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Yields of the Field Experiments 1979

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79/W/CS/174 Sowing Dates and Ccn - Oats

Rothamsted Research

Rothamsted Research (1980) *79/W/CS/174 Sowing Dates and Ccn - Oats* ; Yields Of The Field Experiments 1979, pp 164 - 172 - DOI: <https://doi.org/10.23637/ERADOC-1-45>

79/W/CS/174

SOWING DATES AND CCN

Object: To study the residual effects of sowing date, a nematicide, a soil sterilant and previous cropping on the incidence of cereal cyst-nematode (*Heterodera avenae*) (CCN) and on the yield of oats in a soil known to contain a fungal parasite of the nematode - Woburn, Butt Close.

Sponsor: B.R. Kerry.

The fifth year, oats.

For previous years see 75/W/M/1 and 76-78/W/CS/174.

Design: Single replicate of 36 plots split into 2.

Whole plot dimensions: 2.13 x 6.70.

Treatments: All combinations of:-

Whole plots

1. CROP(76) Crop (cumulative 1975-76):
 WHEAT
 BARLEY
 OATS
2. SCW DATE(76) Sowing date (cumulative 1975-76):
 AUTUMN
 SPRING
3. NEMACIDE(78) Nematicide (cumulative 1975-78):
 NONE None
 OXAMYL Oxamyl at 8.8 kg
4. CROP(78) Crop in 1977 & 1978 (all spring sown):
 WHEAT
 BARLEY
 OATS

Sub plots

5. STERILNT Sterilant:
 NONE None
 FORMALIN Formalin at 3000 l in 109000 l. To SCW DATE SPRING in 1976 & 1978 only. To SCW DATE AUTUMN in 1977 only.

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Basal applications: Manures: Magnesian limestone at 7.5 t. (20:14:14) at 400 kg combine drilled. Weedkillers: Diquat at 0.78 kg ion in 280 l. Mecoprop, bromoxynil and ioxynil ('Brittox' at 3.5 kg in 340 l). Irrigation (mm water):

13 June	25
22 June	7
28 June	6
5-6 July	25
13 July	25
18 July	25
26 July	25
Total	138

Seed: Manod, sown at 200 kg.

Cultivations, etc.:— Diquat applied: 8 Sept, 1978. Subsoiled, tines 55 cm deep, 140 cm apart: 20 Oct. Magnesian limestone applied: 19 Dec. Ploughed: 5 Mar, 1979. Spring-tine cultivated with crumbler attached: 16 Apr. Seed sown: 23 Apr. 'Brittox' applied: 1 June. Combine harvested: 1 Sept.

- NOTES: (1) Soil samples were taken in April for pre-sowing estimates of *Heterodera avenae* cysts and eggs, in July for estimates of unhatched cysts and in September for post-harvest estimates of cysts and eggs.
- (2) Plant samples were taken at weekly intervals from 27 June to 31 August for estimates of numbers of *H. avenae* females infected by parasitic fungi.

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GRAIN TONNES/HECTARE

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

SCW DATE(76)	AUTUMN	SPRING	MEAN	
CROP(76)				
WHEAT	3.01	3.11	3.06	
BARLEY	2.71	2.99	2.85	
OATS	2.52	2.97	2.75	
MEAN	2.75	3.02	2.89	
NEMACIDE(78)	NONE	OXAMYL	MEAN	
CROP(76)				
WHEAT	2.25	3.87	3.06	
BARLEY	1.97	3.72	2.85	
OATS	2.07	3.43	2.75	
MEAN	2.10	3.67	2.89	
NEMACIDE(78)	NONE	OXAMYL	MEAN	
SCW DATE(76)				
AUTUMN	2.05	3.45	2.75	
SPRING	2.15	3.90	3.02	
MEAN	2.10	3.67	2.89	
CROP(78)	WHEAT	BARLEY	OATS	MEAN
CROP(76)				
WHEAT	3.04	3.34	2.81	3.06
BARLEY	2.90	2.66	2.97	2.85
OATS	2.76	2.88	2.60	2.75
MEAN	2.90	2.96	2.80	2.89
CROP(78)	WHEAT	BARLEY	OATS	MEAN
SCW DATE(76)				
AUTUMN	2.80	2.85	2.60	2.75
SPRING	3.00	3.07	2.99	3.02
MEAN	2.90	2.96	2.80	2.89
CROP(78)	WHEAT	BARLEY	OATS	MEAN
NEMACIDE(78)				
NONE	1.91	2.18	2.20	2.10
OXAMYL	3.89	3.74	3.39	3.67
MEAN	2.90	2.96	2.80	2.89
STERILNT	NONE	FORMALIN	MEAN	
CROP(76)				
WHEAT	3.18	2.94	3.06	
BARLEY	2.88	2.81	2.85	
OATS	2.93	2.57	2.75	
MEAN	3.00	2.77	2.89	

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GRAIN TONNES/HECTARE

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

STERILNT SCW DATE(76)	NONE	FORMALIN	MEAN			
AUTUMN	2.93	2.57	2.75			
SPRING	3.06	2.98	3.02			
MEAN	3.00	2.77	2.89			
STERILNT NEMACIDE(78)	NONE	FORMALIN	MEAN			
NONE	2.32	1.88	2.10			
OXAMYL	3.68	3.67	3.67			
MEAN	3.00	2.77	2.89			
STERILNT CROP(78)	NONE	FORMALIN	MEAN			
WHEAT	3.00	2.80	2.90			
BARLEY	3.02	2.90	2.96			
OATS	2.97	2.62	2.80			
MEAN	3.00	2.77	2.89			
SCW DATE(76) NEMACIDE(78) CROP(76)	AUTUMN NONE	OXAMYL	SPRING NONE	OXAMYL		
WHEAT	2.16	3.87	2.34	3.88		
BARLEY	1.82	3.59	2.12	3.85		
OATS	2.16	2.88	1.98	3.97		
SCW DATE(76) CROP(78) CROP(76)	AUTUMN WHEAT	BARLEY	OATS	SPRING WHEAT	BARLEY	OATS
WHEAT	3.22	3.42	2.40	2.86	3.26	3.21
BARLEY	2.66	2.49	2.97	3.14	2.84	2.98
OATS	2.51	2.64	2.42	3.00	3.13	2.79
NEMACIDE(78) CROP(78) CROP(76)	NONE WHEAT	BARLEY	OATS	OXAMYL WHEAT	BARLEY	OATS
WHEAT	2.05	2.48	2.22	4.03	4.19	3.40
BARLEY	1.99	1.66	2.26	3.81	3.67	3.69
OATS	1.68	2.42	2.11	3.84	3.35	3.09
NEMACIDE(78) CROP(78) SCW DATE(76)	NONE WHEAT	BARLEY	OATS	OXAMYL WHEAT	BARLEY	OATS
AUTUMN	1.92	2.06	2.16	3.67	3.64	3.04
SPRING	1.89	2.31	2.24	4.11	3.83	3.75
SCW DATE(76) STERILNT CROP(76)	AUTUMN NONE	FORMALIN	SPRING NONE	FORMALIN		
WHEAT	3.09	2.94	3.28	2.94		
BARLEY	2.87	2.54	2.89	3.09		
OATS	2.83	2.22	3.03	2.92		

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GRAIN TONNES/HECTARE

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

NEMACIDE(78)	NONE		OXAMYL	
STERILNT	NONE FORMALIN		NONE FORMALIN	
CROP(76)				
WHEAT	2.58	1.92	3.79	3.96
BARLEY	2.10	1.85	3.66	3.78
OATS	2.27	1.87	3.58	3.27

NEMACIDE(78)	NONE		OXAMYL	
STERILNT	NONE FORMALIN		NONE FORMALIN	
SCW DATE(76)				
AUTUMN	2.39	1.70	3.46	3.43
SPRING	2.24	2.06	3.89	3.90

CROP(78)	WHEAT		BARLEY		OATS	
STERILNT	NONE FORMALIN		NONE FORMALIN		NONE FORMALIN	
CROP(76)						
WHEAT	3.08	2.99	3.37	3.30	3.10	2.52
BARLEY	3.19	2.62	2.47	2.86	2.98	2.97
OATS	2.74	2.78	3.22	2.54	2.82	2.38

CROP(78)	WHEAT		BARLEY		OATS	
STERILNT	NONE FORMALIN		NONE FORMALIN		NONE FORMALIN	
SCW DATE(76)						
AUTUMN	2.93	2.66	3.01	2.68	2.84	2.35
SPRING	3.07	2.93	3.03	3.12	3.09	2.89

CROP(78)	WHEAT		BARLEY		OATS	
STERILNT	NONE FORMALIN		NONE FORMALIN		NONE FORMALIN	
NEMACIDE(78)						
NONE	2.13	1.69	2.37	2.00	2.45	1.95
OXAMYL	3.88	3.91	3.67	3.80	3.48	3.30

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

TABLE	CROP(76)	SCW DATE(76)	NEMACIDE(78)	CROP(78)
SED	0.243	0.198	0.198	0.243

TABLE	STERILNT	CROP(76) SCW DATE(76)	CROP(76) NEMACIDE(78)	SCW DATE(76) NEMACIDE(78)
SED	0.076	0.343	0.343	0.280

TABLE	CROP(76) CROP(78)	SCW DATE(76) CROP(78)	NEMACIDE(78) CROP(78)	CROP(76) STERILNT
SED	0.420	0.343	0.343	0.260
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CROP(76)				0.131

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GRAIN TONNES/HECTARE

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

TABLE	SOW DATE(76) STERILNT	NEMACIDE(78) STERILNT	CROP(78) STERILNT	CROP(76) SOW DATE(76) NEMACIDE(78)
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SED	0.212	0.212	0.260	0.485
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
SOW DATE(76)	0.107			
NEMACIDE(78)		0.107		
CROP(78)			0.131	

TABLE	CROP(76) SOW DATE(76) CROP(78)	CROP(76) NEMACIDE(78) CROP(78)	SOW DATE(76) NEMACIDE(78) CROP(78)	CROP(76) SOW DATE(76) STERILNT
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SED	0.595	0.595	0.485	0.368
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CROP(76).SOW DATE(76)				0.186

TABLE	CROP(76) NEMACIDE(78) STERILNT	SOW DATE(76) NEMACIDE(78) STERILNT	CROP(76) CROP(78) STERILNT	SOW DATE(76) CROP(78) STERILNT
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SED	0.368	0.300	0.450	0.368
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:				
CROP(76).NEMACIDE(78)	0.186			
SOW DATE(76).NEMACIDE(78)		0.152		
CROP(76).CROP(78)			0.228	
SOW DATE(76).CROP(78)				0.186

TABLE	NEMACIDE(78) CROP(78) STERILNT
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SED	0.368
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:	
NEMACIDE(78).CROP(78)	0.186

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

STRATUM	DF	SE	CV%
WP	4	0.595	20.6
WP.SP	16	0.322	11.2

GRAIN MEAN DM% 79.9

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STRAW TONNES/HECTARE

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

SCW DATE(76)	AUTUMN	SPRING	MEAN	
CROP(76)				
WHEAT	3.20	3.09	3.14	
BARLEY	2.89	3.13	3.01	
OATS	2.66	3.20	2.93	
MEAN	2.92	3.14	3.03	
NEMACIDE(78)	NONE	OXAMYL	MEAN	
CROP(76)				
WHEAT	2.54	3.75	3.14	
BARLEY	2.25	3.77	3.01	
OATS	2.37	3.49	2.93	
MEAN	2.39	3.67	3.03	
NEMACIDE(78)	NONE	OXAMYL	MEAN	
SCW DATE(76)				
AUTUMN	2.20	3.64	2.92	
SPRING	2.57	3.70	3.14	
MEAN	2.39	3.67	3.03	
CROP(78)	WHEAT	BARLEY	OATS	MEAN
CROP(76)				
WHEAT	2.98	3.49	2.97	3.14
BARLEY	3.23	2.66	3.14	3.01
OATS	2.71	3.25	2.82	2.93
MEAN	2.97	3.13	2.98	3.03
CROP(78)	WHEAT	BARLEY	OATS	MEAN
SCW DATE(76)				
AUTUMN	2.88	3.03	2.84	2.92
SPRING	3.07	3.23	3.11	3.14
MEAN	2.97	3.13	2.98	3.03
CROP(78)	WHEAT	BARLEY	OATS	MEAN
NEMACIDE(78)				
NONE	2.25	2.40	2.52	2.39
OXAMYL	3.70	3.87	3.43	3.67
MEAN	2.97	3.13	2.98	3.03
STERILNT	NONE	FORMALIN	MEAN	
CROP(76)				
WHEAT	3.11	3.18	3.14	
BARLEY	3.05	2.97	3.01	
OATS	2.88	2.98	2.93	
MEAN	3.01	3.05	3.03	

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STRAW TONNES/HECTARE

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

STERILNT	NONE	FORMALIN	MEAN			
SCW DATE(76)						
AUTUMN	3.01	2.83	2.92			
SPRING	3.01	3.26	3.14			
MEAN	3.01	3.05	3.03			
STERILNT	NONE	FORMALIN	MEAN			
NEMACIDE(78)						
NONE	2.42	2.35	2.39			
OXAMYL	3.60	3.74	3.67			
MEAN	3.01	3.05	3.03			
STERILNT	NONE	FORMALIN	MEAN			
CROP(78)						
WHEAT	2.95	3.00	2.97			
BARLEY	3.14	3.13	3.13			
OATS	2.94	3.01	2.98			
MEAN	3.01	3.05	3.03			
SCW DATE(76)	AUTUMN		SPRING			
NEMACIDE(78)	NONE	OXAMYL	NONE	OXAMYL		
CROP(76)						
WHEAT	2.52	3.87	2.55	3.62		
BARLEY	1.90	3.89	2.61	3.64		
OATS	2.18	3.15	2.56	3.83		
SCW DATE(76)	AUTUMN			SPRING		
CROP(78)	WHEAT	BARLEY	OATS	WHEAT	BARLEY	OATS
CROP(76)						
WHEAT	3.17	3.63	2.80	2.79	3.35	3.13
BARLEY	3.00	2.52	3.16	3.47	2.80	3.11
OATS	2.48	2.95	2.56	2.95	3.55	3.09
NEMACIDE(78)	NONE			OXAMYL		
CROP(78)	WHEAT	BARLEY	OATS	WHEAT	BARLEY	OATS
CROP(76)						
WHEAT	2.32	2.80	2.51	3.64	4.18	3.43
BARLEY	2.52	1.81	2.43	3.94	3.51	3.85
OATS	1.90	2.58	2.63	3.52	3.92	3.02
NEMACIDE(78)	NONE			OXAMYL		
CROP(78)	WHEAT	BARLEY	OATS	WHEAT	BARLEY	OATS
SCW DATE(76)						
AUTUMN	2.04	2.13	2.44	3.72	3.94	3.25
SPRING	2.46	2.67	2.60	3.68	3.80	3.61

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STRAW TONNES/HECTARE

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

SCW DATE(76)	AUTUMN		SPRING			
STERILNT CROP(76)	NONE	FORMALIN	NONE	FORMALIN		
WHEAT	3.14	3.26	3.08	3.10		
BARLEY	3.01	2.78	3.09	3.17		
OATS	2.89	2.44	2.87	3.52		
NEMACIDE(78)	NONE		OXAMYL			
STERILNT CROP(76)	NONE	FORMALIN	NONE	FORMALIN		
WHEAT	2.65	2.43	3.56	3.94		
BARLEY	2.29	2.22	3.80	3.73		
OATS	2.32	2.42	3.44	3.54		
NEMACIDE(78)	NONE		OXAMYL			
STERILNT CROP(76)	NONE	FORMALIN	NONE	FORMALIN		
SCW DATE(76)						
AUTUMN	2.43	1.98	3.59	3.68		
SPRING	2.42	2.73	3.60	3.80		
CROP(78)	WHEAT		BARLEY		OATS	
STERILNT CROP(76)	NONE	FORMALIN	NONE	FORMALIN	NONE	FORMALIN
WHEAT	2.79	3.17	3.46	3.52	3.07	2.86
BARLEY	3.42	3.04	2.65	2.68	3.07	3.20
OATS	2.64	2.78	3.31	3.19	2.68	2.97
CROP(78)	WHEAT		BARLEY		OATS	
STERILNT CROP(76)	NONE	FORMALIN	NONE	FORMALIN	NONE	FORMALIN
SCW DATE(76)						
AUTUMN	2.84	2.92	3.15	2.92	3.04	2.64
SPRING	3.06	3.08	3.13	3.34	2.84	3.38
CROP(78)	WHEAT		BARLEY		OATS	
STERILNT CROP(76)	NONE	FORMALIN	NONE	FORMALIN	NONE	FORMALIN
NEMACIDE(78)						
NONE	2.49	2.00	2.37	2.43	2.40	2.64
OXAMYL	3.41	4.00	3.91	3.83	3.48	3.39

STRAW MEAN DM% 74.4

SUB PLOT AREA HARVESTED 0.00041