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DEPARTMENT OF AGRICULTURE

Western Australia

EXPERIMENTAL SUMMARY 1977

Septoria Diseases of Wheat

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SEPTORIA DISEASES OF WHEAT

The Effect of Septoria nodorum on Yield of 125 Wheat Cultivars

The aim of this experiment was as described for that of 1976. There were some modifications to the treatments which were as follows:

- (a) Most of the cultivars were 'new' and
- (b) Three levels of Septoria attack were set up:-
 1. Low: cover sprayed throughout the season with the fungicide Difolatan.
 2. Moderate: inoculated with Septoria three times, followed at heading out by cover spraying with Difolatan.
 3. Severe: inoculated four times no fungicide.

The 125 entries were sown as hill plots with the three Septoria environments as main plots in a split-plot design. There were four replications and the experiment was sown at two sites - South Perth and Badgingarra.

Results

Data has yet to be fully measured and analysed but it is quite clear that very large effects of treatment are apparent and that it seems much more likely that there will be a significant cv x environment interaction this year. A few selected entries taken from the S. Perth experiment illustrate the main effects (table 1).

Septoria ratings, including Flag leaf rating at 20 days after anthesis (S. Perth), taken at a single visit (at Badgingarra) and head infection ratings were very variable and indicate that field ratings are of little value in a breeding programs.

The Effect of Difolatan Sprays on Yield of Gamenya and Egret

This experiment examined the feasibility of economic control of Septoria using Difolatan applied:-

- (a) At growth stage 8-9 (Feeke's scale)
- (b) At 9-10
- (c) At both stages

Plots were split for the two cultivars Gamenya and Egret (Egret shows moderate resistance to S. tritici). There were five replications and the experiment was repeated at three sites near Katanning. At a site near Greenhills the experiment was modified. Only one application of fungicide was made at growth stage 10.4 - 10.5.1 but four different fungicides were tested.

Results

At Greenhills very little Septoria was present at spraying and there were no differences between fungicides. The only significant effect was the yield of Egret: 123% of that of Gamenya. At Katanning the sites were all infected by Septoria (mostly S. tritici) when spraying commenced. KA 18 near Borden was already showing damage due to water stress and had a very light infection. KA 19 was light to moderately infected at first spray but showed little water stress until assessment was made at growth stage 11.1. KA 20 was similar but became stressed by the time of the second spray.

Fungicide application had no apparent effect on Septoria infection or water stress.

There were nevertheless consistent effects of the treatment on yield (Table 2). KA 18 grew under near drought conditions until the last assessment was made, but still shows the same trend as KA 19 and 20.

Conditions at Katanning were dry and unfavourable for Septoria in 1977. From the disease scores taken at growth stage 11.1, I would not have expected any effect on yield. Rain fell in the latter part of crop maturation however, and it is conceivable that a late attack of S. nodorum on the glumes may have been the cause of the response to Difolatan. The lack of any differential effect on Egret would also support S. nodorum as the most likely cause. Egret showing no resistance to S. nodorum but good resistance to S. tritici.

TABLE 1 Reaction of six cultivars to three levels of infection by S. nodorum

Cultivar	Leaf Score (%)			Head Score (%)			Yield (g)			1000 Kernel wt. (g)		
	1	2	3	1	2	3	1	2	3	1	2	3
Gamenya	3	20	56	1	34	36	80	40	36	42	26	24
Darkan	3	11	21	2	14	20	75	60	44	55	44	34
Kondut	24	21	23	4	3	20	69	49	35	52	41	41
Iassul	3	9	8	1	6	6	65	66	50	53	51	47
Idaho	2	9	10	1	18	38	58	47	43	38	32	35
Egret	6	35	78	3	19	36	64	31	28	38	23	21

- (1) Fungicide protected
- (2) Inoculated to heading out (3 x)
- (3) Inoculated to grain filling (5 x)

TABLE 2 Yield (t. ha⁻¹) of Difolatan treated wheat at Katanning 1977.

Treatment	KA 18		KA 19		KA 20	
	t	%	t	%	t	%
Nil						
Egret	1.74		2.30		1.65	
Gamenya	1.85		1.98		1.49	
Mean	1.79		2.14		1.57	
1 kg/ha ⁻¹ Difolatan (G.S. 8)						
Egret	1.84		2.45		1.83	
Gamenya	2.00		2.09		1.54	
Mean	1.92	107	2.27	106	1.69	108
1 kg/ha ⁻¹ Difolatan (G.S. 10)						
Egret	1.73		2.46		1.86	
Gamenya	2.00		2.08		1.58	
Mean	1.98	102	2.27	106	1.72	110
2 kg/ha ⁻¹ Difolatan (G.S. 8, 10)						
Egret	1.80		2.58		1.96	
Gamenya	2.00		2.17		1.74	
Mean	1.90	106	2.38	111	1.85	118
Egret mean	1.79	92	2.45	118	1.83	115
Gamenya mean	1.94		2.08		1.59	