1981

Loose smut of barley. Sub-clover root rot. Rapeseed diseases.

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DEPARTMENT OF AGRICULTURE
WESTERN AUSTRALIA

SUMMARY OF EXPERIMENTAL RESULTS 1981

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LOOSE SMUT OF BARLEY

FUNGICIDAL CONTROL OF LOOSE SMUT IN BARLEY

AIM

To further test the effectiveness of the fungicide pickle Erex for control of loose smut in barley. To determine if the relatively poor performance of Erex in the 1979 and 1980 trials is related to a particular loose smut strain or a particular seed line.

LOCALITIES

Mt Barker Research Station (81MT31); Darkan (81NA29).

TREATMENTS

1. Seed line 1 - No seed treatment control
2. Seed line 1 - Panoram dust 25 at 150 g/100 kg
3. Seed line 1 - Erex dust 15 at 100 g/100 kg
4. Seed line 2 - No seed treatment control
5. Seed line 2 - Panoram dust 25 at 150 g/100 kg
6. Seed line 2 - Erex dust 15 at 100 g/100 kg
7. Seed line 3 - No seed treatment control
8. Seed line 3 - Panoram dust 25 at 150 g/100 kg
9. Seed line 3 - Erex dust 15 at 100 g/100 kg

Seed infection was assessed by embryo staining with seed line 1 at 1.7 per cent; seed line 2 at 2.6 per cent and seed line 3 at 6.8 per cent.

Trials were nine treatments x four replications in a randomised block design, with area of each plot being 2.1 m x 60 m for Darkan and 2.1 m x 40 m for Mt Barker.

ASSESSMENTS

Plant density counts were made 10 days after emergence, the per cent smutted heads were recorded at flowering, and grain yields were recorded at harvest.

RESULTS AND COMMENTS

A summary of results is shown in Table 1.

Reasonable levels of loose smut head infection were obtained for both sites for the untreated controls of all three seed lines. Head smut levels for the controls were signifiantly higher compared to where either Panoram or Erex seed treatments had been used. The Erex treatment showed significantly more smutted heads compared to the Panoram treatment. Three years of field results have consistently shown that while Erex does give reasonable control of seed-borne barley loose smut it is still significantly inferior to other registered products and as such it is no longer recommended for barley or wheat loose smut control in Western Australia. There was no indication that the relatively poor performance of Erex in the 1979, 1980 and 1981 trials was in any way related to a particular loose smut strain or to a particular seed line.

Table 1. Fungicidal control of loose smut (Ustilago nuda) in barley. Mean number of smutted heads per treatment and mean harvest yields (kg/ha) per treatment for Mt Barker (81MT31) and Darkan (81NA29).

Treatment	Smutted head counts				Harvest yields (kg/ha)	
	Mt Barker		Darkan			
	Mean count	% smut	Mean count	% smut	Mt Barker	Darkan
Seed line 1 - Control	242.7	0.92	333.2	0.72	1173	1418
Seed line 1 - Panoram	2.5	0.01	21.5	0.05	1223	1342
Seed line 1 - Erex	20.5	0.08	44.7	0.10	1316	1495
Seed line 2 - Control	431.0	1.63	465.0	1.01	1486	1504
Seed line 2 - Panoram	5.0	0.02	22.7	0.05	1496	1371
Seed line 2 - Erex	17.7	0.07	80.0	0.17	1400	1628
Seed line 3 - Control	394.7	1.50	741.0	1.60	1376	1399
Seed line 3 - Panoram	8.5	0.03	59.0	0.13	1400	1504
Seed line 3 - Erex	27.0	0.10	105.5	0.23	1164	1542

Analysis of results for number of smutted heads shown as log transformed data with re-transformed means in brackets

	Mt Barker	Darkan
Control	5.808 (332.81)	6.163 (474.64)
Panoram	1.452 (4.27)	3.334 (28.11)
Erex	2.967 (19.44)	4.230 (68.71)
Significance	***	***
LSD p 0.05	0.345	0.303

Analysis of results for harvest yields
Mt Barker, NS
Darkan, NS

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SUB-CLOVER ROOT ROT

FUNGICIDAL CONTROL OF PYTHIUM SP.

AIM

To attempt to eliminate Pythium spp. from subterranean clover roots and then monitor changes in the levels of tap and lateral root rot and the effects on plant size.

LOCALITIES

Denmark (81AL37); Scott River (81BU3).

TREATMENTS

Main plots

1. Nil treatment
2. 0.25 per cent Ridomil seed treatment
3. Ridomil 1.5 g/m^2 (0.075 g ai/m^2)
4. Ridomil 3.0 g/m^2 (0.015 g ai/m^2)
5. Ridomil 12.0 g/m^2 (0.600 g ai/m^2)

Sub-plots

1. Woogenellup
2. Mt Barker
3. 39327 YB
4. Dinninup
5. Daliak

ASSESSMENTS

Scott River was sown on May 6, 1981 and Denmark on May 13, 1981. Emergence counts were recorded on June 15, 1981 and June 24, 1981 respectively, and on the same dates approximately 25 plants were sampled per row and assessed for levels of tap and lateral root rot, and whole plant dry weights were recorded.

RESULTS AND COMMENTS

A summary of results is shown in Table 2a and b, and 3a and b.

From Tables 2a and b it can be seen that the Ridomil seed and soil drench treatments had no significant effects on tap and lateral root system root rot indices, nor any significant effects upon plant dry weights and number of plants germinated.

From Tables 3a and b it can be seen that there were differences between some of the sub. clover varieties in relation to the levels of tap and lateral root rot, and in relation to total plant dry weights and the number of plants germinated.

Table 2a and b. Effects of Ridomil seed and soil drench treatments on tap and lateral root rot indices, plant dry weights, and number of plants germinated

a) Scott River

Treatment	Mean tap root rot index	Mean lateral root rot index	Mean total plant dry weight (mg)	Mean number of plants germinated
Control	61.0	59.4	25.1	50.3
Ridomil 5W @ 0.25% seed treatment	58.9	58.4	27.5	46.3
Ridomil 5W drench 1.5 g m^2	56.2	58.3	28.4	50.7
Ridomil 5W drench 3.0 g m^2	57.6	63.3	25.2	48.4
Ridomil 5W drench 12.0 g m^2	54.1	51.5	23.4	47.2
Significance	NS	NS	NS	NS

b) Denmark

Treatment	Mean tap root rot index	Mean lateral root rot index	Mean total plant dry weight (mg)	Mean number of plants germinated
Control	63.9	61.3	9.2	30.5
Ridomil 5W @ 0.25% seed treatment	55.5	58.1	10.3	27.5
Ridomil 5W drench 1.5 g m^2	61.3	62.3	8.9	34.9
Ridomil 5W drench 3.0 g m^2	59.0	62.6	9.6	37.1
Ridomil 5W drench 12.0 g m^2	61.8	66.4	7.1	30.8
Significance	NS	NS	NS	NS

Table 3a and b. Effects of sub. clover variety on tap and lateral root rot indices, plant dry weights, and number of plants germinated

a) Scott River

Treatment (variety)	Mean tap root rot index	Mean lateral root rot index	Mean total plant dry weight (mg)	Mean number of plants germinated
Woogenellup	61.1	60.9	28.7	42.3
Mt Barker	62.2	57.6	27.3	47.6
39327 YB	53.7	60.0	35.0	44.4
Dinninup	53.0	52.1	20.9	52.5
Daliak	57.8	60.4	17.6	56.2
Significance	***	**	***	***
LSD p 0.05	2.05	4.93	2.00	4.16

b) Denmark

Treatment (variety)	Mean tap root rot index	Mean lateral root rot index	Mean total plant dry weight (mg)	Mean number of plants germinated
Woogenellup	61.3	62.2	11.0	34.2
Mt Barker	61.6	64.5	8.0	24.0
39327 YB	59.0	61.4	13.3	32.5
Dinninup	63.3	63.3	6.3	29.0
Daliak	56.1	59.3	6.4	41.0
Significance	NS	NS	***	***
LSD p 0.05			1.00	4.17

RAPESEED DISEASES

1. Rapeseed varieties/Lancelin blackleg strain

AIM

To test the susceptibility of six rapeseed varieties to the Lancelin strain of blackleg.

LOCALITY

Lancelin, 81M024

TREATMENTS

The six varieties used were Wesroona, Wesbell, Tower, 76N219-6; 75N70x5 N4; 76N219M17.

Trial was sown on June 3, 1981. 190 kg/ha superphosphate and 45 kg/ha Agran 34/0 were applied at seeding. A further 150 kg/ha of Urea was applied in late July.

ASSESSMENTS

Plots were assessed for levels of both blackleg and white leaf spot diseases. Flowering and maturity times were recorded, and harvest yields were taken.

RESULTS AND COMMENTS

Blackleg disease failed to develop sufficiently for any assessments to be made.

White leaf spot was severe from mid-July onwards, but there were no differences between varieties.

A summary of flowering and maturity times for the six varieties is shown in Table 4.

Harvest yields are shown in the attached Table 5. Wesroona and 76N219-6 were the highest yielding varieties, followed by 76N219M17. Seed yields generally were extremely poor.

Table 4. Flowering and maturity times, Lancelin (81M024), for the six rapeseed varieties

Variety and assessment date	Flowering and maturity times
September 2, 1981	
Wesroona	Initiation to beginning of flowering
Wesbell	50 per cent initiation and rest in rosette stage
Tower	Initiation with odd plants beginning to flower (later than Wesroona)
76N219-6	Initiation to beginning of flowering
75N70x5N4	Initiation to beginning of flowering
76N219M17	Initiation only
September 16, 1981	
Wesroona	Mid-flowering to late mid-flowering
Wesbell	Most initiated and very few beginning to flower
Tower	Middle flowering
76N219-6	Late middle flowering (very uneven and some just initiating)
75N70x5N4	Early to middle flowering
76N219M17	Late to middle flowering
October 21, 1981	
Wesroona	Green pods
Wesbell	Still flowering (very uneven, some plants finished flowering but others not started)
Tower	Green pods - later than Wesroona
76N219-6	Green pods - some drying off
75N70x5N4	Most green pods (very uneven, some end flowering still)
76N219M17	Green pods and some drying - earlier than Wesroona

Table 5. Harvest yields at Lancelin for the six rapeseed varieties

Variety	Harvest yield (mean) (kg/ha)
Wesroona	156
Wesbell	97
Tower	122
76N219-6	156
75N70x5N4	115
76N219M17	142
LSD (p 0.05)	NS

2. Rapeseed varieties/Sclerotinia disease

AIM

To compare the susceptibilities of six rapeseed lines to Sclerotinia. To investigate the effects of sowing date on disease severity.

LOCALITY

Mt Barker Research Station (81MT32)

TREATMENTS

The six varieties used were Wesbell, 73N02-278, Wesroona, Wesway, 75N70x5MN, 76N219M45. There was an early planting (June 30, 1981) and a late planting (July 30, 1981) of all six varieties.

ASSESSMENTS

Plots were assessed for levels of Sclerotinia and blackleg stem canker. Harvest yields were not recorded.

RESULTS AND COMMENTS

Sclerotinia failed to develop in this trial even though trial site was where Sclerotinia had been very severe on rapeseed in the previous season.

Results of blackleg stem canker assessments are shown in Table 6. With the exception of 75N70x5MN and 76N219M45 all varieties were completely wiped out for the first time of planting. All varieties had better plant stands and lower blackleg canker levels for the second time of planting compared to the first time of planting. For the second time of planting 75N70x5MN had the lowest level of lodging and the highest plant density of the six varieties.

Table 6. Blackleg crown canker assessments for both times of planting of trial 81MT32

Rapeseed	First planting (July 7, 1981)				Second planting				
	% plants blackleg			Density rating 0-5	% plants blackleg			% lodging from blackleg	Density rating 0-5
	Healthy	Mild	Severe		Healthy	Mild	Severe		
Wesbell	13	46	41	*WO	29^{B+}	26^{A}	46^{A}	44^{B}	1.8^{B}
73N02-278	-	-	-	WO	26^{B}	35^{A}	39^{A}	54^{B}	1.6^{B}
Wesroona	15	14	51	WO	47^{A}	32^{A}	21^{B}	40^{B}	1.8^{B}
Wesway	-	-	-	WO	26^{B}	33^{A}	41^{A}	80^{A}	0.6^{C}
75N70x5MN	37	40	23	1.2	60^{A}	27^{A}	13^{B}	9^{C}	3.0^{A}
76N219M45	22	52	26	0.8	50^{A}	29^{A}	21^{B}	26^{BC}	2.2^{B}

*WO = Wiped out

+Student-Newnan-Kuels Test

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3. White leaf spot and grey stem of rapeseed

AIM

To monitor the disease survival, spread and progress of white leaf spot and grey stem of rapeseed caused by Pseudocercosporella capsallae. To attempt control with fungicides and obtain some estmate of losses caused by this disease.

LOCALITY

Mt Barker Research Station 81MT33

TREATMENTS

1. Tower rapeseed - No treatment
2. Tower rapeseed - Benlate sprays for full disease control
3. Tower rapeseed - Benlate sprays for partial disease control
4. Wesroona rapeseed - No treatment
5. Wesroona rapeseed - Benlate sprays for full disease control
6. Wesroona rapeseed - Benlate sprays for partial disease control

COMMENTS

Trial was abandonmed mid-term mainly due to poor plant density.