ROTHAMSTED RESEARCH

Yields of the Field Experiments 1971

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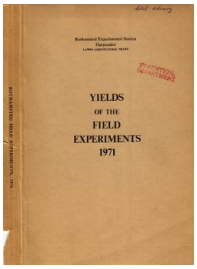

Rotations

Rothamsted Research

Rothamsted Research (1972) *Rotations ;* Yields Of The Field Experiments 1971, pp 50 - 124 **- DOI: https://doi.org/10.23637/ERADOC-1-97**

71/R/RN/1 and 71/R/RN/2

LEY/ARABLE

Object: To study the effects of three-year leys on the fertility of the soil as measured by a sequence of three arable test crops. Since 1968, continuous winter wheat has been grown after the three test crops to study the build-up and decline of take-all (Ophiobolus graminis) after the different cropping sequences - Highfield and Fosters.

The 23rd year, old grass, leys, barley, wheat.

For previous years see 'Details' 1967, 68/B/1(t), 69/R/RN/1&2(t) and 70/R/RN/1&2(t).

Continuous winter wheat: The basal PK for blocks in continuous winter wheat is now 75 kg P_2O_5, 75 kg K_2O as (0:20:20) combine drilled, the N test is unchanged.

Management of hay plots (H): These plots now receive 75 kg N, 75 kg P_2O_5, 75 kg K_2O as (15:15:15) in spring and 75 kg N, 48 kg K_2O as (25:0:16) after each cut except the last. They are cut at the same times as the leys.

HIGHFIELD

2nd year Treatment Crops:

All-grass ley: PK applied: 20 Oct, 1970. NK applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied after first three cuts.

Clover-grass ley: PK applied: 20 Oct, 1970. K applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. K applied after first three cuts.

Lucerne: PK applied: 20 Oct, 1970. Sprayed with paraquat at 0.56 kg ion in 225 l: 4 Feb, 1971. Cut three times: 4 June, 14 July, 7 Sept. Variety: Du Puits.

Hay: Seed undersown in barley at 32 kg: 7 May, 1970. NPK applied: 17 Mar, 1971. Cut four times: 26 May, 14 July, 13 Sept, 2 Nov. NK applied after first three cuts.

2nd Test Crop. Wheat:-

PK applied: 26 Sept, 1970. Deep-tine cultivated twice: 28 Sept. Seed combine drilled at 202 kg: 5 Oct. N applied, plots sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 225 l:14 Apr, 1971. Combine harvested: 24 Aug. Variety: Joss Cambier.

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/1 and 71/R/RN/2

3rd Test Crop. Barley:-
Ground chalk applied: 11 Sept, 1970. Ploughed twice: 11 Sept, 15 Dec. Seed combine drilled at 157 kg: 25 Feb, 1971. N applied: 5 Mar. Sprayed with ioxynil at 0.53 kg plus mecoprop at 1.57 kg in 225 l: 3 May. Combine harvested: 16 Aug. Variety: Julia.

4th, 6th and 7th Test Crops. Wheat:-
Ploughed: 11 Sept, 1970. Seed combine drilled at 202 kg: 5 Oct. N applied: 13 Apr, 1971. Sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 225 l: 14 Apr. Combine harvested: 24 Aug. Variety: Joss Cambier.

Permanent Grasses:
The 23rd experimental year permanent (old) grass, blocks 1, 2 and 4, the 23rd year reseeded grass, blocks 1 and 4. PK applied: 20 Oct, 1970. NK applied to 'all-grass' half plots, K to 'clover-grass' half plots: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied to 'all-grass' half plots and K to 'clover-grass' half plots after each cut except the last.

FOSTERS

2nd year Treatment Crops:
All-grass ley: PK applied: 20 Oct, 1970. NK applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied after first three cuts.
Clover-grass ley: PK applied: 20 Oct, 1970. K applied: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. K applied after first three cuts.
Lucerne: PK applied: 20 Oct, 1970. Sprayed with paraquat at 0.56 kg ion in 225 l: 4 Feb, 1971. Cut three times: 4 June, 14 July, 7 Sept. Variety: Du Puits.
Hay: Seed undersown in barley at 32 kg: 7 May, 1970. NPK applied: 17 Mar, 1971. Cut four times: 26 May, 14 July, 13 Sept, 2 Nov. NK applied after first three cuts.

2nd Test Crop. Wheat:-
PK applied: 26 Sept, 1970. Deep-tine cultivated twice: 28 Sept. Seed combine drilled at 202 kg: 5 Oct. N applied: 13 Apr, 1971. Sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg ion 225 l: 15 Apr. Combine harvested: 24 Aug. Variety: Joss Cambier.

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/1 and 71/R/RN/2

3rd Test Crop. Barley:-
Ploughed twice: 10 Sept, 14 Dec, 1970. Seed combine drilled at 157 kg: 25 Feb, 1971. N applied: 5 Mar. Sprayed with ioxynil at 0.53 kg plus mecoprop at 1.57 kg in 225 l: 3 May. Combine harvested: 16 Aug. Variety: Julia.

4th, 6th and 7th Test Crops. Wheat:-
Ploughed: 10 Sept, 1970. Seed combine drilled at 202 kg: 6 Oct. N applied: 13 Apr, 1971. Sprayed with 2,4-D at 0.56 kg plus dichlorprop at 2.24 kg in 225 l: 15 Apr. Combine harvested: 24 Aug. Variety: Joss Cambier.

Permanent Grasses:
The 23rd year reseeded grass, blocks 1 and 3. PK applied: 20 Oct, 1970. NK applied to 'all-grass' half plots, and K to 'clover-grass' half plots: 17 Mar, 1971. Cut four times: 19 May, 8 July, 13 Sept, 2 Nov. NK applied to 'all-grass' half plots and K to 'clover-grass' half plots after each cut except the last.

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/1 and 71/R/RN/2

SUMMARY OF RESULTS

WHEAT 2ND TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	6.65	6.17	6.86	6.62	6.58	6.06
1971						
N0	6.18	5.72	5.46	5.43	5.70	5.74
N1	7.24	6.32	7.35	6.71	6.90	6.07
N2	7.32	6.64	7.61	7.10	7.17	6.42
N3	5.87	6.01	7.03	7.24	6.54	5.99
1970						
F	6.74	6.22	6.78	6.70	6.61	6.51
D	6.57	6.12	6.95	6.54	6.54	5.60
1970						
N0	7.33	6.30	6.72	6.85	6.80	5.97
N1	7.03	6.61	7.32	6.89	6.96	6.50
N2	6.31	6.09	6.46	6.36	6.31	5.74
N3	5.94	5.69	6.94	6.38	6.23	6.02

Mean D.M. %: 79.8

* AH since 1964

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/1 and 71/R/RN/2

WHEAT 2ND TEST CROP

STRAW: TONNES/HECTARE

HIGHFIELD

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	7.66	7.68	7.17	6.97	7.37	7.14
1971						
N0	7.02	7.02	6.36	5.57	6.49	6.14
N1	8.56	7.94	7.44	7.11	7.76	7.28
N2	7.90	7.92	7.87	7.45	7.78	7.84
N3	7.17	7.85	7.01	7.73	7.44	7.32
1970						
F	7.54	7.59	7.09	6.82	7.26	6.99
D	7.79	7.77	7.25	7.11	7.48	7.30
1970						
N0	7.53	7.26	6.89	6.72	7.10	7.03
N1	7.84	7.74	7.39	7.09	7.51	7.03
N2	7.72	7.75	6.98	6.81	7.32	7.30
N3	7.56	7.97	7.43	7.24	7.55	7.21

Mean D.M. %: 87.6

* AH since 1964

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71/R/RN/1 and 71/R/RN/2

WHEAT 2ND TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	6.74	6.67	6.46	6.17	6.51	6.56
1971						
NO	6.03	6.09	5.83	5.04	5.75	5.31
N1	7.21	7.09	6.87	6.24	6.85	6.92
N2	7.27	7.19	7.05	6.94	7.11	7.25
N3	6.47	6.30	6.10	6.48	6.34	6.75
1970						
F	6.64	6.54	6.34	5.69	6.30	6.68
D	6.85	6.80	6.59	6.66	6.72	6.44
1970						
NO	7.00	6.62	6.47	5.91	6.50	6.48
N1	6.79	6.83	6.14	5.91	6.42	6.32
N2	6.52	6.58	6.81	6.46	6.59	6.47
N3	6.66	6.64	6.43	6.41	6.54	6.96

Mean D.M. %: 79.0

* AH since 1964

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71/R/RN/1 and 71/R/RN/2

WHEAT 2ND TEST CROP

STRAW: TONNES/HECTARE

FOSTERS

	1967 - 69					1949-63
	LU	LC	LN	AH	Mean	R*
Mean	7.08	7.19	6.61	6.54	6.86	7.02
1971						
N0	5.77	6.02	5.53	4.90	5.55	5.73
N1	7.07	7.49	6.69	6.28	6.88	7.07
N2	8.18	7.54	7.71	7.25	7.67	7.78
N3	7.29	7.72	6.53	7.73	7.32	7.51
1970						
F	6.71	6.76	6.17	6.03	6.42	6.77
D	7.45	7.63	7.06	7.05	7.30	7.27
1970						
N0	7.12	7.15	6.33	5.73	6.58	6.87
N1	7.07	6.98	6.39	6.21	6.66	6.71
N2	6.74	7.27	6.85	6.78	6.91	6.93
N3	7.38	7.38	6.88	7.43	7.27	7.58

Mean D.M. %: 87.3

* AH since 1964

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71/R/RN/1 and 71/R/RN/2

BARLEY 3RD TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1966 - 68					1951-62	1951-68		
	LU	LC	LN	AH	Mean	R*	GC	GN	Mean
Mean	5.78	6.14	6.04	5.89	5.96	6.27	6.09	5.94	6.01
1971									
N0	5.29	5.82	5.24	4.91	5.31	6.07	6.27	6.27	6.27
N1	6.27	6.29	6.76	6.37	6.42	6.61	6.55	5.96	6.20
N2	5.92	6.05	5.93	6.15	6.01	6.22	5.52	5.88	5.70
N3	5.64	6.40	6.25	6.14	6.11	6.19	6.01	5.64	5.82
1970									
N0	6.35	6.09	5.70	5.85	6.00				
N1	5.47	6.18	6.04	5.82	5.88				
N2	5.75	5.84	6.22	6.01	5.96				
N3	5.56	6.45	6.22	5.89	6.03				
1969									
F	5.71	6.12	6.10	5.59	5.88	6.14			
D	5.85	6.16	5.99	6.19	6.05	6.40			

Mean D.M. %: 76.3
* AH since 1963

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71/R/RN/1 and 71/R/RN/2

BARLEY 3RD TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1966 - 68					1951-62
	LU	LC	LN	AH	Mean	R*
Mean	6.30	6.22	6.19	5.92	6.16	6.31
1971						
N0	5.19	5.85	5.41	4.64	5.27	5.32
N1	6.25	6.17	6.44	6.12	6.24	6.49
N2	7.26	6.75	6.38	6.29	6.67	6.69
N3	6.51	6.12	6.55	6.65	6.46	6.76
1970						
N0	6.21	6.21	6.21	5.31	5.98	6.65
N1	6.18	6.24	5.87	6.27	6.14	6.11
N2	6.64	6.14	6.22	5.94	6.24	6.34
N3	6.18	6.30	6.47	6.17	6.28	6.16
1969						
F	6.33	6.03	6.15	5.93	6.11	5.94
D	6.27	6.42	6.24	5.91	6.21	6.69

Mean D.M. %: 78.8

* AH since 1963

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71/R/RN/1 and 71/R/RN/2

WHEAT 4TH TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1965 - 67					1950 - 67				
	LU	LC	LN	AH	Mean	RC	RN	GC	GN	Mean
1971										
N1	4.87	6.47	6.69	6.10	6.03	7.01	7.42	6.72	6.73	6.97
N2	5.17	6.76	6.57	6.32	6.21	6.35	7.08	5.83	7.35	6.65
N3	5.23	6.57	6.82	5.72	6.08	6.56	5.67	5.93	5.99	6.04
N4	5.71	5.76	5.75	5.96	5.80	5.32	5.58	4.68	5.79	5.34
Mean	5.24	6.39	6.46	6.03	6.03	6.31	6.44	5.79	6.46	6.25

Mean D.M. %: 82.1

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71/R/RN/1 and 71/R/RN/2

WHEAT 4TH TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1965 - 67					1950 - 67		
	LU	LC	LN	AH	Mean	RC	RN	Mean
1971								
N1	6.18	6.22	6.34	5.72	6.12	7.14	7.01	7.07
N2	7.02	6.41	6.87	6.46	6.69	6.62	6.27	6.45
N3	6.57	6.51	6.42	6.49	6.50	5.82	5.72	5.77
N4	6.00	6.00	5.94	6.37	6.08	6.55	5.90	6.23
Mean	6.45	6.28	6.39	6.26	6.35	6.53	6.23	6.38

Mean D.M. %: 79.5

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71/R/RN/1 and 71/R/RN/2

WHEAT 6TH TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1963 - 65					1951 - 68				
	LU	LC	LN	AH	Mean	RC	RN	GC	GN	Mean
1971										
N1	4.90	5.30	3.41	4.76	4.59	5.54	5.39	5.45	4.20	5.14
N2	5.98	5.70	4.21	5.56	5.36	4.26	5.72	6.39	4.10	5.12
N3	5.25	5.16	4.40	5.80	5.16	4.28	5.35	3.90	4.42	4.49
N4	5.70	4.53	3.94	5.70	4.97	4.26	4.39	5.28	3.94	4.47
Mean	5.46	5.17	3.99	5.45	5.02	4.58	5.21	5.26	4.16	4.80

Mean D.M. %: 84.7

71/R/RN/1 and 71/R/RN/2

WHEAT 6TH TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1963 - 65					1951 - 68		
	LU	LC	LN	AH	Mean	RC	RN	Mean
1971								
N1	5.42	5.94	5.40	5.61	5.59	6.42	5.79	6.11
N2	6.39	6.78	6.48	6.90	6.63	6.82	6.76	6.79
N3	6.52	6.64	6.43	6.52	6.53	6.38	6.48	6.43
N4	6.12	5.77	6.16	6.36	6.10	5.90	5.63	5.77
Mean	6.11	6.28	6.12	6.35	6.21	6.38	6.17	6.27

Mean D.M. %: 79.9

71/R/RN/1 and 71/R/RN/2

WHEAT 7TH TEST CROP

GRAIN: TONNES/HECTARE

HIGHFIELD

	1962 - 64				1950-64		1950 - 67		
	LU	LC	LN	AH	R	Mean	GC	GN	Mean
N1	5.09	5.17	5.54	5.83	6.51	5.63	4.07	2.86	3.46
N2	5.56	5.45	6.08	6.62	6.55	6.05	3.81	4.19	4.00
N3	5.57	6.18	6.00	6.71	6.06	6.11	4.94	3.60	4.27
N4	5.62	4.92	5.61	6.01	5.23	5.48	4.87	4.64	4.75
Mean	5.46	5.43	5.81	6.29	6.09	5.82	4.42	3.82	4.12

Mean D.M. %: 81.8

71/R/RN/1 and 71/R/RN/2

WHEAT 7TH TEST CROP

GRAIN: TONNES/HECTARE

FOSTERS

	1962 - 64				1950-64	
	LU	LC	LN	AH	R	Mean
1971						
N1	5.17	4.85	5.35	4.68	5.46	5.10
N2	6.59	6.35	6.59	6.07	5.90	6.30
N3	6.38	6.15	6.05	6.45	6.26	6.26
N4	5.78	5.73	5.68	5.82	5.77	5.76
Mean	5.98	5.77	5.92	5.75	5.85	5.85

Mean D.M. %: 78.7

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71/R/RN/1 and 71/R/RN/2

HAY

DRY MATTER: TONNES/HECTARE

1st cut	2nd cut	3rd cut	4th cut	Total
		HIGHFIELD		
6.50	3.01	4.13	1.86	15.50

Mean D.M. %: 1st cut: 15.9
2nd cut: 21.6
3rd cut: 25.2
4th cut: 22.5
Total of 4 cuts: 21.3

		FOSTERS		
6.25	3.72	2.25	1.32	13.54

Mean D.M. %: 1st cut: 16.3
2nd cut: 22.1
3rd cut: 24.9
4th cut: 22.3
Total of 4 cuts: 21.4

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71/R/RN/1 and 71/R/RN/2

	HIGHFIELD Mean	FOSTERS Mean
LUCERNE, DRY MATTER: TONNES/HECTARE		
	TOTAL OF 3 CUTS	
2nd year	4.66	5.56
ALL-GRASS LEY, DRY MATTER: TONNES/HECTARE		
	TOTAL OF 4 CUTS	
2nd year	7.33	6.79
CLOVER-GRASS LEY, DRY MATTER: TONNES/HECTARE		
	TOTAL OF 4 CUTS	
2nd year	3.22	4.06
RESEEDED GRASS, DRY MATTER: TONNES/HECTARE		
	TOTAL OF 4 CUTS	

	HIGHFIELD			FOSTERS		
	Blocks	RC	RN	Blocks	RC	RN
23rd Exptl year	1 & 4	3.46	11.17	1 & 4	5.90	9.56

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71/R/RN/1 and 71/R/RN/2

PERMANENT GRASS, DRY MATTER: TONNES/HECTARE

TOTAL OF 4 CUTS

	GC	GN
	HIGHFIELD	
23rd Exptl year		
Blocks 1 & 4	3.21	10.41
Block 2	2.97	10.24

(C) Clover-grass management
(N) All-grass management

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71/W/RN/3

LEY/ARABLE

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

The 34th year, leys, potatoes, rye, carrots, barley.

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

The first test crop was changed from barley to potatoes.

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	126	126
Sainfoin	126	126
Arable with hay	188	188
Arable	0	0
Alternating rotations (last two rotations in order)		
Arable/ley	188	439
Arable with hay/sainfoin	126	126
Ley/arable with hay	63	63
Sainfoin/arable	188	314

Treatments to first test crop potatoes:-

1. Residues of fumigant applied to potatoes 1968 (Arable and Arable with hay only) on quarter plots: None (O), 448 kg (C) chloropicrin.
2. Fresh fumigants on eighth plots: None (O), 448 kg chloropicrin plus 11.2 kg aldicarb (F).
3. Varieties, on half plots after Ley and Sainfoin and quarter plots after Arable and Arable with hay: Maris Piper (R), Pentland Crown (S).

Treatments to rye:-

1. Residues of fumigant applied to potatoes in 1970 on quarter plots: None (O), 448 kg (F) chloropicrin.

Treatments to carrots:-

1. Residues of fumigant applied to potatoes in 1969 on quarter plots: None (O), 448 kg (C) chloropicrin.

NOTE: Red clover, S 123, replaced sainfoin after the first and second year sainfoin failed. Third year sainfoin also failed and the plots were fallowed.

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Basal manuring to both test and treatment potatoes changed to 252 kg N, 252 kg P2O5, 376 kg K2O as (13:13:20).

Cultivations, etc.:

Treatment crops.

Ley 1st year: Ploughed: 4 Sept, 1970. NPK applied: 31 Mar, 1971. Power harrowed, seed sown at 45 kg: 22 Apr. NK applied: 11 Aug. Cut twice: 2 Aug, 8 Sept.

Ley 2nd year: NK applied: 10 Mar, 1971, 15 June, 10 Aug. Cut three times: 1 June, 2 Aug, 8 Sept.

Ley 3rd year: NK applied: 10 Mar, 1971, 15 June, 10 Aug. Cut three times: 1 June, 2 Aug, 8 Sept.

Sainfoin 1st year: Ploughed: 4 Sept, 1970. NPK applied: 31 Mar, 1971. Power harrowed, seed drilled at 45 kg: 22 Apr. Seed redrilled, because of bird damage, at 34 kg: 12 May. Deep-tine cultivated because of second failure: 24 June. Red clover sown at 45 kg: 23 July. Varieties: Sainfoin: Common, Red clover: S 123.

Sainfoin 2nd year: Sprayed with paraquat at 0.6 kg ion in 281 l: 5 Feb, 1971. NK applied: 10 Mar. Cut once: 1 June. Deep-tine cultivated because of crop failure: 22 July. Red clover sown at 45 kg: 23 July. Variety: Red clover S 123.

Sainfoin 3rd year: Sprayed with paraquat at 0.6 kg ion in 281 l: 5 Feb, 1971. NK applied: 10 Mar. Sprayed with paraquat at 1.1 kg ion in 281 l: 4 June. Rotary cultivated after crop failure: 30 June. Deep-tine cultivated: 9 Aug.

Potatoes: Ploughed: 4 Sept, 1970. NPK applied: 26 Mar, 1971. Rotary cultivated: 29 Mar. Potatoes planted: 30 Mar. Sprayed with linuron at 1.12 kg in 371 l: 5 May. Rotary ridged: 1 June. Sprayed with mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l: 28 June. Haulm destroyed mechanically: 23 Aug. Lifted: 24 Aug. Variety: Maris Piper.

Rye: Deep-tine cultivated twice: 29 Sept, 1970. Seed combine drilled at 190 kg: 14 Oct. N applied 13 Apr, 1971. Seeds hay undersown at 45 kg (AH plots): 22 Apr. Combine harvested: 31 Aug. Variety: King II.

Seeds hay: Seeds undersown in rye at 34 kg: 24 Apr, 1970. NPK applied: 10 Mar, 1971. NK applied: 16 Aug. Cut three times: 1 June, 2 Aug, 8 Sept.

Carrots: Ploughed twice: 4 Sept, 1970, 26 Sept. NPK applied: 1 Apr, 1971. Power harrowed: 15 Apr. Seed drilled at 4.5 kg: 16 Apr. Sprayed with demeton-s-methyl at 245 g in 281 l: 19 July. Mechanically hoed: 4 - 5 June. Hand hoed twice: 7 June, 2 July. Lifted: 14 - 18 Oct. Variety: Autumn King.

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Test crops.

Potatoes, 1st test crop: Half corrective K applied to all plots except 35 and 36 after carrots: 23 Sept, 1970. Half corrective K applied to plots 35 and 36: 27 Oct. Ploughed: 3 Nov. Chloropicrin applied: 18 Dec. Remaining corrective K applied to all plots: 5 Mar, 1971. NPK applied: 26 Mar. Aldicarb applied, rotary cultivated: 29 Mar. Potatoes planted: 30 Mar. Sprayed with linuron at 1.12 kg in 371 l: 5 May. Rotary ridged: 1 June. Sprayed with mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l: 28 June. Sprayed with mancozeb at 1.34 kg in 371 l: 12 Aug. Haulm destroyed mechanically: 17 Sept. Sprayed with undiluted BOV at 225 l: 20 Sept. Lifted: 28 - 30 Sept. Varieties: Maris Piper and Pentland Crown.

Barley, 2nd test crop: Magnesian limestone applied at 5020 kg: 8 Oct, 1970. Ploughed: 26 Oct. Seed combine drilled at 168 kg: 10 Mar, 1971. Sprayed with ioxynil at 0.53 kg and mecoprop at 1.58 kg in 281 l: 30 Apr. Combine harvested: 18 Aug. Variety: Julia.

NOTE: Soil samples were taken from the potato plots monthly, throughout the growing season and in the barley stubble, for counts of nematodes.

https://doi.org/10.23637/ERADOC-1-97 *pp 22*

71/W/RN/3

SUMMARY OF RESULTS

RYE

GRAIN: TONNES/HECTARE

	LE	SA	AH	AR	Mean
O	4.15	3.83	3.11	3.17	3.57
D*	3.86	3.68	3.16	3.04	3.44
O	3.71	4.11	3.23	2.99	3.51
F	4.30	3.39	3.04	3.22	3.49
Mean	4.01	3.75	3.14	3.11	3.50

Mean D.M. %: 71.0

* Last applied to test crop sugar beet 1963

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/3

POTATOES TREATMENT CROP

	LE	SA	AH	AR	Mean
	TOTAL TUBERS: TONNES/HECTARE				
0	39.1	31.0	27.0	26.2	30.8
D*	43.2	34.4	30.7	30.5	34.7
Mean	41.2	32.7	28.8	28.4	32.7
	% WARE: 3.81 CM (1.5 INCH) RIDDLE				
0	97.8	94.7	92.8	94.4	94.9
D*	96.9	95.5	95.2	95.4	95.7
Mean	97.3	95.1	94.0	94.9	95.3

* Last applied to test crop sugar beet 1964

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71/W/RN/3

POTATOES 1ST TEST CROP

TOTAL TUBERS: TONNES/HECTARE

	LE	SA	Mean	AH	AR	Mean
R	68.0	74.4	71.2	68.9	62.8	65.8
S	62.6	59.6	61.1	56.2	59.8	58.0
O	64.1	65.3	64.7	60.1	56.9	58.5
D*	66.5	68.8	67.6	65.0	65.6	65.3
O	60.1	63.0	61.5	56.0	56.1	56.1
F	70.5	71.0	70.8	69.1	66.5	67.8
O				59.4	59.3	59.3
C				65.7	63.2	64.5
Mean	65.3	67.0	66.2	62.6	61.3	61.9

* Last applied to test crop sugar beet 1966

https://doi.org/10.23637/ERADOC-1-97 *pp 25*

71/W/RN/3

POTATOES 1ST TEST CROP

% WARE: 3.81 CM (1.5 INCH) RIDDLE

	LE	SA	Mean	AH	AR	Mean
R	98.0	97.6	97.8	97.6	97.4	97.5
S	97.6	97.2	97.4	96.7	97.5	97.1
O	97.8	97.6	97.7	97.0	97.2	97.1
D*	97.7	97.2	97.5	97.3	97.7	97.5
O	97.8	97.4	97.6	96.9	97.3	97.1
F	97.8	97.4	97.6	97.3	97.7	97.5
O				96.9	97.2	97.1
C				97.3	97.7	97.5
Mean	97.8	97.4	97.6	97.1	97.5	97.3

* Last applied to test crop sugar beet 1966

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71/W/RN/3

CARROTS

ROOTS: TONNES/HECTARE

	O	D*	O	C	Mean
SA	97.5	97.2	92.2	102.5	97.4
AR	89.3	96.4	89.4	96.3	92.9
Mean	93.4	96.8	90.8	99.4	95.1

* Last applied to test crop sugar beet 1967

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/4

MARKET GARDEN

Object: To study direct and residual effects of phosphate, applied either as fertiliser or in organic manures in the period 1942 - 67, on yields of three crops grown in rotation - Woburn Lansome I.

The second year of revised scheme, barley and potatoes.

For previous years see 'Details' 1967, 68/B/4(t), 69/W/RN/4 and 70/W/RN/4(t).

Whole plot dimensions: 8.53 x 5.18. Area harvested: 0.00074.

Superphosphate treatments (applied to whole plots with confounding of certain two and three factor interactions):-
Series A: Barley: None (0), 63 kg P_2O_5 (P)
Series B: Potatoes: None (0), 188 kg P_2O_5 (P)

Basal applications:-
Series A: Barley: Manures: 2510 kg ground chalk. 100 kg muriate of potash (60% K_2O), 290 kg 'Nitro-Chalk' 21. Weedkiller: Ioxynil at 0.53 kg and mecoprop at 1.58 kg in 281 l.
Series B: Potatoes: Manures: 2510 kg ground chalk. 417 kg muriate of potash (60% K_2O), 1345 kg 'Nitro-Chalk' 21, 605 kg Epsom salts (16% MgO). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.:
Series A: Barley: Ground chalk applied: 13 Nov, 1970. Ploughed: 14 Nov. N and K applied: 1 Mar, 1971. P treatments applied: 3 Mar. Seed drilled at 157 kg: 17 Mar. Weedkiller applied: 30 Apr. Combine harvested: 16 Aug. Variety: Julia.
Series B: Potatoes: Ground chalk applied, ploughed: 11 Sept, 1970. Deep-tine cultivated: 21 Oct. N, K and Mg applied: 30 Mar, 1971. P treatments applied, rotary cultivated, potatoes planted: 31 Mar. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm mechanically destroyed: 17 Sept. Sprayed with undiluted BOV at 225 l: 20 Sept. Lifted: 28 - 30 Sept. Variety: Pentland Crown.

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71/W/RN/4

SUMMARY OF RESULTS

SERIES A

BARLEY

Organic 1942-61*	Organic 1962-67	P0K0 0	P0K0 P	P1K1 0	P1K1 P	P2K2 0	P2K2 P
		GRAIN: TONNES/HECTARE					
0	0			5.70	5.50	4.33	6.05
S1	0					5.58**	6.18**
S2	0					5.38**	5.77**
T1	0					5.68**	5.76**
T2	0					5.61**	5.77**
D1	D1	4.78	5.64	5.65	5.46		
D2	D2	5.81	5.99	6.21	5.82		
C1	D1	5.84	5.77	4.60	6.22		
C2	D2	6.08	6.18	5.84	6.16		
		STRAW: TONNES/HECTARE					
0	0			3.62	3.79	2.98	4.25
S1	0					3.95**	4.50**
S2	0					3.90**	3.89**
T1	0					3.56**	4.38**
T2	0					4.24**	3.96**
D1	D1	3.62	4.59	4.31	2.66		
D2	D2	4.26	4.57	4.25	3.96		
C1	D1	4.27	3.87	2.85	4.82		
C2	D2	4.70	4.54	3.91	4.54		

General mean: Grain: 5.67
Straw: 3.99
Mean D.M. %: Grain: 76.1
Straw: 67.2

* Last applied to Leeks 1961/62
** P1K1 1962-65

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71/W/RN/4

SERIES B

POTATOES

Organic 1942-61	Organic 1962-64	Organic 1966-67	P0K0 0	P0K0 P	P1K1 0	P1K1 P	P2K2 0	P2K2 P
TOTAL TUBERS: TONNES/HECTARE								
0	0	0			51.7	50.5	55.6	59.1
0	0	PT			50.8	58.2	59.0	61.7
S1	0	0	56.1*	57.9*				
S2	0	0	57.8*	60.6*				
T1	0	0	57.0*	58.0*				
T2	0	0	60.7*	62.7*				
D1	D1	D1	46.5	60.6	58.8	59.9		
D1	D1	0	49.5	58.3	58.8	56.3		
D2	D2	D2	53.2	62.0	63.5	65.4		
D2	D2	0	52.8	54.3	57.9	56.6		
C1	D1	D1	56.9	59.8	64.3	58.1		
C2	D2	D2	61.4	55.2	59.6	62.5		
% WARE: 3.81 CM (1.5 INCH) RIDDLE								
0	0	0			97.2	96.5	96.9	97.1
0	0	PT			97.5	97.8	97.7	97.2
S1	0	0	98.0*	97.9*				
S2	0	0	97.7*	97.2*				
T1	0	0	97.1*	97.0*				
T2	0	0	97.9*	97.5*				
D1	D1	D1	97.4	98.7	96.9	96.4		
D1	D1	0	97.5	97.9	97.6	97.3		
D2	D2	D2	97.1	97.3	96.9	98.4		
D2	D2	0	97.1	98.0	97.6	97.8		
C1	D1	D1	97.2	97.5	97.6	97.1		
C2	D2	D2	97.5	97.1	97.2	97.5		

General mean: Total tubers: 58.1
% ware: 97.4

* P1K1 1962-64

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70/W/RN/4. Replacement for page 81.

70/W/RN/4

SERIES B

BARLEY

Organic 1942-61	Organic 1962-64	Organic 1966-67	P0K0 0	P0K0 P	P1K1 0	P1K1 P	P2K2 0	P2K2 P
GRAIN: CWT								
0	0	0			37.0	37.1	40.0	37.6
0	0	PT			34.3	30.8	37.3	36.3
S1	0	0	36.3*	37.1*				
S2	0	0	32.1*	37.5*				
T1	0	0	42.2*	39.8*				
T2	0	0	30.0*	38.1*				
D1	D1	D1	35.0	36.9	41.3	31.0		
D1	D1	0	36.0	36.7	38.3	37.3		
D2	D2	D2	40.2	38.0	41.1	41.0		
D2	D2	0	45.5	36.4	39.3	42.1		
C1	D1	D1	38.3	42.3	43.1	44.8		
C2	D2	D2	35.0	36.6	37.4	41.4		
STRAW: CWT								
0	0	0			20.2	16.1	20.7	18.2
0	0	PT			18.4	20.2	19.5	19.7
S1	0	0	20.4*	17.1*				
S2	0	0	15.2*	18.3*				
T1	0	0	22.9*	18.6*				
T2	0	0	18.0*	20.1*				
D1	D1	D1	18.7	17.7	18.9	16.3		
D1	D1	0	14.3	16.7	25.5	16.3		
D2	D2	D2	13.1	15.7	18.8	18.8		
D2	D2	0	27.2	12.7	19.7	21.0		
C1	D1	D1	18.6	20.5	23.1	22.7		
C2	D2	D2	18.2	17.9	20.4	22.3		

General mean: Grain: 37.9
Straw: 19.1
Mean D.M. %: Grain: 84.0
Straw: 78.4

* P1K1 1962-64

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71/R/RN/5

ARABLE REFERENCE PLOTS

Object: To study the long term effects of FYM and N, P and K fertilisers on the yield and mineral content of crops - Great Field IV.

The sixteenth year of the rotation barley, ley, potatoes, winter wheat, kale. The twelfth year of the same rotation on the additional plots. The fifteenth year of permanent grass.

For previous years see 58/Bc/1(t), 59/Bc/1(t), 60/B/3(t), 61-64/B/2, 65/B/2(t), 66/B/2(t), 67/B/2, 68/B/3(t) and 69-70/R/RN/5.

Whole plot dimensions: 2.13 x 2.44.

Cultivations, etc.: Ground chalk applied at 3.76 tonnes to all plots of the main experiment: 27 Nov, 1970.

Winter wheat: Balancing Mg applied to half plots: 25 Sept, 1970. Plots dug by hand, test Mg applied: 2 Oct. P, K, Ca and S applied, seed drilled: 5 Oct. First half N dressing applied: 9 Mar, 1971. Trace element spray applied: 19 Apr. All N applied to additional plots, second half N dressing applied: 27 Apr. Harvested: 13 Aug. Variety: Maris Nimrod.

Kale: FYM applied, plots dug by hand: 3 Nov, 1970. P, K, Ca, Mg and S applied to additional plots: 29 Jan, 1971. P and K applied to remainder: 19 Feb. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, seed drilled: 7 Apr. Trace element spray applied: 11 June. Second half N dressing applied to additional plots: 15 June. Sprayed with menazon ('Saphicol' at 0.7 l in 450 l): 6 July. Harvested: 22 Oct. Variety: Thousand headed.

Barley: Plots dug by hand: 3 Nov, 1970. P, K, Mg, Ca and S applied to additional plots: 29 Jan, 1971. P and K applied to remainder: 19 Feb. N applied, plots rotary cultivated, seed drilled: 31 Mar. Trace element spray applied: 24 May. Sprayed (excluding additional plots) with tridemorph fungicide at 0.53 kg in 450 l): 15 June. Harvested - additional plots: 13 Aug, remainder: 16 Aug. Variety: Deba Abed (Midas on additional plots, seed dressed with ethirimol).

Grass-clover ley: Seed drilled in barley stubble: 14 Aug, 1970. P, K, Ca, Mg and S applied: 17 Dec. N applied: 9 Mar, 1971. Trace element spray applied: 19 Apr. Cut three times: 4 June, 23 July, 20 Sept. Varieties: R.V.P. Italian Ryegrass and Dorset Marl Clover.

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71/R/RN/5

Potatoes: FYM applied and plots dug by hand: 4 Nov, 1970. P, K, Ca, Mg and S applied to additional plots: 29 Jan, 1971. P and K applied to remainder: 19 Feb. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, Mg applied to half plots, potatoes planted: 7 Apr. Trace element spray applied: 11 June. Second half N dressing applied to additional plots: 15 June. All plots sprayed on 2 occasions with mancozeb at 1.35 kg plus menazon ('Saphicol' at 0.7 l) in 450 l: 16 June, 28 July. Additional plots only sprayed once as above described: 6 July. Lifted: Plots of main experiment with neither K nor FYM and no fertiliser plots of additional plots: 30 July. Remainder sprayed with captafol fungicide at 1.68 kg plus menazon ('Saphicol' at 0.7 l) in 450 l: 18 Aug. Remaining plots lifted: 14 Sept. Variety: King Edward.

Permanent grass: P and K applied: 17 Dec, 1970. FYM applied: 22 Feb, 1971. N applied: 9 Mar, 20 May, 15 July. Cut three times: 20 May, 15 July, 11 Oct.

NOTES: (1) Yields of dry matter were obtained for each crop.
(2) The percentages of N, P and K were measured in each crop.
(3) The percentage of Mg was measured in potato tubers on the main experiment.
(4) The percentage of K in potato leaves was measured on the main experiment.

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/5

SUMMARY OF RESULTS

GREAT FIELD IV (R): ORIGINAL PLOTS

TONNES/HECTARE

Treatment	WINTER WHEAT: GRAIN	WINTER WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	BARLEY: STRAW	LEY: DRY MATTER 1st cut	LEY: DRY MATTER 2nd cut	LEY: DRY MATTER 3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS	PERMANENT GRASS: DRY MATTER 1st cut	PERMANENT GRASS: DRY MATTER 2nd cut	PERMANENT GRASS: DRY MATTER 3rd cut	PERMANENT GRASS: DRY MATTER Total of 3 cuts
0	3.22	5.20	15.7	2.25	2.36	2.19	0.81	0.97	3.97	7.1	0.73	1.17	1.00	2.90
N1	1.34	4.62	20.9	2.73	3.42	5.16	1.20	1.34	7.70	8.1	1.14	1.39	1.41	3.94
P	2.78	4.34	27.5	3.40	2.87	2.86	0.67	0.50	4.03	13.4	0.59	0.94	0.67	2.20
N1P	0.88	3.56	37.5	2.56	3.28	5.23	0.93	0.36	6.52	8.0	1.75	1.50	1.66	4.91
K	4.18	5.68	12.6	3.11	2.58	3.72	1.95	1.83	7.50	33.8	0.76	1.05	1.11	2.92
N1K	5.69	7.53	13.1	1.53	2.98	4.78	1.86	2.29	8.93	37.1	2.12	1.90	2.03	6.05
PK	4.41	5.93	27.5	3.76	2.79	4.74	3.43	3.26	11.43	36.3	1.00	1.74	1.17	3.91
N1PK	6.52	9.34	42.7	4.79	5.24	6.35	2.71	2.81	11.87	43.4	2.39	1.98	1.60	5.97
N2PK	8.50	11.48	48.4	5.15	5.55	7.40	2.18	2.20	11.78	51.0	4.12	2.49	2.55	9.16
D	5.02	7.74	34.4	4.49	3.81	5.97	2.29	2.26	10.52	45.9	3.75	1.67	1.54	6.96
N1PKD	7.44	11.75	53.2	5.84	5.80	6.45	2.26	2.26	10.97	58.1	3.68	2.59	2.38	8.65
N2PKD	5.00	13.33	61.0	5.55	7.31	7.72	2.09	1.93	11.74	64.9	4.50	4.33	2.43	11.26
Mean D.M.%:	80.0	65.1		74.7	61.2	27.3	25.8	29.6	27.6		27.8	29.2	33.0	30.0

71/R/RN/5

GREAT FIELD IV (R): ADDITIONAL PLOTS

TONNES/HECTARE

Treatment	WINTER WHEAT: GRAIN	STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	STRAW	LEY: DRY MATTER 1st cut	2nd cut	3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS
None	3.33	4.73	17.9	2.86	3.36	2.84	0.76	1.02	4.62	7.0
N2 PK	6.38	7.52	57.6	5.87	7.49	7.31	2.28	2.12	11.71	41.8
N2 PK Mg Ca	7.42	8.67	60.2	4.94	7.93	7.39	2.56	1.86	11.81	32.3
N2 PK Mg S	7.38	8.74	59.7	4.89	6.94	6.65	1.76	1.73	10.14	38.4
N2 PK Ca S	7.39	9.25	59.7	5.29	7.39	7.45	2.13	1.98	11.56	34.4
N2 PK Mg Ca S	7.48	9.22	60.6	6.07	7.46	8.91	2.85	2.46	14.22	34.0
N2 PK Mg Ca S TE	6.66	8.84	61.5	5.81	7.34	7.74	2.31	2.24	12.29	31.4
Mean D.M. %:	80.2	67.5		81.1	78.3	28.5	26.1	28.8	27.8	

71/W/RN/6

ARABLE REFERENCE PLOTS

Object: To study the long term effects of FYM and N, P and K fertilisers on the yield and mineral content of crops - Woburn Stackyard C.

The 12th year, oats, sugar beet, barley, ley, potatoes and old grass.

For previous years see 60/B/3(t), 61-65/B/2, 66/B/2(t), 67/B/2(t), 68/B/3(t), 69/W/RN/6 and 70/W/RN/6(t).

Whole plot dimensions: 2.74 x 2.13.

Cultivations, etc.:-

Winter oats: Balancing Mg applied to half plots, plots dug by hand: 1 Oct, 1970. P and K applied, seed drilled: 6 Oct. First N applied: 1 Mar, 1971. Sprayed ioxynil at 0.63 kg and mecoprop at 1.89 kg in 450 l: 15 Apr. Second N applied: 3 May. Harvested: 6 Aug. Variety: Peniarth.

Sugar beet: FYM applied, plots dug by hand: 1 Dec, 1970. P and K applied: 12 Dec. First N applied, rotary cultivated, Mg applied to half plots, seed drilled: 2 Apr, 1971. Singled, second N applied: 2 June. Sprayed menazon at 0.28 kg in 450 l on three occasions: 18 June, 7 July, 29 July. Harvested: 7 Oct. Variety: Klein E.

Barley: Balancing Mg applied: 29 Oct, 1970. Plots dug by hand: 2 Dec. P and K applied: 12 Feb, 1971. First N applied, rotary cultivated, seed drilled: 1 Mar. Second N applied: 4 May. Harvested: 6 Aug. Variety: Julia.

Grass-clover ley: Seed drilled in barley stubble: 14 Aug, 1970. P and K applied: 1 Dec. N applied: 1 Mar, 1971. Cut three times: 2 June, 29 July, 17 Sept. Varieties: R.V.P. Italian Ryegrass and Dorset Marl Clover.

Potatoes: FYM applied, plots dug by hand: 1 Dec, 1970. P and K applied: 12 Feb, 1971. First N applied, rotary cultivated, Mg applied to half plots, potatoes planted: 15 Apr. Second N applied: 2 June. Earthed up: 3 June. Sprayed mancozeb at 1.34 kg plus menazon at 0.28 kg in 450 l twice: 18 June, 7 July. Lifted plots **without K**, sprayed menazon at 0.28 kg plus captafol at 1.68 kg in 450 l to remaining plots: 29 July. Remaining plots lifted: 3 Sept. Variety: Desiree.

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Permanent grass: P and K applied: 1 Dec, 1970. FYM applied: 12 Feb, 1971. N applied: 1 Mar, 2 June, 20 July. Cut three times: 2 June, 20 July, 8 Oct.

NOTES: (1) Samples were taken for determination of dry matter for each crop, and the percentage of N, P and K.
(2) The percentage of Mg in sugar beet tops, potato tubers and leaves was determined.
(3) The percentage of K in potato leaves was determined.

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/6

SUMMARY OF RESULTS

TONNES/HECTARE

Treatment	OATS		SUGAR BEET		BARLEY	
	GRAIN	STRAW	ROOTS	TOPS	GRAIN	STRAW
None	1.39	1.76	12.8	12.8	1.72	1.31
N1	3.49	4.55	19.5	24.2	2.08	2.04
P	1.74	2.27	15.7	12.6	1.82	1.34
N1P	3.48	4.64	19.5	25.0	0.93*	1.32*
K	1.49	2.56	18.2	16.1	2.07	1.74
N1K	3.45	5.05	32.0	29.1	4.12	4.46
PK	1.65	2.25	20.5	14.1	2.00	1.65
N1PK	3.56	6.33	39.5	32.2	4.28	3.93
N2PK	4.85	8.02	42.7	41.3	4.64	5.41
D	1.93	2.89	36.7	30.4	2.49	1.88
N1PKD	3.98	6.92	51.3	42.0	4.65	4.92
N2PKD	4.92	9.49	57.1	56.2	4.47	5.42
Mean D.M. %:	78.6	44.0			80.3	73.0

* Much of crop destroyed by mice

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71/W/RN/6

TONNES/HECTARE

Treatment	LEY: DRY MATTER 1st cut	2nd cut	3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS	OLD GRASS: DRY MATTER 1st cut	2nd cut	3rd cut	Total of 3 cuts
None	2.71	0.52	0.32	3.55	8.4	1.86	0.17	0.76	2.79
N1	4.64	0.83	0.29	5.76	7.6	3.51	0.84	2.58	6.93
P	2.54	0.63	0.30	3.47	9.0	1.42	0.16	0.61	2.19
N1P	4.63	0.92	0.29	5.84	8.2	3.13	0.70	2.31	6.14
K	3.27	1.28	1.48	6.03	7.9	2.11	0.35	1.18	3.64
N1K	5.34	1.35	1.20	7.89	11.8	4.58	1.24	3.30	9.12
PK	3.98	1.70	1.48	7.16	5.4	1.84	0.21	0.88	2.93
N1PK	6.10	1.38	0.96	8.44	20.2	4.13	1.27	3.21	8.61
N2PK	6.72	1.83	0.99	9.54	26.3	5.28	1.47	2.73	9.48
D	4.14	1.49	1.35	6.98	20.2	3.64	0.44	1.30	5.38
N1PKD	6.73	1.79	1.11	9.63	30.7	5.18	1.55	3.99	10.72
N2PKD	7.59	2.41	1.13	11.13	40.6	4.54	2.38	4.09	11.01
Mean D.M. %:	29.2	31.1	20.6	27.0		28.9	36.5	30.5	32.0

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71/R/RN/7

RESIDUAL PHOSPHATE

Object: To study direct and residual effects of phosphate fertiliser on yields of three crops grown in rotation - Sawyers I and Great Field IV.

The 12th year, potatoes, barley, swedes.

For previous years see 'Details' 1967 and 68/B/5(t), 69/R/RN/7 and 70/R/RN/7(t).

Whole plot dimensions:-
Sawyers I: 4.27 x 20.1. Area harvested: Potatoes and barley - 0.00572, Swedes - 0.00429.
Great Field IV: 4.27 x 19.3. Area harvested: Potatoes and barley - 0.00520, Swedes - 0.00390.

Standard applications:
Potatoes: Weedkillers: Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 427 l. Fungicide: Mancozeb at 1.34 kg in 438 l on 2 occasions. Insecticide: Demeton-s-methyl at 245 g applied with the fungicide on the first occasion.
Barley: Ground chalk at 3140 kg. Weedkiller: Ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l).

Cultivations, etc. (both fields):- Ploughed: 27 Oct, 1970.
Potatoes: Fertilisers applied: 6 Apr, 1971. Plots rotary cultivated, potatoes machine planted: 7 Apr. Weedkiller applied: 10 May. Grubbed: 5 June. Rotary ridged: 7 June. Fungicide plus insecticide applied: 24 June. Fungicide applied: 13 Aug. Sprayed with undiluted BOV at 168 l: 15 Sept. Lifted: 24 Sept. Variety: Majestic.
Barley: Chalk applied: 12 Oct, 1970. Treatment P fertilisers applied: 3 Mar, 1971. Seed combine drilled at 157 kg: 10 Mar. Weedkiller applied: 4 May. Combine harvested: 17 Aug. Variety: Julia.
Swedes: Treatment P and basal K applied: 21 Apr, 1970. N applied: 14 May. Seed drilled at 1.7 kg: 18 May. Singled: 28 June. Lifted: 20 Oct. Variety: Wilhelmsburger.

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Standard errors per plot.

Sawyers I:

Potatoes, total tubers, tonnes/hectare:	2.11 or 6.7% (11 d.f.)
Barley, grain, tonnes/hectare:	0.224 or 4.0% (11 d.f.)
Swedes, roots, tonnes/hectare:	2.30 or 10.4% (11 d.f.)

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/7

SUMMARY OF RESULTS

POTATOES

Treatment	TOTAL TUBERS: TONNES/HECTARE		% WARE: 3.81 CM (1.5 INCH)	
	Great Field IV	Sawyers I	Great Field IV	Sawyers I
		(±1.49)		
0	27.9	23.6	96.6	97.3
A1	32.1	31.8	94.8	95.0
A2	34.3	36.9	94.3	93.1
A3	40.2	42.6	94.6	93.2
A4	46.3	42.3	93.4	93.6
T1	28.1	26.3	96.1	95.5
T2	31.7	28.0	93.8	93.6
R2	34.5	29.4	95.6	95.2
R3	29.5	31.0	93.0	93.6
R4	39.8	38.8	93.7	93.1
G1	28.9	23.8	94.8	95.5
S1	27.8	22.6	95.7	96.2
Mean	33.4	31.4	94.7	94.6

BARLEY

	GRAIN: TONNES/HECTARE		STRAW: TONNES/HECTARE	
		(±0.158)		
0	3.58	4.90	2.98	3.12
A1	4.72	5.70	4.54	3.71
A2	4.60	5.78	3.82	3.79
A3	4.56	5.95	4.01	4.08
A4	5.06	6.28	4.17	4.21
T1	3.94	5.62	3.98	3.69
T2	4.02	5.64	2.86	3.79
R2	4.47	5.41	3.48	3.26
R3	4.60	5.77	4.02	3.94
R4	4.40	5.87	3.67	4.18
G1	4.55	5.35	3.59	3.76
S1	3.09	5.19	3.54	3.56
Mean	4.30	5.62	3.72	3.76
Mean D.M.%:	82.4	83.8	83.8	87.2

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SWEDES, ROOTS: TONNES/HECTARE

Treatment	Great Field IV	Sawyers I
		(±1.63)
0	10.7	9.3
A1	22.0	23.5
A2	28.5	28.0
A3	30.6	27.4
A4	25.5	29.3
T1	19.1	19.0
T2	23.9	21.5
R2	23.8	21.5
R3	26.4	28.9
R4	30.7	28.7
G1	16.0	13.7
S1	13.4	15.5
Mean	22.5	22.2

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/8

CULTIVATION/WEEDKILLER

Object: To determine the long-term effects of weedkillers and different methods of primary cultivation on a rotation of crops - Great Harpenden I.

The 11th year, beans, wheat, potatoes, barley.

For previous years see 'Details' 1967, 68/B/6(t), 69/R/RN/8(t) and 70/R/RN/8.

Paraquat, at 1.68 kg ion in 225 l, was applied to all bean stubble (and not, as hitherto, to half plots) in September 1970 for spring wheat 1971.

Beans tested dinoseb acetate, at 2.80 kg in 425 l, on SY plots and simazine, at 1.12 kg in 225 l, on SX, A, B and C plots.

Whole plot dimensions: 12.8 x 15.2. Area harvested: Beans - 0.00487, Wheat, potatoes and barley - 0.00434.

Cultivations, etc.:-

Spring beans: Barley straw burnt on B plots: 29 Aug, 1970. Paraquat applied to B plots and to G sub plots: 11 Sept. T and B plots deep-tine cultivated once: 30 Oct. T plots deep-tine cultivated second time: 4 Nov. R plots rotary cultivated, P and C plots ploughed: 5 Nov. P, R, T, B and C plots power-harrowed, A plots rotary cultivated, all plots placement drilled at 224 kg: 26 Feb, 1971. Simazine applied to SX, A, B and C plots: 10 Mar. M plots tractor hoed: 30 Apr. Dinoseb acetate applied to SY plots: 4 May. Sprayed with demeton-s-methyl at 245 g in 438 l: 1 July. Combine harvested: 3 Sept. Variety: Maris Bead.

Spring wheat: Bean straw raked off B plots (insufficient to burn): 7 Sept, 1970. Paraquat applied to all plots: 11 Sept. All plots disced twice: 23 Sept. All plots disced: 12 Oct. B plots deep-tine cultivated: 30 Oct. T plots deep-tine cultivated twice: 4 Nov. R plots rotary cultivated, P and C plots ploughed: 5 Nov. P, R, T, B and C plots power-harrowed, A plots rotary cultivated: 31 Mar, 1971. Seed combine drilled at 190 kg: 2 Apr. H sub plots and B and C plots sprayed with ioxynil at 0.84 kg and mecoprop at 2.52 kg in 225 l: 12 May. Combine harvested: 1 Sept. Variety: Kolibri.

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Potatoes: Wheat straw burnt on B plots: 29 Aug. Paraquat applied to B plots and G sub plots: 11 Sept. T plots deep-tine cultivated: 30 Oct, and 4 Nov. R plots rotary cultivated: 5 Nov. P and C plots ploughed: 6 Nov. Basal NPK applied: 6 Apr, 1971. P and T plots power-harrowed, R, A, B and C plots rotary cultivated, potatoes machine planted: 8 Apr. All ridges rolled: 14 Apr. M plots chain harrowed: 30 Apr. M plots grubbed: 4 May. S plots sprayed: 8 May. M plots mechanically weeded: 12 May. M and Y plots grubbed: 3 June. M and Y plots rotary ridged: 4 June. All plots sprayed with mancozeb at 1.35 kg in 438 l: 23 June. Sprayed twice with mancozeb at 1.35 kg in 438 l: 14 Aug and 16 Aug (heavy rain followed the application on 14 Aug). Haulm destroyed mechanically: 9 Sept. Sprayed with undiluted BOV at 169 l: 13 Sept. Lifted: 20 Sept. Variety: Pentland Crown.

Barley: T plots deep-tine cultivated: 30 Oct, 1970. T plots deep-tine cultivated once, C plots twice: 4 Nov. R plots rotary cultivated, B plots spring-tine cultivated, P plots ploughed: 5 Nov. P, R, T, B and C plots power-harrowed, A plots rotary cultivated twice, seed combine drilled at 157 kg: 26 Feb, 1971. H sub plots and B and C plots sprayed with ioxynil at 0.84 kg and mecoprop at 2.52 kg in 225 l: 4 May. Combine harvested: 11 Aug. Variety: Julia.

NOTE: Docks were hand pulled on wheat, coltsfoot on wheat and beans and thistles on all crops. Weed counts were taken.

Standard errors per plot.

Spring beans:	Grain, tonnes/hectare:	Whole plot:	0.488 or 24.2% (8 d.f.)
		Sub plot:	0.158 or 7.8%(9 d.f.)
Spring wheat:	Grain, tonnes/hectare:	Whole plot:	0.366 or 8.9% (8 d.f.)
		Sub plot:	0.116 or 2.8% (9 d.f.)
Potatoes:	Total tubers, tonnnes/hectare:		
		Whole plot:	4.71 or 12.6% (8 d.f.)
		Sub plot:	4.71 or 12.6% (9 d.f.)
Barley:	Grain, tonnes/hectare:	Whole plot:	0.155 or 2.6% (8 d.f.)
		Sub plot:	0.229 or 3.9% (9 d.f.)

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71/R/RN/8

SUMMARY OF RESULTS

SPRING BEANS

GRAIN: TONNES/HECTARE

	P	R	T	Mean
Mean (0.141)	2.18	1.97	1.90	2.02
		(±0.244)		(±0.141)
M	2.39	2.13	1.89	2.14
SX	2.23	1.85	1.85	1.98
SY	1.92	1.92	1.95	1.93
		(1) and (2)		(±0.037)
O	2.09	1.94	1.83	1.95
G	2.27	2.00	1.96	2.08

A	AG	BG	C	CG
2.30	2.24	1.77	2.04	2.34

General mean: 2.03

Mean D.M. %: 81.3

(1) (±0.065) For use in horizontal and diagonal comparisons only
(2) (±0.148) For use in vertical and interaction comparisons only

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SPRING WHEAT

GRAIN: TONNES/HECTARE

	P	R	T	Mean
Mean (±0.106)	4.18	4.15	4.04	4.12
1970				
M (±0.183)	4.28	4.16	3.85	4.09 (±0.106)
S*(±0.129)	4.13	4.14	4.14	4.14 (±0.074)
		(1) and (2)		(±0.027)
1971				
O	4.21	4.08	3.98	4.09
H	4.15	4.21	4.10	4.15

A	AH	BH	CH
3.85	3.99	4.20	4.15

General mean: 4.11

* Duplicated level

Mean D.M. %: 80.9

(1) (±0.047) For use in horizontal and diagonal comparisons only
(2) (±0.111) For use in vertical and interaction comparisons only

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71/R/RN/8

POTATOES

TOTAL TUBERS: TONNES/HECTARE

	P	R	T	Mean
Mean (±1.36)	41.3	33.8	37.2	37.4
		(±2.36)		(±1.36)
M	41.8	34.7	36.9	37.8
SX	40.9	32.7	38.1	37.2
SY	41.1	33.9	36.6	37.2
		(1) and (2)		(±1.11)
O	38.5	32.0	36.3	35.6
G	44.0	35.6	38.1	39.2

A	AG	BG	C	CG
34.1	39.0	33.8	40.4	43.9

General mean: 37.4

(1) (±1.92) For use in horizontal and diagonal comparisons only
(2) (±1.92) For use in vertical and interaction comparisons only

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71/R/RN/8

POTATOES

% WARE: 3.81 CM (1.5 INCH) RIDDLE

	P	R	T	Mean
Mean	94.4	92.6	93.8	93.6
M	94.6	93.3	94.1	94.0
SX	94.4	91.7	93.8	93.3
SY	94.3	92.8	93.4	93.5
O	94.1	92.1	93.4	93.2
G	94.8	93.0	94.1	94.0

A	AG	BG	C	CG
91.2	94.5	92.8	94.1	95.3

General mean: 93.5

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/8

BARLEY

GRAIN: TONNES/HECTARE

	P	R	T	Mean
Mean (±0.045)	6.00	5.76	5.82	5.86
		(±0.077)		(±0.045)
1970				
M	5.95	5.68	5.88	5.84
SX	6.06	5.83	5.86	5.92
SY	5.99	5.77	5.73	5.83
		(1) and (2)		(±0.054)
1971				
O	5.93	5.65	5.73	5.77
H	6.07	5.87	5.92	5.95

A	AH	BH	CH
5.73	5.84	5.61	6.04

General mean: 5.85

Mean D.M. %: 80.2

(1) (±0.093) For use in horizontal and diagonal comparisons only
(2) (±0.080) For use in vertical and interaction comparisons only

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71/R/RN/9

CEREAL DISEASE REFERENCE PLOTS

Object: To study the effects of intensive cereal cropping on the incidence of soil-borne diseases, especially in relation to seasonal variation - Pennell's Piece.

The ninth year, winter wheat, spring wheat, oats, beans.

For previous years see 63/C/10(t), 64-65/C/9, 66/C/7, 67-68/C/5 and 69-70/R/RN/9.

Whole plot dimensions: 17.1 x 4.27. Area harvested: Winter wheat - 0.00479, spring wheat: 0.00473.

Cultivations, etc.: Ploughed: 7 Sept, 1970. All plots except winter wheat plots sprayed with paraquat at 0.56 kg ion in 225 l: 4 Feb, 1971.

Winter wheat: Seed combine drilled at 202 kg: 9 Oct, 1970. Sprayed with terbutryne and related triazines ('Prebane' at 4.48 kg in 225 l): 10 Oct. N applied: 24 Mar, 1971. Sprayed with ioxynil at 0.63 kg and mecoprop at 1.90 kg in 225 l: 15 Apr. Combine harvested: 24 Aug. Variety: Cappelle.

Spring wheat: N applied: 24 Mar, 1971. Seed combine drilled at 191 kg: 31 Mar. Sprayed with ioxynil octanoate, bromoxynil octanoate and the iso-octyl ester of dichlorprop ('Oxytril P' at 1.4 l in 225 l): 11 May. Combine harvested: 1 Sept. Variety: Kolibri.

Oats: Seed combine drilled at 191 kg: 4 Mar, 1971. N applied: 24 Mar. Combine harvested: 16 Aug. Variety: Manod.

Spring beans: Seed placement drilled at 224 kg: 4 Mar, 1971. Sprayed with demeton-s-methyl at 245 g in 438 l: 1 July. Combine harvested: 2 Sept. Variety: Maris Bead.

NOTES: (1) Yields were taken for winter and spring wheat only (Crop sequences 3, 4, 5 and 6).
(2) Estimates were made in spring and summer of incidence of take-all (Ophiobolus graminis) and eyespot (Cercosporella herpotrichoides).

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/9

SUMMARY OF RESULTS

GRAIN: TONNES/HECTARE

Crop in	C3	C4	C5	C6	
1963	W	BE	O	W	
1964	BE	O	W	W	
1965	O	W	W	W	
1966	W	W	W	W	
1967	W	W	BE	W	
1968	W	BE	O	W	
1969	BE	O	W	W	
1970	O	W	W	W	Mean
			WINTER WHEAT		
	5.85	6.76	6.65	6.61	6.47
			SPRING WHEAT		
	3.95	3.85	3.65	3.44	3.72

Mean D.M. %: Winter wheat: 78.9
Spring wheat: 81.5

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71/R/RN/11

IRRIGATION

Object: To study the effects of different timing and intensity of irrigation on a rotation of crops. Other agronomic factors are included from time to time - Great Field I and II.

The eighth year, potatoes, spring beans.

For previous years see 64/C/15(t), 65/C/14(t), 66/C/9(t), 67/C/7(t), 68/C/6(t), 69/R/RN/11(t), and 70/R/RN/11(t).

Design: Potatoes: 4 randomised blocks of 4 plots split into half and quarter plots.
Spring beans: 8 randomised blocks of 2 plots split into half and quarter plots.

Whole plot dimensions:-
Potatoes: 15.2 x 32.0. Sub plot area harvested: 0.00303.
Spring beans: 14.9 x 30.5. Sub plot area harvested: 0.00530.

Treatments:-
Potatoes: All combinations of:-
Whole plots: 1. Irrigation: None (O), full irrigation (I).
2. Chitting and time of planting: Chitted seed planted early (CE), unchitted seed planted late (OL).
Half plots: 3. Planting distances: Ridges 71.1 cm (28 inches) apart, seed 38.2 cm (15 inches) apart (N), ridges 142.2 cm (56 inches) apart, seed 76.3 cm (30 inches) apart (W).
Quarter plots: 4. Fertiliser rates: 1255 (F1), 2510 (F2) kg (13:13:20).
Spring beans: All combinations of:-
Whole plots: 1. Irrigation: None (O), full irrigation (I).
Half plots: 2. Distance between rows and seed rate: 25.4 cm (10 inches), seed rate 336 kg (C), 50.8 cm (20 inches), seed rate 112 kg (W).
Quarter plots: 3. Malathion insecticide: None (O), sprayed at 1.26 l in 809 l on 2 occasions (20 May, 7 June) (M).

Standard applications:
Potatoes: Manures: None. Weedkiller: Linuron at 0.84 kg plus paraquat at 0.42 kg ion in 427 l. Fungicide: Mancozeb at 1.35 kg in 438 l on 2 occasions.

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Spring beans: 405 kg (0:14:28) applied by 'Tume' drill across plots. Weedkillers: Paraquat at 0.28 kg ion in 225 l. Simazine at 1.12 kg in 427 l. Insecticide: Demeton-s-methyl at 245 g in 438 l.

Cultivations, etc.: Ploughed: 2 Nov, 1970.
Potatoes: NPK applied to CE plots: 5 Apr, 1971. Rotary cultivated and machine planted CE plots: 7 Apr. NPK applied to OL plots, rotary cultivated and machine planted OL plots: 5 May. Weedkiller applied to CE plots: 10 May. Weedkiller applied to OL plots: 18 May. CE plots grubbed and rotary ridged: 4 June. OL plots rotary ridged: 18 June. Fungicide applied: 23 June, 13 Aug. Sprayed with undiluted BOV at 168 l: 14 Sept. Haulm destroyed mechanically: 21 Sept. Lifted: 5 Oct. Variety: King Edward.
Spring beans: Paraquat applied: 19 Sept, 1970. PK applied: 24 Feb, 1971. Rotary cultivated*: 26 Feb * 30 Mar. Seed drilled*: 30 Apr. Simazine applied: 3 May. Demeton-s-methyl applied: 6 July. Combine harvested: 16 Sept. Variety: Maris Bead.

* Originally it was intended to include 2 different sowing dates for beans. Early sown plots were rotary cultivated and drilled on 26 Feb, late sown plots were rotary cultivated and drilled on 30 Mar. Because of severe bird damage all plots were power harrowed on 30 Apr for re-drilling as shown above.

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/11

RAINFALL AND IRRIGATION: MM

Week-ending	Rainfall	IRRIGATION Potatoes	IRRIGATION Beans
		I	I
May 1	3.8		
May 8	17.3		
May 15	7.6		
May 22	7.0		
May 29	17.1		
June 5	0.1		
June 12	37.9		
June 19	60.2		
June 26	2.2		
July 3	3.2	15.0	15.0
July 10	1.2		
July 17	0.0	25.0	25.0
July 24	0.9	25.0	25.0
July 31	13.1	15.0	15.0
Aug 7	31.2		
Aug 14	21.5		
Aug 21	5.0		
Aug 28	3.0		
Sept 4	2.9		
Sept 11	TR		
Sept 18	0.0		
Sept 25	3.0		
Oct 2	10.3		
	248.5	80.0	80.0

Standard errors per plot.

Potatoes, total tubers: tonnes/hectare:

Whole plot: 2.45 or 7.6% (9 d.f.)

1/2 plot: 2.82 or 8.7% (12 d.f.)

1/4 plot: 5.09 or 15.7% (24 d.f.)

Spring beans, grain: tonnes/hectare:

Whole plot: 0.140 or 8.1% (7 d.f.)

1/2 plot: 0.187 or 10.9% (14 d.f.)

1/4 plot: 0.234 or 13.6% (28 d.f.)

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71/R/RN/11

SUMMARY OF RESULTS

POTATOES

TOTAL TUBERS: TONNES/HECTARE

	CE	OL	N	W	F1	F2	Mean
	(±1.22)		(1) and (2)		(3) and (4)		(±0.86)
O	28.2	27.8	37.7	18.3	25.0	31.0	28.0
I	36.3	37.3	47.9	25.7	34.7	38.9	36.8
			(1) and (2)		(3) and (4)		(±0.86)
		CE	43.1	21.4	28.9	35.6	32.3
		OL	42.4	22.7	30.7	34.3	32.5
					(5) and (6)		(±0.71)
				N	39.5	46.0	42.8
				W	20.1	23.9	22.0
Mean (±0.90)					29.8	35.0	32.4

(1) (±1.12) (3) (±1.25) (5) (±1.14) For use in vertical and diagonal comparisons only

(2) (±1.00) (4) (±1.27) (6) (±1.27) For use in horizontal and interaction comparisons only

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71/R/RN/11

POTATOES

% WARE: 4.44 CM (1.75 INCH) RIDDLE

	CE	OL	N	W	F1	F2	Mean
O	75.7	74.6	71.0	79.3	74.6	75.8	75.2
I	86.2	83.9	80.1	90.0	84.4	85.7	85.1
		CE	77.5	84.4	79.5	82.5	81.0
		OL	73.6	85.0	79.5	79.0	79.3
				N	73.5	77.6	75.6
				W	85.5	83.9	84.7
Mean					79.5	80.7	80.1

https://doi.org/10.23637/ERADOC-1-97

71/R/RN/11

BEANS

GRAIN: TONNES/HECTARE

	C	W	O	M	Mean
	(1) and (2)		(3) and (4)		(±0.049)
O	2.33	1.24	1.69	1.88	1.79
I	2.25	1.04	1.64	1.65	1.65
			(3) and (4)		(±0.047)
		C	2.22	2.37	2.29
		W	1.11	1.16	1.14
Mean (±0.041)			1.67	1.77	1.72

(1) (±0.068) (3) (±0.064) For use in vertical and diagonal comparisons only

(2) (±0.066) (4) (±0.058) For use in horizontal and interaction comparisons only

Mean D.M. %: 74.2

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71/W/RN/12

ORGANIC MANURING

Object: To study, from crop yields and soil analyses, the cumulative effects of a range of types of organic matter - Woburn Stackyard B.

The seventh year, leys and rye.

For previous years see 66/C/31(t), 67/C/24(t), 68/C/18(t), 69/W/RN/12(t) and 70/W/RN/12(t).

Whole plot dimensions: 8.53 x 30.5. Area harvested: Leys - 0.00524, rye - 0.00421.

Fertilisers applied autumn 1970 (kg)

Treatment	P2O5	K2O	MgO
DG	-	-	-
ST	63	-	25
PT	63	126	-
GM	63	138	38
FD	113	427	38
FS	75	126	38
LC	63	126	38
LN	63	126	38

Fertilisers applied spring 1971 (kg)

Treatment	P2O5	K2O
ST	-	50
LC	63	126
LN	88	251

No P,K, or Mg was required in spring for DG, PT, GM, FD or FS.

NOTE: Residues of N to sugar beet 1969 (N1), (N3), (N5), (N7). 25, 75, 125, 175 kg N as 'Nitro-Chalk' 21.

Basal applications: Rye: 31 kg N as 'Nitro-Chalk' 21.
LN plots: 126 kg N as 'Nitro-Chalk' 21 in spring and after each cut except the last.

Cultivations, etc.:
LC and LN plots: P, K, Mg applied: 6 Oct, 1970. P, K applied: 9 Mar, 1971. N applied to LN plots: 16 Mar, 29 June. Cut: 23 June, 10 Sept.
Rye: P, K, Mg applied: 17 - 18 Sept, 1970. Peat, straw applied: 15 Oct. FYM applied, ploughed: 16 - 17 Oct. Seed drilled

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at 191 kg: 17 Oct. GM plots undersown with Late Flowering Red Clover at 72 kg: 19 Oct. K applied to ST plots only: 9 Mar, 1971. N applied: 14 Apr. Red Clover resown at 72 kg: 22 Apr. Combine harvested: 31 Aug. Variety: King II.

NOTE: Soil samples were taken in the stubble for P, K and Mg analysis.

Standard errors per plot. Rye, grain, tonnes/hectare:
Whole plot: 0.266 or 7.3% (15 d.f.)
Sub plot: 0.199 or 5.5% (54 d.f.)

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71/W/RN/12

SUMMARY OF RESULTS

LEYS

DRY MATTER: TONNES/HECTARE

LC		LN
	1ST CUT	
2.15		6.51
	2ND CUT	
2.13		4.40
	TOTAL OF 2 CUTS	
4.28		10.91

Mean D.M. %: 1st cut: 24.6
2nd cut: 24.1
Total of 2 cuts: 24.4

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71/W/RN/12

RYE

1969

	N1	N3	N5	N7	Mean
	GRAIN: TONNES/HECTARE				
	(1) and (2)				(±0.133)
DG	4.76	4.63	4.46	4.63	4.62
ST	3.61	3.63	3.48	3.76	3.62
PT	3.48	3.43	3.48	3.58	3.49
GM	3.33	3.18	3.46	3.44	3.35
FD	3.29	3.38	3.48	3.32	3.37
FS	3.33	3.46	3.36	3.03	3.29
Mean (±0.041)	3.63	3.62	3.62	3.63	3.62

(1) (±0.158) For use in vertical and diagonal comparisons only
(2) (±0.099) For use in horizontal and interaction comparisons only

STRAW: TONNES/HECTARE

DG	6.27	6.34	5.68	6.11	6.10
ST	4.53	4.46	4.18	4.56	4.43
PT	4.40	4.26	4.40	4.33	4.35
GM	4.25	4.70	5.20	4.53	4.67
FD	4.22	4.41	4.32	4.48	4.36
FS	4.05	4.09	4.05	4.05	4.06
Mean	4.62	4.71	4.64	4.67	4.66

Mean D.M. %: Grain: 75.1
Straw: 88.0

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/13

INTENSIVE CEREALS

Object: To study the effects of intensive cereal cropping on yield, incidence of soil-borne diseases and organic matter in the soil- Woburn Stackyard I.

The sixth year, ley, potatoes, winter wheat, barley.

For previous years see 66/B/9(t), 67/B/9, 68/B/7(t) and 69-70/W/RN/13(t).

Design: For each cereal: 2 randomised blocks of 6 plots, split into 4.

Whole plot dimensions: 8.53 x 20.4. Sub plot area harvested: Potatoes - 0.00343, wheat - 0.00271, barley - 0.00277.

NOTE: The magnesium test on all crops is now ended.

Basal applications: All crops: 5020 kg magnesian limestone three-quarters ploughed in, a quarter applied to plough furrow. 126 kg P_2O_5, 252 kg K_2O as (0:14:28), half ploughed in, half applied to plough furrow.
Weedkiller: Paraquat at 1.12 kg ion in 281 l.
Ley: 63 kg N in seedbed, 63 kg N 8 weeks after sowing, 75 kg N after each cut except the last as 'Nitro-Chalk' 21.
Potatoes: 150 kg N as 'Nitro-Chalk' 21. Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide: Mancozeb at 1.34 kg in 416 l on the first occasion, and 371 l on the second. Insecticide: Demeton-s-methyl at 246 ml applied with first mancozeb spray.
Wheat and barley: Weedkiller: Ioxynil at 0.53 Kg and mecoprop at 1.58 kg in 281 l.

Cultivations, etc.: All plots: Paraquat applied: 16 Sept, 1970. Half PK applied: 24 Sept. Three-quarters magnesian limestone applied: 6 Oct. Ploughed: 10 Oct. Remaining PK and magnesian limestone applied: 14 Oct.
Leys: Deep-tine cultivated barley blocks: 21 Oct, 1970. N applied: 1 Apr. Seeds sown at 33 kg: 22 Apr. First cut: 16 July. N applied: 19 July. Second cut: 8 Sept. Variety: Italian Ryegrass S22.
Potatoes: Deep-tine cultivated barley blocks: 21 Oct, 1970. N applied: 29 Mar, 1971. Rotary cultivated, potatoes planted: 30 Mar. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide plus insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm mechanically destroyed: 13 Sept. Lifted: 14 Sept. Variety: Majestic.
Wheat: Seed drilled at 191 kg: 14 Oct, 1970. N applied: 14 Apr, 1971. Weedkiller applied: 28 Apr. Combine harvested: 28 Aug. Variety: Cappelle.

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Barley: Deep-tine cultivated: 21 Oct, 1970. N applied, seed drilled at 157 kg: 17 Mar, 1971. Power harrowed, re-drilled at 157 kg: 9 Apr. Weedkiller applied: 18 May. Combine harvested: 25 Aug. Variety: Julia.

NOTE: Estimates of eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis) were made on both cereal crops.

Standard errors per sub plot.
Wheat, grain, tonnes/hectare: Sub plot: 0.391 or 10.6% (12 d.f.)
Barley, grain, tonnes/hectare: Sub plot: 0.194 or 4.5% (11 d.f.)

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/13

SUMMARY OF RESULTS

POTATOES

N: KG/HA 1969

63	126	189	252	Mean
	PERMANENT WHEAT BLOCKS			
	TOTAL TUBERS: TONNES/HECTARE			
33.0	32.2	36.7	36.8	34.7
	% WARE: 3.81 CM (1.5 INCH) RIDDLE			
94.1	93.1	95.1	95.3	94.4
	PERMANENT BARLEY BLOCKS			
	TOTAL TUBERS: TONNES/HECTARE			
46.0	42.9	44.3	48.7	45.5
	% WARE: 3.81 CM (1.5 INCH) RIDDLE			
93.5	92.9	94.4	93.8	93.6

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71/W/RN/13

WINTER WHEAT

Crop in 1966	1967	1968	1969	1970	N: KG/HA 63	126	189	252	Mean
					GRAIN: TONNES/HECTARE				
						(1) and (2)			(±0.209)
W	W	W	L	P	3.22	4.77	4.97	4.63	4.40
W	W	L	P	W	2.70	3.95	3.96	3.59	3.55
W	L	P	W	W	2.09	3.53	4.03	4.19	3.46
W	W	W	W	W	2.88	3.55	3.85	3.17	3.36
Mean (±0.138)					2.72	3.95	4.20	3.90	3.69

(1) (±0.317) For use in vertical and diagonal comparisons only
(2) (±0.276) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.1

					STRAW: TONNES/HECTARE				
W	W	W	L	P	3.32	4.06	4.15	3.70	3.81
W	W	L	P	W	2.64	3.87	3.95	3.82	3.57
W	L	P	W	W	2.58	3.38	3.96	4.41	3.58
W	W	W	W	W	3.02	3.66	4.04	3.77	3.62
Mean					2.89	3.74	4.02	3.93	3.64

Mean D.M. %: 87.1

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71/W/RN/13

BARLEY

Crop in 1966	1967	1968	1969	1970	N: KG/HA 63	126	189	252	Mean
					GRAIN: TONNES/HECTARE				
						(1) and (2)			(±0.147)
B	B	B	L	P	3.59	4.58	4.40	4.82	4.35
B	B	L	P	B	3.82	4.55	5.14	5.36	4.72
B	L	P	B	B	3.71	4.64	4.82	4.69	4.47
B	B	B	B	B	3.07	3.62	4.34	4.64	3.92
Mean (±0.069)					3.55	4.35	4.67	4.88	4.36

(1) (±0.189) For use in vertical and diagonal comparisons only
(2) (±0.138) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.4

					STRAW: TONNES/HECTARE				
B	B	B	L	P	2.48	3.30	3.55	3.94	3.32
B	B	L	P	B	2.16	2.87	3.94	3.92	3.22
B	L	P	B	B	2.20	3.17	3.71	3.62	3.18
B	B	B	B	B	1.85	2.83	3.42	3.91	3.00
Mean					2.17	3.04	3.66	3.85	3.18

Mean D.M. %: 87.4

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71/W/RN/14

LONG TERM PHOSPHATE

Object: To study direct and residual effects of superphosphate on yields of three crops grown in rotation - Woburn Stackyard III.

The fourth year, barley and potatoes.

For previous years see 68/B/8(t), 69/W/RN/14 and 70/W/RN/14(t).

Design: 6 blocks of 6 plots, split into 2.

Whole plot dimensions: 8.53 x 15.8. Area harvested: Barley - 0.00442, potatoes - 0.00451.

Treatments:
- Sub plots: Superphosphate:
  - Barley: None (0), 63 kg P_2O_5 (P).
  - Potatoes: None (0), 188 kg P_2O_5 (P).

Basal applications:-
- Barley: Manures: 2510 kg ground chalk, 61 kg of K_2O as muriate of potash, 148 kg N as 'Nitro-Chalk' 21. Weedkiller: Ioxynil at 0.525 kg and mecoprop at 1.58 kg in 281 l.
- Potatoes: Manures: 2510 kg ground chalk, 258 kg of K_2O as muriate of potash in autumn, 250 kg of K_2O as muriate of potash in spring, 251 kg N as 'Nitro-Chalk' 21, 99 kg MgO as Epsom salts. Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide and insecticide: Mancozeb at 1.34 kg and demeton-s-methyl at 246 ml in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Cultivations, etc.:
- Barley: Ground chalk applied: 26 Nov, 1970. Ploughed: 10 Dec. N and K applied: 1 Mar, 1971. P applied: 4 Mar. Seed drilled at 157 kg: 23 Mar. Power harrowed, redrilled because of bird damage: 13 Apr. Sprayed weedkiller: 18 May. Combine harvested: 25 Aug. Variety: Julia.
- Potatoes: Sub soiled, tines 142 cm apart and 61 cm deep, ground chalk and K applied: 11 Sept, 1970. Deep-tine cultivated: 12 Sept. Ploughed: 21 Oct. P applied: 29 Mar, 1971. N, K and Mg applied: 1 Apr. Rotary cultivated, potatoes planted: 2 Apr. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 June. Fungicide applied: 12 Aug. Haulm destroyed mechanically: 13 Sept. Lifted: 14 Sept. Variety: Pentland Crown.

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Standard errors per plot.

Barley: Grain, tonnes/hectare:	Whole plot:	0.234 or 6.0% (9 d.f.)
	Sub plot:	0.343 or 8.8% (10 d.f.)
Potatoes: Total tubers, tonnes/hectare:		
	Whole plot:	2.71 or 7.1% (10 d.f.)
	Sub plot:	3.88 or 10.1% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/14

SUMMARY OF RESULTS

BARLEY

	R0*	R1	R2	R4	R6	Mean
	GRAIN: TONNES/HECTARE					
	(1) & (2)		(3) & (4)			(±0.081)
0	3.15	3.67	3.91	4.08	4.21	3.69
P	3.81	4.31	3.98	4.45	4.37	4.12
Mean	3.48 (±0.096)	3.99	3.94 (±0.135)	4.26	4.29	3.91

(1) (±0.138) (3) (±0.194) For use in horizontal and diagonal comparisons only

(2) (±0.140) (4) (±0.198) For use in vertical and interaction comparisons only

STRAW: TONNES/HECTARE

0	2.11	2.65	2.87	3.04	2.87	2.61
P	2.76	2.98	2.83	3.10	3.15	2.93
Mean	2.43	2.81	2.85	3.07	3.01	2.77

Mean D.M. %: Grain: 80.6
Straw: 83.5

* Duplicated treatment

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71/W/RN/14

ROTATOES

	R0*	R1	R2	R4	R6	Mean
	TOTAL TUBERS: TONNES/HECTARE					
	(1) & (2)		(3) & (4)			(±0.91)
O	32.1	34.4	37.0	41.8	38.4	36.0
P	38.5	42.0	43.2	41.7	40.1	40.7
Mean	35.3 (±1.11)	38.2	40.1	41.8 (±1.56)	39.2	38.3

(1) (±1.57) (3) (±2.23) For use in horizontal and diagonal comparisons only

(2) (±1.58) (4) (±2.24) For use in vertical and interaction comparisons only

% WARE: 3.81 CM (1.5 INCH) RIDDLE

O	97.7	97.2	97.8	98.0	97.2	97.6
P	97.1	96.8	97.7	97.4	97.0	97.2
Mean	97.4	97.0	97.7	97.7	97.1	97.4

* Duplicated treatment

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71/W/RN/15

ROTATION AND FUMIGATION

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

The third year, potatoes, barley, sugar beet.

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

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: 303 kg (0:20:20). Weedkiller: Ioxynil at 0.53 kg plus mecoprop at 1.58 kg in 281 l.

Potatoes: Manures: 1103 kg (0:14:28). Weedkiller: Linuron at 1.12 kg in 371 l. Fungicide with insecticide: Mancozeb at 1.34 kg plus demeton-s-methyl at 245 g in 416 l. Fungicide: Mancozeb at 1.34 kg in 371 l.

Sugar beet: Manures: 2510 kg magnesian limestone, 1103 kg (0:14:28), 'Solubor' at 13.4 kg B203 in 157 l. Insecticide: Demeton-s-methyl at 245 g in 281 l.

Cultivations, etc.:

Barley: Ploughed: 28 Oct, 1970. 'D-D' injected: 16 Dec. Dazomet applied, all plots rotary cultivated: 17 Dec. Ploughed: 11 Feb, 1971. N applied: 1 Mar. Seed combine drilled at 168 kg: 10 Mar. Weedkiller applied: 3 May. Combine harvested: 16 Aug. Variety: Julia.

Potatoes: Ploughed: 9 Nov, 1970. 'D-D' injected: 16 Dec. Dazomet applied, all plots rotary cultivated: 17 Dec. Ploughed: 11 Feb, 1971. PK applied: 29 Mar. N applied, rotary cultivated, potatoes planted: 31 Mar. Weedkiller applied: 5 May. Rotary ridged: 1 June. Fungicide with insecticide applied: 28 June. Fungicide applied: 13 Aug. Haulm destroyed mechanically: 14 Sept. Lifted: 17 Sept. Variety: Pentland Crown.

Sugar beet: Rotary cultivated: 4 Sept, 1970. Magnesian limestone applied: 7 Oct. Ploughed: 28 Oct. 'D-D' injected: 16 Dec. Dazomet applied, all plots rotary cultivated: 17 Dec. Ploughed: 11 Feb, 1971. PK applied: 29 Mar. N applied: 31 Mar. Power harrowed, seed drilled at 6 kg: 8 Apr. Singled: 19 - 20 May. Boron spray applied: 1 June. Hoed by hand twice: 1 - 2 June, 17 - 21 June. Insecticide applied: 19 July. Lifted: 20 Oct. Variety: Klein E.

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NOTE: Samples of soil were taken after harvest for eelworm counts.

Standard errors per sub plot.

Barley, grain, tonnes/hectare: 0.417 or 9.6% (18 d.f.)

Potatoes, total tubers, tonnes/hectare:
5.14 or 13.6% (18 d.f.)

Sugar beet, roots, tonnes/hectare:
2.77 or 5.6% (18 d.f.)

Total sugar, tonnes/hectare:
0.507 or 6.0% (18 d.f.)

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71/W/RN/15

SUMMARY OF RESULTS

BARLEY

	O&R	P	S	B	A	AZ	Mean
N: KG/HA		GRAIN: TONNES/HECTARE					
	(±0.208)*			(±0.295)*			
38	3.07	4.03	4.25	3.24	2.61	5.19	3.64
75	4.71	4.59	5.30	3.96	4.67	5.30	4.75
113	4.52	5.07	4.87	4.22	4.38	4.83	4.63
Mean	4.10 (±0.120)	4.56	4.81	3.80 (±0.170)	3.89	5.11	4.34

* For use in horizontal and interaction comparisons only

STRAW: TONNES/HECTARE

38	2.14	3.06	3.15	2.42	1.95	3.48	2.62
75	3.42	3.68	3.85	2.64	3.54	3.79	3.48
113	3.38	3.74	3.59	3.37	3.20	3.87	3.51
Mean	2.98	3.50	3.53	2.81	2.90	3.71	3.20

Mean D.M. %: Grain: 80.9
Straw: 85.7

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/15

POTATOES

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	TOTAL TUBERS: TONNES/HECTARE						
	(±2.57)*			(±3.63)*			
75	22.5	29.8	26.5	26.5	36.3	38.9	29.0
150	23.8	44.9	37.2	45.1	46.0	45.5	38.1
225	32.9	50.7	48.0	48.3	55.3	56.6	46.4
Mean	26.4 (±1.48)	41.8	37.2	40.0 (±2.10)	45.9	47.0	37.8

* For use in horizontal and interaction comparisons only

% WARE: 3.81 CM (1.5 INCH) RIDDLE

75	90.6	92.2	93.4	90.7	93.4	93.5	92.1
150	94.4	97.7	96.6	94.9	94.7	96.5	95.6
225	95.9	97.5	97.2	96.9	97.2	96.5	96.7
Mean	93.6	95.8	95.7	94.2	95.1	95.5	94.8

https://doi.org/10.23637/ERADOC-1-97

71/W/RN/15

SUGAR BEET

	O&R	P	S	B	A	AZ	Mean
N: KG/HA	ROOTS (WASHED): TONNES/HECTARE						
	(±1.39)*			(±1.96)*			
75	46.3	48.7	48.9	50.0	48.1	53.7	48.9
150	44.5	45.8	48.3	52.1	53.2	46.9	47.9
225	49.3	50.6	53.2	53.4	52.6	50.1	51.2
Mean	46.7 (±0.80)	48.4	50.1	51.8 (±1.13)	51.3	50.2	49.3
	SUGAR %						
75	17.4	17.5	17.1	17.1	16.5	17.4	17.2
150	17.3	17.4	17.0	17.5	16.7	16.8	17.1
225	16.8	16.8	16.7	16.9	16.1	16.7	16.7
Mean	17.2	17.3	16.9	17.2	16.4	16.9	17.0
	TOTAL SUGAR: TONNES/HECTARE						
	(±0.253)*			(±0.358)*			
75	8.03	8.54	8.37	8.57	7.93	9.34	8.40
150	7.67	7.96	8.19	9.14	8.86	7.88	8.20
225	8.31	8.51	8.89	9.04	8.46	8.34	8.55
Mean	8.01 (±0.146)	8.33	8.49	8.92 (±0.207)	8.42	8.52	8.38

* For use in horizontal and interaction comparions only

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