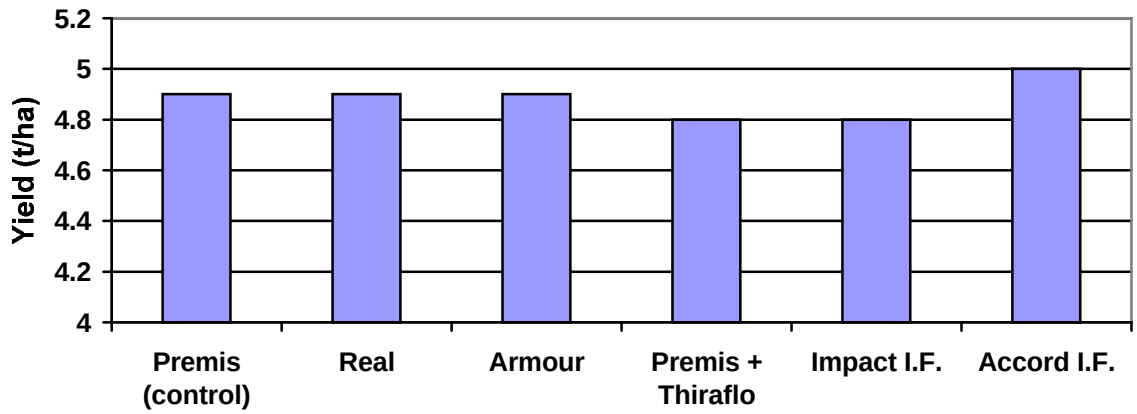
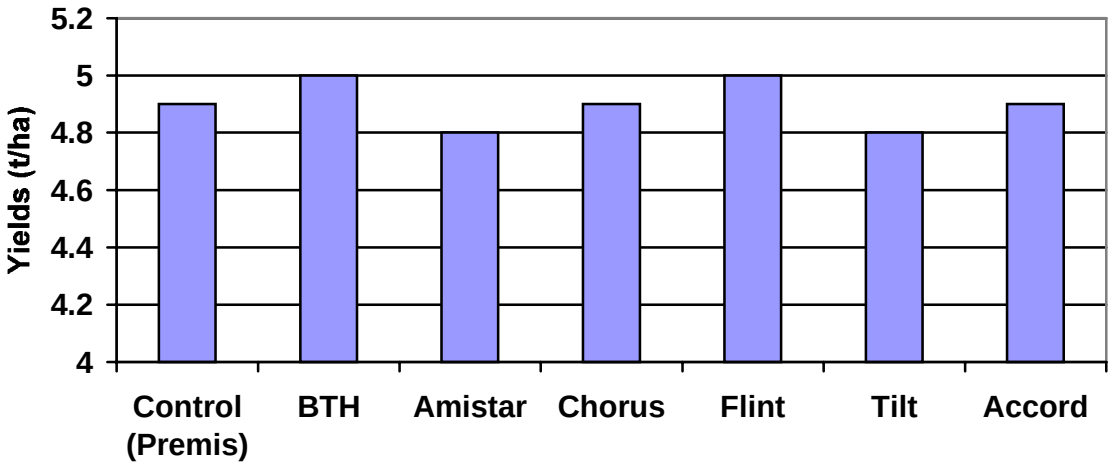


Figure 2: Gairdner barley yields when treated with six different foliar-applied fungicides at the Rupanyup site. LSD 5% = 0.3.



Interpretation
A severe SFNB outbreak did not occur in 2001 as predicted. The late break limited inoculum build up early in the season and the cool dry finish was also unsuitable for SFNB (warm moist conditions favour this disease).

The lack of a yield or grain quality response to fungicide treatments may be attributed to the low disease pressure situation.

BCG will repeated this work in a season with conditions more conducive to a SFNB outbreakepidemic.

Product descriptions:
Premis (triticonazole): Group C fungicide. Registered for the control of loose, covered and flag smut in barley.
Real (triticonazole): Group C fungicide. Registered for controlling, scald, mildew, leaf and stripe rust
Armour (flutriafol): Group C fungicide. Registered for scald, mildew, stripe rust, smut and Septoria control.
Thiraflo (thiram): Group Y (multi-site activity). Has activity on the Net Form of Net Blotch but not the Spot Form.
Impact (flutriafol): Group C fungicide. Useful together with a protectant for the control of Septoria. Has some activity on rust. It is registered in barley.
Accord (triadimefon): Group C fungicide. An old triazole fungicide. Activity on mildew and rust. It is registered in barley and wheat.
BTH (benzothiadiazole): An experimental compound under investigation by Syngenta. It activates the plants innate defence compounds so that they can counter attacks by pathogens.
Amistar (azoxystrobin): Group K fungicide. Systemic, protectant and eradicant activity. Very good on rust and Septoria. Not registered in barley.
Chorus (cyprodinil): Group I fungicide. Primarily a protectant. Good for eyespot, mildew, scald and net blotch. Not registered in barley.
Flint (trifloxystrobin): Group K fungicide. Active on mildew, scald and net blotch. Active on rust, good on Septoria. Limited eradicant activity. Not registered in barley.
Tilt (propiconazole): Group C fungicide. An older fungicide belonging to the triazole group. Has some activity on rusts, Septoria, scald and yellow leaf spot. It is registered in barley.

Commercial Practice

The large increase in Spot Form of Net blotch in Victorian crops did not incur in 2001 as predicted with seasonal conditions not conducive to an outbreak. The late break reduced inoculum build up early in the season and the cool dry finish was also unsuitable for SFNB (warm moist conditions favour this disease).

SFNB is not seed-borne and seed-applied fungicides are not effective against this disease (including systemics). If considering foliar-applied fungicides the most effective time to apply will be just after flag leaf emergence (as it is the top three leaves of the plant which contribute greatest to grain-fill). Research in WA and SA indicates that the most effective foliar-fungicide to control SFNB is Tilt (propiconazole). In Europe, successful control of Net Blotch is being achieved with new Strobilurin chemistry (Group K fungicides).

An integrated approach to controlling SFNB should be adopted including establishing sound rotations, preventing volunteer barley and barley grass growth over summer and autumn and reducing the level of infected stubble by grazing, cultivating or burning.