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72/W/RN/15 Rotation and Fumigation - Potatoes, Barley, Sugar Beet

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72/W/RN/15

ROTATION AND FUMIGATION

Object: To study different ways of using nematicides in a three-course rotation and to determine the effects on crop yield and incidence of pathogenic nematodes - Woburn Butt Close.

Sponsors: F.G.W. Jones, D.C.M. Corbett, A.G. Whitehead, T.D. Williams.

The fourth year, potatoes, barley, sugar beet.

For previous years see 69/W/RN/15(t), 70/W/RN/15(t) and 71/W/RN/15.

Whole plot dimensions: 5.33 x 31.1. Sub plot area harvested:

Barley: 0.00052, potatoes: 0.00104, sugar beet: 0.00127.

Basal applications:

Barley: Manures: 300 kg (0:20:20). Weedkiller: Ioxynil at 0.53 kg plus mecoprop at 1.6 kg in 280 l.

Potatoes: Manures: 1050 kg (0:14:28). Weedkiller: Linuron at 1.1 kg with paraquat at 0.4 kg ion in 370 l. Fungicide: Mancozeb at 1.3 kg in 430 l. Fungicide with insecticide: Mancozeb at 1.3 kg with demeton-s-methyl at 0.25 kg in 430 l.

Sugar beet: Manures: 2.5 tonnes magnesian limestone, 1050 kg (0:14:28), 6.7 kg B2O3, as 'Solubor', in 400 l. Weedkillers: Paraquat at 0.56 kg ion in 280 l. Phenmedipham at 1.1 kg in 280 l. Insecticide: Demeton-s-methyl at 0.5 kg in 280 l.

Seed: Barley: Julia (dressed with ethirimol) sown at 160 kg.

Potatoes: Pentland Crown.

Sugar beet: Klein E sown at 6 kg.

Cultivations, etc.:

Barley: Ploughed: 2 Nov, 1971. Dazomet applied, all plots rotary cultivated: 16 Nov. 'D-D' injected: 17 Nov. Ploughed: 14 Feb, 1972. N applied: 14 Mar. Seed combine drilled: 15 Mar. Weedkiller applied: 3 May. Combine harvested: 17 Aug.

Potatoes: Ploughed: 2 Nov, 1971. Dazomet applied, all plots rotary cultivated: 16 Nov. 'D-D' injected: 17 Nov. Ploughed: 14 Feb, 1972. PK applied: 22 Mar. N applied: 23 Mar. Rotary cultivated, potatoes planted: 5 Apr. Weedkiller applied: 5 May. Rotary ridged: 3 June. Fungicide applied: 5 July. Fungicide with insecticide applied: 26 July. Haulm mechanically destroyed: 6 Sept. Lifted: 15 Sept.

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Sugar beet: Paraquat applied: 10 Sept, 1971. Magnesian limestone applied: 5 Oct. Ploughed: 2 Nov. Dazomet applied, all plots rotary cultivated: 16 Nov. 'D-D' injected: 17 Nov. Ploughed: 14 Feb, 1972. PK applied: 22 Mar. N applied, power harrowed: 23 Mar. Seed drilled: 24 Mar. Phenmedipham applied: 3 May. Singled: 22 May. Boron spray applied: 9 June. Insecticide applied: 29 June. Lifted: 6 - 7 Nov.

NOTE: Soil samples were taken after harvest for eelworm counts.

Standard errors per sub plot.

Barley, grain, tonnes/hectare:	0.598 or 16.8% (21 d.f.)
Potatoes, total tubers, tonnes/hectare:	2.84 or 8.1% (21 d.f.)
Sugar beet, roots, tonnes/hectare:	4.22 or 11.2% (21 d.f.)
total sugar, tonnes/hectare:	0.775 or 11.7% (21 d.f.)

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TABLES OF MEANS

BARLEY

FUMIGANT

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	GRAIN: TONNES/HECTARE						
38	2.75	1.98	3.30	1.97	3.72	4.10	2.94
75	3.88	4.56	4.98	4.02	3.45	3.36	4.02
113	2.74	3.46	4.41	4.06	4.04	4.86	3.76
Mean	3.12	3.33	4.23	3.35	3.73	4.10	3.57

STANDARD ERRORS OF DIFFERENCES

FUMIGANT

N*

FUMIGANT

Between any of P, S, B, A or AZ	0.346	0.598
O&R v any of P, S, B, A or AZ	0.299	0.519

* Within the same level of N only

N: KG/HA	STRAW: TONNES/HECTARE						
38	2.23	2.17	3.10	2.00	2.64	3.47	2.55
75	3.80	4.63	4.24	3.17	3.26	4.79	3.96
113	4.16	4.42	4.94	3.89	3.77	5.53	4.41
Mean	3.40	3.74	4.09	3.02	3.22	4.60	3.64

Mean D.M. %: Grain: 76.1
Straw: 46.9

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POTATOES

FUMIGANT

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	TOTAL TUBERS: TONNES/HECTARE						
75	26.7	30.8	29.2	31.3	29.3	36.4	30.0
150	32.2	37.7	39.5	37.0	39.2	37.7	36.5
225	38.4	37.2	39.2	38.1	43.0	34.2	38.3
Mean	32.5	35.2	35.9	35.5	37.2	36.1	35.0

STANDARD ERRORS OF DIFFERENCES

FUMIGANT N*
FUMIGANT

Between any of P, S, B, A or AZ	1.64	2.84
O&R v any of P, S, B, A or AZ	1.42	2.46

* Within the same level of N only

N: KG/HA PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

75	87.1	91.5	87.5	91.0	89.3	91.7	89.3
150	92.1	93.6	93.2	92.1	92.4	94.0	92.8
225	92.6	94.2	94.7	94.1	92.2	92.1	93.2
Mean	90.6	93.1	91.8	92.4	91.3	92.6	91.8

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SUGAR BEET

FUMIGANT

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	ROOTS (WASHED): TONNES/HECTARE						
75	31.9	35.7	33.0	41.6	28.5	38.1	34.4
150	37.1	43.9	38.8	41.1	36.4	38.8	39.0
225	39.2	42.6	36.4	40.3	37.8	41.4	39.5
Mean	36.1	40.7	36.0	41.0	34.2	39.4	37.7

STANDARD ERRORS OF DIFFERENCES

	FUMIGANT	N* FUMIGANT
Between any of P, S, B, A or AZ	2.44	4.22
O&R v any of P, S, B, A or AZ	2.11	3.66

* Within the same level of N only

N: KG/HA	SUGAR %						
75	18.3	18.1	17.5	18.1	17.2	18.2	18.0
150	17.9	17.6	17.8	17.0	17.5	17.8	17.6
225	17.0	17.4	16.9	17.4	16.8	17.2	17.1
Mean	17.7	17.7	17.4	17.5	17.2	17.7	17.6

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SUGAR BEET

FUMIGANT

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	TOTAL SUGAR: TONNES/HECTARE						
75	5.86	6.47	5.78	7.52	4.89	6.94	6.19
150	6.63	7.74	6.89	6.98	6.36	6.90	6.88
225	6.67	7.43	6.16	7.00	6.37	7.12	6.77
Mean	6.38	7.21	6.28	7.17	5.87	6.99	6.61

STANDARD ERRORS OF DIFFERENCES

	FUMIGANT	N* FUMIGANT
Between any of P, S, B, A or AZ	0.447	0.775
O&R v any of P, S, B, A or AZ	0.387	0.671

* Within the same level of N only