Wheat: Susceptibility of varieties to common root rot.

Sharon Taylor and Catherine Evans, CWFS.

Key Messages

- Common root rot (CRR) is a fungal disease that has the potential to reduce susceptible wheat, barley and oat yields
- Moderately resistant CRR varieties, such as Strzelecki and Sunstate, did not suffer grain yield or grain quality losses due to CRR
- Drysdale, Combat and Hunter showed moderate resistance to CRR, although as yet they have no disease rating

Why do the trial?

The aim of this trial was to evaluate the susceptibility of new wheat varieties, which currently have insufficient trial data to provide a disease score, to CRR compared with varieties with known disease ratings.

How was it done?

The trial site was established on a property 12 km west of Nyngan, NSW. The trial site consisted of two blocks, Block A and Block B. Prior to sowing, both blocks were tested for diseases levels, which showed that Block A had a low level of CRR whilst Block B had a high level of CRR. CRR is caused by a fungus, *Bipolaris sorokiniana,* which causes browning of the roots, particularly on the sub-crown intenode, in wheat, barley and oats. Cereal varieties vary in their susceptibility to CRR, with moderately resistant varieties unlikely to suffer yield loss.

Due to the different levels of CRR in the two blocks the same varieties were sown in each block to determine each variety's susceptibility or resistance to the disease. The varieties used and their disease scores for CRR (1 = susceptible, 9 = resistant) were Strzelecki (7), Sunstate (6), Drysdale (?), Combat (?) and Hunter (?). All varieties were sown at 35 kg/ha on the 26^{lh} June 2004 with 100 kg/ha DAP fertiliser (district rates). The only measurements taken for this trial were grain yield and grain quality.

What happened?

Results are shown in Table 1.

Table 1: Grain yield and grain quality results from the CRR trial at Nyngan, NSW.

Variety	Yield (t/ha) Block A	Yield (t/ha) Block B	Protein (%) Block A	Protein (%) Block B	Test Weight Block A	Test Weight Block B
Combat	0.68	0.52	16.85	17.32	74.67	74.67
Drysdale	0.54	0.37	16.92	17.40	75.33	75.50
Hunter	0.62	0.41	15.82	16.78	73.17	74.33
Strzelecki	0.73	0.40	16.40	17.47	74.50	72.50
Sunstate	0.63	0.43	17.07	17.50	76.83	76.32
*Significance (variety*block)*	*NO*		*NO*		*NO*	

What does this mean?

The grain yield and grain quality results in Table 1 show that the yield, protein and test weight of each variety does not significantly differ from Block A to Block B. The two varieties with known disease scores, Strzelecki (7) and Sunstate (6), have confirmed in this trial that they are moderately resistant to CRR as no significant yield, protein or test weight losses have occurred due to CRR in Block B. The three varieties without any disease scores, Drysdale, Combat and Hunter, have shown that they could also be moderately resistant to CRR as their yield, protein and test weight have stayed the same across Blocks A and B.

Although this trial has found that Drysdale, Combat and Hunter can maintain their grain yield and quality in the presence of CRR it is not being recommended by CWFS that farmers sow these varieties in known CRR paddocks, as disease scores have not been published for these varieties. In a paddock with known CRR problems it is recommended that resistant wheat varieties are sown, such as Strzelecki and Sunstate, or that break crops are included in the rotation, such as pulses, oilseeds or pasture legumes. Host grass weeds should also be controlled.

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Rainfall 2004
Av. Annual Total: 444 mm
Av. Growing Season: 192 mm
Actual annual total: 258 mm
Actual growing season: 111 mm
Plot size
1.8 m x 30 m
Other factors
The major yield limiting factor for 2004 was drought.