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Septoria diseases of wheat

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DEPARTMENT OF AGRICULTURE
WESTERN AUSTRALIA

SUMMARY OF EXPERIMENTAL RESULTS, 1981

SEPTORIA DISEASES OF WHEAT

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EFFECT OF STUBBLE ON SEPTORIA INFECTION

Following the increase in infection brought on by stubble amendment at Badgingarra in 1980 experiments of similar design were sown in 1981. Trials were in conjunction with identical studies on barley diseases, barley plots serving as buffers for the wheat experiments and vice versa.

A mixture of S. nodorum and S. tritici infested stubble was used on all experiments at 30 g/m².

Development of Septoria (Table 1) began more quickly in stubble amended plots but at Badgingarra the nil stubble plots quickly caught up in contrast to 1981. At the other sites nil plots had less disease than stubble plots for a longer period but even so, there were no effects on yield or components of yield (Table 2).

Though inoculum of S. tritici was also included this year this pathogen was dominated by S. nodorum even at Mt Barker. This was probably due to seasonal conditions.

WHEAT - POTENTIAL YIELD EXPERIMENTS

Development of disease in the four surviving experiments is shown in Tables 3, 4, 5. The experiment at Newdegate was lost to weeds as was the first sowing at Chapman, consequently only second and late sowings were monitored for disease.

As previously, Septoria nodorum had a profound effect on the crop at Badgingarra in first and second sowings, with some effect on the late sowing. At Kojonup, there were small effects on the first sowing only, since conditions remained unusually dry for this location. There was no effect of fungicide at Wongan and Esperance.

FUNGICIDES

There were no significant effects of Erex (Bayleton seed dressing) or Bayleton as a spray just after earing on yield of Gamenya or Miling wheat at Badgingarra (Table 6). There may have been a small effect of Erex on functional leaf area of Miling.

There were no significant effects on yield of a range of fungicides applied just after earing on Gamenya wheat at Badgingarra but two new systemic materials, proconazole (TILT®) and prochloraz (Sportak®) appeared promising in terms of extending the period of functional leaf cover. This is useful because they are the first systemic fungicides to reduce S. nodorum infection at Badgingarra.

TABLE 1 Effect of stubble amendment on percentage functional leaf area at intervals through the growing season

	Avondale			Badgingarra			Chapman		
	Date	Nil	Stub.	Date	Nil	Stub.	Date	Nil	Stub.
Leaf* 1	30/7	100	88	9/7	99	98	9/7	97	97
2		100	80		93	68		77	35
3		100	66		70	41		32	3
0		0	0		0	0		10	0
L1	11/8	99	97	22/7	97	96	14/8	98	97
2		90	52		86	81		72	68
3		77	9		55	37		18	10
4		53	0		40	3		0	0
L1	11/9	100	100	29/7	91	86	26/8	100	100
2		100	99		43	34		85	91
3		93	80		36	6		19	20
4		37	25		3	0		0	0
L1	7/10	99	99	14/8	99	99	11/9	99	98
2		94	83		79	77		61	62
3		68	53		32	19		22	8
4		17	0		2	0		0	0
L1	9/10	99	99	7/9	100	100	25/9	85	81
2		95	90		77	81		29	17
3		43	43		19	16		0	0
4		27	0		0	0		0	0
L1				29/9	94	92			
2					34	29			
3					3	3			
4					0	0			

Table 1 (Cont'd)

	Mt Barker			Newdegate			Wongan		
	Date	Nil	Stub.	Date	Nil	Stub.	Date	Nil	Stub
Leaf 1	16/6	100	99	15/7	98	97	22/7	100	99
2		95	95		99	96		95	86
3					97	91		9	6
4					0	0		0	0
L1	8/7	98	98	21/8	99	99	14/8	98	97
2		97	94		90	84		51	45
3		88	74		76	52		8	3
4		61	25		48	5		0	0
L1	30/7	98	99	29/9	97	95	7/9	100	100
2		61	61		81	68		91	87
3		58	32		32	4		41	31
4		18	4		0	0		3	0
L1	6/8	99	98				1/10	96	92
2		95	76					67	46
3		73	29					11	3
4		48	2					0	0
L1	11/9	100	100						
2		97	97						
3		77	81						
4		34	24						
L1	23/10	88	78						
2		73	48						
3		14	4						
4		0	0						

Table 2. Effect of stubble amendment on wheat yields

	Yield kg ha ⁻¹	Ears/ m ²	Grains/ ear	Grain weight mg	Harvest index
Avondale	N* 1860	207	34.7	3.67	0.414
	ST 1932	241	31.9	3.39	0.376
Badgingarra	N 2024	241	29.1	3.37	0.464
	ST 2010	236	28.4	3.31	0.610
Chapman	N 1508	220	24.1	3.69	0.627
	ST 1473	222	23.0	3.70	0.584
Mt Barker	N 1838	223	41.3	4.13	0.343
	ST 1768	200	44.2	4.26	0.340
Newdegate	N 1342	160	30.5	3.17	0.439
	ST 1166	173	28.7	3.13	0.412
Wongan	N 1143	238	32.6	3.51	0.499
	ST 1098	228	30.5	3.51	0.499

N = nil; ST = stubble amended

Table 3. Wheat potential yield: % functional leaf lamina area - early sowing

	Badgingarra Nil Spray				Kojonup Nil Spray			Esperance Nil Spray			Wongan Nil Spray		
Date:	21/7	L1*	99	99	15/7	98	97	4/8	66	81	28/8	99	100
Age (days):	56	L2	96	95	61	68	72	89	51	60	95	84	93
Growth stage: (Zadoks)	Z16/ 23	L3 L4	61 8	71 15	Z14/ 22	87 21	89 20	Z16/ 23	36 2	40 4	Z33	25	59 22
	28/8	L1	88	99	28/8	97	99	28/8	98	99	1/10	79	97
	94	L2	55	89	105	88	87	113	90	88	129	13	62
	Z33	L3	7	38	Z32	35	47	Z33	60	57	Z71	0	9
		L4	0	8		0	6		10	15		0	0
	17/9	L1	79	97	25/9	100	100	15/9	99	100			
	114	L2	8	62	133	91	93	131	86	87			
	Z62	L3	0	12	Z55	52	79	Z34/ 57	17	42			
		L4	0	0		2			0	4			
	24/9	L1	58	95	26/10	72	91						
	121	L2	1	49	164	20	46						
	Z71	L3	0	0	Z75	0	5						
		L4	0	0		0	0						
	29/9	L1	28	95									
	126	L2	0	42									
	Z75	L3	0	0									
		L4	0	0									

*L1 = Leaf 1
(the youngest fully
expanded leaf)

Table 4. Wheat potential yield: % functional leaf lamina - second sowing

		Badgingarra Nil Spray			Kojonup Nil Spray			Esperance Nil Spray			Wongan Nil Spray		
Date:	21/7	L1*	98	98		98	99	28/8	98	99	28/8	98	99
Age (days):	34	L2	94	95	36	48	42	78	82	89	73	45	48
Growth Stage: (Zadoks)	Z12	L3	97	100	Z12	-	-	Z22/	57	70	Z22/	3	4
		L4	-	-		-	-	31	18	38	31	0	0
	28/8	L1	99	99		98	100	15/9	99	100	1/10	98	99
	72	L2	81	94	80	92	97	96	84	96	107	86	84
	Z22/	L3	32	72	Z24/	52	49	Z33/	53	82	Z61	33	43
	32	L4	0	15	31	2	0	44	5	32		0	2
	17/9	L1	100	100		100	100	23/10	71	82			
	92	L2	94	97	107	94	97	134	25	44			
	Z55	L3	62	85	Z43	80	87	Z65	0	1			
		L4	11	48		17	58		0	0			
	24/9	L1	99	100		92	98						
	99	L2	88	92	139	43	69						
	Z61	L3	49	72	Z73	3	18						
		L4	1	25		0	0						
	29/9	L1	81	93									
	121	L2	23	46									
	Z73	L3	0	10									
		L4	0	0									

*L1 = Leaf 1
(the youngest fully
expanded leaf)

Table 5. Wheat potential yield: % functional leaf lamina - late sowing

	Badgingarra Nil Spray				Kojonup Nil Spray			Esperance Nil Spray			Wongan Nil Spray		
Date:	28/8	L1*	98	99	28/8	99	99	28/8	100	100	28/8	99	99
Age (days):	51	L2	72	94	58	74	59	52	94	97	52	74	93
Growth Stage: (Zadoks)	Z14/ 24	L3 L4	14 0	75 21	Z14/ 25	47 0	50 4	Z14/ 23	82 59	90 68	Z15/ 23	31 3	57 12
	17/9	L1	100	100	25/9	100	100	15/9	99	100	1/10	100	100
	71	L2	98	100	86	97	98	70	84	90	86	98	99
	Z33/ 43	L3 L4	86 51	97 81	Z33/ 28	84 73	92 73	Z32	26	59	Z60	95	91
									0	12		65	70
	16/10	L1	97	98	26/10	97	98	23/10	94	97			
	100	L2	69	83	123	80	88	108	70	76			
	Z61	L3	15	44	Z61	39	51	Z61	15	31			
		L4	0	7		1	0		2	1			
	28/10	L1	26	30									
	112	L2	0	3									
	Z83	L3	0	0									
		L4	0	0									

*L1 = Leaf 1
(the youngest fully
expanded leaf)

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Table 6. 81BA48 Effect of Erex seed dressing and Bayleton sprays on % functional leaf lamina area at Badgingarra

		Gamanya				Miling			
		Nil	Seed/tr	Spray	Seed and spray	Nil	Seed/tr	Spray	Seed and spray
August 27	L1	96	96	-	-	97	98	-	-
	L2	62	66	-	-	69	84	-	-
	L3	11	11	-	-	11	31	-	-
	L4	0	0	-	-	0	1	-	-
September 17	L1	96	92	-	-	99	99	-	-
	L2	70	51	-	-	97	97	-	-
	L3	8	1	-	-	81	80	-	-
	L4	0	0	-	-	23	4	-	-
October 28		39	29	47	45	72	63	79	79
Yield (kg ha ⁻¹)		1963	2168	2102	2118	1995	2072	1931	2030 NS

8.

Table 7. 81BA47. Effect of various fungicides applied as a single spray at 259 on % functional leaf area at Badgingarra

	% functional leaf lamina		Yield (kg ha ⁻¹)	Grain weight (mg)
	1st score 18/9	2nd score 28/10		
Erex + Bayleton	47c	77b	1786	3.44
Bayleton	50b	77b	1654	2.94
Tilt	63a	90a	1843	3.36
Sportak	59a	89a	1576	3.18
Captafol	55b	86a	1638	3.23
Mancozeb	53b	83b	1731	3.38
Thibenzole	54b	80b	2096	3.27
Antracol	46c	77b	1784	3.37
Tilt	59a	90a	2046	3.51
Bayleton + Captafol	55b	85a	1878	3.37
Nil	44c	73c	1864	3.26
Nil	45c	73c	1590	3.44
	SED 4.16	SED 6.91	NS	NS