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77/W/CS/184 Cereal Cyst Nematode Study - Oats

Rothamsted Research

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77/W/CS/184

CEREAL CYST NEMATODE STUDY

Object: To study the effects of varieties, aldicarb and formalin on cereal cyst nematode (*Heterodera avenae*), the fungus *Entomophthora* and on the yield of oats - Woburn Butt Close.

Sponsor: T.D. Williams.

The second year, oats.

For previous year see 76/W/CS/184.

Design: 4 randomised blocks of 4 plots split into 4.

Whole plot dimensions: 2.13 x 21.0.

Treatments: All combinations of:-

Whole plots

1. VARIETY(77) Varieties and resistance to cereal cyst nematode:

NELSON/R Nelson (resistant)
TABARD/S Maris Tabard (susceptible)

2. ALDICARB(77) Aldicarb to seedbed (kg):

0
10

Sub plots

3. FORMALIN(76) Formalin applied in 1976 (1):

0
3000

4. FORMALIN(77) Formalin applied in 1977 (1):

0
3000

Basal applications: Manures: (20:14:14) at 380 kg combine drilled. Weedkillers: Paraquat at 0.84 kg ion in 280 l. Ioxynil at 0.63 kg with mecoprop at 1.9 kg in 340 l. 2, 4-D at 0.56 kg plus dichlorprop at 2.2 kg in 340 l.

Seed: Sown at 200 kg.

Cultivations, etc.: - Paraquat applied: 10 Aug, 1976. Rotary cultivated: 21 Sept. Ploughed: 15 Nov. Spring-tine cultivated with crumbler attached: 15 Feb, 1977. Formalin applied: 16 Feb. Aldicarb applied, and these plots only rotary cultivated, all plots spring-tine cultivated: 15 Mar. Spring-tine cultivated with crumbler attached, seed sown: 30 Mar. Ioxynil with mecoprop applied: 18 May. 2, 4-D with dichlorprop applied: 2 June. Combine harvested: 3 Sept.

- NOTES: (1) Plant samples were taken in May for measurements of fresh tops and root weights.
(2) Estimates were made in June of populations of *Heterodera avenae* remaining from the unhatched residues of the 1976 population.
(3) Soil samples were taken in July for counts of white females of *Heterodera avenae*.

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB(77)	0	10	MEAN	
VARIETY(77)				
NELSON/R	1.89	3.55	2.72	
TABARD/S	2.21	4.06	3.14	
MEAN	2.05	3.81	2.93	
FORMALIN(76)	0	3000	MEAN	
VARIETY(77)				
NELSON/R	2.66	2.78	2.72	
TABARD/S	3.17	3.11	3.14	
MEAN	2.92	2.94	2.93	
FORMALIN(76)	0	3000	MEAN	
ALDICARB(77)				
0	2.07	2.04	2.05	
10	3.76	3.85	3.81	
MEAN	2.92	2.94	2.93	
FORMALIN(77)	0	3000	MEAN	
VARIETY(77)				
NELSON/R	2.67	2.78	2.72	
TABARD/S	3.03	3.24	3.14	
MEAN	2.85	3.01	2.93	
FORMALIN(77)	0	3000	MEAN	
ALDICARB(77)				
0	1.94	2.16	2.05	
10	3.75	3.86	3.81	
MEAN	2.85	3.01	2.93	
FORMALIN(77)	0	3000	MEAN	
FORMALIN(76)				
0	2.81	3.02	2.92	
3000	2.89	3.00	2.94	
MEAN	2.85	3.01	2.93	
ALDICARB(77)	0		10	
FORMALIN(76)	0	3000	0	3000
VARIETY(77)				
NELSON/R	1.92	1.87	3.41	3.70
TABARD/S	2.22	2.20	4.12	4.01
ALDICARB(77)	0		10	
FORMALIN(77)	0	3000	0	3000
VARIETY(77)				
NELSON/R	1.76	2.02	3.57	3.54
TABARD/S	2.12	2.30	3.93	4.19

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GRAIN TONNES/HECTARE

***** TABLES OF MEANS *****

FORMALIN(76)	0		3000		
FORMALIN(77)	0	3000	0	3000	
VARIETY(77)					
NELSON/R	2.56	2.77	2.78	2.79	
TABARD/S	3.06	3.28	3.00	3.21	
FORMALIN(76)	0		3000		
FORMALIN(77)	0	3000	0	3000	
ALDICARB(77)					
0	1.95	2.19	1.94	2.13	
10	3.67	3.85	3.83	3.87	
	FORMALIN(76)	0		3000	
	FORMALIN(77)	0	3000	0	3000
VARIETY(77)	ALDICARB(77)				
NELSON/R	0	1.69	2.15	1.84	1.89
	10	3.43	3.38	3.71	3.69
TABARD/S	0	2.21	2.23	2.04	2.36
	10	3.91	4.32	3.96	4.06

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	VARIETY(77)	ALDICARB(77)	FORMALIN(76)	FORMALIN(77)
-----	-----	-----	-----	-----
SED	0.100	0.100	0.075	0.075
TABLE	VARIETY(77)	VARIETY(77)	ALDICARB(77)	VARIETY(77)
	ALDICARB(77)	FORMALIN(76)	FORMALIN(76)	FORMALIN(77)
-----	-----	-----	-----	-----
SED	0.142	0.126	0.126	0.126
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY(77)		0.107		0.107
ALDICARB(77)			0.107	
TABLE	ALDICARB(77)	FORMALIN(76)	VARIETY(77)	VARIETY(77)
	FORMALIN(77)	FORMALIN(77)	ALDICARB(77)	ALDICARB(77)
			FORMALIN(76)	FORMALIN(77)
-----	-----	-----	-----	-----
SED	0.126	0.107	0.178	0.178
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
ALDICARB(77)	0.107			
VARIETY(77).ALDICARB(77)			0.151	0.151
TABLE	VARIETY(77)	ALDICARB(77)	VARIETY(77)	
	FORMALIN(76)	FORMALIN(76)	ALDICARB(77)	
	FORMALIN(77)	FORMALIN(77)	FORMALIN(76)	
			FORMALIN(77)	
-----	-----	-----	-----	-----
SED	0.165	0.165	0.233	
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
VARIETY(77)	0.151			
ALDICARB(77)		0.151		
VARIETY(77).ALDICARB(77)			0.214	

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GRAIN TONNES/HECTARE

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	9	0.201	6.8
BLOCK.WP.SP	36	0.302	10.3

GRAIN MEAN DM% 80.4

STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

ALDICARB(77)	0	10	MEAN
VARIETY(77)			
NELSON/R	1.64	2.64	2.14
TABARD/S	1.72	2.85	2.28
MEAN	1.68	2.74	2.21
FORMALIN(76)	0	3000	MEAN
VARIETY(77)			
NELSON/R	2.11	2.16	2.14
TABARD/S	2.34	2.22	2.28
MEAN	2.23	2.19	2.21
FORMALIN(76)	0	3000	MEAN
ALDICARB(77)			
0	1.68	1.67	1.68
10	2.78	2.71	2.74
MEAN	2.23	2.19	2.21
FORMALIN(77)	0	3000	MEAN
VARIETY(77)			
NELSON/R	2.04	2.24	2.14
TABARD/S	2.23	2.34	2.28
MEAN	2.13	2.29	2.21
FORMALIN(77)	0	3000	MEAN
ALDICARB(77)			
0	1.52	1.83	1.68
10	2.74	2.75	2.74
MEAN	2.13	2.29	2.21

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STRAW TONNES/HECTARE

***** TABLES OF MEANS *****

FORMALIN(77)	0	3000	MEAN		
FORMALIN(76)					
0	2.10	2.36	2.23		
3000	2.17	2.22	2.19		
MEAN	2.13	2.29	2.21		
ALDICARB(77)	0		10		
FORMALIN(76)	0	3000	0	3000	
VARIETY(77)					
NELSON/R	1.57	1.70	2.65	2.63	
TABARD/S	1.79	1.65	2.90	2.80	
ALDICARB(77)	0		10		
FORMALIN(77)	0	3000	0	3000	
VARIETY(77)					
NELSON/R	1.45	1.82	2.62	2.66	
TABARD/S	1.60	1.84	2.86	2.84	
FORMALIN(76)	0		3000		
FORMALIN(77)	0	3000	0	3000	
VARIETY(77)					
NELSON/R	1.96	2.26	2.11	2.21	
TABARD/S	2.23	2.45	2.22	2.23	
FORMALIN(76)	0		3000		
FORMALIN(77)	0	3000	0	3000	
ALDICARB(77)					
0	1.46	1.90	1.59	1.76	
10	2.74	2.82	2.75	2.68	
	FORMALIN(76)	0		3000	
	FORMALIN(77)	0	3000	0	3000
VARIETY(77)	ALDICARB(77)				
NELSON/R	0	1.32	1.83	1.58	1.81
	10	2.60	2.70	2.64	2.61
TABARD/S	0	1.60	1.98	1.60	1.71
	10	2.87	2.93	2.85	2.75

STRAW MEAN DM% 69.7

SUB PLOT AREA HARVESTED 0.00098