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Yields of the Field Experiments 1972

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72/W/RN/3 Ley/ARABLE - Leys, Potatoes, Barley, Wheat

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LEY/ARABLE

Object: To compare the effects on soil fertility of rotations with or without three-year leys. The effects of the cropping system on soil-borne pathogens are also studied - Woburn Stackyard D.

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The 35th year, leys, potatoes, barley, wheat.

For previous years see 'Details' 1967, 68/B/2(t), 69/W/RN/3(t), 70/W/RN/3(t) and 71/W/RN/3(t).

Corrective K dressings (in kg K₂O) as muriate of potash applied to first test crop, potatoes.

	No FYM half plots	FYM half plots
Continuous rotations		
Ley	251	251
Clover	0	0
Arable with hay	314	251
Arable	314	314
Alternating rotations (last two rotations in order)		
Arable/ley	439	376
Arable with hay/clover	126	126
Ley/arable with hay	251	251
Clover/arable	376	376

Treatments to first test crop, potatoes:-

1. Residues of fumigant applied to potatoes 1969 (Arable and Arable with hay only) on quarter plots: None (O), 448 kg chloropicrin (C).
2. Fresh fumigant (Arable and Arable with hay) on eighth plots, and (Ley and Sainfoin) on quarter plots: None (O), 448 kg chloropicrin plus 5.6 kg aldicarb (F).

Treatments to second test crop, winter wheat:-

1. Residues of fumigant applied to potatoes 1971 on eighth plots: None (O), 448 kg chloropicrin plus 11.2 kg aldicarb (F).
2. Nitrogen on eighth plots: 0, 63, 126, 189 kg N as 'Nitro-Chalk'.

Treatments to first treatment crop, potatoes:-

1. Fresh fumigant (Arable and Arable with hay only) on quarter plots: None (O), 448 kg chloropicrin plus 5.6 kg aldicarb (F).

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NOTE: Winter wheat replaced barley as second test crop. Barley replaced rye as second treatment crop (Arable and Arable with hay) and also carrots as third treatment crop (Arable).

Basal manuring: Winter wheat: 290 kg (0:20:20), barley 415 kg (15:15:15), first year clover: 63 kg N as 'Nitro-Chalk', 189 kg P₂O₅ as superphosphate, 126 kg K₂O as muriate of potash. Second and third year clover: 63 kg N as 'Nitro-Chalk', 189 kg K₂O as muriate of potash.

Varieties: Potatoes, first test crop and first treatment crop: Maris Piper.
Winter wheat: Cappelle sown at 180 kg.
Barley: Julia (dressed with ethirimol), sown at 150 kg.
Red Clover: S123 sown at 45 kg.
Ley: Perennial ryegrass S23, Cocksfoot S143, Late flowering red clover, White clover S100: sown at 50 kg.
Hay: Perennial ryegrass S24, Late flowering red clover, Alsike clover: sown at 30 kg.

Cultivations, etc.:-

Treatment crops.

Ley 1st year: Paraquat applied at 0.56 kg ion in 280 l:
9 Sept, 1971. Ploughed: 14 Oct. Deep-tine cultivated:
4 Nov. Ploughed: 29 Feb, 1972. N, P and K applied:
19 Apr. Rotary cultivated: 21 Apr. Rolled, seeds sown: 26 Apr.
NK applied: 3 July. Cut once: 16 Aug. NK applied: 18 Aug.

Ley 2nd and 3rd years: NK applied: 9 Mar, 1972, 16 June, 18 Aug.
Cut twice: 7 June, 16 Aug.

Clover 1st year: Paraquat applied at 0.56 kg ion in 280 l:
9 Sept, 1971. Ploughed: 14 Oct. Deep-tine cultivated:
4 Nov. Ploughed: 29 Feb, 1972. N, P and K applied: 19 Apr.
Rotary cultivated: 21 Apr. Rolled, seed sown: 26 Apr. Cut
once: 16 Aug.

Clover 2nd and 3rd years: N and K applied: 9 Mar, 1972. Cut
twice: 7 June, 16 Aug.

Potatoes: Paraquat applied at 0.56 kg ion in 280 l: 9 Sept, 1971.
Ploughed: 14 Oct. Deep-tine cultivated: 4 Nov. Chloropicrin
applied: 15 Dec. Ploughed: 29 Feb, 1972. NPK applied: 24 Mar.
Aldicarb applied, all plots rotary cultivated twice, potatoes
planted: 29 Mar. Sprayed with linuron at 1.1 kg plus paraquat
at 0.42 kg ion in 370 l: 6 May. Sprayed with mancozeb at 1.3 kg

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in 430 1: 5 July. Sprayed with mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 430 1: 27 July. Haulm mechanically destroyed: 14 Sept. Lifted: 20 Sept.

Barley 2nd treatment crop: Deep-tine cultivated twice: 15 Sept, 1971, 3 Nov. Seed combine drilled: 15 Mar, 1972. Seeds hay undersown (AH plots): 26 Apr. Sprayed with bromoxynil, ioxynil, dichlorprop and MCPA ('Tetroxone' at 5.6 l in 280 1): 8 May. Combine harvested: 18 Aug.

Barley 3rd treatment crop: Ploughed: 30 Sept, 1971. Seed combine drilled: 15 Mar, 1972. Sprayed with ioxynil at 0.52 kg plus mecoprop at 1.6 kg in 280 1: 1 June. Combine harvested: 18 Aug. Seeds hay: Seeds undersown in rye: 22 Apr, 1971. N, P and K applied: 9 Mar, 1972. Cut twice: 7 June, 16 Aug. NK applied: 19 June.

Test crops.

Potatoes 1st test crop: First half corrective K applied: 3 Nov, 1971. Ploughed: 4 Nov. Second half corrective K applied: 29 Nov. Chloropicrin applied: 15 Dec. Ploughed: 29 Feb, 1972. NPK applied: 24 Mar. Aldicarb applied, all plots rotary cultivated, potatoes planted: 29 Mar. Sprayed with linuron at 1.1 kg plus paraquat at 0.42 kg ion in 370 1: 6 May. Sprayed with mancozeb at 1.3 kg in 430 1: 5 July. Sprayed with mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 430 1: 27 July. Haulm mechanically destroyed: 14 - 16 Sept. Lifted: 20 Sept.

Wheat 2nd test crop: Magnesian limestone applied at 5 tonnes, deep-tine cultivated: 6 Oct, 1971. Deep-tine cultivated: 11 Oct. Seed combine drilled: 22 Oct. N applied: 18 Apr, 1972. Sprayed with 2,4-D at 0.7 kg plus dichlorprop at 2.8 kg in 280 1: 27 Apr. Combine harvested: 30 Aug.

NOTE: Soil samples were taken from the potato plots monthly throughout the growing season for counts of nematodes.

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TABLES OF MEANS

POTATOES: 1ST TREATMENT CROP

ROTATION

	LE	SA	AH	AR	Mean
TOTAL TUBERS: TONNES/HECTARE					
DUNG*					
O	41.7	45.3	43.4	36.2	41.6
D	46.4	43.6	38.0	34.1	40.5
FUMIGANTS 1972					
O	39.5	38.8	34.9	27.0	35.1
F	48.5	50.2	46.5	43.3	47.1
Mean	44.0	44.5	40.7	35.2	41.1
PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE					
DUNG*					
O	83.6	90.1	89.3	83.3	86.6
D	93.2	92.0	88.6	76.6	87.6
FUMIGANTS 1972					
O	87.1	89.3	86.9	76.8	85.0
F	89.6	92.7	91.0	83.2	89.1
Mean	88.4	91.0	89.0	80.0	87.1

* Last applied to test crop sugar beet 1965

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POTATOES 1ST TEST CROP

TOTAL TUBERS: TONNES/HECTARE

	ROTATION			ROTATION		
	LE	SA	Mean	AH	AR	Mean
DUNG*						
O	51.3	52.3	51.8	51.8	45.9	48.8
D	54.4	52.6	53.5	49.3	47.8	48.5
FUMIGANT 1972						
O	50.1	50.3	50.2	47.2	43.7	45.4
F	55.6	54.7	55.1	53.9	50.0	52.0
FUMIGANT 1969						
O				50.1	47.0	48.5
C				51.0	46.7	48.9
Mean	52.8	52.5	52.7	50.5	46.8	48.7

* Last applied to test crop sugar beet 1967

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POTATOES 1ST TEST CROP

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

	ROTATION			ROTATION		
	LE	SA	Mean	AH	AR	Mean
DUNG*						
O	96.3	95.7	96.0	95.5	95.2	95.3
D	95.8	95.6	95.7	95.3	95.0	95.2
FUMIGANT 1972						
O	95.7	95.7	95.7	95.3	94.8	95.1
F	96.4	95.6	96.0	95.5	95.3	95.4
FUMIGANT 1969						
O				95.6	95.1	95.3
C				95.2	95.1	95.2
Mean	96.1	95.6	95.8	95.4	95.1	95.2

* Last applied to test crop sugar beet 1967

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WHEAT 2ND TEST CROP

GRAIN: TONNES/HECTARE

	ROTATION			ROTATION		
	LE	SA	Mean	AH	AR	Mean
N: KG/HA 1972						
0	3.29	3.24	3.26	2.21	2.59	2.40
63	5.16	5.12	5.14	4.72	5.07	4.89
126	4.91	5.10	5.00	4.86	4.90	4.88
183	3.87	4.07	3.97	4.49	4.56	4.53
DUNG*						
0	4.19	4.22	4.21	4.09	3.92	4.01
D	4.43	4.54	4.48	4.04	4.64	4.34
FUMIGANT 1971						
0	4.05	4.06	4.05	4.00	3.98	3.99
F	4.57	4.71	4.64	4.13	4.58	4.36
FUMIGANT 1968						
0				4.04	4.34	4.19
C				4.10	4.22	4.16
Mean	4.31	4.38	4.34	4.07	4.28	4.17

* Last applied to test crop sugar beet 1966

Mean D.M. %: 83.0

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WHEAT 2ND TEST CROP

STRAW: TONNES/HECTARE

	ROTATION			ROTATION		
	LE	SA	Mean	AH	AR	Mean
N: KG/HA 1972						
0	2.67	3.04	2.85	1.90	2.12	2.01
63	5.13	5.30	5.21	4.51	4.73	4.62
126	6.21	6.21	6.21	5.53	5.40	5.46
183	6.18	5.98	6.08	6.02	5.88	5.95
DUNG*						
0	4.96	4.92	4.94	4.64	4.28	4.46
D	5.13	5.35	5.24	4.34	4.79	4.56
FUMIGANT 1971						
0	4.58	4.86	4.72	4.26	4.29	4.27
F	5.51	5.41	5.46	4.72	4.77	4.75
FUMIGANT 1968						
0				4.40	4.52	4.46
C				4.58	4.55	4.56
Mean	5.05	5.13	5.09	4.49	4.53	4.51

* Last applied to test crop sugar beet 1966

Mean D.M. %: 84.7