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

Rothamsted Research

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ROTATION AND FUMIGATION

(70/W/RN/15)

The effects of soil fumigants on a rotation of crops - Woburn Butt
Close 1970, 2nd year.

For design, treatments and previous year's results see 'Results'
69/W/RN/15.

Area of each sub-plot: 0.0048. Area harvested: Barley, potatoes: 0.0013,
sugar beet: 0.0038.

NOTE: One of the sub-plots of each plot, untreated in 1969, is now used
to test dazomet at 200 lb before all crops (AZ).

Standard applications:

Barley: Manures: 280 lb (0:20:20). Weedkiller: Ioxynil at 7.5 oz
plus mecoprop at 22.5 oz in 25 gals.

Potatoes: Manures: 940 lb (0:14:28). Weedkiller: Linuron at 1.0 lb
plus paraquat at 0.37 lb ion in 33 gals. Fungicide: Mancozeb at
1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl
at 3.5 fl oz in 37 gals on one occasion with fungicide.

Sugar beet: Manures: 940 lb (0:14:28). Weedkiller: Phenmedipham
(*'Betanal'*) at 5 pts in 20 gals). Insecticide: Demeton-s-methyl
at 3.5 fl oz in 25 gals.

Cultivations, etc.:

Barley: Ploughed: 12 Nov, 1969. Dazomet applied and rotary cultivated
in: 14 Nov. DD injected: 24 Nov. Reploughed: 3 Mar, 1970. N
applied, power harrowed, seed combine drilled at 140 lb: 27 Mar.
Weedkiller applied: 16 May. Combine harvested: 26 Aug. Variety:
Julia.

Potatoes: Ploughed: 12 Nov, 1969. Dazomet applied and rotary culti-
vated in: 14 Nov. DD injected: 24 Nov. Reploughed: 3 Mar, 1970.
N applied: 3 Apr. PK applied: 14 Apr. Rotary cultivated, potatoes
planted: 22 Apr. Weedkiller applied: 13 May. Grubbed: 3 June.
Rotary ridged: 5 June. Fungicide plus insecticide applied: 31 July.
Fungicide applied: 18 Aug. Sprayed with undiluted BOV at 15 gals:
19 Sept. Haulm destroyed mechanically: 23 Sept. Lifted:
30 Sept. Variety: Pentland Crown.

Sugar beet: Rotary cultivated twice: 11 Sept, 1969 and 30 Sept.
Dazomet applied and rotary cultivated in: 14 Nov. DD injected:
24 Nov. Ploughed: 3 Mar, 1970. N applied: 3 Apr. PK applied:
14 Apr. Power harrowed, seed drilled at 5 lb: 20 Apr. Weedkiller
applied: 15 May. Singled: 26 May. Insecticide applied: 22 June.
Lifted: 26 Oct. Variety: Klein E.

70/W/RN/15

- NOTES: (1) Soil samples were taken from all N2 plots for eelworm counts, (*Heterodera rostochiensis*, *H. avenae*) in late November.
- (2) The yields of barley grain and straw have been adjusted for a linear trend down the whole plots.

Standard errors per sub-plot.

Barley, grain, cwt:	3.33 or 25.8% (17 d.f.)
Sugar beet, roots tons:	1.252 or 9.1% (18 d.f.)
Total sugar, cwt:	4.60 or 9.4% (18 d.f.)
Potatoes, total tubers, tons:	2.012 or 11.2% (18 d.f.)

70/W/RN/15

SUMMARY OF RESULTS

BARLEY

	O,S&R	P	B	A	AZ	Mean
	GRAIN: CWT					
	(± 1.36)		(± 2.36)*			
N1	7.2	12.2	8.9	10.1	16.9	9.9
N2	10.6	15.7	15.9	18.4	16.7	14.1
N3	12.5	18.0	15.7	14.0	17.7	14.7
Mean	10.1 (± 0.78)	15.3	13.5 (± 1.36)	14.2	17.1	12.9

* For use in horizontal and interaction comparisons only

STRAW: CWT

N1	8.7	10.5	11.2	11.1	14.0	10.4
N2	12.3	15.6	15.2	16.5	16.0	14.3
N3	11.4	14.2	14.5	12.6	16.5	13.1
Mean	10.8	13.4	13.6	13.4	15.5	12.6

Mean D.M. %: Grain: 80.1
Straw: 71.8

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POTATOES

	O, B&R	P	S	A	AZ	Mean
TOTAL TUBERS: TONS						
	(±0.821)		(±1.423)*			
N1	14.79	15.15	17.23	16.23	17.02	15.71
N2	18.07	19.79	19.36	20.75	19.71	19.12
N3	16.83	19.40	20.31	22.14	20.01	18.91
Mean	16.56 (±0.474)	18.12	18.97 (±0.822)	19.71	18.91	17.91

* For use in horizontal and interaction comparisons only

% WARE: 1.5 INCH						
N1	98.2	98.8	98.4	98.1	98.5	98.4
N2	98.4	98.1	98.7	98.1	98.7	98.4
N3	98.0	98.2	98.3	98.4	98.3	98.2
Mean	98.2	98.4	98.5	98.2	98.5	98.3

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SUGAR BEET

	O, PGR	S	B	A	AZ	Mean
ROOTS (WASHED): TONS						
	(±0.511)		(±0.885)*			
N1	10.85	10.46	11.41	10.66	15.73	11.54
N2	14.34	14.92	13.58	16.07	15.52	14.73
N3	14.02	14.90	17.01	15.74	16.70	15.20
Mean	13.07 (±0.295)	13.43	14.00 (±0.511)	14.16	15.99	13.82

SUGAR %						
N1	18.4	17.9	18.0	18.0	18.2	18.2
N2	17.7	17.7	17.5	17.1	18.0	17.6
N3	17.3	16.9	17.3	16.5	17.1	17.1
Mean	17.8	17.5	17.6	17.2	17.8	17.7

TOTAL SUGAR: CWT						
	(±1.88)		(±3.25)*			
N1	40.0	37.5	40.9	38.3	57.6	42.0
N2	50.9	52.7	47.6	54.9	55.9	52.0
N3	48.6	50.4	58.9	51.9	57.3	52.0
Mean	46.5 (±1.08)	46.9	49.2 (±1.88)	48.4	56.9	48.7

* For use in horizontal and interaction comparisons only