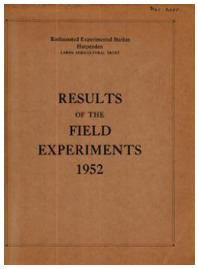
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ROTHAMSTED RESEARCH

Yields of the Field Experiments 1952

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Yields of the Field 1952

Rothamsted Research

Rothamsted Research (1953) *Yields of the Field 1952 ;* Yields Of The Field Experiments 1952, pp 1 - 110 **- DOI: https://doi.org/10.23637/ERADOC-1-178**

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STAT. DEPT.

Rothamsted Experimental Station
Harpenden
LAWES AGRICULTURAL TRUST

RESULTS
OF THE
FIELD
EXPERIMENTS
1952

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Rothamsted Experimental Station

Harpenden

Lawes Agricultural Trust

RESULTS

of the

FIELD

EXPERIMENTS

1952

The summaries given in this report are similar to those contained in the appendices to the Annual Reports of the Station before the war. This year's report includes only experiments conducted at Rothamsted and Woburn. The design and supervision of these experiments are the responsibility of the Field Plots Committee (present members: E.M.Crowther (Chairman), H.V.Garner (Secretary), H.H.Mann, J.R.Moffatt, D.J.Watson, F.Yates).

Price: 5/-

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*At Rothamsted unless otherwise stated.

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52/A/1

WHEAT - BROADBALK 1952

The 109th year

For history, details of treatments etc. see "Results of the Field Experiments 1939-1947".

Cultivations, etc.:

Crop sections. Dung applied, ploughed all plots: Sept 7. Autumn fertilizers applied: Oct 22. Seed drilled at 3¼ bushels per acre: Nov 5. Spring fertilizers applied: Apr 21. Second dressing of nitrate of soda applied to plot 16: May 13. Harvested: Aug 22. Variety: Squareheads Master 13/4.

Fallow section. Ploughed: Sept 6, Apr 22, June 26 and Aug 27.

Summary of Results

	Grain: cwt per acre					Straw: cwt per acre				
Section	I	III	IV	V		I	III	IV	V	
Years after Fallow	1	2	3	4	Mean	1	2	3	4	Mean
2A	22.7	20.8	26.0	24.2	23.4	40.8	38.2	44.8	43.4	41.8
2B	23.8	21.8	26.3	25.1	24.2	45.4	42.4	44.6	42.5	43.7
3	18.2	9.7	10.1	9.8	12.0	36.7	13.5	14.1	13.9	19.6
5	22.1	10.4	11.4	10.8	13.7	39.4	16.0	18.9	20.5	23.7
6	21.2	17.2	16.9	16.8	18.0	40.9	27.0	31.2	30.9	32.5
7	25.7	21.7	20.8	18.8	21.8	44.4	41.8	43.9	41.2	42.8
8	23.1	25.3	24.4	23.8	24.2	44.8	48.4	51.0	47.6	48.0
9	22.3	17.8	18.6	18.2	19.2	40.5	34.5	39.6	36.8	37.8
10	16.7	20.2	21.3	17.9	19.0	30.3	35.1	37.1	31.6	33.5
11	19.3	18.7	21.9	18.5	19.6	32.6	30.2	35.8	33.1	32.9
12	22.8	22.4	20.0	19.6	21.2	38.8	36.2	36.2	34.4	36.4
13	23.0	23.9	21.5	16.1	21.1	43.9	42.1	36.9	33.5	39.1
14	20.6	23.4	22.7	17.6	21.1	39.0	37.5	38.0	31.7	36.6
15	23.0	18.1	17.6	15.4	18.5	38.6	34.0	31.9	32.2	34.2
16	22.0	24.3	23.9	21.1	22.8	44.5	44.2	45.2	41.2	43.8
17	22.0	21.0	22.1	20.6	21.4	40.1	38.3	40.7	41.7	40.2
18	16.9	9.8	9.4	8.0	11.0	26.3	14.2	13.7	13.2	16.8
19	21.6	17.8	14.8	16.9	17.8	38.4	30.7	25.0	31.1	31.3
20	16.9	-	-	-	16.9	30.1	-	-	-	30.1

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52/A/2

BARLEY - HOOSFIELD 1952

The 101st year

For history, details of treatments etc. see "Results of Field Experiments 1939-47".

Cultivations, etc.: Ploughed: Sept 21, 1951. Dung applied: Dec 18. Ploughed: Dec 19. Fertilizers applied: Feb 27, 1952. Seed drilled at 3 bushels per acre: Feb 29. Sprayed with D.N.O.C. 1 gallon per acre: May 9. Harvested: Aug 1. Variety: Plumage Archer.

Note: Owing to a very heavy infestation by Wild Oats (Avena Fatua) the major part of each plot was cut and carted green before the oats ripened. The remainder (generally 1/25 - 1/50 acre) was left to ripen, and the yields shown are measured from these small areas.

Summary of Results

Plot	Grain: cwt per acre	Straw: cwt per acre
1 C	6.8	9.1
2 O	12.2	8.7
3 O	6.7	10.7
4 O	11.9	12.3
5 O	3.0	5.8
1 A	13.5	18.5
2 A	19.3	28.2
3 A	13.1	19.5
4 A	12.2	17.6
5 A	16.1	28.2
1 AA	13.0	20.5
2 AA	15.6	35.9
3 AA	11.9	25.3
4 AA	16.2	22.8
1 AAS	14.9	25.7
2 AAS	21.5	37.0
3 AAS	9.9	27.1
4 AAS	19.6	23.9
1 C	11.9	27.5
2 C	16.8	20.8
3 C	8.5	10.5
4 C	17.0	20.3
7 - 1	6.3	11.2
7 - 2	18.0	20.1
6 - 1	5.2	5.7
6 - 2	6.9	7.5
1 N	10.3	24.5
2 N	15.8	25.0

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WHEAT AFTER FALLOW - HOOSFIELD 1952

Without manure 1851 and since

For history, details of treatments etc., see "Results of Field Experiments 1939-47".

Cultivations, etc.:
Cropped plots. Ploughed: Sept 18, 1951. Seed drilled at 3 bushels per acre: Oct 19. Harvested: July 31, 1952. Variety: Squareheads Master 13/4.
Fallow plots. Ploughed: Sept 18, 1951, Feb 8 and Sept 6, 1952.

Summary of Results

Mean yields: cwt per acre.

Plot	A_1	A_4	A_2	
No. of years of fallow	1	1	3	Mean
Grain	10.5	8.9	8.9	9.4
Straw	19.4	15.3	14.8	16.5

CROPS IN ROTATION - AGDELL 1952

Turnips - 1st crop of 27th course 1952-55

Owing to the repeated failures of the turnip crops of this experiment through club root disease, it was decided not to drill turnips, and the field was fallowed.

Cultivations, etc.: Ploughed: Sept 4, 1951, Feb 13, and Sept 5, 1952.

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52/A/4.1

MANGOLDS AND SUGAR BEET - BARNFIELD 1952

The 77th and 7th years

For history, details of treatments etc, see "Results of the Field Experiments 1939-47".

Cultivations, etc.: Dung applied: Dec 13, 1951. Ploughed: Feb 13, 1952. Fertilizers applied: Apr 23. Seed drilled, mangolds - 9 lb per acre, sugar beet - 18 lb per acre: Apr 28. Sprayed with DDT emulsion: May 19 and again May 23. Singling commenced: June 18. Top dressings applied: July 8. Mangolds lifted: Nov 11 - Dec 20. Sugar beet lifted: Dec 22-30. Varieties: Mangolds - Yellow Globe, sugar beet - Klein E.

Summary of Results

Strip	Cross Dressings: O	N	A	AC	C
		Mangolds, Roots: tons per acre			
1	4.89	19.69	17.42	18.10	17.89
2	10.10	24.97	19.33	24.15	21.02
4	2.29	(a) 15.23	9.45	14.56	16.94
		(b) 18.54			
5	1.72	15.15	6.21	8.06	10.96
6	1.51	13.65	8.91	15.46	15.07
7	1.26	14.66	11.92	18.98	15.90
8	0.87	6.75	4.75	2.41	4.60
9	10.19				
		Mangolds, Leaves: tons per acre			
1	1.47	6.41	5.72	4.82	5.43
2	3.23	7.39	6.09	6.36	4.45
4	0.98	(a) 4.65	3.03	5.92	5.36
		(b) 6.16			
5	0.42	4.84	2.84	3.94	5.04
6	0.37	3.47	3.45	6.75	5.38
7	0.42	2.4[illegible]	3.16	7.49	4.16
8	0.71	2.08	2.03	1.27	2.98
9	3.18				

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52/A/4.2

Strip	Cross-Dressings: 0	N	A	AC	C
	Sugar Beet, Roots: tons per acre				
1	7.44	15.31	13.02	13.41	15.02
2	6.17	13.65	8.42	10.76	14.43
4	1.81	(b) 11.60	8.37	13.31	11.94
5	1.22	9.64	3.91	5.38	7.05
6	1.17	8.12	6.90	11.35	9.20
7	0.87	10.42	9.20	13.26	9.54
8	1.27	5.87	5.28	6.07	5.38
	Sugar Beet, Tops: tons per acre				
1	4.11	11.01	15.17	15.76	7.19
2	3.57	12.87	8.61	12.48	10.23
4	0.98	(b) 9.83	5.68	11.06	8.71
5	1.17	6.75	3.96	7.83	6.61
6	1.17	7.83	5.43	13.90	6.46
7	1.03	9.74	6.21	17.57	9.30
8	1.47	6.85	6.65	9.64	8.51

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52/A/5

HAY - THE PARK GRASS PLOTS 1952

The 97th year

For history, details of treatments etc., see "Results of Field Experiments 1939-47."

Cultivations, etc.: Lime applied: Dec 17. Mineral fertilizers applied: Jan 11. Nitrogenous fertilizers applied: 1st dressing - Mar 10, 2nd dressing - Apr 15. 1st cut: June 19. 2nd cut: Sept 22.

Summary of Results

Yield of Hay: cwt per acre

Plot	Not limed 1st Crop	Not limed 2nd Crop	Not limed Total	Limed 1st Crop	Limed 2nd Crop	Limed Total
1	9.0	0.6	9.6	22.2	2.0	24.2
2	16.1	4.2	20.3	21.4	2.1	23.5
3	15.4	3.6	19.0	20.3	1.5	21.8
4-1	23.3	8.6	31.9	21.5	4.0	25.5
4-2	15.3	0.8	16.1	32.0	4.4	36.4
5-1	10.2	1.1	11.3			
5-2	21.2	4.6	25.8			
6	32.0	9.4	41.4			
7	28.5	10.1	38.6	40.8	12.9	53.7
8	28.4	6.4	34.8	22.0	3.0	25.0
9	44.1	2.9	47.0	50.4	6.6	57.0
10	15.7	2.0	17.7	38.8	6.0	44.8
11-1	43.6	10.9	54.5	59.1	10.4	69.5
11-2	61.3	11.4	72.7	68.3	15.8	84.1
12	18.5	5.2	23.7			
13	35.5	8.0	43.5	36.5	8.8	45.3
14	56.1	17.2	73.3	49.1	5.1	54.2
15	21.3	7.9	29.2	28.8	11.8	40.6
16	37.9	9.4	47.3	40.5	7.9	48.4
17	19.8	6.1	25.9	22.1	5.8	27.9
18	5.6	1.1	6.7	33.6*	5.1*	38.7*
				33.6†	5.5†	39.1†
19	34.4	5.2	39.6	28.8*	5.1*	33.9*
				31.2†	5.2†	36.4†
20	44.2	6.9	51.1	44.2*	4.6*	48.8*
				43.3†	5.6†	48.9†

* Heavy liming.

† Light liming.

Note: The second crop was carted green; hay yields were estimated from the dry matter.

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BARLEY - EXHAUSTION LAND HOOSFIELD 1952

History: From 1852 - 1875 wheat was grown on this field under fertilizer treatments similar to those on some of the Broadbalk plots, on strips 1/5 acre in area. From 1876 - 1901 potatoes were grown continuously, several of the strips retaining their original treatments.

The field received no fertilizers whatsoever from 1902 - 1939 during which period cereals were grown. In 1940 and thereafter, a top dressing of nitrogen, at present 2½ cwt sulphate of ammonia per acre, has been applied each year, the intention being to study further the residual effects of the fertilizers applied to the potatoes. No yields were taken between 1922 and 1948 except in 1935.

The fertilizers (per acre) applied to potatoes from 1876-1901 as follows:-

Plot 1 Unmanured

2 Previously unmanured
1876-1881 6 years of F.Y.M. at 14 tons
1882-1901 unmanured.

3 Previously unmanured
1876-1882 7 years superphosphate at 350 lb. (200 lb. bone ash, 150 lb. sulphuric acid)
1876-1901 26 years F.Y.M. at 14 tons

4 Previously unmanured
1876-1882 7 years superphosphate at 350 lb.
1876-1881 6 years nitrate of soda at 550 lb.
1876-1901 26 years F.Y.M. at 14 tons

5 Previously 400 lb. ammonium salts
1876-1901 26 years ammonium salts at 400 lb.

6 Previously 400 lb. ammonium salts
1876-1901 26 years nitrate of soda at 550 lb.

7 Previously 400 lb. ammonium salts and minerals
1876-1901 26 years ammonium salts at 400 lb.
1877-1887 11 years superphosphate (200 lb. bone ash, 150 lb. sulphuric acid)
1888-1896 9 years super at 392 lb. (made from mineral phosphate)
1897-1901 5 years basic slag at 400 lb.
1877-1901 25 years sulphate of potash at 300 lb.
1877-1901 25 years sulphate of magnesia at 100 lb.
1877-1901 25 years sulphate of soda at 100 lb.

8 Previously 400 lb.ammonium salts and minerals
1876-1901 26 years nitrate of soda at 550 lb.
1876-1901 minerals as applied to plot 7

9 Previously complete minerals
1877-1901 25 years phosphate as applied on plot 7

10 Previously complete minerals
1877-1901 minerals as applied to plot 7

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Cultivations, etc.: Ploughed: Sept 14 and again Dec 17, 1951. Seed drilled at 3 bushels per acre, sulphate of ammonia applied: Feb 28. Harvested: July 31. Variety: Plumage Archer.

Summary of Results

Manuring to Potatoes 1876 - 1901*	Grain: cwt per acre	Straw: cwt per acre
1 Unmanured	12.9	16.7
2 Unmanured after 6 years dung	10.1	13.0
3 Dung	23.2	27.2
4 Dung	22.8	29.4
5 Ammonium salts	16.5	19.8
6 Nitrate of soda	13.1	15.5
7 Ammonium salts and complete minerals	21.3	27.0
8 Nitrate of soda and complete minerals	21.4	24.3
9 Superphosphate	19.7	22.2
10 Complete minerals	21.8	23.9

*For certain changes see list of treatments.

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52/A/7

WHEAT - WOBURN STACKYARD 1952

For history, details of treatments etc., see "Results of the Field Experiments 1939-47".

Cultivations, etc.: Ploughed: Sept 4, 1951. Seed drilled at 3 bushels per acre: Oct 20. Nitrochalk applied: Apr 23, 1952. Sprayed with D.N.O.C. 2/3 gallon per acre: May 19 and again May 23. Harvested: July 29. Variety: Squareheads Master (13/4).

Summary of Results

Plot	Nitrochalk dressing cwt per acre	Grain: cwt per acre	Straw: cwt per acre
3	2	3.2	8.5
1	4	7.0	22.7
7	6	4.8	13.9
6	2	4.2	11.3
9	4	7.7	18.6
4	6	8.6	25.3
11b (2)	2	6.1	13.5
11b (3)	4	9.3	21.4
11b (1)	6	13.6	25.2
11a	2	3.9	13.0
10a	4	6.5	18.4
10b	6	7.0	16.8

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52/A/8

BARLEY - WOBURN STACKYARD, 1952

For history, details of treatments etc., see "Results of the Field Experiments 1939-47", with the exception that in 1952 it was decided to divide each plot into two, and sow one half with a Winter variety, and the other, as before with a Spring variety.

Cultivations, etc.: Ploughed: Sept 28, 1951. Seed drilled at 3 bushels per acre on "Winter" plots: Dec 3. Seed drilled at 3 bushels per acre on "Spring" plots, nitrochalk applied to all plots: Mar 17, 1952. Sprayed with D.N.O.C.: May 19. Harvested: Winter barley - July 29, Spring barley - Aug 15. Varieties: Winter barley - Pioneer, Spring barley - Plumage Archer.

Summary of Results

Plot	Nitrochalk dressing cwt per acre	Grain: cwt per acre		Straw: cwt per acre	
		Winter sown	Spring sown	Winter sown	Spring sown
1	2	21.9	13.0	22.0	19.9
3	4	21.7	12.4	25.3	16.4
7	6	23.5	8.1	27.8	8.6
6	2	22.3	9.7	21.1	14.5
9	4	26.6	9.5	27.7	14.0
4	6	20.3	11.3	23.4	15.9
11b (3)	2	28.7	9.6	28.2	20.7
11b (1)	4	37.3	6.6	40.7	10.2
11b (2)	6	33.7	6.5	40.5	14.9
10b	2	28.4	11.3	- +	18.4
11a	4	24.2	12.7	24.3	15.4
10a	6	11.1	- *	26.2	- *

* No yields taken owing to bird damage.

\+ Recorded yield obviously incorrect.

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52/Ba/1.1

THREE COURSE ROTATION EXPERIMENT

1st year of revised scheme

This experiment was recast commencing with the crops of 1952 from the old design, full details of which can be found in the 1951 Station report page 135, together with a summary of 18 years results.

The present design is as follows. The rotation is as before - 3 series, each in turn carrying potatoes, barley and sugar beet. The compost and magnesium sulphate treatments are stopped, the present experiment being confined to testing straw. The plots formerly receiving only inorganic fertilizers now test inorganic nitrogen applied as sulphate of ammonia in alternate years. One third of the original plots testing straw or compost continue to receive straw in alternate years, while the remainder test, in the presence and absence of sulphate of ammonia, the effect of an amount of muriate of potash equivalent to the K_2O contained in the straw application. In the original experiment the straw received a quantity of nitrogen at the conventional rate - 0.7% of the dry weight of straw, but in the new experiment the straw receives nitrogen at two rates - 0.4% and 1.2% respectively: the straw plots having the lower rate of nitrogen being supplemented by a direct addition of sulphate of ammonia in the second year. No further nitrogen is added in the second year to the straw plots receiving the high level of nitrogen.

Every plot is divided into two to test an addition of muriate of potash. The half plots are only weighed separately when the crop is potatoes, as this crop is most likely to reveal differences in potash responses in the presence and absence of straw.

The above remarks may be summarised as follows:-

For each of the three crops potatoes, barley, sugar beet there are available:-

(a) 6 main plots of the former Ar treatment, 3 in each phase.
(b) 12 main plots of the former St_1 and St_2 treatments, 6 in each phase.
(c) 6 main plots of the former Ad treatment, 3 in each phase.

The main plot treatments for (a) are 0 v. 0.4 cwt. N

		1950	1951
Phase 1	0.4 N v. 0 v. 0.4 N	(Ar)	Ar
Phase 2	0 v. 0.4N v. 0	Ar	(Ar)

The main plot treatments for (b) are (0 v. 0.4 N) v. (0 v. St0.2N v. K_s) where K_s is muriate of potash supplying as much K_2O as the straw.

							1950	1951
Phase 1	St0.2N v.	St0.6N v.	0.4N v.	0 v.	K_s0.4N v.	K_s	(St)	St
Phase 2	0.4N v.	0 v.	0 v.	0.4N v.	0 v.	0.4N	St	(St)

N.B. The brackets indicate treatments applied the previous year.

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The main plot treatments for (c) are:

		1950	1951
Phase 1	St0.6N v. 0.4N v. K_s0.4N	(Ad)	Ad
Phase 2	0 v. 0 v. 0	Ad	(Ad)

All main plots will be split in every crop to test 0 v. 0.5 cwt K_2O. To prevent build up of K_2O on one half of the splits the side which received high potash one year will receive low potash the next.

Basal Dressings:-	cwt per acre N	P_2O_5	K_2O
Barley	0	0.2	0
Sugar beet	0.2	0.4	0.25
Potatoes	0.4	0.6	0.5

The form of fertilizer is:

(a) nitrogen as sulphate of ammonia.
(b) phosphate as superphosphate.
(c) potash as muriate of potash.

All fertilizers are spring applied, including the potash equivalent of the straw.

Potato fertilizers are broadcast on the flat. The land is ridged and the tubers planted by dropper in the ridges.

Area of each plot: Potatoes (sub-plot) - 0.0092 acre; barley - 0.0200 acre; sugar beet - 0.0204 acre.

Cultivations etc.:

Potatoes: Straw applied, ploughed all plots: Dec 15, 1951. Fertilizers applied: Apr 18, 1952. Ridged: Apr 22. Potatoes planted with mechanical dropper: Apr 24. Earthed up ridges: July 8. Sprayed with medium volume copper sulphate solution, 5 lb per acre: Aug 12 and again Sept 4. Sprayed with 20% sulphuric acid: Sept 23. Lifted: Oct 6. Variety: Majestic.

Barley: Straw applied, ploughed all plots: Dec 15, 1951 1 ton. Ground chalk per acre applied: Feb 26, 1952. Seed drilled at 3 bushels per acre: Mar 3. Fertilizers applied: Mar 4. Sprayed with low volume MCPA 5 lb per acre: May 10. Harvested: July 30. Variety: Plumage Archer.

Sugar beet. Straw applied, ploughed all plots: Dec 15, 1951. Fertilizer applied, seed drilled at 18 lb per acre: Mar 21, 1952. Singled: May 26. Lifted: Dec 28. Variety: Klein E.

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Summary of Results

Potatoes

Previous Treatments 1950	Previous Treatments 1951	Treatments 1952: No N; cwt K_2O per acre: None	No N; cwt K_2O per acre: 0.5	0.4 cwt N per acre as sulphate of ammonia; cwt K_2O per acre: None	0.4 cwt N per acre as sulphate of ammonia; cwt K_2O per acre: 0.5	$53\frac{1}{3}$ cwt per acre cut straw; 0.2 cwt N per acre; cwt K_2O per acre: None	$53\frac{1}{3}$ cwt per acre cut straw; 0.2 cwt N per acre; cwt K_2O per acre: 0.5	$53\frac{1}{3}$ cwt per acre cut straw; 0.6 cwt N per acre; cwt K_2O per acre: None	$53\frac{1}{3}$ cwt per acre cut straw; 0.6 cwt N per acre; cwt K_2O per acre: 0.5	K_2O in $53\frac{1}{3}$ cwt cut straw; cwt K_2O per acre: None	K_2O in $53\frac{1}{3}$ cwt cut straw; cwt K_2O per acre: 0.5	0.4 cwt N per acre as sulph.amm.+ K_2O in $53\frac{1}{3}$ cwt cut straw; cwt K_2O per acre: None	0.4 cwt N per acre as sulph.amm.+ K_2O in $53\frac{1}{3}$ cwt cut straw; cwt K_2O per acre: 0.5	Mean
Total clean tubers: tons per acre														
Art	Art	4.05*	4.49*	4.66	4.66									
	Straw	3.93	4.41	3.71*	5.00*									
Straw	Art	5.30†	4.98†	5.21†	5.97†									
	Straw	4.22	5.14	4.41	4.75	5.09	4.56	4.46	6.55	5.24	4.56	4.36	5.29	
Adco	Art	4.87†	4.58†											
	Adco			4.27	4.56			5.24	4.80			4.03	4.17	
Mean														4.80
Percentage Ware														
Art	Art	51.6*	54.3*	56.5	62.7									
	Straw	58.3	66.4	50.4*	60.9*									
Straw	Art	65.2†	65.6†	65.9†	67.8†									
	Straw	62.1	64.5	64.4	67.8	65.9	61.6	64.7	72.4	62.2	58.4	60.3	63.9	
Adco	Art	63.1†	65.4†											
	Adco			60.8	65.3			70.1	67.8			65.1	61.2	
Mean														62.8

* means of 2 sub plots
† means of 3 sub plots
remainder means of 1 sub plot only.

52/Ba/1.3

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Barley

Treatments 1952

Previous Treatments 1950	1951	No N	0.4 cwt N per acre as sulphate of ammonia	$53\frac{1}{3}$ cwt per acre cut straw 0.2 cwt N per acre	0.6 cwt N per acre	K_2O in $53\frac{1}{3}$ cwt cut straw	0.4 cwt N per acre as sulph. amm. + K_2O in $53\frac{1}{3}$ cwt cut straw	Mean
			Grain: cwt per acre					
	Art	28.7*	33.3					
Art		26.4	31.6*					
	Straw	27.4†	34.0†					
Straw		28.1	33.8	19.8	30.5	29.1	33.9	
	Adco	25.1†						
Adco			33.9		35.2		33.6	
Mean								29.9
			Straw: cwt per acre					
	Art	27.2*	38.4					
Art		26.3	35.7*					
	Straw	26.2†	40.0†					
Straw		28.1	35.9	20.4	34.5	29.2	41.3	
	Adco	23.0†						
Adco			37.7		39.8		37.4	
Mean								31.8

* means of 2 sub plots
† means of 3 sub plots
remainder means of 1 sub plot only.

52/Ba/1.4

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Sugar Beet

Treatments 1952

Previous Treatments 1950	1951	No N	0.4 cwt N per acre as sulphate of ammonia	53⅓ cwt per acre cut straw: 0.2 cwt N per acre	53⅓ cwt per acre cut straw: 0.6 cwt N per acre	K_2O in 53⅓ cwt cut straw	0.4 cwt N per acre as sulph. amm. + K_2O in 53⅓ cwt cut straw	Mean
Roots (washed): tons per acre								
	Art	10.92	12.55					
Art		9.65	13.15					
	Straw	10.29	12.80					
Straw		10.34	12.16	9.10	12.75	11.55	11.76	
	Adco	11.08						
Adco			12.88		9.76		11.85	
Mean								11.46
Sugar percentage								
	Art	16.63	16.53					
Art		16.39	16.56					
	Straw	16.71	16.24					
Straw		16.76	15.55	16.68	16.65	16.96	16.42	
	Adco	16.56						
Adco			16.59		16.50		16.30	
Mean								16.51

52/Ba/1.5

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Sugar Beet

Treatments 1952

Previous Treatments 1950	Previous Treatments 1951	No N	0.4 cwt N per acre as sulphate of ammonia	5⅓ cwt per acre cut straw: 0.2 cwt N per acre as sulphate of ammonia	5⅓ cwt per acre cut straw: 0.6 cwt N per acre as sulphate of ammonia	K_2O in 5⅓ cwt cut straw	0.4 cwt N per acre as sulph. amm. + K_2O in 5⅓ cwt cut straw	Mean
Total sugar: cwt per acre								
	Art	36.3	41.5					
Art		31.6	43.6					
	Straw	34.4	41.5					
Straw		34.7	37.8	30.4	42.4	39.2	38.6	
	Adco	36.6						
Adco			42.7		32.2		38.6	
Mean								37.8
Plant number: thousands per acre								
	Art	23.9	23.0					
Art		28.2	25.2					
	Straw	26.6	21.6					
Straw		25.2	26.6	24.8	24.4	25.5	19.4	
	Adco	25.0						
Adco			23.9		22.3		25.8	
Mean								24.5

52/Ba/1.6

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52/Ba/2.1

FOUR COURSE ROTATION EXPERIMENT

The 23rd year

Direct and residual effects of organics and phosphates - Hoosfield 1952.

For details of treatments and rotation see "Results of the Field Experiments 1939-47".

Area of each plot: Potatoes: 0.0242 acre. Barley and wheat: 0.0244 acre. Ryegrass: 0.0233 acre.

Manures (cwt per acre) applied 1951-52

	Organic manures				Supplementary fertilizers		
	Organic matter	N	P_2O_5	K_2O	N as Sulph. of amm.	P_2O_5 as Super	K_2O as Mur. of potash
Dung†	50	1.191	0.526	2.485	0.609	0.674	0.515
Adco	50	1.140	0.795	0.351	0.660	0.405	2.649
Straw	132	0.684	0.262	1.395	1.116	0.938	1.605
Super			None		0.36	1.2	0.6
Rock phosphate			None		0.36	1.2*	0.6

*As rock phosphate

†Note: The application of Dung to the Ryegrass and Wheat was made in error at a rate to supply:

Organic matter	N	P_2O_5	K_2O
59	1.413	0.625	2.950

Cultivations, etc.:

Potatoes:

Ploughed: Sept 13, 1951. Dung, Adco and supplementary fertilizers and first dressing to straw plots applied: Dec 18. Straw applied, all plots ploughed: Dec 19. Second dressing to straw plots applied: Feb 7, 1952. Ridged: Apr 25. Spring fertilizers, including third dressing to straw plots, and sulphate of ammonia to half plots, applied: Apr 26. Potatoes planted: Apr 28. Earthed up: July 10. Sprayed with copper fungicide 5 lb per acre: Sept 4. Sprayed with sulphuric acid, 20% B.O.V.: Sept 23. Lifted: Oct 7. Variety: Majestic.

Barley:

Dung and Adco applied: Dec 18, 1951. Supplementary fertilizers to dung and Adco, and first dressing to straw plots applied: Dec 19. Straw applied, all plots ploughed: Dec 20. Second dressing to straw plots applied: Feb 7, 1952. Ground chalk 22½ cwt per acre applied: Feb 26. Spring fertilizers and

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third dressing to straw plots applied, seed drilled at 3 bushels per acre: Mar 3. Sprayed with M.C.P.A. 5 pints per acre: May 10. Harvested: July 30. Variety: Plumage Archer.

Ryegrass:

Dung, Adco and supplementary fertilizers, and first dressing to straw plots applied: Sept 24, 1951. Straw applied, all plots ploughed: Sept 25. Autumn fertilizers applied: Oct 22. Seed sown at 112 lb per acre: Oct 25. Second dressing to straw plots applied: Dec 20. Sulphate of ammonia and third dressing to straw plots applied: Apr 16, 1952. Sprayed with M.C.P.A. 5 pints per acre: May 10. Harvested: June 16. Variety: Western Wolths.

Wheat:

Ploughed: Aug 1, 1951. Dung, Adco and supplementary fertilizers, and first dressing to straw plots applied: Sept 25. Straw applied, ploughed all plots: Sept 26. Autumn fertilizers applied, seed drilled at 3 bushels per acre: Oct 20. Second dressing to straw plots applied: Dec 20. Sulphate of ammonia and third dressing to straw plots applied: Apr 24, 1952. Sprayed with M.C.P.A. 5 pints per acre: May 10. Harvested: July 29. Variety: Squareheads Master 13/4.

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Summary of Results

Manure[+]	Year of Cycle	Potatoes: Total tubers, tons per acre — Additional N Without	With	Mean	Response to N	Potatoes: Percentage Ware — Additional N Without	With	Mean	Response to N	Barley: Grain cwt per acre	Barley: Straw cwt per acre	Ryegrass: Dry Matter cwt per acre	Wheat: Grain cwt per acre	Wheat: Straw cwt per acre
Manure as F.Y.M.	I	11.59	11.62	11.60	0.03	87.1	82.4	84.8	-4.7	35.0	38.1	25.0	16.6	38.0
	II	5.93	7.07	6.50	1.14	77.1	79.3	78.2	2.2	20.0	18.3	15.6	9.9	20.4
	III	6.56	9.19	7.88	2.63	74.1	83.0	78.6	8.9	20.4	19.0	14.0	7.0	15.5
	IV	6.74	9.66	8.20	2.92	80.0	83.9	82.0	3.9	16.9	14.3	11.4	10.4	18.2
	V	3.21	5.73	4.47	2.52	60.0	78.7	69.4	18.7	17.2	16.5	13.6	10.4	19.5
Manure as Adco	I	7.38	7.26	7.32	-0.12	79.2	73.1	76.2	-6.1	31.1	34.2	23.0	19.7	*
	II	5.38	6.14	5.76	0.76	81.0	77.8	79.4	-3.2	26.1	25.4	15.0	13.4	24.9
	III	7.34	7.30	7.32	-0.04	80.9	82.9	81.9	2.0	19.1	15.4	15.1	9.7	18.7
	IV	5.65	8.52	7.08	2.87	76.5	85.4	81.0	8.9	20.7	18.3	15.5	8.2	14.0
	V	5.65	6.48	6.06	0.83	72.1	78.2	75.2	6.1	14.1	12.6	12.8	11.8	23.8
Manure as Straw	I	5.89	8.55	7.22	2.66	76.9	74.6	75.8	-2.3	31.9	35.6	31.4	14.3	36.6
	II	6.60	6.95	6.78	0.35	78.9	81.1	80.0	2.2	17.4	14.3	14.2	8.7	16.4
	III	6.68	9.46	8.07	2.78	74.6	75.0	74.8	0.4	20.1	17.8	17.5	10.7	22.4
	IV	8.27	9.94	9.10	1.67	76.9	80.0	78.4	3.1	19.8	21.8	13.7	8.8	18.5
	V	5.46	7.09	6.28	1.63	75.5	81.1	78.3	5.6	18.2	16.6	14.5	8.8	16.2
Super-phosphate	I	8.97	8.72	8.84	-0.25	76.4	75.9	76.2	-0.5	28.3	28.5	24.5	13.7	32.7
	II	8.45	9.39	8.92	0.94	82.8	81.1	82.0	-1.7	24.9	26.3	24.6	8.6	23.6
	III	4.05	5.58	4.82	1.53	64.9	77.9	71.4	13.0	23.5	29.2	26.2	10.0	19.7
	IV	5.10	5.22	5.16	0.12	80.3	78.5	79.4	-1.8	27.5	27.5	22.5	7.3	20.0
	V	6.52	7.82	7.17	1.30	72.0	81.2	76.6	9.2	28.2	30.1	24.3	10.6	23.1
Rock phosphate	I	4.20	5.27	4.74	1.07	60.0	71.7	65.8	11.7	26.0	26.3	21.1	15.2	28.8
	II	5.41	6.56	5.98	1.15	84.8	81.4	83.1	-3.4	26.1	26.5	22.8	12.5	21.7
	III	3.22	2.76	2.99	-0.46	69.9	62.2	66.0	-7.7	27.6	29.2	21.6	13.5	26.5
	IV	3.77	6.25	5.01	2.48	76.2	79.0	77.6	2.8	24.6	25.6	25.9	10.2	20.6
	V	6.20	6.35	6.28	0.15	82.1	87.4	84.8	5.3	25.8	28.4	21.6	16.8	31.0

52/Ba/2.3

[+]Note: All manures are supplemented by fertilizers as shown in table on page 52/Ba/2.1

*Recorded yield obviously incorrect. No estimate possible at this stage.

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52/Ba/3.1

SIX COURSE ROTATION EXPERIMENT

The 23rd year

Seasonal effects of fertilizers - Rothamsted Long Hoos IV and Woburn Stackyard, 1952.

For details of rotation and treatments etc. see "Results of the Field Experiments 1939-47".

Area of each plot: Rothamsted - 0.0250 acre. Woburn - 0.0266 acre.

Cultivations, etc.:

Rothamsted

Sugar beet.
Ploughed: Aug 28, 1951 and again Dec 22. Fertilizers applied: Mar 18, 1952. Seed drilled at 18 lb per acre: Mar 21. Singled: May 23. Lifted: Dec 31. Variety: Klein E.

Barley.
Ploughed: Dec 17, 1951. Ground chalk applied at 20 cwt per acre: Feb 25, 1952. Fertilizers applied, seed drilled at 3 bushels per acre: Mar 3. Harvested: July 28. Variety: Plumage Archer.

Clover.
Seed undersown in barley at 40 lb per acre: Apr 17, 1951. Autumn fertilizers applied: Nov 4. Sulphate of ammonia applied: Apr 16, 1952. Cut: June 25. Variety: Late flowering Montgomery Red.

Wheat.
Ploughed: Aug 7, 1951. Autumn fertilizers applied: Oct 18. Seed drilled at 3 bushels per acre: Oct 19. Sulphate of ammonia applied: Apr 24, 1952. Sprayed with M.C.P.A. 5 pints per acre: May 10. Harvested: July 26. Variety: Yeoman.

Potatoes.
Ploughed: Aug 25, 1951 and again Dec 18. Ridged, fertilizers applied, potatoes planted: Apr 25, 1952. Earthed up: July 8. Sprayed with copper fungicide 5 lb per acre: Sept 3. Sprayed with sulphuric acid, 20% B.O.V: Sept 23. Lifted: Oct 7. Variety: Majestic.

Rye.
Cultivated: Oct 10, 1951. 25 cwt ground chalk per acre and autumn fertilizers applied: Oct 17. Seed drilled at 3 bushels per acre: Oct 18. Sulphate of ammonia applied: Apr 17, 1952. Harvested: July 26. Variety: King II.

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Woburn

Sugar beet.
Ploughed: Sept 13, 1951 and again Jan 7, 1952. Fertilizers applied and seed drilled at 18 lb per acre: Apr 18. Singled: May 29. Lifted: Oct 8. Variety: Klein E.

Barley.
Ploughed: Oct 12, 1951 and again Feb 9, 1952. Ground chalk applied at 20 cwt per acre: Feb 29. Fertilizers applied: Mar 13. Seed drilled at 3 bushels per acre: Mar 14. Harvested: July 31. Variety: Plumage Archer.

Clover.
Seed undersown in barley at 40 lb per acre: Apr 18, 1951. Autumn fertilizers applied: Dec 3. Sulphate of ammonia applied: Apr 23, 1952. Cut: June 30. Variety: Late flowering Montgomery Red.

Wheat.
Ploughed: July 24, 1951 and again Sept 7. Autumn fertilizers applied: Oct 23. Seed drilled at 3 bushels per acre: Oct 26. Sulphate of ammonia applied: May 2, 1952. Sprayed with D.N.B.P.: May 24. Harvested: July 28. Variety: Red Standard.

Potatoes.
Ploughed: Sept 7, 1951 and again Jan 9, 1952. Ridged: Apr 23. Fertilizers applied, potatoes planted: Apr 24. Earthed up: June 16. Sprayed with copper fungicide 5 lb per acre: Aug 11 and again Sept 22. Sprayed with sulphuric acid, 15% B.O.V: Sept 22. Lifted: Oct 7. Variety: Majestic.

Rye.
Ploughed: Oct 9, 1951. Autumn fertilizers applied: Oct 23. Ground chalk applied at 20 cwt per acre: Oct 25. Seed drilled at 3 bushels per acre: Oct 26. Sulphate of ammonia applied: May 2, 1952. Harvested: July 25. Variety: King II.

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Summary of Results

Mean yields per acre and responses in yield per cwt of N, P_2O_5 and K_2O

	Rothamsted	Woburn	Rothamsted	Woburn
	Sugar Beet, roots (washed): tons per acre		Barley, grain: cwt per acre	
Mean	12.37	9.21	32.0	25.3
Response to: N	+1.39	+0.73	+16.5	+30.7
P	-2.69	-2.43	+1.3	+2.4
K	-2.40	+3.11	+1.0	+2.7
	Sugar Beet, sugar percentage		Barley, straw: cwt per acre	
Mean	17.07	19.58	37.2	29.8
Response to: N	-0.34	-0.37	+40.0	+47.9
P	-0.05	+0.37	+4.1	-1.1
K	-0.50	+0.20	+0.8	+2.5
	Sugar Beet, total sugar: cwt per acre		Clover, hay, dry matter: cwt per acre	
Mean	42.2	36.1	37.6	43.8
Response to: N	+3.9	+1.9	-7.1	+10.0
P	-9.3	-8.8	+7.1	-15.3
K	-9.3	+12.5	-0.7	+14.8
	Sugar Beet, tops: tons per acre		Wheat, grain: cwt per acre	
Mean	*	4.79	34.3	8.6
Response to: N		+2.10	+14.0	+10.0
P		-1.75	-4.7	+7.1
K		+1.76	+1.0	-0.2
	Sugar Beet, plant number: thousands per acre		Wheat, straw: cwt per acre	
Mean	28.6	*	60.6	15.8
Response to: N	+2.8		+31.8	+18.2
P	-4.9		-1.9	+6.8
K	0.0		-0.4	+2.4

*not recorded.

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	Rothamsted	Woburn	Rothamsted	Woburn
	Potatoes, total tubers: tons per acre		Rye, grain: cwt per acre	
Mean	8.15	6.29	27.3	22.8
Response to: N	+1.87	+4.39	+12.5	+24.4
P	+0.26	+1.79	+10.8	-0.7
K	+3.03	-1.43	+1.2	+3.0
	Potatoes, percentage ware		Rye, straw: cwt per acre	
Mean	75.0	86.8	38.2	26.0
Response to: N	+1.5	-2.1	+21.3	+24.9
P	+7.1	+11.7	+17.2	+1.8
K	+7.4	-3.6	+3.3	+1.8

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52/Bb/1.1

DEEP CULTIVATION ROTATION EXPERIMENT

The 9th Year

Deep ploughing, fertilizers and dung - Long Hoos I and II 1952.

For details of rotation and treatments etc. see "Results of the Field Experiments 1939-47".

Area of each plot: 0.0312 acre. Area harvested: Sugar beet (half plot), 0.0119 acre; barley, wheat, spring oats, 0.0265 acre; ley, 0.0275 acre; potatoes (half plot), 0.0107 acre.

Cultivations, etc.:

Sugar beet (Series 1)
Fertilizers for ploughing in applied: Sept 28, 1951. Dung applied and ploughed in 'deep': Oct 9. Dung applied and ploughed in 'shallow': Oct 10. Fertilizers for surface application broadcast, seed drilled at 16 lb per acre: Mar 22, 1952. Singled: May 26. Lifted: Jan 2, 1953. Variety: Klein E.

Barley (Series 6)
Ploughed: Dec 18, 1951. Ground chalk applied at 1 ton per acre: Feb 25, 1952. Basic slag and sulphate of ammonia applied: Feb 27. Seed drilled at 3 bushels per acre: Feb 28. Harvested: July 31. Variety: Plumage Archer.

Ley (Series 2)
Seeds undersown in barley: Apr 18, 1951. Cut: June 24, 1952. Seeds mixture (per acre): 18 lb S.24 perennial ryegrass, 8 lb Montgomery red clover, 2 lb American Alsike clover.

Wheat (Series 3)
Ploughed 'deep' plots: July 30, 1951. Ploughed 'shallow' plots: Aug 8. Ploughed all plots: Sept 25. Seed drilled at 3 bushels per acre: Oct 20. Basal sulphate of ammonia applied: Apr 16, 1952. Harvested: July 26. Variety: Yeoman.

Potatoes (Series 4)
Fertilizers for ploughing in applied: Sept 28, 1951. Dung applied and ploughed in 'deep': Oct 9. Dung applied and ploughed in 'shallow': Oct 10. Ridged: May 1, 1952. Fertilizers applied in ridges, potatoes planted: May 2. Earthed up ridges: July 10. Sprayed with copper fungicide 5 lb per acre: Aug 12 and again Sept 3. Sprayed with sulphuric acid, 20% B.O.V: Sept 23. Lifted: Oct 18. Variety: Majestic.

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Spring oats (Series 5)
Ploughed: Oct 29, 1951. Ground chalk applied at 1 ton per acre: Feb 25, 1952. Basal sulphate of ammonia drilled: Feb 27. Seed drilled at 3½ bushels per acre: Feb 28. Harvested: July 22.
Variety: Star.

Standard errors per plot:

Sugar beet,	Total sugar,	whole plot:	2.49 cwt per acre or 4.4%	(4 d.f)
		sub-plot:	3.65 cwt per acre or 6.5%	(7 d.f)
Barley,	Grain:		2.16 cwt per acre or 8.4%	(4 d.f)
Ley,	Hay:		2.48 cwt per acre or 4.0%	(4 d.f)
Wheat,	Grain:		2.34 cwt per acre or 6.9%	(4 d.f)
Potatoes,	Total tubers,	whole plot:	0.510 tons per acre or 7.3%	(4 d.f)
		sub-plot:	1.093 tons per acre or 15.7%	(7 d.f)
Spring oats,	Grain:		2.84 cwt per acre or 8.3%	(4 d.f)

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52/Bb/1.3

Summary of Results

Series 1: Sugar Beet

Responses to treatments

Response to	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Roots (washed): Mean yield 17.83 tons per acre									
Ploughing deep-shallow	+2.91	-	-	+3.42	+2.40	+2.85	+2.97	+2.60	+3.22
Dung	+3.63	+4.14	+3.12	-	-	+3.94	+3.32	+4.78	+2.48
Phosphate	+0.24	+0.18	+0.30	+0.55	-0.07	-	-	-0.02	+0.50
Potash	+1.07	+0.76	+1.38	+2.22	-0.08	+0.81	+1.33	-	-
Sugar Percentage: Mean 15.77									
Ploughing deep-shallow	-0.13	-	-	-0.08	-0.18	-0.05	-0.21	-0.20	-0.06
Dung	-0.16	-0.11	-0.21	-	-	-0.34	+0.02	-0.19	-0.13
Phosphate	+0.06	+0.14	-0.02	-0.12	+0.24	-	-	+0.26	-0.14
Potash	-0.07	-0.14	0.00	-0.10	-0.04	+0.13	-0.27	-	-
Total Sugar: Mean yield 56.2 cwt per acre									
	(±1.25)					(±1.76)			
Ploughing deep-shallow	8.7	-	-	10.6	6.8	8.8	8.6	7.5	9.9
Dung	10.9	12.8	9.0	-	-	11.2	10.6	14.5	7.3
Phosphate	1.0	1.1	0.9	1.3	0.7	-	-	1.0	1.0
Potash	3.2	2.0	4.4	6.8	-0.4	3.2	3.2	-	-
Plant Number: Mean 26.6 thousands per acre									
Ploughing deep-shallow	+1.2	-	-	+1.2	+1.2	+1.4	+1.0	+0.9	+1.5
Dung	+0.1	+0.1	+0.1	-	-	+0.5	-0.3	+0.3	-0.1
Phosphate	-0.6	-0.4	-0.8	-0.2	-1.0	-	-	-0.9	-0.3
Potash	+0.2	-0.1	+0.5	+0.4	0.0	-0.1	+0.5	-	-
Noxious Nitrogen: Mean 25.0 mg. per 100 g.									
Ploughing deep-shallow	+0.6	-	-	+1.2	0.0	+0.6	+0.6	-0.6	+1.8
Dung	+2.5	+3.1	+1.9	-	-	+1.9	+3.1	+1.9	+3.1
Phosphate	-1.9	-1.9	-1.9	-2.5	-1.3	-	-	-1.9	-1.9
Potash	+0.6	-0.6	+1.8	0.0	+1.2	+0.6	+0.6	-	-

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Series 1: Sugar beet

	Phosphate			Potash			
	None	Ploughed in	In seed bed	None	Ploughed in	In seed bed	Mean
Roots (washed): tons per acre							
Shallow	16.28	16.98	15.95	16.00	17.42	16.09	16.37
Deep	19.13	19.32	19.55	18.59	19.89	20.06	19.28
No dung	15.74	16.36	16.22	14.91	17.18	17.07	16.02
Dung	19.68	19.94	19.28	19.68	20.13	19.08	19.64
Mean	17.71	18.15	17.75	17.29	18.65	18.08	17.83
Sugar Percentage							
Shallow	15.76	15.64	16.16	15.90	15.70	15.82	15.83
Deep	15.71	15.71	15.69	15.71	15.62	15.79	15.71
No dung	15.91	15.58	16.00	15.90	15.77	15.82	15.85
Dung	15.57	15.77	15.84	15.71	15.55	15.78	15.69
Mean	15.74	15.68	15.92	15.80	15.66	15.80	15.77
Total Sugar: cwt per acre							
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	51.3	53.2	51.5	50.8	54.7	50.9	51.8
Deep	60.1	60.7	61.3	58.3	62.1	63.3	60.5
No dung	50.1	51.0	51.8	47.4	54.2	54.1	50.7
Dung	61.3	62.9	61.0	61.8	62.6	60.2	61.6
Mean	55.7	56.9	56.4	54.6	58.4	57.1	56.2
Plant Number: thousands per acre							
Shallow	26.2	25.8	25.8	26.1	25.9	26.0	26.0
Deep	27.6	26.9	26.7	26.9	27.2	27.8	27.2
No dung	26.7	26.6	26.2	26.3	26.7	26.9	26.6
Dung	27.1	26.1	26.2	26.6	26.4	26.9	26.6
Mean	26.9	26.3	26.2	26.5	26.5	26.9	26.6

(a) ±1.25 for use in comparisons other than horizontal.
(b) ±1.82 for use in horizontal comparisons.
(c) ±1.79 as (a).

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Series 1: Sugar beet

	Phosphate			Potash			
	None	Ploughed in	In seed bed	None	Ploughed in	In seed bed	Mean
Noxious Nitrogen: mg. per 100 mg.							
Shallow	25.6	23.8	23.8	25.0	25.0	23.8	24.7
Deep	26.2	25.0	23.8	24.4	27.5	25.0	25.3
No dung	25.0	22.5	22.5	23.8	23.8	23.8	23.8
Dung	26.9	26.2	25.0	25.6	28.8	25.0	26.2
Mean	25.9	24.4	23.8	24.7	26.2	24.4	25.0

Series 6: Barley

Responses to treatments to previous Sugar Beet

Response to	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 25.7 cwt per acre									
	(±1.08)				(±1.53)				
Ploughing deep-shallow	-2.6	-	-	-1.3	-3.9	-3.0	-2.2	-3.7	-1.5
Dung	+1.5	+2.8	+0.2	-	-	+1.9	+1.1	+2.6	+0.4
Phosphate	+0.2	-0.2	+0.6	+0.6	-0.2	-	-	-0.2	+0.6
Potash	+1.1	0.0	+2.2	+2.2	0.0	+0.7	+1.5	-	-
Straw: Mean yield 26.5 cwt per acre									
Ploughing deep-shallow	-2.6	-	-	-0.9	-4.3	-2.9	-2.3	-3.4	-1.8
Dung	+3.4	+5.1	+1.7	-	-	+3.5	+3.3	+4.2	+2.6
Phosphate	+0.3	0.0	+0.6	+0.4	+0.2	-	-	0.0	+0.6
Potash	+0.5	-0.3	+1.3	+1.3	-0.3	+0.2	+0.8	-	-

Series 2: Ley

Hay: Mean yield 62.5 cwt per acre									
	(±1.24)				(±1.75)				
Ploughing deep-shallow	-0.1	-	-	-0.7	+0.5	+0.1	-0.3	-2.7	+2.5
Dung	+4.8	+4.2	+5.4	-	-	+4.1	+5.5	+6.1	+3.5
Phosphate	-0.6	-0.4	-0.8	-1.3	+0.1	-	-	-2.7	+1.5
Potash	+1.3	-1.3	+3.9	+2.6	0.0	-0.8	+3.4	-	-

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Series 3: Wheat

Responses to treatments*

Response to	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 33.7 cwt per acre									
	(±1.17)				(±1.66)				
Ploughing deep-shallow	+0.1	-	-	0.0	+0.2	-1.0	+1.2	+0.7	-0.5
Dung	+0.7	+0.6	+0.8	-	-	-0.1	+1.5	-1.7	+3.1
Phosphate	-1.6	-2.7	-0.5	-2.4	-0.8	-	-	+0.9	-4.1
Potash	-1.0	-0.4	-1.6	-3.4	+1.4	+1.5	-3.5	-	-
Straw: Mean yield 62.3 cwt per acre									
Ploughing deep-shallow	+5.1	-	-	+2.6	+7.6	-0.3	+10.5	+6.0	+4.2
Dung	+5.4	+2.9	+7.9	-	-	+8.7	+2.1	+1.3	+9.5
Phosphate	-4.7	-10.1	+0.7	-1.4	-8.0	-	-	-4.2	-5.2
Potash	+2.8	+3.7	+1.9	-1.3	+6.9	+3.3	+2.3	-	-

* Cultivation treatments direct to wheat, remainder to previous sugar beet.

Series 4: Potatoes

Total tubers: Mean yield 6.96 tons per acre

	(±0.255)			(±0.361)					
Ploughing deep-shallow	-1.27	-	-	-1.38	-1.16	-1.27	-1.27	-1.35	-1.19
Dung	+2.54	+2.43	+2.65	-	-	+2.10	+2.98	+3.60	+1.48
Phosphate	+1.61	+1.61	+1.61	+1.17	+2.05	-	-	+0.72	+2.50
Potash	+0.99	+0.91	+1.07	+2.05	-0.07	+0.10	+1.88	-	-
Percentage Ware: Mean 76.0									
Ploughing deep-shallow	-1.0	-	-	-2.8	+0.8	-1.1	-0.9	-1.9	-0.1
Dung	+8.0	+6.2	+9.8	-	-	+6.8	+9.2	+10.2	+5.8
Phosphate	-2.9	-3.0	-2.8	-4.1	-1.7	-	-	-1.3	-4.5
Potash	+5.4	+4.5	+6.3	+7.6	+3.2	+7.0	+3.8	-	-

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Series 4: Potatoes

	Phosphate None	Phosphate Ploughed in	Phosphate In ridges	Potash None	Potash Ploughed in	Potash In ridges	Mean
Total tubers: tons per acre							
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	6.79	7.78	9.03	7.15	6.99	9.11	7.60
Deep	5.53	6.27	8.00	5.80	6.11	7.62	6.33
No dung	5.11	5.32	7.25	4.67	5.81	7.62	5.70
Dung	7.21	8.73	9.79	8.27	7.29	9.11	8.23
Mean	6.16	7.03	8.52	6.47	6.55	8.36	6.96
Percentage Ware							
Shallow	78.0	76.0	74.0	74.2	78.1	79.4	76.5
Deep	76.8	72.1	76.1	72.3	76.9	80.4	75.5
No dung	74.0	69.6	70.3	68.2	75.4	76.2	72.0
Dung	80.9	78.6	79.7	78.4	79.6	83.6	80.0
Mean	77.4	74.1	75.0	73.3	77.5	79.9	76.0

Series 5: Spring Oats

Responses to treatments to previous potatoes

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 34.4 cwt per acre									
	(±1.42)				(±2.01)				
Ploughing deep-shallow	-4.0	-	-	-1.9	-6.1	-4.3	-3.7	-3.3	-4.7
Dung	-1.1	+1.0	-3.2	-	-	-0.5	-1.7	-1.2	-1.0
Phosphate	+1.7	+1.4	+2.0	+2.3	+1.1	-	-	+0.3	+3.1
Potash	-1.4	-0.7	-2.1	-1.5	-1.3	-2.8	0.0	-	-
Straw: Mean yield 43.6 cwt per acre									
Ploughing deep-shallow	-3.4	-	-	-1.8	-5.0	-4.1	-2.7	-2.9	-3.9
Dung	+4.1	+5.7	+2.5	-	-	+4.3	+3.9	+2.7	+5.5
Phosphate	+0.9	+0.2	+1.6	+1.1	+0.7	-	-	-0.1	+1.9
Potash	-0.2	+0.3	-0.7	-1.6	+1.2	-1.2	+0.8	-	-

(a) ±0.255 for use in comparisons other than horizontal.
(b) ±0.547 for use in horizontal comparisons.
(c) ±0.463 as (a).

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52/Bc/1.1

LEY AND ARABLE ROTATIONS

Highfield and Fosters Field 1952 - the 4th year.

This experiment was started in autumn 1948 for cropping in 1949 on two fields, Highfield previously old grassland, and Fosters previously old arable. The cropping treatments tested are:

1. Three year ley grazed by sheep.
2. Three year cut grass, as for drying.
3. Three year lucerne, cut as for hay.
4. Three year arable rotation of hay, potatoes, barley.

The three test crops which follow all the above four cropping treatments are. Wheat in the first year, potatoes in the second and barley in the third. Outside this sequence of treatment and test crops there are permanent grass treatments of old grass and of reseeded grass on Highfield and of reseeded grass only on Fosters. All the permanent grass plots are grazed with sheep for two years and hayed on the third. The experiment on Highfield is set out in blocks of 6 plots and on Fosters in blocks of 5 plots each. The cropping in the 6 plot blocks on Highfield for the first six year cycle is illustrated by the following table.

Phase		Plots					
A	B	(1)	(2)	(3)	(4)	(5)	(6)
1949	1952	L	Lu	CG	H	G	R
1950	1953	L	Lu	CG	P	G	R
1951	1954	L	Lu	CG	B	G	R
1952	1949	W	W	W	W	G	R
1953	1950	P	P	P	P	G	R
1954	1951	B	B	B	B	G	R

L = 3 year ley Lu = Lucerne CG = Cut grass
G = Old permanent grass R = Reseeded grass B = Barley
H = 1 year arable hay. P = Potatoes W = Wheat

Hay = 1 cut then fallow. Lucerne: cut for hay.
Cut grass: Several cuts. Ley: Grazed with sheep.
Reseeded and old grass: Grazed 2 years with sheep, hay with aftermath grazing in the 3rd year.

In the first year (1949) two blocks were started in phase A (treatment crops followed by test crops) and a further two blocks in phase B which is 3 years behind phase A, starting with the three test crops before the treatment crops. The arrangement is the same for Fosters except that there is no treatment G.

In 1950 an exactly similar set of four blocks were started on each field, and again in 1951, when all six stages of all the rotations were represented in duplicate.

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In 1952 the fertility effects built up by the leys, lucerne and other treatment crops, can be measured for the first time on the test crops of wheat on two blocks on each field.

Treatment and basal dressings: Tests are made on nitrogen and dung as follows:

Nitrogen: 2 levels appropriate to the crop (none to lucerne) are applied to the treatment crops, and the effects of the treatment crop grown at each level is measured at two levels of nitrogen in the subsequent test crops. Nitrogen is applied as sulphate of ammonia to potatoes and as nitrochalk to the other crops according to the following schedule, which also shows the basal dressing applied.

Dung: None: 12 tons per acre applied in the ridges to potatoes both in the arable rotation and to the test crop. It is applied to quarter plots to test all combinations of (0 v.D) x (N_1 v.N_2).

Crop	Crop Symbol	Treatments cwt. N per acre as Nitrochalk N_1		N_2	Basal dressing per acre
1st year Lucerne	Lu_1	-		-	
1st year Cut Grass	Cg_1	0.15	(a)	0.3	0.6 cwt.P_2O_5 0.6 cwt.K_2O in seedbed
1st year Grazed Ley	L_1	0.075	(b)	0.15	
2nd year Lucerne	Lu_2	-		-	
3rd year Lucerne	Lu_3	-		-	
2nd year Cut Grass	Cg_2	0.15	(a)	0.3	
3rd year Cut Grass	Cg_3	0.15	(a)	0.3	
2nd year Grazed Ley	L_2	0.075	(b)	0.15	0.3 cwt.P_2O_5 0.3 cwt.K_2O in winter
3rd year Grazed Ley	L_3	0.075	(b)	0.15	
Reseeded and Old Permanent Grass 1st and 2nd years	R G	0.075	(b)	0.15	
Reseeded and Old Permanent Grass 3rd year	R G	0.15	(b)	0.30	0.6 cwt.P_2O_5 0.6 cwt.K_2O in winter
Wheat	W	0.3		0.6	0.15 cwt.P_2O_5 0.15 cwt.K_2O Combine drilled with the seed
Barley	B	0.2		0.4	0.15 cwt.P_2O_5 0.15 cwt.K_2O Combine drilled with the seed
1 year Seeds Hay	H	0.3		0.6	0.15 cwt.P_2O_5 0.15 cwt.K_2O in winter
Potatoes	P	0.5 / 0vD (12 tons dung per acre)	(c)	1.0	0.9 cwt.P_2O_5 0.9 cwt.K_2O in ridges

For footnote of (a), (b) and (c) see next page.

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A suitable dressing of calcium carbonate will be applied every 6 years before the Test Barley crop.

(a) 1st dressing of N_1 and N_2 in spring. Repeated dressings of N_1 and N_2 at the same rates after the 1st, 2nd, 3rd, 4th etc.cuts (not the last).
(b) 1st dressing of N_1 and N_2 in spring. A second dressing at the same rates later in the summer (in third year after hay is cut).
(c) N as sulphate of ammonia to Potatoes only.

The basal dressing is applied as a Granulated Compound containing 13% P_2O_5, 13% K_2O.

Sheep Grazing Technique. This has been modified since the experiment started, the present scheme being as follows:

The grazing unit is a half plot of about 1/25 acre. This is presented to the sheep as two or more folds, the team being of such a size that it will graze a single fold to about the level of the sample cut (2") in one day. The intention is to provide fresh untainted grazing every day, leaving the grazed area as a run back. To equalize conditions between the folds within one sub plot, the order of grazing the folds is reversed at every cycle, i.e. the fold which was grazed first on one cycle is grazed last on the next.

Quarter plot area: 0.0220 acre.

Areas harvested (acres): Wheat: 0.0187. Potatoes: 0.0174. Barley: Highfield - 0.0198, Fosters:- 0.0187. Hay, Cut Grass: 0.0199. Grazed ley, Permanent grass, Reseeded: $\frac{1}{2}$ plot - 0.0398. Cut grass 0.000979. Lucerne: $\frac{1}{2}$ plot - 0.0398.

Cultivations, etc:

Highfield

Wheat (Blocks 2 and 3). Ploughed: Oct 4, 1951. Seed drilled at 3 bushels per acre with basal fertilizers: Oct 20. Nitrochalk applied: Apr 30, 1952. Harvested: Aug 1. Variety: Yeoman.

Potatoes (Blocks 9-12). Ploughed: Sept 7, 1951 and again Feb 7, 1952. Ridged, dung, sulphate of ammonia and basal fertilizers applied, potatoes planted: Apr 30. Earthed up: July 9. Sprayed with copper sulphate solution 5 lb per acre, medium volume: Aug 12 and Sept 6. Sprayed with 20% sulphuric acid: Oct 8. Lifted: Oct 16. Variety: Majestic.

Barley (Blocks 5-8). Ploughed: Jan 22, 1952. Ground chalk applied to Blocks 6 and 7: Feb 28. Seed drilled at 3 bushels per acre with basal fertilizers: Feb 29. Nitrochalk applied: Mar 1. Harvested: July 29. Variety: Plumage Archer.

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Cut Grass, Grazed Ley, Lucerne and all 1st year (Blocks 1 and 4). Ploughed: Oct 4, 1951. Basal fertilizers applied: Apr 5, 1952. Nitrochalk applied (none to Lucerne): Apr 18.

Cut Grass. Seeds sown at 38 lb per acre: Apr 19. Cut: 3 times - July 21, Sept 3 and Sept 27. Nitrochalk applied after each cut except the last.
Grazed Ley. Nitrochalk applied: June 28. Grazed: 6 circuits plots 11-12, 5 circuits 45 and 46.
Lucerne. Seed drilled at 33 lb per acre: Apr 19. Cut twice: July 21 and Sept 11. Variety: Du Puits.

Hay 1st year (Blocks 1 and 4). Seeds sown at 38 lb per acre: Apr 18, 1951. Basal fertilizers applied: Dec 20. Nitrochalk applied: Mar 27, 1952. Cut: June 8.

Reseeded grass 4th year (Blocks 1-4). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 27, 1952. Cut: May 15. Nitrochalk applied: June 18. Grazed: 4 circuits, May 29 - Sept 22.

Permanent grass (Blocks 1-4). Basal fertilizers applied: Dec 20,1951. Nitrochalk applied: Mar 27, 1952. Pre-grazing cut: May 15. Nitrochalk applied: June 18. Grazed: 3 circuits, May 29-Sept 26.

Cut Grass, Grazed Ley, Lucerne, Resceded Grass all 2nd year. Permanent Grass (Blocks 9 and 12, Reseeded and Permanent Grass 9-12). Basal fertilizers applied: Dec 20. Nitrochalk applied (none to Lucerne): Mar 27.

Cut Grass. Cut: 5 times - May 16, June 16, July 21, Sept 3 and Sept 26. Nitrochalk applied after each cut except the last.
Grazed Ley. Pre-grazing cut: May 13. Nitrochalk applied: June 18. Grazed: 4 circuits, May 21-Sept 14.
Lucerne. Cut: 3 times - June 11, July 21, Sept 10.
Reseeded Grass. Pre-grazing cut: May 13. Nitrochalk applied: June 17 and 28. Grazed:4 circuits, May 21-Oct 8.
Permanent Grass. Cut: May 14. Nitrochalk applied: June 28. Grazed: 4 circuits, May 21-Oct 12.

Cut Grass 3rd year (Blocks 5 and 8). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 27, 1952. Cut: 5 times May 16, June 16, July 21, Sept 3, Sept 26. Nitrochalk applied after each cut except the last.

Grazed Ley. 3rd year (Blocks 5 and 8). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 27, 1952. Pre-grazing cut: May 15. Nitrochalk applied: June 28. Grazed: 4 circuits, May 25-Sept 12.

Lucerne 3rd year (Blocks 5 and 8). Basal fertilizers applied: Dec 20, 1951. Cut: 3 times, June 11, July 21, Sept 10.

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Reseeded grass. 3rd year (Blocks 5-8). Basal fertilizers applied: Dec 20, 1951. Ground chalk applied to Blocks 6 and 7: Feb 28,1952. Nitrochalk applied: Mar 27. Cut: June 13. Nitrochalk applied: June 17. Grazed: 2 circuits, Aug 29-Sept 30.

Permanent grass. 3rd year (Blocks 5-8). Basal fertilizers applied: Dec 20, 1951. Ground chalk applied to Blocks 6 and 7: Feb 28, 1952. Nitrochalk applied: Mar 27. Cut: June 13. Nitrochalk applied: June 17. Grazed: 2 circuits, Aug 31-Oct 4.

Fosters

Wheat (Blocks 2 and 4). Ploughed: Oct 13, 1951. Seed drilled at 3 bushels per acre with basal fertilizer: Oct 20. Nitrochalk applied: Apr 29, 1952. Harvested: July 25. Variety: Yeoman.

Potatoes (Blocks 6, 10, 11, 12). Ploughed: Aug 28, 1951 and again Jan 22, 1952. Ridged, dung and artificials applied, potatoes planted: Apr 29. Earthed up: June 19. Sprayed with copper sulphate solution, 5 lb per acre: Aug 12 and again Sept 4. Sprayed with 20% sulphuric acid: Sept 23. Lifted: Oct 18. Variety: Majestic.

Barley (Blocks 5, 7, 8, 9). Ploughed: Jan 18, 1952. Seed drilled at 3 bushels per acre with basal fertilizers, nitrochalk applied: Feb 29. Sprayed with MCPA low volume, 5 pints per acre: May 10. Harvested: July 25. Variety: Plumage Archer.

Cut Grass, Grazed Ley, Lucerne, all 1st year (Blocks 1 and 3). Ploughed: Oct 3 , 1951 and again Jan 19, 1952. Basal fertilizer applied: Apr 5. Nitrochalk applied (none to Lucerne): Apr 17.

Cut grass. Seeds sown at 38 lb per acre: Apr 17. Topped: twice July 10 and 18. Cut twice: Sept 5 and 27. Nitrochalk applied: Sept 5.
Grazed Ley. Seeds sown at 55 lb per acre. Topped twice: July 10 and 18. Grazed: 3 circuits, June 3-Sept 14.
Lucerne. Seed drilled at 33 lb per acre: Apr 17. Cut: twice July 18 and Sept 11. Variety: Du Puits.

Hay 1st year (Blocks 1 and 3). Seeds sown at 38 lb per acre: Apr 18, 1951. Basal fertilizers applied: Dec 20. Cut: June 12, 1952.

Reseeded Grass 4th year (Blocks 1-4). Basal fertilizers applied: Dec 20, 1951. Cut: May 10, 1952. Nitrochalk applied: June 21. Grazed: 4 circuits, May 30-Sept 30.

Cut Grass 2nd year (Blocks 6 and 11). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 26, 1952. Cut: 5 times May 19, June 16, July 18, Sept 4 and Sept 26. Nitrochalk applied after each cut except the last.

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Grazed Ley 2nd year (Blocks 6 and 11). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 26, 1952. Pre-grazing cut: May 9. Nitrochalk applied: June 19. Grazed: 4 circuits, May 22-Sept 12.

Lucerne 2nd year (Blocks 6 and 11). Basal fertilizers applied: Dec 20, 1951. Cut: 3 times June 12, July 18 and Sept 9, 1952.

Reseeded grass 2nd year (Blocks 6, 10, 11, 12). Basal fertilizers applied: Dec 20. Nitrochalk applied: Mar 26. Pre-grazing cut: May 9. Nitrochalk applied: June 17. Grazed: 4 circuits, May 22-Oct 4.

Cut Grass 3rd year (Blocks 5 and 7). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 26, 1952. Cut: 5 times May 19, June 16, July 18, Sept 4 and Sept 26. Nitrochalk applied after each cut except the last.

Grazed Ley 3rd year (Blocks 5 and 7). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 26, 1952. Pre-grazing cut: May 10. Nitrochalk applied: June 27. Grazed: 4 circuits, May 26 to Sept 10.

Lucerne 3rd year (Blocks 5 and 7). Basal fertilizers applied: Dec 20, 1951. Cut: 3 times June 12, July 18 and Sept 9, 1952.

Reseeded grass 3rd year (Blocks 5, 7, 8, 9). Basal fertilizers applied: Dec 20, 1951. Nitrochalk applied: Mar 26, 1952. Pre-grazing cut: June 12. Nitrochalk applied: June 17. Grazed: 2 circuits, Aug 26-Sept 26.

Standard errors per $\frac{1}{4}$ plot

Wheat, grain. Highfield: 2.49 cwt per acre or 6.5% (13 d.f.)
Fosters: 0.83 cwt per acre or 2.3% (13 d.f.)

Potatoes, total tubers.
Highfield: 1.61 tons per acre or 12.8% (21 d.f.)
Fosters: 1.35 tons per acre or 10.7% (21 d.f.)

Barley, grain. Highfield: 2.34 cwt per acre or 8.3% (21 d.f.)
Fosters: 1.53 cwt per acre or 4.3% (21 d.f.)

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52/Bc/1.7

Summary of Results

Wheat (1st Test Crop)

Grain: cwt per acre

cwt N per acre	Treatment crops for previous 3 years: Lucerne	Ley	Cut Grass	Arable with hay	Mean
		Highfield			
Mean (±0.88)	40.7	36.1	34.1	43.1	38.5
To Test Crop					
0.3 (±1.24)	42.6	37.0	37.0	44.0	40.1
0.6	38.9	35.2	31.1	42.3	36.9
Diff. (±1.76)	-3.7	-1.8	-5.9	-1.7	-3.2 (±0.88)
To Treatment Crops					
Single rate (±1.24)		35.7	34.4	43.2	37.8
Double rate		36.4	33.8	43.1	37.8
Diff. (±1.76)		+0.7	-0.6	-0.1	0.0 (±0.88)
		Fosters			
Mean (±0.29)	40.5	34.7	36.2	35.3	36.7
To Test Crop					
0.3 (±0.42)	40.1	33.5	35.8	33.6	35.8
0.6	41.0	35.8	36.5	37.1	37.6
Diff. (±0.59)	+0.9	+2.3	+0.7	+3.5	+1.8 (±0.29)
To Treatment Crops					
Single rate (±0.42)		34.8	36.5	35.1	35.5
Double rate		34.6	35.8	35.6	35.3
Diff. (±0.59)		-0.2	-0.7	+0.5	-0.2 (±0.29)

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Wheat (1st Test Crop)

Straw: cwt per acre

cwt N per acre	Treatment crops for previous 3 years: Lucerne	Ley	Cut grass	Arable with hay	Mean
Highfield					
Mean	83.5	79.0	72.6	88.0	80.8
To Test Crop					
0.3	85.1	78.9	74.5	86.9	81.3
0.6	82.0	79.2	70.7	89.2	80.3
Diff.	-3.1	+0.3	-3.8	+2.3	-1.0
To Treatment Crops					
Single rate		77.8	72.2	87.3	79.1
Double rate		80.3	73.0	88.8	80.7
Diff.		+2.5	+0.8	+1.5	+1.6
Fosters					
Mean	74.7	68.7	65.4	61.7	67.6
To Test Crop					
0.3	73.5	67.0	62.8	58.7	65.5
0.6	75.8	70.4	68.0	64.7	69.7
Diff.	+2.3	+3.4	+5.2	+6.0	+4.2
To Treatment Crops					
Single rate		69.1	65.4	61.5	65.3
Double rate		68.3	65.4	61.9	65.2
Diff.		-0.8	0.0	+0.4	-0.1

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Wheat (1st Test Crop)

Grain: cwt per acre

cwt N per acre	N: To previous treatment crop — Single rate	Double rate	Mean	Dung: tons per acre — To previous potato crop — None	12	Mean
Highfield						
To Test Crop	(±1.02)			(±1.76)		
0.3	39.2	39.4	39.3	44.9	43.1	44.0
0.6	36.3	36.1	36.2	42.1	42.5	42.3
Mean	37.8	37.8	37.8	43.5	42.8	43.1
	(±0.72)			(±1.24)		
To previous treatment crop				(±1.76)		
Single rate				43.0	43.4	43.2
Double rate				44.0	42.2	43.1
Mean				43.5	42.8	43.1
				(±1.24)		
Fosters						
To Test Crop	(±0.34)			(±0.59)		
0.3	35.0	33.6	34.3	35.4	31.9	33.6
0.6	35.9	37.1	36.5	36.6	37.5	37.1
Mean	35.5	35.3	35.4	36.0	34.7	35.3
	(±0.24)			(±0.42)		
To Previous treatment crop				(±0.59)		
Single rate				35.8	34.3	35.1
Double rate				36.2	35.1	35.6
Mean				36.0	34.7	35.3
				(±0.42)		

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Wheat (1st Test Crop)

Straw: cwt per acre

cwt N per acre	N: To previous treatment crop: Single rate	N: To previous treatment crop: Double rate	N: Mean	Dung: tons per acre: To previous potato crop: None	Dung: tons per acre: To previous potato crop: 12	Dung: tons per acre: Mean
Highfield						
To Test Crop						
0.3	79.9	80.2	80.1	88.0	85.8	86.9
0.6	78.2	81.2	79.7	83.7	94.7	89.2
Mean	79.1	80.7	79.9	85.8	90.3	88.0
To previous treatment crop						
Single rate				85.1	89.4	87.3
Double rate				86.6	91.1	88.8
Mean				85.8	90.3	88.0
Fosters						
To Test Crop						
0.3	63.9	61.7	62.8	63.3	54.1	58.7
0.6	66.7	68.7	67.7	59.6	69.9	64.7
Mean	65.3	65.2	65.3	61.4	62.0	61.7
To previous treatment crop						
Single rate				62.1	60.9	61.5
Double rate				60.7	63.0	61.9
Mean				61.4	62.0	61.7

N. B. There are no pages numbered 52/Bc/1.11 and 12.

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Potatoes (2nd Test Crop)

Dung: tons per acre	Highfield cwt N per acre 0.5	1.0	Mean	Fosters cwt N per acre 0.5	1.0	Mean
	Total tubers: tons per acre					
			(±0.402)			(±0.337)
None	11.32	12.31	11.81	11.51	11.91	11.71
		(±0.568)			(±0.447)	
12	12.60	13.88	13.24	13.48	13.66	13.57
Mean	11.96	13.09	12.53	12.49	12.79	12.64
		(±0.402)			(±0.337)	
	Percentage ware					
None	73.3	78.0	75.7	79.2	78.8	79.0
12	73.0	77.9	75.5	82.9	83.6	83.2
Mean	73.2	78.0	75.6	81.1	81.2	81.1

Barley (3rd Test Crop)

Dung to potatoes: tons per acre	Highfield cwt N per acre 0.2	0.4	Mean	Fosters cwt N per acre 0.2	0.4	Mean
	Grain: cwt per acre					
			(±0.58)			(±0.38)
None	27.2	26.4	26.8	34.5	35.6	35.1
		(±0.83)			(±0.54)	
12	30.5	29.0	29.8	35.4	36.5	35.9
Mean	28.9	27.7	28.3	34.9	36.1	35.5
		(±0.58)			(±0.38)	
	Straw: cwt per acre					
None	61.2	60.9	61.0	42.7	49.9	46.3
12	66.5	64.8	65.6	44.8	52.5	48.6
Mean	63.8	62.8	63.3	43.8	51.2	47.5

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52/Bc/1.14

One Year Hay

Dry Matter: cwt per acre

	Nitrogen to 3 previous test crops		Dung to Potatoes 1950 tons per acre		
	Single rate	Double rate	0	12	Mean
Highfield					
Nitrogen to Hay					
0.3 cwt	66.0	65.3	67.3	64.0	65.6
0.6 cwt	68.4	64.4	63.7	69.1	66.4
N to test crop					
Single rate			65.8	68.6	67.2
Double rate			65.2	64.5	64.8
Mean			65.5	66.6	66.0
Fosters					
Nitrogen to Hay					
0.3 cwt	62.5	62.4	60.4	64.5	62.5
0.6 cwt	67.3	60.5	61.7	66.1	63.9
N to test crop					
Single rate			63.9	66.0	64.9
Double rate			58.3	64.7	61.5
Mean			61.1	65.3	63.2

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Cut Grass

Dry Matter: cwt per acre

Nitrogen (1) to cut grass	Nitrogen to previous 3 test crops: Single rate	Nitrogen to previous 3 test crops: Double rate	Dung to potatoes 1950 tons per acre: 0	Dung to potatoes 1950 tons per acre: 12	Mean
1st year		Highfield			
Single rate	46.5	44.9	43.3	48.1	45.7
Double rate	44.5	47.9	46.0	46.4	46.2
N to test crops					
Single rate			43.6	47.5	45.5
Double rate			45.8	47.0	46.4
Mean			44.7	47.2	46.0

	N to cut grass (1) Single rate	N to cut grass (1) Double rate	Mean
2nd year (5 cuts)	56.4	63.1	59.8
3rd year (5 cuts)	49.2	57.4	53.3

Nitrogen (1) to cut grass	Nitrogen to previous 3 test crops: Single rate	Nitrogen to previous 3 test crops: Double rate	Dung to potatoes 1950: 0	Dung to potatoes 1950: 12	Mean
1st year		Fosters			
Single rate	11.7	10.0	11.0	10.7	10.8
Double rate	11.3	12.5	12.3	11.5	11.9
N to test crops					
Single rate			11.1	11.9	11.5
Double rate			12.2	10.3	11.2
Mean			11.7	11.1	11.4

	N to cut grass (1) Single rate	N to cut grass (1) Double rate	Mean
2nd year (5 cuts)	59.4	68.0	63.7
3rd year (5 cuts)	47.7	51.3	49.5

(1) 0.15 v. 0.3 cwt N as nitrochalk for every cut.

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Ley

Dry Matter: cwt per acre

	Cutting (1) Nitrogen (2) Single rate	Double rate	Mean	Grazing from sampling cuts Nitrogen (2) Single rate	Double rate	Mean
Highfield						
1st year				34.2	37.2	35.7
2nd year	27.3	27.2	27.3	25.2	27.1	26.1
3rd year	26.1	28.9	27.5	19.9	21.5	20.7
Fosters						
1st year				18.2	18.6	18.4
2nd year	19.6	19.7	19.7	21.0	21.6	21.3
3rd year	16.4	18.2	17.3	22.6	23.4	23.0

(1) Preliminary before grazing
(2) The nitrogen applied is 0.15 v. 0.3 cwt per acre in all for the preliminary cut and the grazing

Reseeded Grass

Dry Matter: cwt per acre

	Cutting Nitrogen (3) Single rate	Double rate	Mean	Grazing from sampling cuts Nitrogen (3) Single rate	Double rate	Mean
Highfield						
4th year grazing (1)	30.4	34.0	32.2	21.8	21.8	21.8
2nd year grazing (1)	22.3	26.1	24.2	27.1	27.6	27.3
3rd year hay	65.4	68.8	67.1	15.9(2)	18.2(2)	17.0
Fosters						
4th year grazing (1)	18.2	19.7	18.9	22.3	25.0	23.6
2nd year grazing (1)	14.2	17.3	15.8	25.1	24.8	25.0
3rd year hay	47.4	52.3	49.8	12.1(2)	14.5(2)	13.3

(1) Preliminary cut before grazing
(2) Aftermath grazing
(3) N for preliminary cut and grazing 0.15 v. 0.3 cwt in all
N for preliminary cut and hay 0.15 v. 0.3 cwt
N for preliminary cut and aftermath 0.15 v. 0.3 cwt.

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Permanent Grass

Dry Matter: cwt per acre

	Blocks	Cutting Nitrogen (3) Single rate	Double rate	Mean	Grazing from sampling cuts Nitrogen (3) Single rate	Double rate	Mean
		Highfield					
Grazing (1)	1-4	28.2	29.9	29.0	17.8	18.0	17.9
Grazing	9-12	11.2	12.6	11.9	25.7	27.7	26.7
Hay	5-8	50.1	54.6	52.4	13.2 (2)	14.5 (2)	13.9

(1) Preliminary cut before grazing (2) Aftermath grazing.
(3) N for preliminary cut and grazing 0.15 v. 0.3 cwt in all
N for preliminary cut and hay 0.15 v. 0.3 cwt
N for preliminary cut and aftermath 0.15 v. 0.3 cwt.

Lucerne

Dry Matter: cwt per acre

		Nitrogen to 3 previous test crops Single rate	Double rate	Mean	Nitrogen to 3 previous test crops Single rate	Double rate	Mean
1st Year (2 cuts)		Highfield			Fosters		
Dung to potatoes 1950	0	44.0	42.1	43.1	29.6	33.8	31.7
	12 tons	46.9	45.0	45.9	35.5	20.4	27.9
Mean		45.4	43.5	44.5	32.5	27.1	29.8
2nd year (3 cuts)		Mean = 81.5			Mean = 93.0		
3rd year (3 cuts)		Mean = 68.7			Mean = 102.9		

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52/Bd/1.1

GREEN MANURING EXPERIMENT

Woburn Stackyard - 1952, the 16th year

For details of treatments etc. see "Results of Field Experiments 1939-47". Since 1950 the fallow, lupin and ryegrass plots of the cabbage crop have been split into two for early and late planting.

Cultivations, etc.:

Green manures. Clover and ryegrass undersown in barley: Apr 18, 1951. Ploughed fallow, lupin and rape plots: Sept 17, 1951 and Jan 6, 1952. Sulphate of ammonia applied: Apr 3. Rape sown: Apr 17. Lupins drilled: Apr 19. Rape dusted with D.D.T: Apr 26 and May 17.

Cabbages. Dung and straw applied to fallow, clover and ryegrass plots, and ploughed in: May 13, 1952. Dung and straw applied to lupin and rape plots, ploughed in: June 23. Basal fertilizers applied: June 24. Cabbages planted and watered in (calomel treated): June 24. Sprayed with Parathion: July 30 and Sept 5. Harvested: Nov 11, 1952 - Mar 18, 1953. Variety: January King.

Barley. Ploughed: Mar 20, 1952. Chalk (46 cwt per acre) applied: Mar 26. Sulphate of ammonia applied: Apr 15. Seed drilled at 3 bushels per acre: Apr 16. Clover and ryegrass undersown: Apr 17. Harvested: Aug 15. Variety: Plumage Archer.

Standard errors per plot:

Cabbages, weight of headed cabbages: 0.383 tons per acre or 28.3% (9 d.f.)

Barley, grain: 2.24 cwt per acre or 24.3% (9 d.f.)

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Summary of Results

Cabbages

	Green Manure					
	None	Lupins	Clover	Rape	Rye-grass	Mean
Weight of headed cabbages: tons per acre						
			(±0.309)			(±0.138)
No Dung	1.40	1.62	3.14	0.11	1.38	1.53
Dung	3.31	2.30	4.39	1.59	2.64	2.85
No Straw	2.56	1.93	3.71	0.92	1.98	2.22
Straw	2.15	2.00	3.82	0.78	2.04	2.16
Sulph.amm.						
2 cwt per acre	2.27	1.56	3.54	0.74	1.53	1.93
4 cwt per acre	2.44	2.36	4.00	0.96	2.48	2.45
Sulph.amm.to green manure						
Low	2.09	1.70	4.22	0.67	1.86	2.11
High	2.62	2.22	3.32	1.03	2.16	2.27
Mean (±0.219)	2.36	1.96	3.77	0.85	2.01	2.19
Total produce: tons per acre						
No Dung	4.43	4.29	6.28	2.44	4.46	4.38
Dung	6.57	5.08	7.46	4.50	5.59	5.84
No Straw	5.68	4.70	6.70	3.62	5.06	5.15
Straw	5.32	4.66	7.04	3.32	4.99	5.07
Sulph.amm.						
2 cwt per acre	5.62	4.30	6.78	3.20	4.46	4.87
4 cwt per acre	5.38	5.06	6.95	3.74	5.58	5.34
Sulph.amm.to green manure						
Low	5.14	4.38	7.24	2.93	4.79	4.89
High	5.86	4.99	6.50	4.01	5.26	5.32
Mean	5.50	4.68	6.87	3.47	5.02	5.11

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Cabbages

	Green Manure					
	None	Lupins	Clover	Rape	Rye-grass	Mean
Headed cabbages as percentage of total number						
No Dung	19.0	24.3	36.0	2.7	20.0	20.4
Dung	36.8	30.6	44.0	23.8	34.0	33.8
No Straw	29.6	27.8	40.6	14.6	25.8	27.7
Straw	26.1	27.0	39.4	11.9	28.2	26.5
Sulph.amm.						
2 cwt per acre	28.4	21.2	37.4	11.0	22.6	24.1
4 cwt per acre	27.3	33.7	42.6	15.4	31.4	30.1
Sulph.amm.to green manure						
Low	23.6	26.0	45.4	11.0	27.1	26.6
High	32.1	28.8	34.7	15.4	26.9	27.6
Mean	27.9	27.4	40.0	13.2	27.0	27.1

Differential Responses

Response to	Mean	Dung		Straw		Sulph.Amm. cwt per acre		Sulph.Amm. to green manure	
		Abs.	Pres.	Abs.	Pres.	2	4	Low	High
Weight of headed cabbages: tons per acre	(±0.196)			(±0.280)					
Dung	+1.31	-	-	+1.08	+1.54	+1.51	+1.11	+0.98	+1.64
Straw	-0.06	-0.29	+0.17	-	-	+0.23	-0.35	-0.42	+0.30
Sulph.amm.	+0.52	+0.72	+0.32	+0.81	+0.23	-	-	+0.87	+0.17
Sulph.amm.to green manure	+0.16	-0.17	+0.49	-0.20	+0.52	+0.51	-0.19	-	-
Total produce: tons per acre									
Dung	+1.46	-	-	+1.37	+1.55	+1.66	+1.26	+1.26	+1.66
Straw	-0.08	-0.17	+0.01	-	-	+0.26	-0.42	-0.44	+0.28
Sulph.amm.	+0.47	+0.67	+0.27	+0.81	+0.13	-	-	+0.66	+0.28
Sulph.amm.to green manure	+0.43	+0.23	+0.63	+0.07	+0.79	+0.62	+0.24	-	-
Headed cabbages as percentage of total number									
Dung	+13.4	-	-	+11.9	+14.9	+17.0	+9.8	+10.8	+16.0
Straw	-1.2	-2.7	+0.3	-	-	+2.8	-5.2	-6.3	+3.9
Sulph.amm.	+6.0	+9.6	+2.4	+10.0	+2.0	-	-	+9.6	+2.4
Sulph.amm.to green manure	+1.0	-1.6	+3.6	-4.1	+6.1	+4.6	-2.6	-	-

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Barley

	Green Manure					
	None	Lupins	Clover	Rape	Rye-grass	Mean
Grain: cwt per acre						
			(±1.12)			(±0.50)
No Dung to cabbages 1951	7.0	8.7	10.3	10.3	9.8	9.2
Dung to cabbages	5.5	9.8	10.2	10.6	9.9	9.2
No Straw to cabbages 1951	5.6	9.0	10.0	10.8	8.9	8.9
Straw to cabbages	6.9	9.5	10.5	10.1	10.8	9.6
Sulph.amm.to cabbages 1951						
2 cwt per acre	7.0	9.2	10.2	10.4	8.6	9.1
4 cwt per acre	5.5	9.4	10.3	10.5	11.1	9.4
Sulph.amm. to barley						
Nil	5.0	7.1	11.1	9.3	7.1	7.9
1½ cwt per acre	7.5	11.4	9.5	11.6	12.6	10.5
Mean (±0.79)	6.2	9.3	10.3	10.5	9.9	9.2

Straw: cwt per acre

No Dung to cabbages 1951	6.9	10.9	12.2	12.6	11.7	10.9
Dung to cabbages	7.6	12.0	16.3	13.4	13.5	12.5
No Straw to cabbages 1951	7.0	10.5	12.8	14.2	12.0	11.3
Straw to cabbages	7.5	12.4	15.7	11.8	13.1	12.1
Sulph.amm.to cabbages 1951						
2 cwt per acre	7.6	11.6	13.0	12.4	11.1	11.1
4 cwt per acre	6.9	11.3	15.5	13.6	14.0	12.3
Sulph.amm.to barley						
Nil	6.6	8.8	13.1	12.0	9.1	9.9
1½ cwt per acre	7.9	14.2	15.4	14.0	16.1	13.5
Mean	7.3	11.5	14.2	13.0	12.6	11.7

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Barley

Differential Responses

Response to	Mean	Dung to Cabbages Abs.Pres.		Straw to Cabbages Abs.Pres.		Sulph. amm. to cabbages cwt per acre 2	4	Sulph. amm. to barley cwt per acre 0	$1\frac{1}{2}$
				Grain: cwt per acre					
	(±0.71)				(±1.01)				
Dung to cabbages 1951	0.0	-	-	+0.1	-0.1	+0.6	-0.6	-1.5	+1.5
Straw to cabbages 1951	+0.7	+0.8	+0.6	-	-	-0.4	+1.8	+1.4	0.0
Sulph.amm to cabbages 1951	+0.3	+0.9	-0.3	-0.8	+1.4	-	-	+0.8	-0.2
Sulph.amm to barley	+2.6	+1.1	+4.1	+3.3	+1.9	+3.1	+2.1	-	-
				Straw: cwt per acre					
Dung to cabbages 1951	+1.7	-	-	+1.4	+2.0	+1.6	+1.8	-0.9	+4.3
Straw to cabbages 1951	+0.8	+0.5	+1.1	-	-	-1.1	+2.7	+0.8	+0.8
Sulph.amm to cabbages 1951	+1.1	+1.0	+1.2	-0.8	+3.0	-	-	+1.2	+1.0
Sulph.amm. to barley	+3.6	+1.0	+6.2	+3.6	+3.6	+3.7	+3.5	-	-

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52/Be/1.1

LEY AND ARABLE ROTATIONS

Woburn Stackyard - 1952 the 15th year.

For details of rotations and treatments etc., see "Results of Field Experiments 1939-47".

Cultivations, etc.:

Block I. Ley - first year. Ploughed: Sept 7, 1951 and again Jan 9, 1952. Basal fertilizers applied, seeds sown: Apr 17. Topped: June 6 and Aug 19. Grazed by sheep: 2 circuits - Aug 26-Sept 3 and Sept 19-24. Seeds mixture per acre: 21 lb S23 Perennial Ryegrass, 12 lb S143 Cocksfoot, 6 lb Late flowering Montgomery Red Clover, 3 lb S100 White Clover.

Lucerne - first year. Ploughed: Sept 7, 1951 and again Jan 9, 1952. Basal fertilizers applied, seed drilled at 28 lb per acre: Apr 17. Dusted with D.D.T: Apr 29 and again May 17. Cut twice: July 23 and Oct 2. Variety: Du Puits.

Potatoes. Ploughed: Sept 7, 1951 and again Jan 9, 1952. Ridged, basal fertilizers applied: Apr 17. Potatoes planted: Apr 19. Earthed up ridges: June 16. Sprayed with copper fungicide, 5 lb per acre: Aug 8 and again Sept 2. Sprayed with sulphuric acid, 15% B.O.V: Sept 22. Lifted: Oct 6. Variety: Majestic.

Block II. Ley - second year. Nitrochalk applied: June 26. Grazed by sheep: 6 circuits - May 9-17, May 31-June 9, June 17-25, July 8-16, Aug 18-26 and Sept 11-19.

Lucerne - second year. Cut three times: June 17, July 23 and Oct 2.

Rye. Ploughed: Oct 10, 1951. Seed drilled at 3 bushels per acre: Oct 26. Nitrochalk applied: Apr 25, 1952. Harvested: July 25. Variety: King II.

Block III. Barley. Ploughed: Jan 7. Ground chalk applied: Feb 29. Basal fertilizers applied: Mar 13. Seed drilled at 3 bushels per acre: Mar 14. Sprayed with M.C.P.A: May 22. Harvested: Aug 14. Variety: Plumage Archer.

Block IV. Ley - third year. Grazed by sheep: 6 circuits - May 1-9, 22-31, June 9-17, June 25-July 3, Aug 7-14 and Sept 3-11.

Lucerne - third year. Cut three times: June 17, July 23 and Oct 2.

Hay. Seeds undersown in Rye: Apr 19, 1951. 2 cwt nitrochalk per acre applied: Apr 17, 1952. First cut: June 6. 1 cwt nitrochalk applied: June 10. Second cut: Oct 2. Seeds mixture per acre: 27 lb S24 Perennial Ryegrass, 12 lb Montgomery Red Clover, 3 lb Canadian Alsike Clover.

Sugar beet. Ploughed: Sept 7, 1951 and Jan 9, 1952. Basal fertilizers applied, seed drilled at 18 lb per acre: Apr 18. Singled: May 30. Lifted: Oct 8. Variety: Klein E.

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Block V. Potatoes. Ploughed: Oct 12, 1951 and Feb 1, 1952. Ridged, dung and basal fertilizers applied: Apr 23. Potatoes planted: Apr 25. Earthed up ridges: June 17. Sprayed with copper fungicide, 5 lb per acre: Aug 8 resprayed Aug 11 and Sept 2. Sprayed with sulphuric acid 15% B.O.V.: Sept 22. Lifted: Oct 6. Variety: Majestic.

Standard errors per plot:

Block III. Barley.

Grain, whole plot: 1.071 cwt per acre or 4.9% (4 d.f.)
sub plot: 0.740 cwt per acre or 3.4% (4 d.f.)

Block V. Potatoes.

Total tubers, whole plot: 0.990 tons per acre or 9.8% (4 d.f.)
sub plot: 1.355 tons per acre or 13.5% (4 d.f.)

Summary of Results

Ley. First year — Block I

	Sheep days of grazing per acre
Mean	339

Lucerne. First year

Yield of Lucerne Hay (85% Dry Matter) cwt per acre

	1st Crop	2nd Crop	Total
No Dung	4.4	15.1	19.5
Dung in 1950	10.0	25.9	35.9
Mean	7.2	20.5	27.7
Increase	5.6	10.8	16.4
Previous rotation			
Lucerne	7.7	21.7	29.4
Arable with Hay	6.7	19.3	26.0

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Block I

Potatoes

	Total tubers tons per acre	Percentage Ware
No Dung	4.26	81.6
Dung in 1950	6.48	88.1
Mean	5.37	84.9
Increase	2.22	6.5
Previous Rotation		
Ley	6.54	86.2
Lucerne	5.78	87.0
Arable with Hay	4.74	85.8
Arable with Sugar Beet	4.43	80.5

Block II

Ley. Second year

	Sheep days of grazing per acre
Mean	1962

Lucerne. Second year

Yield of Lucerne Hay (85% Dry Matter) cwt per acre

	1st crop	2nd crop	3rd crop	Total
No Dung	36.1	16.6	16.1	68.8
Dung in 1949	29.8	15.8	16.7	62.3
Mean	33.0	16.2	16.4	65.6
Increase	-6.3	-0.8	+0.6	-6.5
Previous Rotation				
Lucerne	36.3	14.0	13.9	64.2
Arable with Sugar Beet	29.6	18.4	18.9	66.9

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Block II

Rye

	Grain: cwt per acre	Straw: cwt per acre
No Dung	29.0	31.5
Dung in 1949	30.8	34.7
Mean	29.9	36.2
Increase	1.8	-3.0
Previous Rotation		
Ley	31.6	36.5
Lucerne	32.6	34.0
Arable with Hay	28.8	31.6
Arable with Sugar Beet	26.6	30.3

Block III

Barley

	Previous Rotation				
	Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean
	Grain: cwt per acre				
No Dung (±0.84)(1)	23.6	22.2	14.1	16.8	19.2
Dung in 1951	25.8	26.4	21.8	23.0	24.2
Mean (±0.76)	24.7	24.3	17.9	19.9	21.7
Increase (±0.74)	2.2	4.2	7.7	6.2	5.0 (±0.37)
	Straw: cwt per acre				
No dung	25.2	22.1	13.7	18.6	19.9
Dung in 1951	29.7	30.5	22.3	26.3	27.2
Mean	27.5	26.3	18.0	22.4	23.5
Increase	4.5	8.4	8.6	7.7	7.3

Standard error (1) for use in comparisons other than vertical

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Block IV

Ley. Third year

	Sheep days of grazing per acre
Mean	2089

Lucerne. Third year

Yield of Lucerne Hay (85% Dry Matter) cwt per acre

	1st crop	2nd crop	3rd crop	Total
No Dung	28.2	17.2	17.5	62.9
Dung in 1948	35.4	22.5	21.5	79.4
Mean	31.8	19.8	19.5	71.2
Increase	7.2	5.3	4.0	16.5
Previous rotation				
Lucerne	34.1	23.2	20.0	77.3
Arable with Hay	29.5	16.5	19.0	65.0

Hay

Yield (85% Dry Matter) cwt per acre

	1st crop	2nd crop	Total
No Dung	51.6	4.6	56.2
Dung in 1948	58.2	8.4	66.6
Mean	54.9	6.5	61.4
Increase	6.6	3.8	10.4
Previous Rotation			
Lucerne	52.7	10.0	62.7
Arable with Hay	57.1	3.0	60.1

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Block IV

Sugar Beet

	Roots (washed) tons per acre	Tops tons per acre	Total sugar cwt per acre	Sugar Percentage
No Dung	12.62	7.16	48.0	19.04
Dung in 1948	14.99	7.76	56.0	18.68
Mean	13.80	7.46	52.0	18.86
Increase	+2.37	+0.60	+8.0	-0.36
Previous Rotation				
Ley	13.89	7.62	52.1	18.76
Arable with Sugar Beet	13.72	7.31	51.8	18.96

Block V

Potatoes

Previous Rotation

	Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean	
	Total tubers: tons per acre					
No Dung (±0.974)(1)	10.46	7.42	7.19	6.54	7.90	
Dung in 1952	15.05	11.45	11.20	11.28	12.24	
Mean (±0.700)	12.75	9.44	9.19	8.91	10.07	
Increase (±1.36)	4.59	4.03	4.01	4.74	4.34	(±0.678)
	Percentage Ware					
No Dung	94.1	89.2	92.4	89.4	91.3	
Dung in 1952	94.0	94.2	92.5	94.2	93.7	
Mean	94.0	91.7	92.4	91.8	92.5	
Increase	-0.1	+5.0	+0.1	+4.8	+2.4	

Standard error (1) for use in comparisons other than vertical

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52/Bf/1.1

WOBURN MARKET GARDEN EXPERIMENT

Organic manures and nitrochalk - Lansome 1952 the 11th year.

The present cropping comprises two series, each carrying in turn the crops of a two course rotation: 1st year - Globe beet followed by Spring cabbages; 2nd year - Leeks.

System of replication (each series): 4 randomized blocks of 10 plots each, certain interactions being confounded with block differences.

Area of each plot: 0.0125 acre.

Treatments applied to each crop:
Organic manures: Dung; sewage sludge compost; sewage sludge (West Middlesex); vegetable compost, each at 10 and 20 tons per acre.
Nitrochalk; None; 0.3 cwt N per acre on plots receiving organic manure. None; 0.3, 0.6, 0.9 cwt N per acre on plots not receiving organic manure. The last two rates are applied in two equal dressings.

Basal manuring per acre to each crop: 0.3 cwt P_2O_5; 0.3 cwt K_2O, applied as granular fertilizer (13% P_2O_5; 13% K_2O).

Cultivations, etc.:
Globe beet. Organic manures applied and ploughed in: Apr 1. Nitrochalk applied (first dressing to 0.6 and 0.9 N plots): Apr 23. Basal manure applied: Apr 25. Seed drilled at 13 lb per acre: Apr 26. Dusted against flea beetle: May 1-17. Singled: June 12. Second application of nitrochalk to 0.6 and 0.9 N plots: June 13. Lifted: July 11-Sept 24. Variety: Detroit.

Spring cabbages 1952-53. Organic manures applied and ploughed in: Sept 25, 1952. Basal manures applied: Sept 26. Cabbages planted (calomel treated) and watered in, 2½ cwt of 5% D.D.T. dust broadcast before planting: Sept 29. Owing to damage by birds cabbages had to be ploughed in: Mar 12, 1953. Variety: Durham Early.

Leeks 1952-53. Organic manures applied and ploughed in: July 8, 1952. Basal manures and nitrochalk applied (first dressing to 0.6 and 0.9 N plots): July 30. Leeks planted and watered in: Aug 5-7. Second dressing of nitrochalk to 0.6 and 0.9 N plots: Sept 12. Harvested: Feb 6-Apr 16, 1953. Variety: Musselburgh.

Standard errors per plot:
Globe beet, saleable bulbs: 1.29 tons per acre or 17.1% (17 d.f.)
Leeks, saleable produce: 0.470 tons per acre or 12.6% (17 d.f.)

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Summary of Results

Globe Beet

Organic Manures	Level of manuring (tons per acre)	Nitrochalk, cwt N per acre: None	0.3	0.6	0.9	Mean
Saleable bulbs: tons per acre				(±0.911)		(±0.644)
None		1.59	4.88	7.63	4.24	3.24*
Dung	10	4.98	9.58			7.28
	20	9.74	9.60			9.67
Sludge compost	10	6.01	6.69			6.35
	20	7.06	9.56			8.32
Sludge	10	8.78	9.88			9.33
	20	8.37	8.18			8.27
Vegetable compost	10	7.30	8.60			7.95
	20	6.84	10.81			8.83
Mean (±0.322)		7.39†	9.11†			7.52
Total produce: tons per acre						
None		5.68	9.84	12.77	7.32	7.76*
Dung	10	7.73	14.06			10.89
	20	14.91	15.04			14.97
Sludge compost	10	11.11	9.92			10.52
	20	10.82	14.88			12.85
Sludge	10	14.00	16.88			15.44
	20	12.62	11.88			12.24
Vegetable compost	10	11.82	12.64			12.23
	20	9.97	16.03			13.00
Mean		11.62†	13.91†			11.99
Plant number: thousands per acre						
None		95.4	98.7	110.5	51.4	97.1*
Dung	10	60.1	93.0			76.5
	20	102.3	86.9			94.6
Sludge compost	10	113.4	61.2			87.3
	20	76.4	97.3			86.8
Sludge	10	100.2	130.2			115.2
	20	87.6	60.5			74.0
Vegetable compost	10	86.2	93.3			90.8
	20	64.5	102.6			83.5
Mean		86.6†	90.6†			88.7

* Mean over None and 0.3 cwt N per acre only.
† Excluding 'No organics'.

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Leeks

Organic Manures	Level of manuring (tons per acre)	Nitrochalk, cwt N per acre: None	0.3	0.6	0.9	Mean
Saleable produce: tons per acre			(±0.332)			(±0.235)
None		1.94	3.09	3.52	2.93	2.52*
Dung	10	3.98	3.83			3.90
	20	4.44	5.03			4.73
Sludge compost	10	3.48	4.05			3.77
	20	3.71	4.01			3.86
Sludge	10	3.09	3.44			3.27
	20	3.24	3.30			3.27
Vegetable compost	10	4.10	4.20			4.15
	20	4.54	4.53			4.53
Mean (±0.117)		3.82†	4.05†			3.72
Percentage saleable (by number)						
None		87.1	92.9	93.5	92.2	90.0*
Dung	10	95.6	94.9			95.2
	20	97.1	97.6			97.4
Sludge compost	10	94.3	95.5			94.9
	20	95.7	95.6			95.7
Sludge	10	94.5	94.9			94.7
	20	93.1	94.7			93.9
Vegetable compost	10	98.1	95.7			96.9
	20	96.2	97.2			96.7
Mean		95.6†	95.8†			94.8

* Mean over None and 0.3 cwt N per acre only.
† Excluding 'No organics'.

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52/Bg/1.1

IRRIGATION EXPERIMENT

The 2nd year

The effects of irrigation and nitrogen - Woburn Butt Close 1952.

The cropping comprises four series; three of these in turn carry the crops of a 3-course rotation:-

1st year: Early potatoes followed by winter cabbages
2nd year: Sugar beet
3rd year: Barley

The fourth series remains in long term grass for cutting.

System of replication: 3 randomized blocks of 4 plots each, plots being split into two for the application of nitrogen.

Area of each sub plot: Cut grass - 0.0264, remainder - 0.0278 acre.
Area harvested: Cut grass - 0.0264, early potatoes - 0.0155, winter cabbages - 0.0175, sugar beet - 0.0176, barley - 0.0168 acre.

Treatments: All combinations of:-
Whole plots. Irrigation:-

	Grass	Arable crops
0	None	None
C	Full irrigation	Full irrigation to maintain deficit at 1".
B	2/3 of C	None till mid-season, then as C.
A	1/3 of C	As C till mid-season, then none

The actual amounts applied are given below.

Sub plots. Nitrogen: 2 levels applied to crops as below.

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Rainfall and Irrigation: inches

Week ending	Rain-fall	Irrigation: Early Potatoes A	B	C	Sugar beet A	B	C	Barley A	B	C	Cut Grass A	B	C
May 19	.08												
26	.40												
June 2	.30												.16
9	.19	1.00		1.00	.83		.83	1.09		1.09	.51	.85	.97
16	.62	.50		.50	.67		.68	.50		.50			.50
23	.29												
30	.00		.50	.50					.50	.50		.53	.53
July 7	.12		.75	.75	.50		.50						
14	.21				1.15		1.15		.81	.81	.53	.70	.80
21	.02					.52	.52				.56	.56	.52
28	.00					1.21	1.21				.25	.77	1.41
Aug 4	1.03												
11	1.51												
18	.27												
25	.38												
Sept 1	.00												
8	.90					.70	.70						.20
15	.50												
22	.25												
29	.53												
Total	7.60	1.50	1.25	2.75	3.15	2.43	5.59	1.59	1.31	2.90	1.85	3.41	5.09

Levels of nitrogen (in addition to N in basal dressing):

cwt per acre)

Early Potatoes:	None;	0.5	Applied as sulphate of ammonia
Winter Cabbages (after potatoes):	0.5;	1.0	Applied as nitrochalk
Sugar beet:	None;	0.4	Applied as nitrochalk
Barley:	None;	0.2	Applied as nitrochalk
Cut grass:	0.15;	0.30	Applied as nitrochalk after each cut

Basal manurings: cwt per acre

	As compound fertilizer N	P_2O_5	K_2O	Salt
Early potatoes	0.5	0.5	0.75	None
Winter cabbages (after potatoes)		None		None
Sugar beet	0.4	0.4	0.6	None
Barley	0.2	0.2	0.3	5.0
Cut grass (yearly)	None	0.6	0.6	None

In addition 18 cwt carbonate of lime per acre was applied after early potatoes.

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Cultivations, etc.:

Early potatoes. Ploughed: Sept 20 and again Dec 17, 1951. Potatoes planted by machine: Apr 10, 1952. Ridged: Apr 12. Fertilizers applied: Apr 18. Earthed up ridges: Apr 29. Lifted: July 10. Variety: Ulster Chieftain.

Winter cabbages. 19 cwt chalk per acre applied: July 11, 1952. Irrigated all plots ready for planting, planted cabbages and watered in: July 21. Sprayed with Parathion: Aug 12 and again Sept 8. Variety: January King. The crop was a failure, mainly owing to bird damage.

Sugar beet. Fertilizers applied, seed drilled at 18 lb per acre: Apr 18. Singled: May 26. Lifted: Nov 20. Variety: Klein E.

Barley. Fertilizers applied: Mar 12. Seed drilled at 3 bushels per acre: Mar 14. Harvested: Aug 12. Variety: Plumage Archer.

Cut grass. Basal fertilizers applied: Mar 21. Cut: Apr 29, May 19, June 16, July 9 and Aug 11. Nitrochalk applied after each cut except the last.

Standard errors per plot:

Early potatoes.	Total tubers,	whole plot	0.506 tons per acre or	6.3% (6 d.f.)
		sub plot	0.446 tons per acre or	5.6% (8 d.f.)
Sugar beet.	Total sugar,	whole plot	4.85 cwt per acre or	3.4% (6 d.f.)
		sub plot	1.88 cwt per acre or	3.3% (8 d.f.)
	Tops,	whole plot	0.690 tons per acre or	6.5% (6 d.f.)
		sub plot	0.940 tons per acre or	8.9% (8 d.f.)
Barley.	Grain,	whole plot	2.27 cwt per acre or	9.8% (6 d.f.)
		sub plot	1.95 cwt per acre or	8.4% (8 d.f.)
Cut grass (total of 5 cuts)	Hay (85% D.M.)	whole plot	5.59 cwt per acre or	6.6% (6 d.f.)
		sub plot	6.21 cwt per acre or	7.3% (8 d.f.)

Summary of Results

cwt N per acre	Irrigation 0	A	B	C	Mean
Early Potatoes, total tubers: tons per acre					
			(±0.344)*		
0	6.05	8.08	6.72	9.74	7.65
0.5	6.20	8.89	7.43	10.88	8.35
Mean (±0.292)	6.12	8.49	7.08	10.31	8.00
Difference (±0.364)	0.15	0.31	0.71	1.14	0.70 (±0.182)

*for use in comparisons other than vertical.

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cwt N per acre	Irrigation 0	A	B	C	Mean
Sugar beet, roots (washed): tons per acre					
0	12.90	16.11	16.36	15.85	15.43
0.4	15.06	15.60	17.37	16.52	16.14
Mean	13.98	15.86	17.11	16.18	15.78
Difference	+2.16	-0.51	+0.51	+0.67	+0.71
Sugar beet, sugar percentage					
0	18.22	18.39	18.27	18.20	18.27
0.4	18.41	17.97	18.15	18.04	18.14
Mean	18.31	18.18	18.21	18.12	18.21
Difference	+0.19	-0.42	-0.12	-0.16	-0.13
Sugar beet, total sugar: cwt per acre (±2.90)*					
0	47.1	59.3	61.6	57.7	56.4
0.4	55.5	56.2	63.1	59.6	58.6
Mean (±2.80)	51.3	57.7	62.3	58.7	57.5
Difference (±1.53)	+8.4	-3.1	+1.5	+1.9	+2.2 (±0.77)
Sugar beet, tops: tons per acre (±0.553)*					
0	8.14	9.80	10.65	10.11	9.67
0.4	10.32	11.29	12.71	11.58	11.48
Mean (±0.398)	9.23	10.54	11.68	10.85	10.58
Difference (±0.768)	+2.18	+1.49	+2.06	+1.47	1.81 (±0.384)
Sugar beet, noxious nitrogen: mg. per 100 g.					
0	25.0	26.7	26.7	26.7	26.2
0.4	25.0	25.0	26.7	25.0	25.4
Mean	25.0	25.8	26.7	25.8	25.8
Difference	0.0	-1.7	0.0	-1.7	-0.8

*for use in comparisons other than vertical.

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cwt N per acre	Irrigation 0	A	B	C	Mean
Barley, grain: cwt per acre					
			(±1.53)*		
0	21.7	18.8	21.7	22.7	21.2
0.2	23.1	23.3	26.3	27.2	25.0
Mean (±1.31)	22.4	21.1	24.0	25.0	23.1
Difference (±1.59)	1.4	4.5	4.6	4.5	3.8 (±0.80)
Barley, straw: cwt per acre					
0	25.2	23.3	24.6	25.6	24.7
0.2	27.9	27.2	32.8	34.3	30.6
Mean	26.5	25.3	28.7	30.0	27.6
Difference	2.7	3.9	3.2	8.7	5.9
Cut grass, hay at 35% D.M. 7 cuts: cwt per acre					
after each cut			(±4.10)*		
0.15	63.1	76.1	93.3	97.8	82.6
0.30	66.2	83.0	95.0	103.5	86.9
Mean (±3.23)	64.6	79.6	94.2	100.7	84.8
Difference (±5.07)	3.1	6.9	1.7	5.7	4.3 (±2.54)

*for use in comparisons other than vertical.

Winter Cabbages. Crop failed.

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WHEAT

Effect of various crop sequences on incidence of Eyespot (Cercosporella herpotrichoides) - Little Knott 1952, the 3rd preliminary year.

Arrangement of previous treatment crops: 4 longitudinal and 3 cross strips.

Area of each plot: Variable. Area harvested: 0.034-0.050 acre.

Treatments:
Longitudinal strips, crops grown in 1950: Wheat; Ryegrass; Potatoes; fallow.
Cross strips, crops grown in 1951: Wheat; Ryegrass; Potatoes.

Basal manuring: 2½ cwt sulphate of ammonia per acre.

Cultivations, etc.: Ploughed: Sept 3, 1951. Seed drilled at 3 bushels per acre: Oct 18. Sulphate of ammonia applied: Apr 16, 1952. Harvested: July 28. Variety: Squareheads Master 13/4.

Note. Yields of grain from two of the treatment crops (Oats (S.147) and Barley (Pioneer)) for the wheat test crop of 1953 were taken and are shown after the wheat figures.

Summary of Results

Crop in 1951	Crop in 1950: Wheat	Rye-grass	Potatoes	Fallow	Mean
Wheat, grain: cwt per acre					
Wheat	15.2	18.3	23.1	15.3	18.0
Ryegrass	16.3	28.6	30.5	24.3	24.9
Potatoes	26.5	28.0	30.0	22.7	26.8
Mean	19.3	25.0	27.9	20.8	23.2
Wheat, straw: cwt per acre					
Wheat	47.1	45.1	52.0	38.5	45.7
Ryegrass	44.3	52.5	59.6	61.8	54.6
Potatoes	53.7	54.8	64.8	55.0	57.1
Mean	48.4	50.8	58.8	51.8	52.5

N.B. The crop was damaged when ripe by birds, particularly on the 'Fallow - Potatoes' plot.

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Treatment Crops

Crop in 1951	Crop in 1950 Wheat	Rye grass	Potatoes	Fallow	Mean
	Oats, grain: cwt per acre				
Wheat	32.5	37.4	38.2	35.2	35.8
Fallow	32.6	35.3	32.8	33.2	33.5
Mean	32.6	36.4	35.5	34.2	34.7
	Barley, grain: cwt per acre				
Fallow	28.5	32.5	32.0	24.3	29.3

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52/Ca/2.1

WHEAT

Control of Eyespot (Cercosporella Herpotrichoides) - Great Field I 1952.

System of replication: 8 randomized blocks of 8 plots each, certain high order interactions and the effect of spraying being confounded with block differences. In addition each block contained two extra plots with no nitrogen. The variety x seed rate interaction being confounded.

Area of each plot: 0.0197 acre.

Treatments: All combinations of
Variety: Squareheads Master 13/4; Bersee (V_1; V_2).
Seedrate: 1½; 3 bushels per acre (R_1; R_2).
Nitrogen: 0.4; 0.8 cwt per acre applied as sulphate of ammonia (N_1; N_2).
Time of application of N: At time of sowing; early March; mid-April; 3rd week May (T_1; T_2; T_3; T_4).
Spraying: 4 blocks sprayed with 12½% sulphuric acid at 100 gallons per acre.

Basal manuring: None.

Cultivations, etc.: Ploughed: Oct 8. Seed drilled, T_1 applied: Oct 25. T_2 applied: Mar 13. Sprayed 4 blocks: Mar 14. T_3 applied: Apr 16. Sprayed all plots with D.N.O.C.: Apr 18. T_4 applied: May 22. Harvested: Aug 19. Previous crop: Linseed.

Standard error per plot:
Grain: 2.92 cwt per acre or 10.9% (24 d.f.)

NB. (1) Counts of incidence of Eyespot were made and are available.
(2) In the Summary of Results:-
(a) The standard errors given are not valid for testing the effects of spraying for any particular treatment level; the interactions of spraying with treatments may however be tested.
(b) The V x R tables do not include the plots receiving no nitrogen.

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Summary of Results

Grain: cwt per acre

	Unsprayed					Sprayed				
	T_1	T_2	T_3	T_4	Mean	T_1	T_2	T_3	T_4	Mean
	(±1.46)					(±1.46)				
V_1	23.6	20.0	21.7	24.5	22.5	32.7	31.0	33.7	33.4	32.7
V_2	37.9	33.0	31.7	31.7	33.6	46.4	45.5	45.7	42.9	45.1
Diff. (±2.06)	14.3	13.0	10.0	7.2	11.1 (±1.03)	13.7	14.5	12.0	9.5	12.4 (±1.03)
R_1	34.1	28.2	28.6	30.2	30.3	39.4	36.8	40.9	41.3	39.6
R_2	27.4	24.8	24.7	26.1	25.8	39.7	39.7	38.5	34.9	38.2
Diff. (±2.06)	-6.7	-3.4	-3.9	-4.1	-4.5 (±1.03)	+0.3	+2.9	-2.4	-6.4	-1.4 (±1.03)
N_1	32.1	25.5	25.8	27.8	27.8	37.9	38.7	38.0	38.3	38.2
N_2	29.4	27.5	27.5	28.4	28.2	41.2	37.8	41.4	38.0	39.6
Diff. (±2.06)	-2.7	+2.0	+1.7	+0.6	+0.4 (±1.03)	+3.3	-0.9	+3.4	-0.3	+1.4 (±1.03)
Mean (±1.03)	30.7	26.5	26.7	28.1	28.0	39.6	38.2	39.7	38.1	38.9

	Unsprayed			Sprayed		
	R_1	R_2	Diff.	R_1	R_2	Diff.
	(±1.03)		(±1.46)	(±1.03)		(±1.46)
V_1	24.8	20.1	-4.7	33.3	32.1	-1.2
V_2	35.7	31.4	-4.3	45.9	44.4	-1.5
Diff. (±1.46)	+10.9	+11.3	+0.4	+12.6	+12.3	-0.3

	Unsprayed				Sprayed			
	N_0	N_1	N_2	Mean	N_0	N_1	N_2	Mean
	(±1.46)	(±1.03)			(±1.46)	(±1.03)		
V_1	22.4	22.0	22.9	22.4	31.2	33.5	31.9	32.4
V_2	28.9	33.6	33.6	32.6	36.8	42.9	47.3	43.5
Diff. (±1.46)	+6.5 (1)	+11.6	+10.7	+10.2 (±0.84)	+5.6 (1)	+9.4	+15.4	+11.1 (±0.84)
	(±1.46)	(±1.03)			(±1.46)	(±1.03)		
R_1	28.7	29.9	30.7	30.0	36.6	39.4	39.8	39.0
R_2	22.6	25.7	25.8	25.1	31.5	37.0	39.4	36.9
Diff. (±1.46)	-6.1 (1)	-4.2	-4.9	-4.9 (±0.84)	-5.1 (1)	-2.4	-0.4	-2.1 (±0.84)
Mean (±0.73)	25.7 (2)	27.8	28.2	27.5	34.0 (2)	38.2	39.6	37.9

(1) ±2.06 (2) ±1.03

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Straw: cwt per acre

	Unsprayed					Sprayed				
	T_1	T_2	T_3	T_4	Mean	T_1	T_2	T_3	T_4	Mean
V_1	67.5	67.4	68.3	61.6	66.2	69.5	73.4	69.2	68.9	70.3
V_2	59.4	61.0	59.4	48.5	57.1	57.0	61.3	56.2	49.8	56.1
Diff.	-8.1	-6.4	-8.9	-13.1	-9.1	-12.5	-12.1	-13.0	-19.1	-14.2
R_1	62.7	62.9	62.7	55.9	61.0	61.0	66.1	62.9	57.7	61.9
R_2	64.2	65.5	65.0	54.2	62.2	65.5	68.7	62.5	61.0	64.4
Diff.	+1.5	+2.6	+2.3	-1.7	+1.2	+4.5	+2.6	-0.4	+3.3	+2.5
N_1	61.6	63.4	61.9	56.2	60.8	62.8	65.9	61.4	60.9	62.7
N_2	65.3	65.0	65.7	53.9	62.5	63.7	68.9	64.0	57.8	63.6
Diff.	+3.7	+1.6	+3.8	-2.3	+1.7	+0.9	+3.0	+2.6	-3.1	+0.9
Mean	63.4	64.2	63.8	55.1	61.6	63.2	67.4	62.7	59.3	63.2

	R_1	R_2	Diff.	R_1	R_2	Diff.
V_1	65.9	66.5	+0.6	68.7	71.8	+3.1
V_2	56.2	58.0	+1.8	55.1	57.0	+1.9
Diff.	-9.7	-8.5	+1.2	-13.6	-14.8	-1.2

	N_0	N_1	N_2	Mean	N_0	N_1	N_2	Mean
V_1	58.5	65.3	67.0	64.7	59.6	69.7	70.8	68.1
V_2	46.0	56.2	57.9	54.9	47.3	55.8	56.4	54.3
Diff.	-12.5	-9.1	-9.1	-9.8	-12.3	-13.9	-14.4	-13.8
R_1	53.5	60.7	61.4	59.5	52.3	61.0	62.8	60.0
R_2	51.0	60.9	63.6	60.0	54.7	64.4	64.4	62.5
Diff.	-2.5	+0.2	+2.2	+0.5	+2.4	+3.4	+1.6	+2.5
Mean	52.3	60.8	62.5	59.8	53.5	62.7	63.6	61.2

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WHEAT

Residual effect of dung - Little Hoos 1952.

System of replication: 4 randomized blocks of 12 plots each.

Area of each plot: 0.0318 acre.

Treatments: All combinations of:-
Dung: None; 5; 10; 15 tons per acre applied to potatoes 1950-51.
Methods of application: Ploughed in, in winter (1950); ploughed in, in spring (1951); placed in ridges (1951).

Basal dressing: 3 cwt sulphate of ammonia per acre.

Cultivations, etc: Cultivated twice: Oct 11. Seed drilled at 3 bushels per acre: Oct 19. Sulphate of ammonia applied: Apr 17. Sprayed with 2 gallons D.N.O.C. plus 6 lb sulphate of ammonia per acre: Apr 30. Harvested: July 29. Variety: Nord Desprez. Previous crop: Potatoes.

Standard error per plot:
Grain: 1.94 cwt per acre or 6.9% (35 d.f.)

Summary of Results

Method of application	Dung applied to potatoes 1950-51: tons per acre 0	5	10	15	Mean
	Grain: cwt per acre				
			(±0.97)		(±0.56)
Ploughed in, in winter		28.6	29.9	29.2	29.2
Ploughed in, in spring		25.9	29.2	30.1	28.4
Placed in ridges		28.1	28.8	30.2	29.1
Mean (±0.56)	25.1	27.5	29.3	29.8	27.9
	Straw: cwt per acre				
Ploughed in, in winter		41.2	42.2	42.6	42.0
Ploughed in, in spring		37.4	40.5	41.5	39.8
Placed in ridges		39.0	40.5	43.0	40.9
Mean	36.7	39.2	41.1	42.4	39.8

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WHEAT

The control of wireworm by insecticides - Geescroft 1952.

System of replication: 3 randomized blocks of 8 plots each.

Area of each plot: 0.0289 acre.

Treatments:
O = None (triplicate plots)
S = Gammexane seed dressing 2 oz per bushel
G = Gammexane combine drilled with seed at 56 lb per acre 3.5% dust
A = Aldrin " " " " " 200 lb " " 1.78% "
C = Chlordane " " " " " 100 lb " " 5% "
D = D.D.T. " " " " " 150 lb " " 5% "

Basal dressing: 3 cwt sulphate of ammonia per acre.

Cultivations, etc: Ploughed: Nov 9. Seed drilled at 3 bushels per acre with insecticides: Dec 1. Sulphate of ammonia applied: Apr 21. Sprayed with low volume M.C.P.A: May 7. Harvested: Aug 31. Variety: Nord Desprez. Previous crop: Old Grass.

Standard error per plot:
Grain: 1.24 cwt per acre or 3.8% (16 d.f.)

Summary of Results

	O	S	G	A	C	D	Mean
Grain: cwt per acre							
Mean (±0.71)	31.6(1)	32.9	33.6	36.3	33.7	31.7	32.9
Increase (±0.83)		1.3	2.0	4.7	2.1	0.1	
Straw: cwt per acre							
Mean	43.6	46.7	45.6	47.0	44.6	42.6	44.7
Increase		3.1	2.0	3.4	1.0	-1.0	

Standard error (1) 0.41.

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WHEAT

Late application of nitrogen and methods of harvesting - Fosters 1952.

System of replication: 4 randomized blocks of 3 plots each, blocks and plots being split into 2 strips for different methods of harvesting.

Area of each plot: 0.0242 acre. Area harvested: 'binder' plots - 0.0202 acre, 'combine' plots - 0.0091 acre.

Treatments:
Nitrochalk: None; 1½; 3 cwt per acre applied as top dressing.
Methods of harvesting: Binder; N.I.A.E. combine harvester.

Basal manuring: 3 cwt sulphate of ammonia per acre.

Cultivations, etc.: Ploughed: Sept 11. Seed drilled at 3 bushels per acre: Oct 24. Sulphate of ammonia applied: Apr 18. Sprayed with D.N.O.C.: May 15. Nitrochalk applied: June 28. Harvested: 'binder' plots - Aug 12, 'combine' plots - Aug 13. Variety: Yeoman. Previous crop: Wheat.

Standard errors per plot. Grain:
Strip: 1.72 cwt per acre or 8.9% (3 d.f.)
Whole plot: 1.32 cwt per acre or 6.9% (6 d.f.)
Sub plot: 1.68 cwt per acre or 8.7% (6 d.f.)

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Summary of Results

	Nitrochalk: cwt per acre as top dressing			Mean
	None	1.5	3.0	
Grain: cwt per acre				
	(a) and (b)			
Binder	19.0	20.9	20.8	20.2
Combine	18.7	18.4	17.5	18.2
Mean (±0.66)	18.8	19.7	19.2	19.2
Difference (±1.55)	-0.3	-2.5	-3.3	-2.0 (±1.21)

(a) ±0.89 for use in horizontal comparisons only
(b) ±1.13 for use in diagonal comparisons only

Binder Plots

Straw: cwt per acre				
	33.7	34.1	35.9	34.6
Crude Protein: cwt per acre				
Grain	2.11	2.44	2.43	
Increase		0.33	0.32	
Straw	0.68	0.68	0.74	
Increase		0.00	0.06	
Percentage uptake of added nitrogen				
Grain		23	11	
Straw		1	2	

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BARLEY

Late application of nitrogen and methods of harvesting - Great Field II 1952.

System of replication: 4 randomized blocks of 3 plots each, blocks and plots being split into 2 strips for different methods of harvesting.

Area of each plot: 0.0242 acre. Area harvested: 'binder' plots - 0.0242 acre, 'combine' plots - 0.0091 acre.

Treatments:
Nitrochalk: None; 1½; 3 cwt per acre applied as top dressing.
Methods of harvesting: Binder; N.I.A.E. combine harvester.

Basal manuring per acre: 2¼ cwt sulphate of ammonia; 1 cwt superphosphate combine drilled with seed.

Cultivations, etc.: Sulphate of ammonia applied to linseed: Mar 19. Harrowed in linseed which had failed: May 12. Seed and superphosphate drilled: May 13. Sprayed with M.C.P.A., medium volume, 5 pints in 30 gallons water per acre: June 9. Nitrochalk applied: June 16. Harvested: 'binder' plots - Sept 16, 'combine' plots - Sept 19. Variety: Plumage Archer. Previous crop: Permanent grass.

Standard errors per plot. Grain:
Strip: 1.09 cwt per acre or 7.6% (3 d.f.)
Whole plot: 1.05 cwt per acre or 7.4% (6 d.f.)
Sub plot: 1.18 cwt per acre or 8.3% (6 d.f.)

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Summary of Results

	Nitrochalk: cwt per acre as top dressing			
	None	1.5	3.0	Mean
Grain: cwt per acre				
	(a) and (b)			
Binder	13.1	13.5	13.1	13.2
Combine	14.7	15.6	15.5	15.3
Mean (±0.53)	13.9	14.5	14.3	14.2
Difference (±1.03)	1.6	2.1	2.4	2.1 (±0.77)

(a) ±0.67 for use in horizontal comparisons only
(b) ±0.79 for use in diagonal comparisons only

Straw: cwt per acre

Binder	19.6	18.3	19.2	19.0

Crude Protein: cwt per acre

Grain: Binder	1.76	1.84	1.78	
Increase		0.08	0.02	
Combine	2.07	2.16	2.14	
Increase		0.09	0.07	
Straw: Binder	1.17	1.11	1.12	
Increase		-0.06	-0.05	

Percentage uptake of added nitrogen

Grain: Binder		6	1
Combine		6	2
Straw: Binder		-4	-2

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52/Cb/2

BARLEY

Nitrophosphates placement - Highfield 3 1952.

System of replication: 4 randomized blocks of 6 plots each.

Area of each plot (average): 0.0143 acre.

Treatments: Nitrochalk at 0.5 cwt N per acre broadcast (two plots per block), and all combinations of:-
Manures: Nitrophosphate (British) 13.9% N, 14.6% P_2O_5; Nitrochalk and Granular Superphosphate. Each manure provided 0.5 cwt N and 0.53 cwt P_2O_5 per acre.
Method of placement: Broadcast; Combine drilled.

Basal dressing: None.

Cultivations, etc.: Ploughed: Sept 18. Seed drilled at 3¼ bushels per acre and all fertilizers applied: Mar 15. Harvested: July 30.
Variety: Plumage Archer. Previous crop: Linseed.

Standard errors per plot: Grain.
Yield: 2.37 cwt per acre or 11.0% (16 d.f.)
P_2O_5 uptake: 0.0180 cwt per acre or 16.0% (16 d.f.)

Summary of Results

	Nitrochalk	Nitrophosphate		Nitrochalk and superphosphate		
	broadcast	broadcast	combine drilled	broadcast	combine drilled	Mean
Yield: cwt per acre						
Grain (±1.18)	18.9(1)	21.9	24.4	22.0	22.6	21.4
Increase (±1.45)		3.0	5.5	3.1	3.7	
Straw	32.6	30.5	36.7	33.2	32.9	33.1
Increase		-2.1	+4.1	+0.6	+0.3	
P_2O_5 uptake: cwt per acre						
Grain (±0.0090)	0.098(2)	0.115	0.132	0.117	0.114	0.112
Increase (±0.0110)		0.017	0.034	0.019	0.016	
Straw	0.028	0.023	0.030	0.030	0.026	0.027
Increase		-0.005	+0.002	+0.002	-0.002	

(1) ±0.84
(2) ±0.0064

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SPRING OATS

Late application of nitrogen - Long Hoos III 1952.

System of replication: 8 randomized blocks of 3 plots each.

Area of each plot: 0.0145 acre.

Treatments: Nitrochalk: None; 1½; 3 cwt per acre applied as a late top dressing.

Basal dressing: 2½ cwt sulphate of ammonia per acre; 1 cwt superphosphate per acre drilled with the seed.

Cultivations, etc.: Ploughed: Dec 10. Sulphate of ammonia applied: Mar 3. Seed drilled at 4 bushels per acre with superphosphate: Mar 15. Sprayed with M.C.P.A. low volume, 2½ pints in 10 gallons of water: May 13. Nitrochalk applied: June 30. Harvested: July 24. Variety: Star. Previous crop: Wheat.

Standard errors per plot:
Grain*: 1.74 cwt per acre or 4.9% (14 d.f.)
Straw*: 2.39 cwt per acre or 5.2% (14 d.f.)

Summary of Results

	Nitrochalk: cwt per acre, as top dressing			
	None	1½	3	Mean
Yield: cwt per acre				
Grain* (±0.62)	35.5	36.4	35.2	35.7
Straw* (±0.84)	45.5	45.5	45.6	45.5
Crude protein: cwt per acre				
Grain	3.57	3.87	3.81	
Increase		0.30	0.24	
Straw	0.87	0.92	0.97	
Increase		0.05	0.10	
Percentage uptake of added nitrogen				
Grain		21	8	
Straw		3	3	

*Corrected to 85% dry matter owing to variable conditions during harvesting.

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52/Cd/1.1

SPRING BEANS

Fertilizer placement - Great Harpenden II 1952.

System of replication: 8 randomized blocks of 9 plots each.

Area of each plot: 0.0152 acre. Area harvested: 0.0126 acre.

Treatments: All combinations of:-
Superphosphate, cwt per acre: None; 2.6 broadcast on seed bed; 2.6 drilled in band 2" to side of seed.
Sulphate of potash, cwt per acre: None; 1.6 broadcast on seed bed; 1.6 drilled in band 2" to side of seed.

Basal manuring: None.

Cultivations, etc.: Ploughed: Oct 30. 40 cwt ground chalk per acre applied: Mar 13. Seed drilled at 4 bushels per acre, fertilizers applied: Mar 18. Sprayed with Nicotine against blackfly: June 19 and again July 7. Harvested: Aug 6. Variety: Ashwells Selection. Previous crop: Oats.

Standard error per plot:
Grain, Dry Matter: 1.13 cwt per acre or 20.6% (55 d.f.)

Note: The yield of grain, dry matter, has been adjusted to allow for the omission to spray four of the plots.

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Summary of Results

Sulphate of potash: 1.6 cwt per acre	Superphosphate: 2.6 cwt per acre None	Broadcast on seed bed	Drilled in band 2" to side of seed	Mean
Grain, Dry Matter: cwt per acre				
		(±0.40)		(±0.23)
None	4.1	4.9	4.5	4.5
Broadcast on seed bed	5.5	4.6	4.7	4.9
Drilled in band 2" to side of seed	7.0	6.7	7.2	7.0
Mean (±0.23)	5.5	5.4	5.5	5.5
Plant number: thousands per acre				
None	166	163	157	162
Broadcast on seed bed	166	165	156	163
Drilled in band 2" to side of seed	172	167	165	168
Mean	168	165	159	164

Mean Dry Matter %: 79.2

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52/Cd/2

SPRING BEANS

Control of Black Aphis - Great Harpenden II 1952.

System of replication: 2* randomized blocks of 7 plots each.

Area of each plot: 0.00831 acre.

Treatments - Insecticidal sprays at 300 gallons per acre.

None.	(0)
Parathion, 0.02% technical W/V.	(A)
Pyrethrum, 0.05% W/V total pyrethrins.	(B)
DDT emulsion, 0.1% W/V DDT.	(C)
DDT suspension, 0.1% W/V DDT	(D)
Systox, 0.05% W/V.	(E)
Nicotine, 0.1% V/V technical nicotine alkaloid.	(F)

Basal dressing, per acre: 1½ cwt nitrochalk, 3 cwt superphosphate, 1½ cwt sulphate of potash.

Cultivations, etc.: Ploughed: Oct 30. 40 cwt ground chalk per acre applied: Mar 13. Basal fertilizers applied: Mar 15. Beans drilled at 4 bushels per acre: Mar 18. Spray treatments applied: June 12. Harvested: Aug 2. Variety: Ashwells selection. Previous crop: Oats.

Standard error per plot:
Grain: 4.50 cwt per acre or 49.7% (6 d.f.)

*Note. The experiment was originally designed as one of 4 blocks of 7, but as at spraying time 2 of the blocks carried a very poor crop these were not used in the experiment.

Summary of Results

	Spray							
	0	A	B	C	D	E	F	Mean
	Grain: cwt per acre							
Mean (±3.19)	1.4	11.8	10.3	11.8	1.3	12.0	14.8	9.1
Increase (±4.50)		10.4	8.9	10.4	-0.1	10.6	13.4	
	Straw: cwt per acre							
Mean	14.2	19.3	14.4	15.4	15.4	16.7	18.3	16.2
Increase		5.1	0.2	1.2	1.2	2.5	4.1	

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52/Cd/3

BROAD BEANS

Fertilizer placement - Great Harpenden II 1952.

System of replication: 4 randomized blocks of 5 plots each.

Area of each plot: 0.00344 acre.

Treatments: No fertilizer; and all combinations of:-
Compound granular PK fertilizer (13¾% P_2O_5; 13¾% K_2O): 2.7; 4.9 cwt per acre.
Method of placement: Broadcast on seed bed; drilled in band beside seed.

Basal dressing per acre: 1½ cwt nitrochalk; 3 cwt superphosphate; 1½ cwt sulphate of potash.

Cultivations, etc.: Ploughed: Oct 30. 40 cwt ground chalk per acre applied: Mar 13. Basal fertilizers applied: Mar 15. Beans sown: Mar 18. Harvested: July 1. Variety: Seville Long Pod. Previous crop: Spring Oats.

Standard error per plot:
Yield of green beans in pod: 2.45 cwt per acre or 9.1% (12 d.f.)

Summary of Results

	Compound PK fertilizer: cwt per acre					
		2.7		4.9		
	None	Broadcast	Drilled	Broadcast	Drilled	Mean
Yield of green beans in pod: cwt per acre						
Mean (±1.22)	22.8	24.5	29.5	26.6	31.8	27.0
Increase (±1.73)		1.7	6.7	3.8	9.0	

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52/Ce/1.1

POTATOES

Application of dung - West Barnfield II 1952.

System of replication: 4 randomized blocks of 12 plots each, plots being split into 2 for the application of N, P and K; the three 2-factor interactions being confounded with whole plot differences, and certain high order interactions being confounded with block differences.

Area of each sub plot: 0.0175 acre. Area harvested: 0.0140 acre.

Treatments: All combinations of:-

Whole plots Dung: None; 5; 10; 15 tons per acre.
Method of application: Ploughed in, in winter (W); Ploughed in, in spring (S); Placed in the ridges in spring (R).

Sub plots N: None; 0.6 cwt per acre applied as sulphate of ammonia.
P_2O_5: None; 0.6 cwt per acre applied as super-phosphate.
K_2O: None; 1.0 cwt per acre applied as muriate of potash.

Basal dressing: None.

Cultivations, etc.: Dung applied to 'W' plots, ploughed all plots: Sept 26. Dung applied to 'S' plots, ploughed all plots: Mar 12. Ridged all plots: May 5. Dung applied to 'R' plots, fertilizers applied in the ridges, potatoes planted: May 6. Earthed up: July 17. Sprayed with copper fungicide 5 lb per acre: Aug 12 and again Sept 5. Sprayed with sulphuric acid, 20% B.O.V.: Sept 24. Lifted: Oct 9. Variety: Majestic. Previous crop: Wheat.

Standard errors per plot: Total tubers.
Whole plot: 0.755 tons per acre or 7.4% (32 d.f.)
Sub plot: 1.060 tons per acre or 10.4% (29 d.f.)*

* 1 missing value.

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Summary of Results

Total tubers: tons per acre

	Dung: tons per acre				
	None	5	10	15	Mean
Mean (±0.218)	7.76	9.64	11.09	12.45	10.24
Method of application					
			(±0.378)		(±0.218)
Ploughed in, in winter		9.12	10.63	11.28	10.34
Ploughed in, in spring		9.17	11.16	12.90	11.08
Placed in ridges in spring		10.64	11.50	13.15	11.76
N: cwt per acre			(±0.307)*		
None	7.02	8.72	10.58	11.75	9.52
0.6	8.51	10.57	11.60	13.15	10.96
Response to N (±0.433)	1.49	1.85	1.02	1.40	1.44(1)
P_2O_5: cwt per acre			(±0.307)*		
None	7.65	9.05	10.50	12.18	9.85
0.6	7.88	10.24	11.68	12.71	10.63
Response to P (±0.433)	0.23	1.19	1.18	0.53	0.78(1)
K_2O: cwt per acre			(±0.307)*		
None	5.69	8.49	10.47	11.92	9.14
1.0	9.84	10.80	11.72	12.97	11.33
Response to K (±0.433)	4.15	2.31	1.25	1.05	2.19(1)

(1) ±0.216

*Standard error for use in comparisons other than vertical.

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Total tubers: tons per acre

	Method of application of dung		
	Ploughed in, in winter	Ploughed in, in spring	Placed in ridges in spring
N: cwt per acre		(±0.307)*	
None	9.70	10.32	11.03
0.6	10.99	11.83	12.50
Response to N (±0.433)	1.29	1.51	1.47
P_2O_5: cwt per acre		(±0.307)*	
None	9.86	10.55	11.32
0.6	10.83	11.60	12.21
Response to P (±0.433)	0.97	1.05	0.89
K_2O: cwt per acre		(±0.307)*	
None	9.23	10.13	11.51
1.0	11.46	12.02	12.01
Response to K (±0.433)	2.23	1.89	0.50

*Standard error for use in comparisons other than vertical.

	Responses to treatments (±0.307)**					
	N		P		K	
Response to:	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.
N	-	-	1.24	1.64	1.12	1.76
P	0.58	0.98	-	-	0.17	1.39
K	1.87	2.51	1.58	2.80	-	-

**Standard error of horizontal difference between two responses 0.436.

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Percentage Ware ($1\frac{1}{2}$" riddle)

	Dung: tons per acre				
	None	5	10	15	Mean
Mean	75.8	82.5	84.8	86.0	82.3
Method of application					
Ploughed in, in winter		82.0	84.7	85.5	84.0
Ploughed in, in spring		82.2	87.2	88.5	85.9
Placed in ridges in spring		83.3	82.6	84.1	83.3
N: cwt per acre					
None	75.1	82.6	85.4	86.5	82.4
0.6	76.6	82.4	84.2	85.5	82.2
Response to N	+1.5	-0.2	-1.2	-1.0	-0.2
P_2O_5: cwt per acre					
None	81.8	84.9	86.1	87.5	85.1
0.6	69.9	80.0	83.5	84.5	79.5
Response to P	-11.9	-4.9	-2.6	-3.0	-5.6
K_2O: cwt per acre					
None	65.7	77.7	82.0	85.0	77.6
1.0	86.0	87.3	87.6	87.0	87.0
Response to K	+20.3	+9.6	+5.6	+2.0	+9.4

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Percentage Ware ($1\frac{1}{2}$" riddle)

	Method of application of dung		
	Ploughed in, in winter	Ploughed in, in spring	Placed in ridges in spring
N: cwt per acre			
None	83.8	86.0	84.7
0.6	84.3	85.9	81.9
Response to N	+0.5	-0.1	-2.8
P_2O_5: cwt per acre			
None	87.2	86.5	84.9
0.6	80.9	85.4	81.8
Response to P	-6.3	-1.1	-3.1
K_2O: cwt per acre			
None	79.6	83.6	81.6
1.0	88.5	88.3	85.1
Response to K	+8.9	+4.7	+3.5

Responses to treatments

Response to:	N		P		K	
	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.
N	-	-	-0.1	-0.5	+0.7	-1.3
P	-5.4	-5.8	-	-	-7.9	-3.3
K	+10.4	+8.4	+7.1	+11.7	-	-

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POTATOES

Methods of planting and fertilizer application - West Barnfield II 1952.

System of replication: 4 randomized blocks of 18 plots each.

Area of each plot: 0.021 acre. Area harvested: 0.014 acre.

Treatments: All combinations of:-
Compound granular fertilizer (7% N, 7% P_2O_5, 10.5% K_2O): None; $7\frac{1}{2}$; 15 cwt per acre.
Methods of planting and fertilizer application: Ridge, broadcast fertilizer, hand plant and split back at once (A); Ridge, and expose ridges for 7 days, broadcast fertilizer over ridges, hand plant same time as A, split back ridges (B); Broadcast fertilizer on flat, plant from flat with dropper(C); Plant from flat with dropper, fertilizer placed 2" to side of seed (D); Broadcast fertilizer on flat, plant in ridges with dropper (E); Plant in ridges with dropper, fertilizer placed 2" to side of seed (F).

Basal dressing: None.

Cultivations, etc.: Ploughed: Sept 27 and again Mar 12. Ridged 'B' plots: May 3. Fertilizers applied to 'C' and 'E' plots: May 5. Ridged 'A' plots, fertilizers applied and potatoes planted on 'A' and 'B' plots: May 9. Fertilizers applied and potatoes planted on 'C', 'D', 'E' and 'F' plots: May 10. Earthed up: July 17. Sprayed with copper fungicide 5 lb per acre: Aug 12 and again Sept 5. Sprayed with sulphuric acid, 20% B.O.V.: Sept 4. Lifted: Oct 10. Variety: Majestic. Previous crop: Wheat.

Standard error per plot:
Total tubers: 0.857 tons per acre or 9.1% (51 d.f.)*

*2 missing values.

Note: Treatment B was included to test whether the drying out of the ridges would depress the yield. Since there was considerable rain during the period of exposure this effect could not be tested.

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Summary of Results

Compound Fertilizer cwt per acre	Hand planted Fertilizer Broadcast: ridges planted at once	Hand planted Fertilizer Broadcast: ridges exposed	Planted by dropper in ridges: From flat: Broadcast on flat	From flat: Placed	In ridges: Broadcast on flat	In ridges: Placed	Mean
Total tubers: tons per acre							
None	4.67	4.96	5.46(1)		4.94(1)		5.07 (±0.175)
7½ (±0.428)	9.97	10.53	7.90	11.54	8.24	10.71	9.81
15	14.03	14.15	11.54	14.36	11.06	14.71	13.31
Mean excluding none (±0.303)	12.00	12.34	9.72	12.95	9.65	12.71	9.40*
Percentage Ware (1½" riddle)							
None	72.5	68.5	76.7		74.0		73.7
7½	82.8	80.3	82.4	86.5	86.4	84.8	83.9
15	82.3	85.5	82.6	84.6	84.6	87.5	84.5
Mean excluding none	82.6	82.9	82.5	85.6	85.5	86.2	80.7*

(1) ±0.303

*General mean.

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POTATOES

Control of Blight - Little Hoos 1952.

System of replication: 4 × 4 Latin Square, plots being split into 2 for determination of tractor damage.

Area of each sub plot: 0.014 acre.

Treatments:

Whole plots: No Spray; Copper fungicide 5 lb per acre sprayed twice in summer; 100 gallons Sulphuric acid, 15% B.O.V. per acre sprayed to destroy haulms; Copper fungicide and sulphuric acid sprayed as above. The tractor used for spraying was driven over all the plots on each occasion.

Sub plots: The 4 inner rows damaged by three passages of the tractor were compared with the 4 outer and undamaged rows.

Basal dressing: 10 cwt compound granular fertilizer (7% N, 7% P_2O_5, 10½% K_2O) per acre.

Cultivations, etc.: Dung applied: Sept 27. Ploughed: Sept 29 and again Feb 4. Basal fertilizer broadcast, ridged: Apr 24. Potatoes planted: Apr 25. Earthed up: July 7. Sprayed appropriate plots with copper fungicide: Aug 13 and again Sept 4. Sprayed appropriate plots with sulphuric acid: Oct 7. Lifted: Nov 3. Variety: Majestic. Previous crop: Wheat.

Standard errors per plot: Total tubers.
Whole plot: 0.984 tons per acre or 13.5% (6 d.f.)
Sub plot: 0.614 tons per acre or 8.4% (12 d.f.)

Blight counts were made and are available. The mean level of infection was only 0.2%.

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52/Ce/3.2

Summary of Results

	Spray				
	None	Copper fungicide	Sulphuric Acid	Copper fungicide and Sulphuric Acid	Mean
	Total tubers: tons per acre				
		(±0.538)*			
Undamaged rows	7.45	7.55	7.17	6.99	7.29
Damaged rows	7.36	7.80	7.26	6.63	7.26
Mean (±0.492)	7.40	7.67	7.22	6.81	7.28
Difference (±0.434)	-0.09	+0.25	+0.09	-0.36	-0.03 (±0.217)
	Percentage Ware**				
	86.1	90.7	84.9	84.1	86.4

* for use in all comparisons other than vertical.

**estimated from produce of damaged rows only.

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52/Ce/4

POTATOES

Nitrophosphates - Highfield 5 1952.

System of replication: 6 × 6 Latin Square.

Area of each plot: 0.0196 acre. Area harvested: 0.0147 acre.

Treatments: None; Superphosphate at 0.3 and 0.6 cwt P_2O_5 per acre; British nitrophosphate (14.2% N, 14.4% P_2O_5) at 0.45 cwt P_2O_5 per acre; French nitrophosphate (12.1% N, 11.9% P_2O_5, 13.0% K_2O) at 0.45 cwt P_2O_5 per acre; Dutch nitrophosphate (19.3% N, 20.2% P_2O_5) at 0.45 cwt P_2O_5 per acre.

Treatments received extra sulphate of ammonia and muriate of potash to bring them to the level of 0.6 cwt N and 1.0 cwt K_2O per acre.

Basal dressing: None.

Cultivations, etc.: Ploughed: Mar 18. Ridged: Apr 30. Fertilizers applied, potatoes planted: May 1. Earthed up: July 9. Sprayed with copper fungicide 5 lb per acre: Aug 13 and again Sept 5. Sprayed with sulphuric acid, 20% B.O.V.: Oct 8. Lifted: Oct 17. Variety: Majestic. Previous crop: Kale.

Standard error per plot:
Total tubers: 1.25 tons per acre or 9.0% (20 d.f.)

Summary of Results

	No fert-ilizer	Superphosphate at 0.3 cwt P_2O_5 per acre	Superphosphate at 0.6 cwt P_2O_5 per acre	Nitrophosphate at 0.45 cwt P_2O_5 per acre: British	French	Dutch	Mean
Total tubers: tons per acre							
Mean (±0.511)	13.87	12.97	14.89	14.00	13.89	13.41	13.84
Increase (±0.722)		-0.90	+1.02	+0.13	+0.02	-0.46	
Percentage Ware (1½" riddle)							
Mean	82.1	80.4	78.4	81.2	81.9	79.8	80.6
Increase		-1.7	-3.7	-0.9	-0.2	-2.3	

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52/Cf/1.1

LUCERNE

Fertilizer placement - Highfield 5 1952.

System of replication: 8 randomized blocks of 8 plots each, a high order interaction being confounded with block differences.

Area of each plot: 0.0136 acre.

Treatments: All combinations of:-
Superphosphate: None; 1.0 cwt P_2O_5 per acre.
Muriate of Potash: None; 1.0 cwt K_2O per acre.
Method of placement: Broadcast on seed bed (B): Ploughed in 10" (D)
Starter: None; 2 cwt granular superphosphate per acre placed beneath seed.

Basal dressing: None.

Cultivations, etc.: 'D' fertilizers applied: Mar 17. Ploughed: Mar 18. 'B' fertilizers applied: May 2. Starter applied, seed drilled at 20 lb per acre: May 7. Dusted with D.D.T: June 5. Cut and weighed green: July 29 and again Oct 10. Variety: Du Puit. Previous crop: Kale.

Standard errors per plot: Dry Matter.
1st cut: 1.18 cwt per acre or 11.8% (42 d.f.)
2nd cut: 1.78 cwt per acre or 8.6% (42 d.f.)

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Summary of Results

Dry Matter: cwt per acre

Starter	No fertilizer	Superphosphate Broadcast	Superphosphate Ploughed in	Muriate of potash Broadcast	Muriate of potash Ploughed in	Superphosphate and Muriate of potash Broadcast	Superphosphate and Muriate of potash Ploughed in	Mean
				1st cut*				
None (±0.57)	6.8(1)	7.7	9.0	6.5	7.6	9.0	10.1	7.9
Granular Super	12.0(1)	10.7	12.2	12.5	12.2	12.9	13.2	12.2
Mean (±0.42)	9.4(2)	9.2	10.6	9.5	9.9	10.9	11.6	10.1
Difference (±0.78)	5.2(3)	3.0	3.2	6.0	4.6	3.9	3.1	4.3(2)

(1) ±0.42
(2) ±0.30
(3) ±0.59

Mean Dry Matter %: 27.7

* Adjusted for block effects

2nd cut

None (±0.89)	18.8(4)	19.5	19.4	18.6	18.6	20.6	20.6	19.4
Granular Super	21.9(4)	21.6	21.6	22.2	22.2	21.4	22.3	21.9
Mean (±0.63)	20.3(5)	20.6	20.5	20.4	20.4	21.0	21.5	20.6
Difference (±1.26)	3.1(6)	2.1	2.2	3.6	3.6	0.8	1.7	2.5(5)

(4) ±0.63
(5) ±0.45
(6) ±0.89

Mean Dry Matter %: 22.9

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52/Cg/1

PERMANENT GRASS

Residual of nitrophosphates - Highfield 9 1952.

System of replication: 6 × 6 Latin Square.

Area of each plot: 0.0102 acre. Area harvested: 0.0093 acre.

Treatments, applied 1951: None; Sulphate of ammonia; Superphosphate; Sulphate of ammonia and superphosphate; British nitrophosphate (12.8% N, 15.25% P_2O_5); Dutch nitrophosphate (20% N, 20.3% P_2O_5). The dressings supply 0.39 cwt N and 0.39 cwt P_2O_5 per acre, the British nitrophosphate receiving extra N to reach this standard.

Basal dressing: 1⅓ cwt muriate of potash per acre.

Cultivations, etc.: Muriate of potash applied: Mar 12. Cut: June 19 and weighed green.

Standard errors per plot:
Hay, dry matter: 1.97 cwt per acre or 5.2% (20 d.f.)
P_2O_5 uptake: 0.00822 cwt per acre or 4.7% (20 d.f.)

Summary of Results

	Fertilizers applied 1951						
	None	Sulphate of Ammonia	Super-phosphate	Sulphate of Ammonia and Super-phosphate	British Nitro-phosphate	Dutch Nitro-phosphate	Mean
Hay, dry matter: cwt per acre							
Mean (±0.80)	37.3	37.0	38.7	37.1	39.2	38.8	38.0
Increase (±1.14)		-0.3	+1.4	-0.2	+1.9	+1.5	
P_2O_5 uptake: cwt per acre							
Mean (±0.0034)	0.163	0.160	0.184	0.172	0.174	0.187	0.173
Increase (±0.0047)		-0.003	+0.021	+0.009	+0.011	+0.024	

Mean Dry Matter %: 39.6

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GLOBE BEET

Fertilizer placement - Long Hoos IV 1952.

System of replication: 4 randomized blocks of 5 plots each.

Area of each plot: 0.00344 acre.

Treatments: No fertilizer; and all combinations of:-
National Compound fertilizer No. 1A (8% N; 6% P_2O_5; 10½% K_2O): 2.5; 5.0 cwt per acre.
Method of placement: Broadcast on seed bed; drilled in band beside seed.
Note. On calibration, the levels of fertilizer actually drilled were found to be 2.0 and 4.5 cwt per acre.

Basal dressing: None.

Cultivations, etc.: Ploughed: Feb 5. Seed drilled at 8 lb per acre, fertilizer applied: May 13. Lifted: Aug 6. Variety: Crimson Globe. Previous crop: Barley.

Standard error per plot:
Saleable produce*: 1.60 tons per acre or 45.2% (12 d.f.)

Summary of Results

	Compound fertilizer: cwt per acre					
	None	2.5 Broadcast	2.0 Drilled	5.0 Broadcast	4.5 Drilled	Mean
	Saleable produce*: tons per acre					
Mean (±0.80)	3.99	3.18	3.25	3.20	4.03	3.53
Increase (±1.13)		-0.81	-0.74	-0.79	+0.04	
	Total produce*: tons per acre					
Mean	5.50	4.72	4.58	4.65	5.31	4.95
Increase		-0.78	-0.92	-0.85	-0.19	

*Bulbs and tops.

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SUGAR BEET

Control of Virus Yellows - Great Harpenden II 1952.

System of replication: 5 randomized blocks of 3 plots each, plots being split into 3 for singling dates.

Area of each sub plot: 0.0208 acre. Area harvested: 0.0181 acre.

Treatments:
Whole plots: Sowing date. 1 - As early as possible; 2 - As soon as first sowing above ground; 3 - As soon as second sowing above ground.
Sub plots: Singling date. A - Early (Cotyledons and first leaf less than 1"); B - Normal (Cotyledons and 4 leaves); C - Late (8-12 leaves).

Basal dressing per acre: 3 cwt nitrate of soda; 4 cwt superphosphate; 2 cwt sulphate of potash; 5 cwt salt.

Cultivations, etc.: Ploughed: Oct 30, 1951. 2 tons ground chalk per acre applied: Mar 4, 1952. Basal fertilizers except nitrate of soda applied: Mar 15. Nitrate of soda applied, seed drilled at 18 lb per acre: '1' plots - Mar 17, '2' plots - Apr 17, '3' plots - May 6. DDT dust applied to '1' plots: Apr 15. Singled: Plots '1A' - May 13, '1B' and '2A' - May 22, '1C', '2B' and '3A' - May 29, '2C' and '3B' - June 6, '3C' - June 17. Lifted: Jan 5, 1953. Variety: Klein E. Previous crop: Oats.

Standard errors per plot:
Total sugar: whole plot, 4.18 cwt per acre or 9.5% (8 d.f.)
sub plot, 6.18 cwt per acre or 14.0% (24 d.f.)
Percentage Virus Yellows (transformed values): whole plot, 3.17 or 14.7% (8 d.f.)
sub plot, 5.14 or 23.9% (24 d.f.)

Note. The analysis of the incidence of Virus Yellows has been carried out on percentages transformed to degrees, and all tests of significance should be applied to the transformed values.

Summary of Results

Sowing Date	Singling Date: Early	Normal	Late	Mean
	Roots (washed): tons per acre			
17th March	14.86	16.98	13.68	15.17
17th April	16.52	15.95	12.60	15.02
6th May	13.36	12.25	10.35	11.99
Mean	14.91	15.06	12.21	14.06

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Sowing Date	Singling Date: Early	Normal	Late	Mean
Sugar Percentage				
17th March	15.70	15.96	15.68	15.78
17th April	15.94	15.84	15.15	15.64
6th May	15.54	15.27	15.21	15.34
Mean	15.73	15.69	15.35	15.59
Total Sugar: cwt per acre				
		(a and b)		(±1.87)
17th March	46.7	54.2	43.1	48.0
17th April	52.6	50.6	38.6	47.3
6th May	41.5	37.4	31.5	36.8
Mean (±1.60)	46.9	47.4	37.7	44.0
Plant Number: thousands per acre				
17th March	27.5	29.4	27.6	28.2
17th April	29.9	28.3	23.1	27.1
6th May	28.2	28.6	22.0	26.2
Mean	28.5	28.7	24.2	27.2
Noxious Nitrogen: mg per 100 g.				
17th March	15.0	15.0	19.0	16.3
17th April	18.0	17.0	22.0	19.0
6th May	17.0	21.0	22.0	20.0
Mean	16.7	17.7	21.0	18.4

(a) ±2.76 for use in horizontal comparisons only.
(b) ±2.93 for use in all other comparisons.

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Sowing Date	Singling Date: Early	Normal	Late	Mean
	Percentage Virus Yellows (means calculated from transformed values)			
17th March	12.6	15.6	12.8	13.7
17th April	18.3	10.8	19.4	15.9
6th May	10.7	10.8	11.7	11.0
Mean	13.7	12.2	14.4	13.4
	Percentage Virus Yellows (transformed values)			
		(a and b)		(±1.42)
17th March	20.8	23.3	20.9	21.7
17th April	25.3	19.2	26.1	23.5
6th May	19.1	19.2	20.0	19.4
Mean (±1.33)	21.7	20.5	22.3	21.5

(a) ±2.30 for use in horizontal comparisons only.
(b) ±2.35 for use in all other comparisons.

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SUGAR BEET

Krilium - Rothamsted, Great Harpenden II; Woburn, Butt Close, 1952.

System of replication: Rothamsted - 3 × 3 Latin square. Woburn - 3 randomized blocks of 3 plots each.

Area of each plot: 0.00083 acre.

Treatments:
Krilium: None; 5 cwt per acre broadcast and harrowed into seed bed; 1 cwt per acre drilled in 3" band.

Basal manuring per acre: 2 cwt sulphate of potash; 4 cwt superphosphate; 3 cwt nitrate of soda; 5 cwt salt.

Cultivations, etc.:
Rothamsted. Ploughed: Oct 30, 1951. 2 cwt ground chalk per acre applied: Mar 4, 1952. Sulphate of potash and superphosphate drilled: Mar 15. Krilium applied, seed drilled at 18 lb per acre: Mar 21. Nitrate of soda applied: Mar 26. Singled: May 17. Lifted: Jan 12, 1953. Variety: Klein E.
Woburn. Ploughed: Apr 5, 1952. Krilium and basal fertilizers applied, seed drilled at 18 lb per acre: Apr 28. Singled: May 27 Lifted: Dec 10. Variety: Klein E.

Summary of Results

Rothamsted				Woburn			
Krilium: cwt per acre				Krilium: cwt per acre			
None	5 Broadcast	1 Drilled	Mean	None	5 Broadcast	1 Drilled	Mean
Clean Beet: tons per acre							
16.11	17.84	15.95	16.63	12.07	15.39	15.37	14.28
Sugar Percentage							
16.35	16.16	16.07	16.19	15.83	16.47	15.95	16.08
Total Sugar: cwt per acre							
52.7	57.6	51.3	53.8	38.8	50.6	49.0	46.2
Tops: tons per acre							
8.93	9.91	9.11	9.32	12.14	14.46	16.61	14.40
Plant Number: thousands per acre							
30.0	28.0	28.8	28.9	29.6	31.6	31.6	30.9
Noxious Nitrogen: mg. per 100 g.							
15.0	15.0	18.3	16.1	28.3	28.3	28.3	28.3

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52/Cj/1.1

CLOVER, RYEGRASS, RED BEET AND CARROTS

Krilium - Rothamsted, Fosters and Barnfield; Woburn, Stackyard and Warren Field.

System of replication: 4 × 4 Latin square.

Area of each plot: 0.00207 acre. Area harvested: Clover and Ryegrass - 0.000275 acre, Red beet and Carrots - 0.000689 acre.

Treatments:

Krilium per acre: None; 3 cwt broadcast and twice rotary cultivated in (K_1); 6 cwt broadcast and twice rotary cultivated in (K_2); 3 cwt broadcast and raked into seed bed (K_3).

Basal manuring: 5 cwt Compound fertilizer (7% N, 7% P_2O_5, 10.5% K_2O) per acre.

Cultivations, etc.:

Rothamsted

Ploughed: Feb 13. K_1 and K_2 applied, all plots rotor tilled: May 14. Rotor tilled 2nd time, applied K_3, seeds drilled: May 15. Dusted red beet with DDT: June 4. 1st cut ryegrass: Fosters - July 25, Barnfield - Aug 27. Clover cut: Aug 29. 2nd cut ryegrass: Sept 18. Carrots lifted: Nov 13. Beet, Barnfield lifted: Nov 14. The beet on Fosters were damaged by sheep and the yields were not taken. Varieties: Clover - Crimson; Ryegrass - Western Wolth; Carrots - James Scot Intermediate; Red Beet - Detroit.

Woburn

Ploughed: Stackyard - Sept 17 1951 and Jan 4 1952. Warren Field - Feb 22. K_1 and K_2 applied, all plots rotor tilled: May 14. Applied K_3 and basal manures, rotor tilled, seeds drilled: May 15. Owing to rabbit damage the clover ryegrass and carrots on Warren Field were not harvested. Clover and ryegrass harvested: Aug 22. Beet lifted: Sept 12. Carrots lifted: Oct 30. Varieties: Clover - Scarlet Isles Trifolium; Ryegrass - Italian; Carrots - Scarlet Intermediate; Red Beet - Detroit.

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Standard errors per plot:

Clover, fresh weight.

Fosters:	9.66 cwt per acre	or 14.1%	(6 d.f.)
Barnfield:	3.73 cwt per acre	or 12.0%	(6 d.f.)
Stackyard:	19.3 cwt per acre	or 31.6%	(6 d.f.)

Ryegrass, fresh weight.

Fosters,	1st cut:	2.09 cwt per acre	or 22.0%	(6 d.f.)
	2nd cut:	10.9 cwt per acre	or 17.3%	(6 d.f.)
Barnfield,	1st cut:	5.86 cwt per acre	or 9.9%	(5 d.f.)*
	2nd cut:	1.37 cwt per acre	or 9.7%	(6 d.f.)
Stackyard:		14.3 cwt per acre	or 11.4%	(6 d.f.)

Red Beet, weight of bulbs.

Barnfield:	0.960 tons per acre	or 18.8%	(6 d.f.)
Stackyard:	3.62 tons per acre	or 39.9%	(6 d.f.)
Warren Field:	0.436 tons per acre	or 8.2%	(6 d.f.)

Carrots, roots.

Fosters:	1.02 tons per acre	or 7.8%	(6 d.f.)
Barnfield:	0.525 tons per acre	or 19.9%	(6 d.f.)
Stackyard:	1.15 tons per acre	or 33.5%	(6 d.f.)

*1 missing value.

Summary of Results

	Krilium: cwt per acre				
	None	Broadcast 3	Broadcast 6	Broadcast in seedbed 3	Mean
Clover, fresh weight: cwt per acre					
Fosters					
Mean (±4.83)	67.0	66.8	68.2	72.8	68.7
Increase (±6.83)		-0.2	+1.2	+5.8	
Barnfield					
Mean (±1.87)	30.4	31.0	31.0	32.2	31.2
Increase (±2.64)		+0.6	+0.6	+1.8	
Stackyard					
Mean (±9.6)	60.7	63.2	62.4	58.3	61.1
Increase (±13.6)		+2.5	+1.7	-2.4	

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	Krilium: cwt per acre				
	None	Broadcast 3	Broadcast 6	Broadcast in seedbed 3	Mean
Ryegrass, fresh weight: cwt per acre					
Fosters, 1st cut					
Mean (±1.05)	9.2	9.2	9.7	9.9	9.5
Increase (±1.48)		0.0	+0.5	+0.7	
Fosters, 2nd cut					
Mean (±5.43)	71.1	60.8	61.3	58.2	62.8
Increase (±7.68)		-10.3	-9.8	-12.9	
Barnfield, 1st cut					
Mean (±2.93)	58.7	57.4	58.3	62.1	59.1
Increase (±4.14)		-1.3	-0.4	+3.4	
Barnfield, 2nd cut					
Mean (±0.68)	15.5	14.2	12.4	14.5	14.1
Increase (±0.97)		-1.3	-3.1	-1.0	
Stackyard					
Mean (±7.1)	132.2	123.0	124.5	123.0	125.7
Increase (±10.1)		-9.2	-7.7	-9.2	
Red Beet, weight of bulbs: tons per acre					
Barnfield					
Mean (±0.480)	5.56	5.49	4.57	4.83	5.11
Increase (±0.679)		-0.07	-0.99	-0.73	
Stackyard					
Mean (±1.81)	9.01	10.26	9.61	7.47	9.09
Increase (±2.56)		+1.25	+0.60	-1.54	
Warren Field					
Mean (±0.218)	5.61	4.12	5.93	5.64	5.32
Increase (±0.308)		-1.49	+0.32	+0.03	
Carrots, roots: tons per acre					
Fosters					
Mean (±0.510)	13.37	11.59	13.77	13.74	13.12
Increase (±0.721)		-1.78	+0.40	+0.37	
Barnfield					
Mean (±0.263)	2.50	2.88	2.31	2.88	2.65
Increase (±0.371)		+0.38	-0.19	+0.38	
Stackyard					
Mean (±0.577)	3.34	3.35	3.49	3.60	3.45
Increase (±0.816)		+0.01	+0.15	+0.26	

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CHEMICAL ANALYSES OF MANURES USED IN THE THREE, FOUR AND SIX COURSE ROTATION EXPERIMENTS 1952

Manures	% Organic Matter	% N	% P_2O_5	% K_2O
Three Course Rotation				
Wheat Straw	80.7	0.52	0.20	1.05
Sulphate of Ammonia		21.0		
Superphosphate			18.4 (total)	
Muriate of Potash				56.7
Four Course Rotation				
Wheat Straw	80.7	0.52	0.20	1.05
Adco Compost	16.8	0.38	0.27	0.12
Dung	16.5	0.39	0.17	0.82
Sulphate of Ammonia		21.0		
Superphosphate			18.4 (total)	
Mineral Phosphate			27.9	
Muriate of Potash				56.7
Six Course Rotation				
Sulphate of Ammonia		21.0		
Superphosphate			18.4 (total)	
Muriate of Potash				56.7

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METEOROLOGICAL RECORDS ROTHAMSTED 1952

(Departure from long period means in brackets)

Month	Total Hours of Sunshine	Mean Temperature (°F.) Air[1]	Dew Point	In Ground 1 ft	In Ground 4 ft	Ground[2] Frosts	Total Rainfall (in) 1/1000 acre Guage	Rain[3] Days	Drainage through 20 in soil	Wind[4] m.p.h
Jan.	88 (+36)	36.5 (-0.9)	32.7	37.3	43.8	19	1.92 (-0.61)	18	1.17	6.7
Feb.	78 (+9)	36.7 (-1.7)	32.1	36.1	40.6	21	0.70 (-1.23)	12	0.68	4.9
Mar.	89 (-29)	43.1 (+1.8)	39.0	42.3	42.6	11	2.84 (+0.93)	21	1.14	5.5
Apr.	165 (+9)	49.5 (+3.7)	42.1	46.4	44.5	6	2.01 (+0.05)	15	2.20	4.0
May	212 (+16)	55.7 (+3.8)	47.7	55.7	49.4	0	1.72 (-0.43)	12	0.09	3.9
June	219 (+14)	58.2 (+0.7)	49.6	59.1	53.2	0	0.81 (-1.36)	12	-	4.0
July	180 (-16)	62.4 (+1.7)	52.8	64.3	56.8	0	0.55 (-2.01)	5	-	4.5
Aug.	178 (-7)	61.5 (+1.3)	54.3	61.6	58.0	0	5.13 (+2.57)	16	2.34	4.0
Sept.	120 (-26)	51.8 (-4.3)	46.3	54.2	56.6	2	3.68 (+1.31)	21	1.40	4.9
Oct.	100 (-5)	47.5 (-1.4)	43.7	47.4	52.3	4	2.94 (-0.05)	16	1.77	5.4
Nov.	65 (+2)	38.2 (-4.2)	35.1	40.7	48.5	13	4.04 (+1.23)	18	2.51	6.1
Dec.	61 (+16)	35.4 (-3.1)	32.2	36.0	42.8	20	2.88 (+0.30)	19	3.55	4.7
Year*	1555 (+19)	48.0 (-0.2)	42.3	48.4	49.1	96	29.22 (+0.70)	185	16.85	4.9

(1) Mean of maximum and minimum.
(2) Number of nights grass minimum 30°F or less.
(3) Number of days rainfall was 0.01 in. or more.
(4) At 2 metres above ground level.

*Mean or total.

52/E/2.1

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52/E/2.2

METEOROLOGICAL RECORDS WOBURN 1952

Month	Total hours of Sunshine	Mean Temperature (°F) Air(1)	Mean Temperature (°F) In Ground 1 ft.	Grass Minimum: °F	Total Rainfall: (in.) 8" gauge	Rain(2) days
January	87	37.0	37.1	28.7	1.51	14
February	87	36.8	36.3	26.9	0.67	8
March	90	43.4	43.3	34.6	3.56	22
April	162	49.5	48.0	35.8	1.93	15
May	216	55.9	57.9	42.7	2.46	15
June	207	58.2	60.7	44.6	1.19	11
July	222	62.6	66.7	49.1	0.39	6
August	183	61.2	62.9	48.9	3.18	14
September	119	51.7	54.0	38.7	3.06	17
October	99	47.2	46.8	36.9	2.96	18
November	65	38.2	39.9	30.0	3.24	16
December	68	35.9	35.8	27.7	2.06	19
Year*	1605	48.1	49.1	37.0	26.21	175

(1) Mean of maximum and minimum.

(2) Number of days rainfall was 0.01 in. or more.

*Mean or total.

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