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Yields of the Field Experiments 1973

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73/W/CS/49 - Resistance to Cyst Nematode - Winter Oats

Rothamsted Research

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73/W/CS/49

RESISTANCE TO CYST NEMATODE

Object: To study the residual effects of formalin, applied at different times to winter and spring sown wheat 1970-72, on yields and the incidence of cereal cyst nematode on resistant and susceptible winter oats - Woburn Butt Close.

Sponsor: T.D. Williams.

The fourth year, winter oats.

For previous years see 70/W/CS/49(t), 71/W/CS/49(t) and 72/W/CS/49(t).
(Until 1972 the title of the experiment was 'Fumigant and H'.)

Design: A single replicate of 4 blocks of 4 plots, split into 8.

Whole plot dimensions: 2.16 x 21.0. Sub plot area harvested: 0.00041.

Treatments: All combinations of:-

Whole plots:

1. Crops, sowing dates and times of applying formalin in the period 1970-1972:	CROPEIC
Winter wheat sown in autumn, formalin in early autumn	WVA
Winter wheat sown in spring, formalin in early autumn	WVS
Spring wheat sown in spring, formalin in early autumn	WSS
Spring wheat sown in spring, formalin in early spring	WSS*

Quarter plots (broadways):

2. Residues of nitrogen fertiliser (kg N) applied annually 1970-1972 in presence of basal dressing of 75 kg N in 1973:	NRESID
75	75
125	125
176	176
226	226

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3. Formalin in 1970-1972:			FORMALIN
1970	1971	1972	
None	None	None	OOO
None	Formalin	None	OFO
Formalin	None	Formalin	FOF
Formalin	Formalin	Formalin	FFF

Half plots (lengthways):

4. Varieties in 1973:	VARIETY
Peniarth - susceptible to cereal cyst nematode	SUSCEPT
Peniarth x Avena sterilis - resistant to cereal cyst nematode	RESISTANT

Basal applications: Manures: 7.5 tonnes magnesian limestone, 340 kg (0:20:20) combine drilled, 300 kg 'Nitro-Chalk' in spring. Weedkiller: Ioxynil at 0.42 kg plus mecoprop at 1.30 kg in 290 l on first occasion, ioxynil at 0.63 kg plus mecoprop at 1.90 kg in 290 l on second occasion.

Seed: Both varieties sown at 180 kg.

Cultivations, etc.:- Deep-tine cultivated: 13 Sept, 1972. Magnesian limestone applied: 3 Oct. Seed sown: 26 Oct. N applied: 29 Mar, 1973. Weedkiller applied: 13 Apr, 26 Apr. Harvested by hand: 31 July.

- NOTES: (1) Soil samples were taken before sowing and after harvest for counts of *Heterodera avena* eggs and larvae.
(2) Plant samples were taken in May for counts of root invasion by *Heterodera avenae*.

Standard errors per plot. Grain, tonnes/hectare:
Whole plot: 0.281 or 15.3% (8 d.f.)
Pooled quarter and half plot: 0.351 or 19.5% (72 d.f.)

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TABLES OF MEANS

GRAIN: TONNES/HECTARE

CROP/ETC	NRESID		FORMALIN				VARIETY	Mean			
	75	125	176	226	000	0F0	FOF		FFF	SUSCEPT	RESISTANT
CROP/ETC	2.20	2.37	2.20	1.98	2.28	2.35	2.26	1.86	2.14	2.24	2.19
	1.65	2.01	1.63	1.74	1.73	1.70	1.85	1.74	1.77	1.74	1.76
	1.72	2.07	1.97	1.41	1.78	1.83	1.87	1.69	1.81	1.78	1.79
	1.58	1.66	1.55	1.66	1.55	1.66	1.62	1.62	1.67	1.55	1.61
NRESID											
			75								
			125								
			176								
			226								
Mean	1.80	2.00	1.82	0.53	1.78	1.82	1.99	2.02	1.78	1.82	1.84
	2.19	1.90	1.85	1.78	2.03	1.85	1.94	1.57	2.03	1.88	1.89
	1.66	2.06	1.94	1.71	1.87	1.85	1.71	1.68	1.85	1.89	1.90
	1.69	1.59	1.85	1.73	1.92	1.73	1.72	1.73	1.85	1.72	1.73
FORMALIN											
		000									
		0F0									
		FOF									
		FFF									
Mean	D.M. %		80.8								
	1.85	1.83									

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STANDARD ERRORS OF DIFFERENCES

CROPETC	NRESID	FORMALIN	VARIETY	CROPETC NRESID	CROPETC FORMALIN	CROPETC VARIETY
0.199	0.090	0.090	0.063	0.219	0.219	0.155
Except when comparing means with same level of CROPETC				0.180	0.180	0.127
NRESID FORMALIN	NRESID VARIETY	FORMALIN VARIETY				
0.180	0.127	0.127				