1979

1979 Field crops experiments

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SUMMARY OF EXPERIMENTAL RESULTS 1979

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711

Field Crops Experiments

Resistance of lupins to *Phomopsis leptostromiformis* (P.McR. Wood, Plant Research Division, J. Hamblin, Plant Production Division).

Stage 1-2 Plant Breeders' Plots

Phomopsis infection of 96 entries (replicated) was assessed just prior to harvest at seven sites - Chapman Valley Research Station (CVRS), Badgingarra Research Station (BRS), Wongan Hills Research Station (WHRS), Avondale Research Station (ARS), Mount Barker Research Station (MBRS), Esperance Downs Research Station (EDRS) and on a farmer's property at Eradu.

At four sites, CVRS, Eradu, MBRS and EDRS, only very low levels of infection were apparent. At the other three sites, the currently available varieties rarely had lower infection figures than average, and commonly had higher Phomopsis levels (see table 1).

Table 1: Overall level of Phomopsis for best genotypes and currently available varieties

Variety	Phomopsis level
Mean	1.95
Unicrop	2.52
Illyarie	2.03
Uniharvest	2.01
Marri	2.01
70A61-8	0.85
62-3	1.12
66A02.4.4.11	1.22
71A33-4	1.20
71A33.7	1.22
72A07.5	1.22
72A04-5	1.27
72A08-2	1.30
66A02.4.4.2	1.32
70A62-27	1.32
72A04-6	1.32

Phomopsis data from 81 genotypes in 1978 S1-1 trials was compared with that of the same genotypes in the 1979 S1-2 trials. Heritability of Phomopsis resistance was estimated at 55% which indicates that selection for this factor is possible (J. Hamblin, personal communication).

Lupin Disease Nurseries

Only very low Phomopsis infection was evident at CVRS and MBRS. The nursery at BRS was not able to be assessed due to herbicide damage. The Phomopsis infection figures from WHRS and Northam Research Station have not yet been compiled.

Fungicide Spray Trials

At BRS and MBRS, there were two identical S1-2 trials (four replicates), with two replicates at each site sprayed with a mixture of benomyl and mancozeb. At BRS there was early light-brown spot infection (Pleiochaeta setosa) which was partially controlled with the fungicide, as was Phomopsis. Yields of the treated plots were 25% higher than untreated controls, presumably as a result of control of the two fungi (see table 2).

At MBRS, several fungi were implicated in a leaf disorder which was partially controlled with fungicidal sprays. The resultant yield increase can be attributed to this (see table 2).

Table 2: The effect of fungicides on Phomopsis and leaf pathogens

	BRS		MBRS	
	Fungicidal sprays	Untreated control	Fungicidal sprays	Untreated control
Mean yield (tonnes/ha)	2.24	1.78	2.06	1.60
Mean leaf disease rating	0.13	0.28	0.76	1.18
Mean Phomopsis rating (0-5)	0.94	2.36	Traces only	

Slashing of Lupins

In a cooperative trial with Moora District Office and the Animal Health Division, the effect on Phomopsis levels of time of slashing of WA Blue lupins is being monitored. The results of the first sampling (early December) are shown in table 3.

Table 3: The effect of slashing on Phomopsis levels

Time of slashing	Positive Phomopsis isolations (%)
October 1	53
8	51
15	44
22	32
29	47
November 5	81
Control (Standing crop)	89

Sheep feeding trials to test for toxicity levels are in progress. The initial results show that for successful control of Phomopsis, the time of slashing is critical, and in this trial was October 22.

Black Spot of Peas (Ascochyta/Mycosphaerella Complex)

Fungicide sprays (Mancozeb/benomyl mixture) were applied in an attempt to establish the effect of disease on yield.

The results are summarised in the table below. Statistical analysis is not yet available.

Treatment*	Disease Score (0-5) (Means of 3 reps.)			Yield (kg)
	Lower stem	Lower leaves	Upper leaves	
1	3.6	4.3	1.8	4.0
2	3.7	4.3	2.0	3.9
3	3.5	4.1	2.1	5.1
4	2.3	3.8	1.3	5.7
5	1.6	2.4	0.7	7.5
6	0.6	1.0	0.2	7.0
7	0.2	0.1	0.1	7.8
8	0.8	0.9	0.3	8.5
9	1.8	1.8	0.3	8.0
Control	4.1	4.8	2.2	3.3
Control	4.3	4.9	2.5	4.2
Control	4.3	4.9	2.5	3.9

*1. Spray applied 30 days after emergence
2. 30 + 40
3. 30 + 40 + 50
4. 30 + 40 + 50 + 60
5. 30 + 40 + 50 + 60 + 70
6. 30 + 40 + 50 + 60 + 70 + 80
7. 30 + 40 + 50 + 60 + 70 + 80 + 90
8. 40 + 50 + 60 + 70 + 80 + 90
9. 50 + 60 + 70 + 80 + 90

Thus treatments 4 to 9 gave good control of both leaf and stem disease, with mean yields 95% higher than that of untreated controls. From these results it appears likely that two sprays applied at 60 and 70 days after emergence has potential as a means of economical control of the disease. However, further trials are needed to establish this.