ROTHAMSTED RESEARCH

Yields of the Field Experiments 1959

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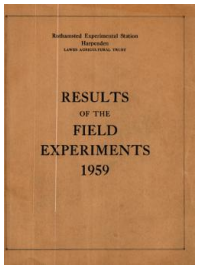

Yields of the Field Experiments 1959 - Results

Rothamsted Research

Rothamsted Research (1960) *Yields of the Field Experiments 1959 - Results ;* Yields Of The Field Experiments 1959, pp 1 - 112 **- DOI: https://doi.org/10.23637/ERADOC-1-179**

Rothamsted Experimental Station

Harpenden

Lawes Agricultural Trust

RESULTS

of the

FIELD

EXPERIMENTS

1959

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: F. Yates (Chairman), G.V. Dyke, (Secretary), G.W. Cooke, H.V. Garner, P.H. Gregory, J.R. Moffatt, C.A. Thorold, R.G. Warren, D.J. Watson.).

Price: 5/-

https://doi.org/10.23637/ERADOC-1-179

Index 1959

Classical Experiments*

Long Term Experiments

Short Term Experiments*

*At Rothamsted unless otherwise stated.

~~P.T.O.~~

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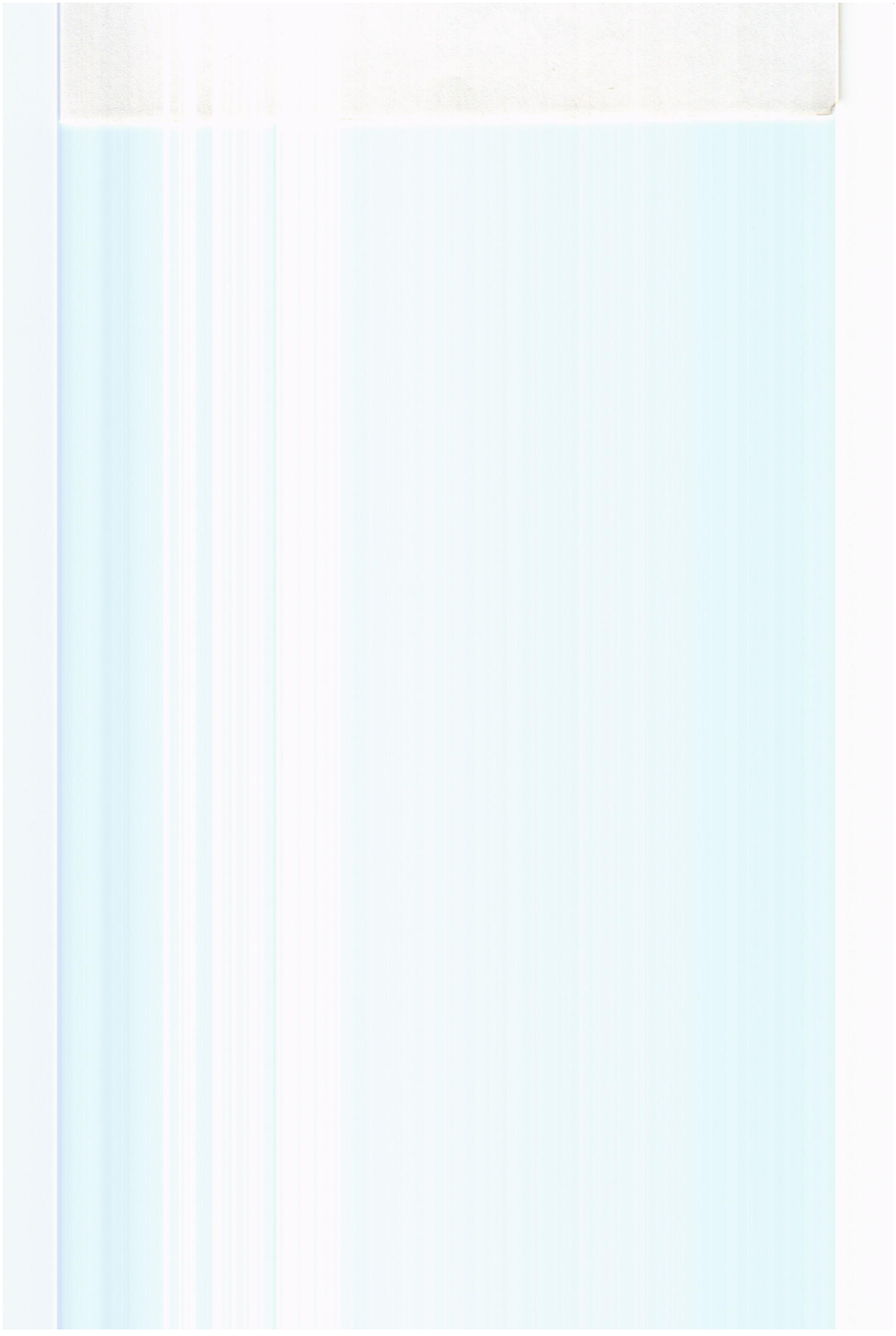

WHEAT - BROADBALK 1959

The 116th year

For history, treatments, etc., see "Details of the Classical and Long Term Experiments" 1956.

Cultivations, etc.:

Cropped sections. Ground chalk applied: Sept 22, 1958. Ploughed: Oct 20 - Nov 11. Dung applied: Nov 10. Autumn fertilizers applied: Dec 4. Seed drilled at 2¾ bushels per acre: Dec 8*. Spring fertilizers applied: Apr 27, 1959. Second dressing of nitrate of soda applied to plot 16: May 6. Section IA under continuous wheat sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: May 12. Combine harvested: Aug 19. Variety: Squarehead's Master 13/4.

*Note: Owing to weather conditions plot 2 was sown on Jan 5, 1959.

Fallow section. (IV) Ploughed: Oct 20 - Nov 11, 1958; May 9, 1959; Aug 10.

On a few plots an estimate was made of the chaff, cavings, dust, etc., not picked up by the baler.

Broadbalk Wilderness. N.

Cultivations, etc.: Shrubs grubbed out: Dec 9, 1958. Part mown: Apr 20, 1959, May 12, May 25, June 16, July 15.

Summary of Results

Grain (at 85% dry matter): cwt per acre

Section	VA	VB	II	IB	III	IA	
Years after fallow	unlimed 1	limed 1	2	3	4	8	Mean
2A	26.3	26.9	25.1	19.5	20.9	15.4	23.0
2B	28.5	27.6	27.7	22.8	23.9	18.8	25.6
3	16.1	14.4	11.9	13.6	12.5	11.8	13.2
5	20.3	18.3	17.7	16.7	14.2	14.3	16.9
6	19.3	19.7	19.3	16.9	18.6	16.9	18.7
7	14.6	15.4	25.8	19.3	23.3	23.8	21.1
8	11.0	17.0	30.8	14.7	23.6	22.9	21.6
9	14.4	13.1	19.2	18.7	15.5	20.4	16.8
10	11.9	13.3	21.7	18.0	18.8	18.3	17.7
11	7.8	11.8	25.3	19.8	16.5	24.2	17.9
12	11.5	12.0	23.2	21.5	21.4	23.0	19.3
13	7.3	13.5	22.6	24.0	20.5	22.4	18.9
14	8.6	12.7	24.6	21.5	22.0	23.6	19.6
15	12.9	16.9	17.9	19.3	20.0	20.1	18.0
16	21.3	20.0	28.5	25.0	27.8	26.0	25.5
17	15.7	15.3	10.6	8.8	11.3	10.5	11.9
18	25.0	22.3	17.2	18.8	24.0	18.8	21.1
19	21.0	20.0	17.0	16.9	21.1	17.8	19.1
20			14.0	17.0		15.6	15.4

https://doi.org/10.23637/ERADOC-1-179

59/A/2.1

BARLEY - HOOSFIELD 1959

The 108th year

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956.

Cultivations, etc.: Sprayed with 2,4-D ester at $1\frac{3}{4}$ pints in 40 gallons per acre on stubble: Sept 20, 1958. Ploughed: Nov 28 - Dec 6. Dung applied: Dec 5. Fertilizers applied: Mar 30, 1959. Seed drilled at 3 bushels per acre: Apr 2. Sprayed with MCPA at $6\frac{1}{2}$ pints (30% potassium salt) in 40 gallons per acre: May 26. Combine harvested: Aug 18. Variety: Plumage Archer.

In 1959 the plots were harvested by taking a single combine cut down the centre of each plot (including plots 1N and 5 - 0) for the full length, except on strips 1, 3 and 4, where five combine cuts were taken per plot and weighed separately, the yields shown being estimated from the totals of these cuts. One cut only was taken from plot 5 - A, situated at the south side to avoid couch grass (Agropyron repens).

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Plot	Grain (at 85% dry matter): cwt per acre	Straw (at 85% dry matter): cwt per acre
1 0	9.7	4.7
2 0	14.0	9.0
3 0	10.5	4.7
4 0	14.9	7.3
5 0	15.6	9.2
1 A	16.5	7.9
2 A	21.4	11.7
3 A	21.0	13.2
4 A	28.3	17.2
5 A	31.0	20.3
1 AA	18.9	11.7
2 AA	25.1	14.4
3 AA	23.8	15.5
4 AA	27.3	14.3
1 AAS	24.7	13.9
2 AAS	27.3	16.0
3 AAS	26.3	12.6
4 AAS	30.0	19.3
1 C	24.9	12.1
2 C	25.4	12.9
3 C	26.4	15.9
4 C	27.7	15.5
7 - 1	12.2	5.9
7 - 2	28.7	19.3
6 - 1	8.6	4.2
6 - 2	10.4	4.8
1 N	18.3	7.7
2 N	21.5	12.9
Mean dry matter % as harvested:	85.7	89.6

https://doi.org/10.23637/ERADOC-1-179

59/A/3

WHEAT AFTER FALLOW - HOOSFIELD 1959

Without manure 1851 and since

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956. In 1957 the original plots were reduced in size to 0.0628* acres to provide additional land for the study of Wheat Bulb Fly.

Area harvested: 0.0334 acres.

Cultivations, etc.:
Cropped plots. Ploughed: Oct 21, 1958. Seed sown at 3 bushels per acre: Nov 21. Combine harvested: Aug 20, 1959. Variety: Squarehead's Master 13/4.
Fallowed plots. Ploughed: Oct 21, 1958 and June 2, 1959.

*Note: This is the full area; the area given in previous reports is the area harvested before allowing for sampling.

Note: Counts of plant shoot and ear number and estimates of incidence of Eyespot (Cercosporella herpotrichoides) and Take-All (Ophiobolus graminis) were made. There was no lodging.

Summary of Results

Grain (at 85% dry matter): cwt per acre

Plot	B_1	B_2	B_3	Mean
No. of years of fallow	1	1	3	
	9.1	8.2	9.4	8.9

Mean dry matter % as harvested: 86.2

https://doi.org/10.23637/ERADOC-1-179

59/A/4.1

GRASS AND MULTIPLE CROPPING X P

AGDELL 1959

For history, treatments, etc., see "Details of the Classical and Long Term Experiments" 1956.

In 1959 a system of multiple cropping designed to measure crop responses to phosphate was added to the 1958 scheme, the fallow half of each main plot carrying potatoes, sugar beet and barley in 3 strips, each divided into 4 blocks of 3 sub-plots each.

Area of each sub-plot: 0.0034 acres. Area of grass harvested: 0.0023 acres.

Treatments applied to sub-plots: none; 0.25; 1.00 cwt P_2O_5 per acre as superphosphate.

Basal dressings:

To grass: 0.80 cwt N applied in spring and after each silage cut.
To potatoes and sugar beet: 1.00 cwt N per acre as sulphate of ammonia and 1.20 cwt K_2O per acre as sulphate of potash.
To barley: 0.50 cwt N per acre as sulphate of ammonia and 0.60 cwt K_2O per acre as sulphate of potash.

Cultivations, etc.: Ground chalk applied to plots 1 and 2 at 36 cwt per acre: February 10th, 1959. Fallow halves ploughed: February 12th.

Grass. "Nitra-Shell" applied: April 10th. Cut 3 times for silage: May 27th, July 7th and August 24th. "Nitra-Shell" applied after 1st and 2nd cuts, "Nitro-Chalk" 21 after the last. Variety: Italian Ryegrass S22.

Barley. Fertilizers broadcast, seed drilled at $2\frac{1}{2}$ bushels per acre: April 2nd. Harvested: August 12th. Variety: Proctor.

Potatoes. Ridged, fertilizers applied, potatoes planted: May 11th. Sprayed with copper fungicide at 5lb. in 40 gallons per acre: August 24th. Lifted: October 9th. Variety: Majestic (chitted).

Sugar beet: Fertilizers applied, seed drilled at 19 lb. per acre: May 5th. Hand sprayed with miscible DDT at 3 pints in 8 gallons per acre against mangold fly: May 26th. Singled: June 19th-27th. Hand sprayed with demeton methyl at 16 fluid oz. in 8 gallons per acre against aphis: July 3rd. Lifted: November 18th. Variety: Klein E.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Manure to turnips until 1948 Plot Rotation	None since 1848 5 Fallow	6 Clover	Mineral manure* no nitrogen 3 Fallow	4 Clover	Mineral* and nitrogenous manure+ 1 Fallow	2 Clover	Mean
Grass Dry Matter: cwt per acre							
1st cut	30.0	12.8	39.1	36.3	38.1	31.6	31.3
2nd cut	7.5	5.7	12.4	13.7	16.7	15.8	12.0
3rd cut	5.6	3.5	12.2	9.6	11.9	11.4	9.0
Total of 3 cuts	43.1	22.0	63.6	59.6	66.8	58.7	52.3
Potatoes total tubers: tons per acre							
P_2O_5 cwt per acre							
None	3.58	3.50	8.42	7.32	7.32	6.41	6.09
0.25	6.32	5.24	9.53	8.62	9.02	7.72	7.74
1.00	8.48	6.77	10.32	9.96	10.89	9.60	9.34
Mean	6.13	5.17	9.42	8.63	9.08	7.91	7.72
Sugar Beet: Roots (washed) tons per acre							
None	8.50	9.80	14.95	13.80	11.56	8.94	11.26
0.25	10.54	9.78	15.61	12.52	11.58	9.57	11.60
1.00	10.65	10.13	14.92	13.28	11.84	10.55	11.90
Mean	9.90	9.90	15.16	13.20	11.66	9.69	11.58
Sugar Beet: Sugar Percentage							
None	15.4	15.4	17.6	16.5	16.4	15.6	16.2
0.25	15.9	15.3	17.2	16.6	16.2	16.1	16.2
1.00	16.0	15.6	17.1	16.5	16.2	16.2	16.3
Mean	15.8	15.4	17.3	16.5	16.3	16.0	16.2

* P, K, Na, Mg.

\+ Rape dust (or castor meal + ammonium sulphate)

https://doi.org/10.23637/ERADOC-1-179

Maure to turnips until 1948 Plot Rotation	None since 1848 5 Fallow	6 Clover	Mineral manure* no nitrogen 3 Fallow	4 Clover	Mineral* and nitrogenous manure+ 1 Fallow	2 Clover	Mean
Sugar Beet: Total Sugar cwt per acre							
P_2O_5 cwt per acre							
None	26.2	30.1	52.5	45.4	37.8	28.0	36.7
0.25	33.4	30.0	53.7	41.6	37.5	30.8	37.8
1.00	34.1	31.6	50.9	43.7	38.5	34.1	38.8
Mean	31.2	30.6	52.4	43.6	37.9	31.0	37.8
Sugar Beet: Tops tons per acre							
None	7.43	8.59	8.91	10.49	10.24	8.79	9.08
0.25	9.04	9.32	9.51	10.21	9.12	9.19	9.40
1.00	9.89	11.25	10.16	10.71	10.43	10.37	10.47
Mean	8.79	9.72	9.53	10.47	9.93	9.45	9.65
Barley grain(at 85% dry matter): cwt per acre							
None	15.5	12.8	34.1	28.7	21.4	26.1	23.1
0.25	20.2	20.9	34.1	30.7	22.5	27.6	26.0
1.00	26.9	32.0	34.5	35.5	21.5	23.9	29.0
Mean	20.9	21.9	34.2	31.6	21.8	25.9	26.0
Barley straw(at 85% dry matter): cwt per acre							
None	18.4	18.9	30.6	29.2	19.3	19.5	22.6
0.25	21.2	22.0	30.1	29.4	20.0	22.5	24.2
1.00	24.2	31.8	32.6	31.8	20.4	20.8	26.9
Mean	21.3	24.2	31.1	30.1	19.9	20.9	24.6

Mean dry matter % as harvested:

Grass	1st cut	23.4
	2nd cut	35.9
	3rd cut	56.7
	Total of 3 cuts	38.7
Barley	grain	79.0
	straw	63.1

* P, K, Na, Mg.

\+ Rape dust (or castor meal + ammonium sulphate)

MANGOLDS AND SUGAR BEET - BARNFIELD

The 84th and 14th years

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956.

Cultivations, etc.: Dung applied: Nov 24 - 27, 1958. Dung ploughed in: Dec 3, remainder ploughed: Feb 10, 1959. Fertilizers applied: May 4 - 6. Sugar beet drilled at 19 lb per acre, mangolds drilled at 8 lb per acre: May 11. Singled: June 26 - July 9. Top dressings applied: July 14. Lifted: Oct 22 - Nov 12. Varieties: Mangolds - Yellow Globe, sugar beet - Klein E.

Summary of Results

Strip	Cross dressing 0	N	A	AC	C
		Mangolds, roots: tons per acre			
1	11.13	20.75	20.26	21.48	15.26
2	10.89	16.99	14.46	16.41	12.29
4	3.82	(a) 10.83*	11.40	17.79	12.97
		(b) 13.02*			
5	2.77	11.91	5.42	6.31	6.95
6	2.38	9.87	9.78	14.87	10.91
7	3.02	12.18	11.83	14.42	11.89
8	3.00	7.24	5.04	6.66	6.60
9	11.65				
		Mangolds, leaves: tons per acre			
1	2.08	2.96	3.25	3.44	2.74
2	1.93	2.69	3.08	3.03	2.44
4	1.39	(a) 2.08*	2.27	3.59	2.37
		(b) 2.76*			
5	1.24	2.27	1.95	2.00	2.44
6	1.18	2.76	2.39	3.54	2.12
7	1.37	3.42	3.27	4.45	2.42
8	0.85	2.88	2.15	2.83	2.61
9	2.88				
		Mangolds, plant number: thousands per acre			
1	18.5	20.8	20.4	21.0	19.8
2	21.3	22.0	20.7	20.9	20.8
4	20.8	(a) 19.1*	20.8	20.0	20.5
		(b) 19.8*			
5	18.2	21.7	17.3	17.2	19.2
6	15.7	19.4	20.6	20.6	21.2
7	17.8	23.0	20.6	21.7	21.1
8	16.1	20.0	19.5	20.0	20.6
9	21.4				

*No nitrate of soda. Nitrogen applied as calcium and potassium nitrates.

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Strip	Cross dressing 0		N	A	AC	C
	Sugar beet, roots (washed): tons per acre					
1	6.63		9.54	9.34	10.82	8.93
2	5.54		7.44*	8.34	8.54	8.57
4	2.05	(b)	6.64*	6.44	9.66	7.79
5	2.47		6.63	4.63	5.48	5.58
6	1.60		4.80	6.68	7.80	6.06
7	2.44		6.90	7.05	8.27	6.80
8	2.70		5.84	4.09	5.79	4.92
9	7.14					
	Sugar beet, tops: tons per acre					
1	4.30		7.96	7.47	10.75	7.03
2	4.01		6.74*	8.50	8.70	6.89
4	1.71	(b)	5.76*	5.03	8.11	4.89
5	2.04		6.40	3.86	7.62	5.76
6	1.47		2.39	4.64	7.86	6.20
7	1.62		8.40	5.18	8.06	7.23
8	1.84		6.06	4.01	5.08	7.08
9	5.81					
	Sugar beet, plant number: thousands per acre					
1	22.1		22.2	21.2	22.0	22.8
2	20.1		23.2*	24.3	24.0	24.2
4	19.7	(b)	22.0*	22.7	22.0	23.1
5	22.5		21.5	19.7	20.6	22.1
6	18.6		19.1	18.9	20.4	20.8
7	16.6		20.7	20.9	23.7	24.2
8	21.2		22.5	19.1	22.6	19.8
9	19.9					
	Sugar beet, sugar percentage					
1	18.0		16.3	16.0	17.1	16.6
2	17.0		15.8*	16.1	16.1	16.7
4	17.0	(b)	16.5*	17.4	16.8	17.4
5	16.7		15.8	17.0	15.5	16.4
6	16.9		16.2	17.7	16.9	16.7
7	17.6		15.8	17.6	17.0	16.6
8	17.2		16.2	16.7	15.7	15.7
9	17.1					

*No nitrate of soda. Nitrogen applied as calcium and potassium nitrates.

https://doi.org/10.23637/ERADOC-1-179

59/A/6.1

HAY - THE PARK GRASS PLOTS 1959

For history, treatments etc. see "Details of the Classical and Long Term Experiments" 1956.

Use of flail-type forage harvester

At the time of the first cut the forage harvester was tested on small sample areas of 4 plots (1, 7, 11-1 and 13) and comparable samples were cut by cutter-bar machine. The produce was carted green. The grass remaining on these plots as well as that from the other plots of the experiment was harvested as in previous years, and the yields given in the summary are based on this method. At the second cut the forage harvester alone was used, the produce being carted green. The yields are based on sample cuts, 2 each from plots 1, 2, 3, 4-1, 4-2, 11-1, 11-2, 12, 14, 15, 16, 17, 19 and 20-1, 20-2, 20-3, and 4 each from the remainder. The area harvested per plot for the second cut varied from 0.0143 to 0.0784 acres.

Cultivations, etc.: Mineral fertilizers applied: Feb 18, 1959. Nitrogenous fertilizers applied: 1st dressing - Mar 25; 2nd dressing - Apr 10. Cut twice: June 15 and Sept 14 - 19.

https://doi.org/10.23637/ERADOC-1-179

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	1.0	6.0	7.0	15.8	23.0	38.8
2	4.6	11.0	15.6	14.8	22.6	37.4
3	5.1	14.2	19.3	14.4	19.4	33.8
4-1	16.4	16.9	33.3	17.0	22.9	39.9
4-2	4.9	15.5	20.4	27.6	16.9	44.5
5-1	3.8	12.2	16.0			
5-2	24.7	19.9	44.6			
6	30.6	19.8	50.4			
7	34.1	16.2	50.3	44.1	19.9	64.0
8	18.5	19.1	37.6	16.8	17.5	34.3
9	14.4	29.6	44.0	55.1	15.6	70.7
10	7.6	20.4	28.0	34.6	13.1	47.7
11-1	1.4	47.6	49.0	55.7	21.1	76.8
11-2	12.0	45.9	57.9	66.9	33.0	99.9
12	5.8	17.6	23.4			
13	35.0	18.4	53.4	34.4	24.4	58.8
14	50.9	21.0	71.9	60.6	30.5	91.1
15	26.7	16.4	43.1	45.4	23.6	69.0
16	37.8	16.4	54.2	53.3	27.8	81.1
17	12.9	14.5	27.4	20.8*	19.2	40.0
18	1.4	5.5	6.9	18.8*	15.2	34.0
				16.0+	17.9	33.9
19	17.4	16.6	34.0	30.3*	18.8	49.1
				19.7+	16.2	35.9
20	33.7	16.6	50.3	35.3*	26.1	61.4
				33.5+	22.1	55.6

*Heavy liming. +Light liming.

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

Mean dry matter % as weighed: 1st crop 82.1; 2nd crop 16.1.

https://doi.org/10.23637/ERADOC-1-179

59/A/7.1

BARLEY - EXHAUSTION LAND HOOSFIELD 1959

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956.

In 1959 the whole experiment was sown to barley again.

Combine harvesting 1959:- One central cut was taken down the length of each plot except plots 5 and 9, 90 links at the end of plots 2, 4, 6, 8 and 10 being discarded; parts of plots 5 and 9 were harvested separately as microplots and the remainder discarded.

The following should be added to the details for 1958:

Combine harvesting 1958:- The barley crop on the western halves was combine harvested, one central cut being taken from plots 4, 6, 8 and 19, and from plot 2, two cuts separately, one on the north side and the other on the south side.

Basal dressing: 0.5 cwt N per acre as 'Nitra-Shell'.

Cultivations, etc.: Ploughed: Feb 16, 1959. 'Nitra-Shell' applied, seed drilled at $2\frac{3}{4}$ bushels per acre: Mar 17. Sprayed with CMPP at 4 pints in 40 gallons per acre: May 27. Plots 5 and 9 cut by hand: Aug 5. Remaining plots combine harvested: Aug 18. Variety: Plumage Archer.

https://doi.org/10.23637/ERADOC-1-179

59/A/7.2

Summary of Results

Barley

Yields (at 85% dry matter): cwt per acre

Plots not cross cropped in 1957 and 1958 and combined harvested in 1959

Plot.	Manuring to potatoes 1876 - 1901*	Grain	Straw
2	Unmanured after dung 1876 - 81	21.1	13.5
4	Dung	28.5	17.7
6	Nitrate of soda	19.0	11.1
8	Nitrate of soda and complete minerals	25.3	14.9
10	Complete minerals	23.5	14.9

Plots cross cropped in 1957 and 1958 and combined harvested in 1959

Plot.	Manuring to potatoes 1876 - 1901*	Grain	Straw
1	Unmanured	26.3	16.0
3	Dung	32.0	20.5
7	Ammonium salts and complete minerals	29.9	19.9
	Mean dry matter % of combine harvested plots	87.2	88.2

*For certain changes see history.

https://doi.org/10.23637/ERADOC-1-179

Barley

Yields (at 85% dry matter): cwt per acre

Plots cross cropped in 1957 and 1958 and harvested by nand as microplots in 1959.

Strip	Treatment for 1957 crop (1958 fallow)	Previous crop: Potatoes Grain	Potatoes Straw	Sugar beet Grain	Sugar beet Straw	Kale Grain	Kale Straw	Barley Grain	Barley Straw	Wheat Grain	Wheat Straw	Swedes Grain	Swedes Straw
5	P	30.1	39.5	25.9	31.8	28.0	38.0	16.8	18.9	24.4	30.3	26.8	33.5
	P^{o}	24.1	27.7	27.2	38.0	25.8	34.8	25.9	26.1	27.6	37.8	24.8	32.5
	P_1	26.5	30.4	29.8	41.3	31.2	41.2	24.9	25.7	27.3	32.9	25.7	30.0
	P_2	33.1	38.7	27.4	36.1	35.1	47.7	20.7	20.5	25.6	28.7	29.7	34.1
9	P_4	31.5	38.6	34.5	42.6	33.8	33.2	30.9	33.2	28.8	30.4	43.0	39.5
	P^{o}_4	28.1	37.6	33.6	45.2	36.8	36.0	33.6	34.1	25.8	29.9	29.5	31.7
	Treatment for 1958 crop (1957 fallow)												
5	P	29.2	38.3	21.3	24.9	31.4	40.5	20.6	26.0	17.6	30.5	25.2	33.6
	P^{o}	30.8	39.1	24.3	28.5	27.5	36.8	23.4	29.6	20.7	29.5	24.9	34.1
	P_1	28.5	35.4	21.4	24.8	27.9	39.2	26.1	31.9	21.5	28.3	27.7	36.3
	P_2	27.9	35.5	24.8	28.9	27.4	36.4	27.2	33.4	26.5	33.0	21.0	34.9
9	P_4	36.7	36.8	26.3	29.8	29.7	40.7	27.8	29.9	27.5	29.3	31.8	33.7
	P^{o}_4	34.9	32.1	31.7	34.1	33.5	41.2	28.3	30.9	27.5	29.3	29.0	32.4

Mean dry matter % of hand harvested plots:
Grain: 84.9
Straw: 84.7

59/A/7.3

CLOVER - ROTHAMSTED GARDEN 1959

The 106th year

For history, etc. see "Details of the Classical and Long Term Experiments" 1956.

Cultivations, etc.: Muriate of potash applied: Jan 5, 1959. Blank patches resown: May 2 and July 17. Cut twice: July 17, Sept 21.

Summary of Results

Dry matter: cwt per acre

Muriate of potash: cwt per acre	Cuts		Total
	1st	2nd	
None	4.1	3.1	7.2
2	11.2	9.2	20.4

https://doi.org/10.23637/ERADOC-1-179

WHEAT AND BARLEY - WOBURN STACKYARD 1959

For history, treatments, etc., see "Details of the Classical and Long Term Experiments" 1956.

Strip cropping 1959: To investigate the residual effects of early manures, winter wheat and spring barley were sown in strips across these two experiments. Yields were estimated from sample combine cuts.

Cultivations, etc.: The site of the Continuous Wheat was ploughed on May 28 and Sept 26, 1958 and that of the Continuous Barley on May 27 and Oct 28.

Wheat: Seed drilled at 3 bushels per acre: Dec 5. 'Nitra-Shell'(20.5% N) applied at 4½ cwt per acre: Mar 25, 1959. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: Apr 29. Combine harvested: Aug 20. Variety: Squarehead's Master 13/4.

Barley: Seed drilled at 3 bushels per acre: Mar 16, 1959. 'Nitra-Shell' (20.5% N) applied at 4½ cwt per acre: Mar 25. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: May 11. Combine harvested: Aug 19. Variety: Plumage Archer.

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59/A/9.2

Summary of Results

Yields (at 85% dry matter): cwt per acre

Crop in 1959 / Previous crop	Wheat		Barley	
	Continuous Wheat	Continuous Barley	Continuous Wheat	Continuous Barley
Grain				
Plots				
1	20.7	23.2	20.7	19.2
2	13.5	17.6	15.1	19.3
3	21.1	29.2	21.3	19.3
4	19.3	21.4	24.4	21.0
5	17.9	21.0	28.8	21.0
6	18.4	24.8	24.3	22.1
7	17.0	23.8	23.0	19.7
8	19.7	23.7	21.7	23.9
9	18.2	25.5	24.1	22.3
10a	19.0	26.5	17.9	16.1
10b	20.1	25.6	17.4	17.0
11a	20.3	29.0	21.4	21.5
11b	23.9	31.4	25.6	25.8
Straw				
Plots				
1	27.1	31.8	14.4	11.4
2	18.4	25.8	11.8	10.4
3	25.1	38.7	13.4	10.1
4	32.0	34.2	22.9	14.6
5	27.6	33.6	19.4	14.9
6	32.1	42.9	21.0	18.1
7	24.4	32.0	15.9	11.9
8	26.9	46.9	12.8	16.1
9	29.8	42.5	16.6	18.1
10a	23.0	34.5	12.7	10.2
10b	20.3	30.6	11.1	8.3
11a	26.2	39.1	14.6	13.3
11b	30.2	41.4	18.1	16.6

Mean dry matter % as harvested: Grain 87.4 — 88.2; Straw 91.4 — 90.0

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59/Ba/1.1

SIX COURSE ROTATION EXPERIMENT

The 30th year

Seasonal effects of fertilizers - Rothamsted Long Hoos IV and Woburn Stackyard 1959.

For history, treatments, etc., see "Details of the Classical and Long Term Experiments" 1956.

In 1959 the cereals on the Woburn experiment were combine harvested the yields being estimated from one central cut.

Magnesium test 1959 (Woburn only): Magnesium sulphate was applied to half plots on the potato crop to give a test of MgO chemically equivalent to 0 v 1 cwt K_2O per acre.

Area of each plot (acres): Rothamsted - 0.0250; Woburn - 0.0265.
Area harvested: Rothamsted - full area; Woburn - Sugar beet - full area; Barley, wheat, rye - 0.0101; Potatoes (sub plot) - 0.0095.

Cultivations, etc.:

Rothamsted

Sugar beet.
Ploughed twice: Sept 24, 1958 and Apr 7, 1959. Fertilizers applied, seed drilled at 18¾ lb per acre: Apr 22. Hand sprayed with miscible DDT at 3 pints in 8 gallons per acre: May 27. Singled: June 4 - 9. Sprayed with demeton methyl at 12 fluid oz in 60 gallons per acre: June 11. Lifted: Oct 26. Harvested: Nov 6 - 14. Variety: Klein E.

Barley.
Sugar beet tops spread: Dec 9, 1958. Ground chalk applied at 19 cwt per acre: Feb 10, 1959. Ploughed: Feb 11. Fertilizers applied: Mar 12. Seed drilled at 2¾ bushels per acre: Mar 17. Clover seed undersown: Apr 29. Harvested: Aug 4. Variety: Plumage Archer.

Clover.
Seed undersown in barley at 40 lb per acre: Apr 25, 1958. Autumn fertilizers applied: Jan 2, 1959. Sulphate of ammonia applied: Apr 2. Cut: June 17. Variety: S123 Late Flowering Red.

Wheat.
Ploughed twice: July 18 and Oct 17, 1958. Autumn fertilizers applied, seed drilled at 2¾ bushels per acre: Oct 22. Sulphate of ammonia applied by hand: Apr 2, 1959. Sprayed with CMPP, 6 pints in 40 gallons per acre: Apr 23. Harvested: Aug 4. Variety: Yeoman.

Potatoes.
Ploughed: Oct 17, 1958. Ridged, fertilizers applied, potatoes planted: Apr 14, 1959. Earthed up: June 18. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: Aug 24. Sprayed with

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sulphuric acid, 15% BOV at 100 gallons per acre: Sept 7. Lifted: Sept 28. Variety: Majestic.

Rye.

Ploughed: Oct 17, 1958. Ground chalk applied at 16 cwt per acre, autumn fertilizers applied, seed drilled at 3 bushels per acre: Oct 22. Sulphate of ammonia applied: Apr 3, 1959. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 23. Harvested: Aug 4. Variety: King II.

Woburn

Sugar beet.

Ploughed twice: Sept 23 and November 25, 1958. Fertilizers applied: Apr 1, 1959. Seed drilled at 12 lb per acre: Apr 6. Sprayed with dieldrin at 2 pints in 40 gallons per acre: May 26. Singled: May 27. Sprayed with demeton methyl at 12 oz in 40 gallons per acre: June 3 and June 20. Lifted: Oct 28. Variety: Klein E.

Barley.

Ploughed: Nov 1, 1958. Fertilizers applied: Mar 2, 1959. Seed drilled at 3 bushels per acre: Mar 13. Hydrated lime applied at 16 cwt per acre: May 12. Combine harvested: Aug 5. Variety: Herta.

Clover.

Ploughed: Sept 25 and Nov 21, 1958. Fertilizers applied, seed broadcast at 40 lb per acre: Mar 2, 1959. Sprayed with dieldrin at 2 pints in 40 gallons per acre: Apr 30. Sprayed with 2,4-D at 2 pints in 40 gallons per acre: May 12. Ploughed: June 3.

Wheat.

Ploughed twice: July 16 and Sept 25, 1958. Autumn fertilizers applied: Oct 17. Seed drilled at 2½ bushels per acre: Oct 21. Sulphate of ammonia applied: Apr 13, 1959. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: Apr 29. Combine harvested: Aug 18. Variety: Yeoman.

Potatoes.

Ploughed twice: Sept 23 and Nov 21, 1958. Fertilizers applied and potatoes hand planted: Apr 8, 1959. Earthed up: June 22. Sprayed with zineb at 2 lb and demeton methyl at 12 oz in 40 gallons per acre: Aug 15. Haulms destroyed mechanically: Sept 22. Lifted: Sept 30. Variety: Majestic.

Rye.

Ploughed: Oct 16, 1958. Ground chalk applied at 22 cwt per acre: Oct 18. Fertilizers applied, seed drilled at 2½ bushels per acre: Oct 21. Sulphate of ammonia applied: Apr 13, 1959. Combine harvested: Aug 18. Variety: King II.

Note: At Woburn the clover was heavily infested with weeds and was therefore abandoned.

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59/Ba/1.3

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	11.55	12.39	21.5*	28.6*
Response to: N	+2.67	+1.09	+20.0	+8.3
P	-0.99	+1.01	+0.9	+6.8
K	+0.17	-1.73	+1.7	-2.0
Mean dry matter % as harvested:			84.8	84.4
	Sugar Beet, sugar percentage		Barley, straw: cwt per acre	
Mean	18.7	18.8	20.6*	18.3*
Response to: N	-0.5	-1.0	+23.5	+2.6
P	+1.1	+0.5	+2.7	+5.2
K	+0.4	-0.2	+1.4	-3.4
Mean dry matter % as harvested:			86.5	84.8
	Sugar Beet, total sugar: cwt per acre		Clover, hay, dry matter: cwt per acre	
Mean	43.3	46.5	37.6	
Response to: N	+8.5	+1.8	+2.5	(Ploughed in)
P	-0.9	+4.9	-5.7	
K	+1.8	-7.2	+7.0	
Mean dry matter % as harvested:			81.4	
	Sugar Beet, tops: tons per acre		Wheat, grain: cwt per acre	
Mean	6.10	6.52	30.6*	16.2*
Response to: N	+2.59	+3.21	+0.9	+17.5
P	-2.19	+0.55	+9.3	+1.2
K	-0.52	-0.77	+4.0	-1.7
Mean dry matter % as harvested:			85.2	86.4
	Sugar Beet, plant number: thousands per acre		Wheat, straw: cwt per acre	
Mean	26.8	**	51.8*	20.0*
Response to: N	-3.7		+21.6	+19.8
P	+0.5		+3.4	+5.6
K	+0.3		+6.8	-4.4
Mean dry matter % as harvested:			88.4	92.3

*(At 85% dry matter). **Not recorded.

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

	Rothamsted	Woburn		Rothamsted	Woburn
	Potatoes, total tubers: tons per acre			Rye, grain: cwt per acre	
		Without Mg	With Mg		
Mean	8.59	8.17	7.98	29.4*	27.1*
Response to: N	+4.42	+3.08	+3.82	+16.5	+19.6
P	+3.14	-1.88	-1.80	+0.9	-6.1
K	+0.31	+0.57	+0.48	+2.9	-0.4
Mean dry matter % as harvested:				84.6	86.3
	Potatoes, percentage ware			Rye, straw: cwt per acre	
	(1)	(2)			
Mean	90.5	77.1	77.9	40.2*	29.2*
Response to: N	+5.1	+8.0	+7.8	+36.3	+13.0
P	-3.5	+4.6	+12.2	+3.5	-8.7
K	-1.3	+3.6	+5.4	+1.0	+3.6
Mean dry matter % as harvested:				88.7	90.9

*(At 85% dry matter)

Riddle: (1) $1\frac{1}{2}$"; (2) $1\frac{5}{8}$".

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LEY AND ARABLE ROTATIONS

Highfield and Fosters Field 1959 - the 11th year.

For details of treatments, rotations, etc. see "Details of the Classical and Long Term Experiments" 1956.

The following addition should be made to the 1958 details:-
Sheep grazing: Live weight records were discontinued this year.

Rates of application of supplementary (corrective) potash (K_2O: cwt per acre)

Crop	Year of cycle	Field etc.	Rate	
Permanent grass	"1st treatment"	Highfield (blocks 6 & 7)	2.5	(2 previous hay crops taken)
Reseeded grass	"1st treatment"	Highfield (blocks 6 & 7) Fosters (blocks 8 & 9)	3.0	(2 previous hay crops taken)
Lucerne	"1st treatment"	Highfield Fosters	3.0 4.0	(3 years previous lucerne)
Cut grass	"1st treatment"	Highfield Fosters	3.5 4.0	(3 years previous cutting)

The following should be added to the list for 1957:

Permanent and reseeded grass	"2nd treatment"	Highfield (blocks 5 & 8) Fosters (blocks 5 & 7)	1.0	(1 previous hay crop taken)

Cultivations, etc.:

HIGHFIELD

1st year Treatment Crops

Cut grass. Ploughed twice: Sept 4, 1958 and Nov 20. Supplementary K applied: Nov 24. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied Apr 10. Seeds sown at 33 lb per acre: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. Cut 3 times: June 26, Aug 8, Sept 16. 'Nitra-Shell' applied after every cut except the last.

Grazed ley. Ploughed twice: Sept 4, 1958 and Nov 20. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied: Apr 10. Seed sown at 44 lb per acre: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. 'Nitra-Shell' applied: July 16. Grazed: 4 circuits, June 5 - Aug 12.

Lucerne. Ploughed twice: Sept 4, 1958 and Nov 20. Supplementary K applied: Nov 24. Basal PK compound applied: Apr 8, 1959. Seed drilled at 28 lb per acre: Apr 13. Cut twice: July 22 and Sept 8. Variety: Du Puits.

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Hay. Seeds undersown in barley at 28 lb per acre: Apr 24, 1958. Basal PK compound applied: Feb 16, 1959. 'Nitra-Shell' applied: Mar 25. Cut: June 9.

2nd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 16, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3 and after every cut, except the last. Cut 4 times: May 25, June 25, Aug 8, Sept 16.

Grazed ley. Basal PK compound applied: Feb 14, 1959. 'Nitra-Shell' applied: June 1 and July 16. Grazed: 5 circuits, Apr 22 - Aug 8.

Lucerne. Basal PK compound applied: Feb 14, 1959. Cut 4 times: June 9, July 9, Aug 31, Nov 12.

Potatoes. Ploughed twice: June 16 and Nov 20, 1958. Ridged: Apr 14, 1959. Basal PK compound applied: Apr 23. Sulphate of ammonia and dung applied, potatoes planted: Apr 25. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 16, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3, and after every cut except the last. Cut 4 times: May 25, July 3, Aug 10, Sept 8.

Grazed ley. Basal PK compound applied: Feb 14, 1959. 'Nitra-Shell' applied: June 6 and July 16. Grazed: 7 circuits, Apr 26 - Aug 30.

Lucerne. Basal PK compound applied: Feb 14, 1959. Cut 3 times: June 9, July 9, Aug 31.

Oats. Ploughed: Oct 15, 1958. Seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK compound: Mar 13, 1959. 'Nitra-Shell' applied: Mar 14. First sowing damaged by birds. Resown: Apr 11. Combine harvested: Aug 17. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Sept 5 and Oct 20, 1958. Ploughed ley: Oct 11*. Seed combine drilled at $2\frac{3}{4}$ bushels per acre with basal PK compound: Oct 27. 'Nitra-Shell' applied: Mar 26, 1959. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 20. Combine harvested: Aug 15. Variety: Cappelle.

2nd Test Crop, Potatoes

Ploughed: Sept 5 and Nov 20, 1958. Ridged: Apr 14, 1959. Basal PK applied: Apr 23. Sulphate of ammonia, additional P and K and dung applied, potatoes planted: Apr 25. Earthed up: June 30. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 24. Sprayed with sulphuric acid, 15% BOV, at 100 gallons per acre: Sept 18. Lifted: Sept 30. Variety: Majestic.

*Note: Plots 85 and 86 were also ploughed on June 16, 1958 owing to failure of the lucerne.

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3rd Test Crop, Barley

Ploughed: Oct 15, 1958. Additional P and K applied: Jan 5, 1959. Ground chalk applied to blocks 10 and 11: Feb 9. Seed combine drilled at 2 bushels per acre with basal PK compound: Mar 14. 'Nitra-Shell' applied: Mar 16. Combine harvested: Aug 7. Variety: Proctor.

Permanent grasses. Basal PK compound applied to all plots: Feb 13 - 16, 1959.

9th year reseeded, 9th experimental year of permanent grass, Blocks 9 - 12.

Blocks 10 and 12. 'Nitra-Shell' applied: Mar 25, 1959. Cut for silage: June 6. 2nd dressing of 'Nitra-Shell' applied to permanent grass plots: July 20 and to reseeded plots: July 21. Grazed: 3 circuits, July 17 - Sept 9.

Blocks 9 and 11. 'Nitra-Shell' applied: June 9, 1959. 2nd dressing of 'Nitra-Shell' applied to permanent grass plots: July 23 and to reseeded plots: July 25. Grazed: 6 circuits, May 2 - Sept 11.

10th year reseeded, 10th experimental year of permanent grass, Blocks 5 - 8.

Blocks 7 and 8. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied: Mar 25, 1959. Cut for silage: June 6. 2nd application of 'Nitra-Shell' applied: July 16. Grazed: 3 circuits, July 9 - Sept 5.

Blocks 5 and 6. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied: June 6 and July 17, 1959. Grazed: 6 circuits, Apr 26 - Sept 7.

11th year reseeded, 11th experimental year of permanent grass, Blocks 1 - 4.

Blocks 1 and 3. 'Nitra-Shell' applied: Mar 25, 1959. Cut for silage: June 6. 2nd dressing of 'Nitra-Shell' applied: July 16. Grazed: 3 circuits, July 6 - Aug 28.

Blocks 2 and 4. 'Nitra-Shell' applied: June 1 and July 16, 1959. Grazed: 6 circuits, Apr 22 - Sept 1.

FOSTERS

1st year Treatment Crops

Cut grass. Ploughed twice: Sept 11 and Nov 19, 1958. Supplementary K applied: Nov 21. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied: Apr 10. Seeds sown at 33 lb per acre: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. Cut 3 times: July 3, Aug 7, Sept 16. 'Nitra-Shell' applied after each cut except the last.

Grazed ley. Ploughed twice: Sept 11 and Nov 19, 1958. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied: Apr 10. Seeds sown: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. 2nd application of 'Nitra-Shell': July 17. Grazed: 4 circuits, June 8 - Aug 17.

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Lucerne. Ploughed twice: Sept 11 and Nov 19, 1958. Supplementary K applied: Nov 21. Basal PK compound applied: Apr 8, 1959. Seeds sown at 28 lb per acre: Apr 11. Cut twice: July 7 and Sept 1.

Hay. Seeds undersown in barley at 28 lb per acre: Apr 24, 1958. Basal PK applied: Feb 17, 1959. 'Nitra-Shell' applied: Mar 25. Cut: June 4.

2nd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 17, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3 and after all cuts except the last. Cut 4 times: May 25, July 3, Aug 10, Sept 16.

Grazed ley. Basal PK compound applied: Feb 16. 'Nitra-Shell' applied: June 2 and July 17. Grazed: 5 circuits, Apr 23 - Aug 9.

Lucerne. Basal PK compound applied: Feb 16, 1959. Cut 4 times: June 8, July 7, Aug 28, Nov 12.

Potatoes. Ploughed twice: June 16 and Nov 19, 1958. Ridged: Apr 14, 1959. Dung, sulphate of ammonia and basal PK compound applied, potatoes planted: Apr 23. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 17, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3 and after each cut except the last. Cut 4 times: May 25, July 3, Aug 11, Sept 1.

Grazed ley. Basal PK compound applied: Feb 16, 1959. 'Nitra-Shell' applied: June 6 and July 17. Grazed: 6 circuits, Apr 27 - Aug 30.

Lucerne. Basal PK compound applied: Feb 16, 1959. Cut 3 times: June 8, July 7, Aug 28.

Oats. Ploughed: Oct 16, 1958. Seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK compound: Mar 13. 'Nitra-Shell' applied: Mar 14. Combine harvested: Aug 5. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Sept 11 and Oct 20, 1958. Ploughed leys: Oct 9. Seed drilled at $2\frac{3}{4}$ bushels per acre with basal PK compound: Oct 27. 'Nitra-Shell applied: Mar 26, 1959. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 20. Combine harvested: Aug 8. Variety: Cappelle.

2nd Test Crop, Potatoes

Ploughed twice: Sept 11 and Nov 19. Ridged: Apr 14, 1959. Dung, sulphate of ammonia, basal PK compound applied, potatoes planted: Apr 24. Earthed up: July 1. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 24. Sprayed with sulphuric acid, 15% BOV, at 100 gallons per acre: Sept 17. Haulms destroyed mechanically: Sept 26. Lifted: Sept 30. Variety: Majestic.

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3rd Test Crop, Barley

Ploughed: Oct 16, 1958. Additional P and K applied: Dec 15. Seed drilled at 2 bushels per acre with basal PK compound: Mar 14, 1959. 'Nitra-Shell' applied: Mar 16. Combine harvested: Aug 8. Variety: Proctor.

Permanent grasses. Basal PK compound applied to all plots: Feb 16 - 17, 1959.

9th year reseeded grass, Block 6, 10, 11, 12.

Blocks 6 and 10. 'Nitra-Shell' applied: Mar 25 and July 18 - 22, 1959. Cut for silage: June 4. Grazed: 2 circuits, July 14 - Aug 17.

Blocks 11 and 12. 'Nitra-Shell' applied: June 6 and July 17, 1959. Grazed: 6 circuits, May 1 - Sept 6.

10th year reseeded grass, Blocks 5, 7, 8, 9.

Blocks 5 and 9. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied Mar 25 and July 18 - 22, 1959. Cut for silage: June 4. Grazed 2 circuits, July 14 - Aug 21.

Blocks 7 and 8. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied: June 6, July 17, 1959. Grazed: 7 circuits, Apr 27 - Sept 4.

11th year reseeded grass, Blocks 1 - 4.

Blocks 1 and 2. 'Nitra-Shell' applied: Mar 25 and July 28, 1959. Cut for silage: June 4. Grazed: 2 circuits, July 22 - Aug 29.

Blocks 3 and 4. 'Nitra-Shell' applied: June 2 and July 17, 1959. Grazed: 6 circuits, Apr 23 - Sept 2.

Standard errors per plot. Test Crops.

Wheat, grain (at 85% dry matter).		Highfield:	4.13 cwt per acre or 8.7% (14 d.f.)
		Fosters:	3.94 cwt per acre or 8.6% (14 d.f.)
Potatoes, total tubers.	Highfield	$\frac{1}{4}$ plot:	0.702 tons per acre or 4.8% (14 d.f.)
		$\frac{1}{8}$ plot:	0.781 tons per acre or 5.3% (20 d.f.)
	Fosters	$\frac{1}{4}$ plot:	0.540 tons per acre or 4.1% (14 d.f.)
		$\frac{1}{8}$ plot:	0.224 tons per acre or 1.7% (20 d.f.)
Barley, grain (at 85% dry matter).		Highfield:	2.33 cwt per acre or 4.9% (15 d.f.)*
		Fosters:	2.14 cwt per acre or 4.6% (14 d.f.)

*1 missing value.

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59/Bb/1.6

Summary of Results

Wheat 1st test crop

N: cwt per acre	Treatment crops 1956 - 1958 Lucerne	Ley	Cut grass	Arable with hay	Mean
Grain (at 85% dry matter): cwt per acre					
Highfield					
Mean	47.3	48.5	47.8	45.6	47.3
To test crop					
0.3	45.6	48.4	45.5	42.6	45.5
0.6	49.0	48.6	50.2	48.6	49.1
Difference (±2.92)	+3.4	+0.2	+4.7	+6.0	+3.6 (±1.46)
To treatment crops					
Single rate		49.0	46.6	44.6	46.7
Double rate		48.0	49.1	46.6	47.9
Difference (±2.92)		-1.0	+2.5	+2.0	+1.2 (±1.69)
Fosters					
Mean	51.0	45.6	45.4	40.9	45.7
To test crop					
0.3	48.7	43.1	42.4	36.6	42.7
0.6	53.3	48.1	48.4	45.1	48.7
Difference (±3.10)	+4.6	+5.0	+6.0	+8.5	+6.0 (±1.55)
To treatment crops					
Single rate		44.7	47.0	39.7	43.8
Double rate		46.4	43.8	42.0	44.1
Difference (±3.10)		+1.7	-3.2	+2.3	+0.3 (±1.79)

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Wheat 1st test crop

N: cwt per acre	Excluding Lucerne: N to previous treatment crop: Single rate	Excluding Lucerne: N to previous treatment crop: Double rate	Excluding Lucerne: Mean	Arable with hay only: Dung to potatoes 1957: tons per acre: None	Arable with hay only: Dung to potatoes 1957: tons per acre: 12	Arable with hay only: Mean
Grain (at 85% dry matter): cwt per acre						
Highfield						
To test crop			(±1.68)			(±2.92)
0.3	45.2	45.7	45.5	41.9	43.3	42.6
0.6	48.3	50.0	49.1	47.9	49.3	48.6
Mean	46.7	47.9	47.3			
			(±1.19)			
To previous treatment crops						(±2.92)
Single rate				44.3	45.0	44.6
Double rate				45.5	47.7	46.6
Mean				44.9	46.3	45.6
					(±2.06)	
Mean dry matter % as harvested: 78.3						
Fosters						
To test crop			(±1.61)			(±2.79)
0.3	40.8	40.5	40.7	36.1	37.1	36.6
0.6	46.8	47.6	47.2	44.7	45.6	45.1
Mean	43.8	44.1	43.9			
			(±1.14)			
To previous treatment crops						(±2.79)
Single rate				37.6	41.9	39.7
Double rate				43.2	40.8	42.0
Mean				40.4	41.3	40.9
					(±1.97)	
Mean dry matter % as harvested: 85.6						

Wheat 1st test crop

N: cwt per acre	Treatment crops 1956 - 1958 Lucerne	Ley	Cut grass	Arable with hay	Mean
Straw (at 85% dry matter): cwt per acre					
Highfield					
Mean	53.5	46.9	41.7	36.9	44.7
To test crop					
0.3	51.3	46.5	38.6	34.4	42.7
0.6	55.7	47.2	44.9	39.5	46.8
Difference	+4.4	+0.7	+6.3	+5.1	+4.1
To treatment crops					
Single rate		47.7	41.8	36.5	44.9
Double rate		46.0	41.6	37.4	44.6
Difference		-1.7	-0.2	+0.9	-0.3
Fosters					
Mean	42.6	39.6	34.0	28.7	36.2
To test crop					
0.3	38.7	36.5	31.5	25.2	33.0
0.6	46.5	42.7	36.6	32.1	39.5
Difference	+7.8	+6.2	+5.1	+6.9	+6.5
To treatment crops					
Single rate		41.1	35.6	27.8	34.8
Double rate		38.0	32.5	29.5	33.3
Difference		-3.1	-3.1	+1.7	-1.5

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Wheat 1st test crop

N: cwt per acre	Excluding Lucerne: N to previous treatment crop Single rate	Excluding Lucerne: N to previous treatment crop Double rate	Excluding Lucerne: Mean	Arable with hay only: Dung to potatoes 1957: tons per acre None	Arable with hay only: Dung to potatoes 1957: tons per acre 12	Arable with hay only: Mean
Straw (at 85% dry matter): cwt per acre						
Highfield						
To test crop						
0.3	42.9	42.5	42.7	34.6	34.1	34.4
0.6	46.9	46.6	46.8	39.7	39.3	39.5
Mean	44.9	44.6	44.7			
To previous treatment crops						
single rate				37.6	35.4	36.5
Double rate				36.8	38.1	37.4
Mean				37.2	36.7	36.9

Mean dry matter % as harvested 89.2

Fosters

To test crop						
0.3	31.2	30.9	31.0	24.4	26.0	25.2
0.6	38.5	35.8	37.1	31.3	32.9	32.1
Mean	34.8	33.3	34.1			
To previous crop treatment crops						
Single rate				26.0	29.7	27.8
Double rate				29.8	29.2	29.5
Mean				27.9	29.5	28.7

Mean dry matter % as harvested: 91.5

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Potatoes 2nd test crop. Total tubers: tons per acre

	Treatment crops 1955-1957				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	14.74	14.77	15.67	13.64	14.70
N: cwt per acre					
0.5	14.92	15.06	15.80	13.23	14.75
1.0	14.57	14.49	15.54	14.05	14.66
Difference (±0.497)	-0.35	-0.57	-0.26	+0.82	-0.09 (±0.248)
Dung: tons per acre					
None	14.43	14.76	15.63	12.95	14.44
12	15.06	14.78	15.71	14.33	14.97
Difference (±0.497)	+0.63	+0.02	+0.08	+1.38	+0.53 (±0.248)
P_2O_5: cwt per acre*					
0.9	15.08	14.38	15.22	14.15	14.71
1.8	14.41	15.16	16.11	13.12	14.70
Difference (±0.391)	-0.67	+0.78	+0.89	-1.03	-0.01 (±0.195)
K_2O: cwt per acre*					
0.9	14.63	14.59	15.49	13.46	14.54
1.8	14.85	14.95	15.85	13.81	14.87
Difference (±0.391)	+0.22	+0.36	+0.36	+0.35	+0.33 (±0.195)
Fosters					
Mean	14.13	13.58	13.36	12.14	13.30
N: cwt per acre					
0.5	14.30	13.55	13.44	12.20	13.37
1.0	13.96	13.61	13.28	12.09	13.23
Difference (±0.382)	-0.34	+0.06	-0.16	-0.11	-0.14 (±0.191)
Dung: tons per acre					
None	13.09	12.58	12.58	11.22	12.37
12	15.17	14.58	14.13	13.06	14.24
Difference (±0.382)	+2.08	+2.00	+1.55	+1.84	+1.87 (±0.191)
P_2O_5: cwt per acre*					
0.9	13.99	13.53	13.11	11.72	13.08
1.8	14.28	13.63	13.61	12.57	13.52
Difference (±0.112)	+0.29	+0.10	+0.50	+0.85	+0.44 (±0.056)
K_2O: cwt per acre*					
0.9	13.88	13.67	12.95	12.18	13.17
1.8	14.38	13.49	13.77	12.10	13.44
Difference (±0.112)	+0.50	-0.18	+0.82	-0.08	+0.27 (±0.056)

*Including basal dressing

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Potatoes 2nd test crop. Total tubers: tons per acre

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Highfield						
N: cwt per acre						
0.5	14.38	15.12	14.81	14.69	14.65	14.85
1.0	14.50	14.82	14.61	14.71	14.44	14.88
Dung: tons per acre						
None			14.48	14.40	14.17	14.70
12			14.93	15.00	14.91	15.03
	(±0.248)		(1) and (2)		(1) and (2)	

Lucerne rotation only	K_2O: cwt per acre* 0.9	1.8	Mean
P_2O_5: cwt per acre*	(3) and (4)		
0.9	14.87	15.28	15.08
1.8	14.40	14.43	14.41
Mean	14.63	14.85	14.74

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Fosters						
N: cwt per acre						
0.5	12.46	14.29	13.13	13.62	13.24	13.51
1.0	12.28	14.19	13.04	13.43	13.10	13.37
Dung: tons per acre						
None			12.18	12.56	12.04	12.70
12			13.99	14.48	14.30	14.17
	(±0.191)		(1) and (2)		(1) and (2)	

Lucerne rotation only	K_2O: cwt per acre* 0.9	1.8	Mean
P_2O_5: cwt per acre*	(3) and (4)		
0.9	13.63	14.35	13.99
1.8	14.14	14.42	14.28
Mean	13.88	14.38	14.13

*Including basal dressing.

Highfield	Fosters	
(1) ±0.195	(1) ±0.056	for use in horizontal and interaction comparisons.
(2) ±0.223	(2) ±0.141	for use in all others.
(3) ±0.497	(3) ±0.382	for use only in testing the PK interaction.
(4) ±0.447	(4) ±0.282	for use in all other comparisons.

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Potatoes 2nd test crop. Percentage ware (1½" riddle)

	Treatment crops 1955-1957				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	87.9	87.9	91.6	90.6	89.5
N: cwt per acre					
0.5	87.8	87.0	91.1	89.6	88.9
1.0	88.1	88.8	92.1	91.5	90.1
Difference	+0.3	+1.8	+1.0	+1.9	+1.2
Dung: tons per acre					
None	87.5	86.6	91.2	88.9	88.5
12	88.3	89.2	92.0	92.3	90.4
Difference	+0.8	+2.6	+0.8	+3.4	+1.9
P_2O_5: cwt per acre*					
0.9	88.8	87.5	91.5	91.1	89.7
1.8	87.0	88.3	91.7	90.1	89.3
Difference	-1.8	+0.8	+0.2	-1.0	-0.4
K_2O: cwt per acre*					
0.9	87.2	87.4	91.8	89.7	89.0
1.8	88.6	88.4	91.4	91.4	89.9
Difference	+1.4	+1.0	-0.4	+1.7	+0.9
Fosters					
Mean	96.0	95.3	94.5	95.6	95.3
N: cwt per acre					
0.5	95.9	95.0	94.5	95.4	95.2
1.0	96.0	95.6	94.5	95.8	95.5
Difference	+0.1	+0.6	0.0	+0.4	+0.3
Dung: tons per acre					
None	95.7	94.7	93.3	95.2	94.7
12	96.3	95.9	95.6	96.0	95.9
Difference	+0.6	+1.2	+2.3	+0.8	+1.2
P_2O_5: cwt per acre*					
0.9	95.3	95.5	94.6	95.3	95.2
1.8	96.6	95.1	94.3	95.8	95.5
Difference	+1.3	-0.4	-0.3	+0.5	+0.3
K_2O: cwt per acre*					
0.9	96.0	95.1	94.2	96.1	95.3
1.8	96.0	95.5	94.8	95.1	95.3
Difference	0.0	+0.4	+0.6	-1.0	0.0

*Including basal dressing

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Potatoes 2nd test crop. Percentage ware ($1\frac{1}{2}$" riddle)

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Highfield						
N: cwt per acre						
0.5	87.5	90.2	89.2	88.5	88.4	89.4
1.0	89.6	90.7	90.2	90.0	89.7	90.5
Dung: tons per acre						
None			88.8	88.3	87.7	89.4
12			90.7	90.2	90.4	90.5

Lucerne rotation only

P_2O_5: cwt per acre*	K_2O: cwt per acre* 0.9	1.8	Mean
0.9	87.5	90.1	88.8
1.8	86.9	87.1	87.0
Mean	87.2	88.6	87.9

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Fosters						
N: cwt per acre						
0.5	94.5	95.9	94.8	95.6	94.9	95.4
1.0	94.9	96.0	95.6	95.4	95.7	95.2
Dung: tons per acre						
None			94.5	95.0	95.0	94.5
12			95.9	96.0	95.7	96.2

Lucerne rotation only

P_2O_5: cwt per acre*	K_2O: cwt per acre* 0.9	1.8	Mean
0.9	95.2	95.5	95.3
1.8	96.8	96.5	96.6
Mean	96.0	96.0	96.0

*Including basal dressing

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59/Bb/1.14

Barley 3rd test crop. Grain (at 85% dry matter): cwt per acre

	Treatment crops 1954-1956				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	46.4	48.1	46.7	49.9	47.8
N: cwt per acre					
None	47.5	49.2	46.6	49.0	48.1
0.2	45.3	47.1	46.7	50.7	47.5
Difference (±1.65)	-2.2	-2.1	+0.1	+1.7	-0.6 (±0.82)
Dung to potatoes 1958: tons per acre					
None	48.1	49.2	49.0	49.1	48.9
12	44.7	47.0	44.4	50.6	46.7
Difference (±1.65)	-3.4	-2.2	-4.6	+1.5	-2.2 (±0.82)
Fosters					
Mean	50.6	47.2	47.1	43.0	47.0
N: cwt per acre					
None	48.0	44.8	45.5	40.2	44.6
0.2	53.3	49.6	48.7	45.9	49.4
Difference (±1.51)	+5.3	+4.8	+3.2	+5.7	+4.8 (±0.76)
Dung to potatoes 1958: tons per acre					
None	50.7	46.1	46.3	41.9	46.2
12	50.6	48.3	47.9	44.2	47.7
Difference (±1.51)	-0.1	+2.2	+1.6	+2.3	+1.5 (±0.76)

	Highfield		Fosters	
	N: cwt per acre		N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1958: tons per acre	(±0.82)		(±0.76)	
None	49.5	48.3	43.8	48.7
12	46.7	46.6	45.4	50.1

Mean dry matter % as harvested:
Highfield: 84.5
Fosters: 85.7

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59/Bb/1.15

Barley 3rd test crop. Straw (at 85% dry matter): cwt per acre

	Treatment crops 1954-1956				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	39.1	37.6	34.9	33.8	36.3
N: cwt per acre					
None	32.3	35.6	33.1	30.8	33.0
0.2	46.0	39.6	36.6	36.7	39.7
Difference	+13.7	+4.0	+3.5	+5.9	+6.7
Dung to potatoes 1958: tons per acre					
None	39.9	37.4	33.5	32.3	35.7
12	38.4	37.8	36.2	35.3	36.9
Difference	-1.5	+0.4	+2.7	+3.0	+1.2
Fosters					
Mean	29.9	27.6	29.5	26.2	28.3
N: cwt per acre					
None	28.8	25.3	27.6	23.2	26.2
0.2	31.1	30.0	31.4	29.2	30.4
Difference	+2.3	+4.7	+3.8	+6.0	+4.2
Dung to potatoes 1958: tons per acre					
None	29.8	28.5	30.2	24.6	28.3
12	30.0	26.8	28.8	27.9	28.4
Difference	+0.2	-1.7	-1.4	+3.3	+0.1

	Highfield		Fosters	
	N: cwt per acre		N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1958: tons per acre				
None	33.3	38.2	25.9	30.6
12	32.6	41.2	26.5	30.3

Mean dry matter % as harvested:
Highfield: 91.4
Fosters: 89.9

https://doi.org/10.23637/ERADOC-1-179

59/Bb/1.16

Treatment crops Arable and Hay rotation

(values based on mean of 2 sub plots only)

	Highfield N: cwt per acre applied in 1959			Fosters N: cwt per acre applied in 1959		
	Single rate	Double rate	Mean	Single rate	Double rate	Mean
Hay (dry matter): cwt per acre						
No dung	60.2	60.4	60.3	60.1	58.3	59.2
Dung in 1957	54.4	67.7	61.0	61.7	76.2	68.9
Mean	57.3	64.0	60.7	60.9	67.3	64.1
Potatoes, total tubers: tons per acre						
No dung	10.49	11.45	10.97	11.73	10.33	11.03
Dung in 1959	12.25	14.47	13.36	12.57	11.73	12.15
Mean	11.37	12.96	12.17	12.15	11.03	11.59
Potatoes, percentage ware ($1\frac{1}{2}$" riddle)						
No dung	89.4	88.0	88.7	96.4	92.9	94.6
Dung in 1959	89.8	94.8	92.3	94.1	95.5	94.8
Mean	89.6	91.4	90.5	95.2	94.2	94.7
Oats						
	None	0.2		0.2	0.4	
Grain (at 85% dry matter): cwt per acre						
No dung	16.7	16.4	16.6	42.6	42.4	42.5
Dung in 1958	15.5	16.0	15.8	43.2	43.6	43.4
Mean	16.1	16.2	16.2	42.9	43.0	42.9
Straw (at 85% dry matter): cwt per acre						
No dung	15.7	20.0	17.8	29.6	30.4	30.0
Dung in 1958	18.6	20.9	19.8	25.8	30.0	27.9
Mean	17.2	20.4	18.8	27.7	30.2	28.9

Highfield, Oats, Mean dry matter % as harvested Grain: 78.4 Straw: 84.8
Fosters, Oats, Mean dry matter % as harvested Grain: 81.6 Straw: 88.8

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Cut grass. Dry matter: cwt per acre

1st year	Highfield N to previous 3 test crops: Single rate	Highfield N to previous 3 test crops: Double rate	Highfield Dung to potatoes 1957: tons per acre: None	Highfield Dung to potatoes 1957: tons per acre: 12	Highfield Mean	Fosters N to previous 3 test crops: Single rate	Fosters N to previous 3 test crops: Double rate	Fosters Dung to potatoes 1957: tons per acre: None	Fosters Dung to potatoes 1957: tons per acre: 12	Fosters Mean
N (1) to cut grass (3 cuts)										
Single rate	40.3	39.0	36.5	42.9	39.7	21.7	24.8	22.9	23.5	23.2
Double rate	42.7	44.4	42.7	44.3	43.5	25.0	26.6	24.9	26.7	25.8
N: test crops										
Single rate			39.5	43.5	41.5			23.0	23.6	23.3
Double rate			39.7	43.7	41.7			24.8	26.6	25.7
Mean			39.6	43.6	41.6			23.9	25.1	24.5

	Highfield N to cut grass (1): Single rate	Highfield N to cut grass (1): Double rate	Highfield Mean	Fosters N to cut grass (1): Single rate	Fosters N to cut grass (1): Double rate	Fosters Mean
2nd year (4 cuts)	54.8	70.8	62.8	42.9	58.7	50.8
3rd year (4 cuts)	43.4	60.2	51.8	52.8	63.1	58.0

(1) 0.15 v. 0.3 cwt N as 'Nitro-Chalk' for every cut

Corrective dressing of K_2O cwt per acre to cut grass 1st year:
Highfield: 3.5
Fosters: 4.0

59/Bb/1.17

Lucerne. Dry Matter: cwt per acre

1st Year (2 cuts)	Highfield N to 3 previous test crops Single rate	Highfield N to 3 previous test crops Double rate	Highfield Mean	Fosters N to 3 previous test crops Single rate	Fosters N to 3 previous test crops Double rate	Fosters Mean
Dung to potatoes 1957						
None	32.0	32.5	32.2	37.3	36.2	36.7
12 tons	36.4	34.1	35.2	38.3	37.6	37.9
Mean	34.2	33.3	33.7	37.8	36.9	37.3
2nd year (4 cuts)			98.6			110.3
3rd year (3 cuts)			58.0			70.2

Grazed Ley. Dry matter: cwt per acre (estimated from sample cuts)

	Highfield N: cwt per acre (yearly) 0.15	Highfield N: cwt per acre (yearly) 0.30	Highfield Mean	Fosters N: cwt per acre (yearly) 0.15	Fosters N: cwt per acre (yearly) 0.30	Fosters Mean
1st year	13.8	16.6	15.2	9.2	11.5	10.3
2nd year	15.5	21.2	18.4	15.6	16.1	15.9
3rd year	21.4	27.5	24.5	23.0	20.9	22.0

Corrective dressing of K_2O cwt per acre to Lucerne 1st year:
Highfield: 3.0
Fosters: 4.0

https://doi.org/10.23637/ERADOC-1-179

Reseeded Grass. Dry matter: cwt per acre

	Cut for silage N			Grazed Estimated from sampling cuts N		
	Single rate	Double rate	Mean	Single rate	Double rate	Mean
Highfield						
9th exptl. year						
Blocks 9 and 11				25.8	23.7	24.7
Blocks 10 and 12	37.2	40.3	38.7	18.4*	20.5*	19.5*
10th exptl. year						
Blocks 5 and 6				21.8	22.1	22.0
Blocks 7 and 8	47.6	58.2	52.9	14.2*	13.8*	14.0*
11th exptl. year						
Blocks 2 and 4				19.7	21.4	20.5
Blocks 1 and 3	48.7	54.5	51.6	16.2*	19.4*	17.8*
Fosters						
9th exptl. year						
Blocks 11 and 12				29.6	34.2	31.9
Blocks 6 and 10	39.4	43.0	41.2	11.0*	11.3*	11.2*
10th exptl. year						
Blocks 7 and 8				23.5	28.2	25.8
Blocks 5 and 9	47.3	46.5	46.9	8.5*	8.9*	8.7*
11th exptl. year						
Blocks 3 and 4				32.4	32.9	32.6
Blocks 1 and 2	52.6	53.0	52.8	10.9*	14.1*	12.5*

Corrective dressing of K_2O cwt per acre to Reseeded Grass 10th experimental year: Highfield Blocks 6 and 7; Fosters Blocks 8 and 9: 3.0

Permanent Grass. Dry matter: cwt per acre

Highfield						
9th exptl. year						
Blocks 9 and 11				19.3	21.7	20.5
Blocks 10 and 12	40.3	46.5	43.4	12.7*	14.1*	13.4*
10th exptl. year						
Blocks 5 and 6				14.8	18.4	16.6
Blocks 7 and 8	35.3	42.4	38.8	19.3*	18.2*	18.8*
11th exptl. year						
Blocks 2 and 4				18.6	25.2	21.9
Blocks 1 and 3	43.0	51.4	47.2	20.1*	19.9*	20.0*

* Aftermath grazing.

Corrective dressing of K_2O cwt per acre to Permanent Grass 10th experimental year. Highfield Blocks 6 and 7: 2.5

https://doi.org/10.23637/ERADOC-1-179

REFERENCE PLOTS

The effects of N P K and Dung on a sequence of five arable crops and on permanent grass - Great Field IV 1959.

From 1959 cropping year onwards dung is applied only to the root crops of the rotation. The rate of dressing is now 20 tons per acre for these two crops.

Permanent grass still has an annual dressing of dung at 15 tons per acre.

Area of each plot: 0.0013 acres.

Cultivations, etc.:

Winter wheat. Dug by hand: Sept 17, 1958. PK applied, seed drilled: Oct 17. First N dressing applied: Mar 2, 1959. Second N dressing applied: May 1. Harvested: July 31. Variety: Cappelle.

Kale. Dung applied, plots dug by hand: Nov 19, 1958. N P and K applied, seed sown: Apr 3, 1959. Harvested: Nov 17. Variety: Thousand head.

Barley. Dug by hand: Nov 10, 1958. N P and K applied, seed drilled and undersown: Apr 2, 1959. Harvested: July 27. Variety: Proctor.

Grass - clover ley. Undersown in barley: Mar 25, 1958. N P and K applied: Mar 2, 1959. Cut three times: Oct 30, 1958, June 6 and Aug 13, 1959. Varieties: S22 ryegrass and Giant Hybrid red clover.

Potatoes. Dung applied, plots dug by hand: Dec 1, 1958. N P and K applied on flat, setts planted: Apr 2, 1959. Harvested: Sept 14. Variety: King Edward.

Permanent grass. Dung applied: Dec 2, 1958. First N dressing and PK applied: Feb 17, 1959. Second N dressing applied: June 2. Cut twice: June 2 and Sept 24.

For details of the previous years results see "Results of the Field Experiments" 58/Bc/1 in which the rates of N P and K are given.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Treatment	Wheat cwt per acre (at 85% D.M.)		Barley cwt per acre (at 85% D.M.)		Ley (dry matter) cwt per acre			Total	Potatoes tons per acre	Kale tons per acre	Permanent grass cwt per acre (dry matter)		
	Grain	Straw	Grain	Straw	1st cut	2nd cut	3rd cut		Total tubers	Total weight	1st cut	2nd cut	Total
None	44.9	48.4	21.3	16.8	9.0	31.1	11.7	51.8	3.46	6.49	30.3	11.2	41.5
N_1	52.1	57.5	18.4	14.4	9.9	38.9	10.9	59.7	4.38	11.14	28.6	11.4	40.0
P	49.8	55.5	30.8	28.4	9.4	33.1	11.9	54.4	6.43	6.75	29.2	12.3	41.5
N_1P	53.2	66.1	29.2	24.9	9.4	41.5	13.1	64.0	4.14	15.17	36.9	13.3	50.2
K	46.8	57.4	27.9	23.3	11.4	42.6	25.5	79.5	7.28	4.71	27.5	11.1	38.6
N_1K	47.4	57.5	31.1	25.2	10.8	46.1	20.4	77.3	7.84	11.87	56.8	17.7	74.5
PK	52.5	76.1	29.3	26.2	14.4	47.3	27.3	89.0	8.72	7.86	47.4	14.1	61.5
N_1PK	59.6	80.7	34.0	29.3	15.0	65.1	18.8	98.9	12.14	11.80	50.8	16.6	67.4
N_2PK	47.2	89.9	36.6	31.9	14.7	62.8	13.9	91.4	14.80	18.73	54.7	21.7	76.4
D	51.3	65.3	30.5	26.8	15.6	53.0	23.0	91.6	16.06	10.42	55.9	11.6	67.5
N_1PKD	60.1	82.6	35.1	29.9	16.3	65.0	23.8	105.1	20.11	16.10	54.7	23.1	77.8
N_2PKD	52.7	77.6	41.5	42.0	16.2	66.7	19.9	102.8	19.46	24.09	71.4	29.0	100.4
Mean dry matter % as harvested:	68.6	54.6	69.8	51.8	16.1	28.0	30.0	24.7			25.5	40.4	33.0

59/Bc/1.2

59/Bd/1.1

GREEN MANURING EXPERIMENT

Woburn Stackyard - 1959, the 6th year of the revised scheme.

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956. In 1959 the barley was combine harvested for the first time, yields being estimated from one combine cut per plot. Weights of straw were not recorded.

Area of each plot (acres): 0.0406. Area harvested: Potatoes - 0.0221; barley - 0.0301.

Cultivations, etc.:

Green manures after barley 1958 (for early potatoes 1959): Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, undersown: Apr 29, 1958. Varieties: Trefoil - English; Ryegrass - Western Wolths.

Early potatoes: Straw applied: Sept 25, 1958. "Fallow" plots ploughed: Sept 26 and Nov 26. All plots ploughed: Feb 6, 1959. Basal fertilizer and 'Nitra-Shell' applied, potatoes mechanically planted: Mar 25. Earthed up: June 12. Sprayed with dieldrin at 2 pints in 40 gallons per acre: June 26. Lifted: July 21. Variety: Ulster Chieftain.

Green manures after early potatoes 1958 (for barley 1959): Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, sown: Aug 1, 1958. Varieties: Trefoil - English; Ryegrass - Western Wolths.

Barley: "Fallow" plots and "early" green manure plots ploughed: Oct 23, 1958. "Late" green manure plots ploughed: Feb 5, 1959. Ground chalk applied at 18 cwt per acre: Feb 9. 'Nitra-Shell' applied: Mar 12. Seed drilled at 3 bushels per acre: Mar 13. Trefoil and ryegrass undersown: Mar 12, failed and resown: Aug 7. Combine harvested: Aug 4. Variety: Herta.

Standard errors per plot:

Potatoes. Total tubers: 0.523 tons per acre or 12.5% (18 d.f.)

Barley. Grain (at 85% D.M): 3.00 cwt per acre or 12.1% (20 d.f.)

Estimates of produce (roots and tops) of green manure crops: cwt per acre

	Green manures	Ploughed in	Dry matter	Nitrogen
For early potatoes	Trefoil		20.9	0.672
	Ryegrass		26.8	0.352
For barley	Trefoil	Early	20.1	0.629
	Ryegrass	Early	33.0	0.462
	Trefoil	Late	14.7	0.453
	Ryegrass	Late	44.1	0.595

https://doi.org/10.23637/ERADOC-1-179

59/Bd/1.2

Summary of Results

Early potatoes, total tubers: tons per acre

	Straw: tons per acre		N: cwt per acre (including basal)		Dung to cabbages 1953: tons per acre		Mean
	None	1½	0.6	1.2	None	10	
Excluding plots fallow under old scheme							
Undersown green manures for potatoes	(±0.185)		(±0.185)		(±0.185)		(±0.131)
None	4.12	4.05	4.01	4.16	4.02	4.15	4.08
	(±0.262)		(±0.262)		(±0.262)		(±0.185)
Trefoil	4.21	4.40	4.37	4.24	4.22	4.38	4.30
Ryegrass	4.63	4.86	4.88	4.61	4.28	5.22	4.74
Straw: tons per acre			(±0.185)		(±0.185)		(±0.131)
None			4.24	4.29	4.09	4.44	4.27
1½			4.39	4.29	4.18	4.50	4.34
N: cwt per acre (including basal)							
0.6					4.10	4.54	4.32
1.2					4.17	4.41	4.29
Mean (±0.131)					4.13	4.47	4.30
Plots fallow under old scheme							
Straw: tons per acre			(±0.370)		(±0.370)		(±0.262)
None			3.52	3.56	3.42	3.66	3.54
1½			3.96	4.07	3.84	4.19	4.02
N: cwt per acre (including basal)							
0.6					3.58	3.90	3.74
1.2					3.68	3.95	3.82
Mean (±0.262)					3.63	3.92	3.78

	Undersown green manures for potatoes				
	None	None	Trefoil	Ryegrass	
Old scheme	Fallow	Excluding fallow			Mean
	3.78 (±0.185)	4.08 (±0.131)	4.30 (±0.185)	4.74	4.20

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Barley, Grain (at 85% dry matter): cwt per acre

	Green manures: In barley for potatoes		Green manures: After potatoes for barley		N: cwt per acre (including basal)		Dung to cabbages 1952: tons per acre		
	None	Undersown	Trefoil	Ryegrass	0.23	0.46	None	10	Mean
Excluding plots fallow under old scheme									
Green manures ploughed in	(±1.06)		(±1.06)		(±1.06)		(±1.06)		(±0.75)
Early	22.1	24.4	23.1	23.4	21.6	24.9	22.4	24.1	23.2
Late	26.7	30.0	30.0	26.7	25.6	31.1	27.6	29.1	28.4
Green manures in barley for potatoes									
None			25.3	23.5	22.5	26.3	23.4	25.4	24.4
Undersown			27.8	26.5	24.6	29.8	26.5	27.9	27.2
Green manures after potatoes for barley									
Trefoil					25.8	27.3	25.4	27.8	26.6
Ryegrass					21.3	28.7	24.6	25.5	25.0
N: cwt per acre (including basal)									
0.23							22.5	24.7	23.6
0.46							27.4	28.6	28.0
Mean (±0.75)							25.0	26.6	25.8

Plots fallow under old scheme

Old scheme	Green manures after potatoes for barley: None Fallow	Trefoil (Excluding fallow)	Ryegrass (Excluding fallow)	Mean
	20.7 (±1.06)	26.6	25.0 (±0.75)	24.8

N: cwt per acre (including basal)			
	(±2.12)		(±1.50)
0.23	13.2	19.3	16.3
0.46	26.2	24.0	25.1
Mean (±1.50)	19.7	21.6	20.7

Mean dry matter % as harvested: 84.4

59/Ba/1.3

59/Be/1.1

LEY AND ARABLE ROTATIONS

Woburn Stackyard 1959 - the 22nd year.

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956.

Combine harvesting: In 1959 the combine harvester was introduced for barley and rye; the whole plot area was harvested for yield estimates.

Cultivations, etc.,

Treatment crops

Ley rotations

Ley 1st year. Ploughed twice: Sept 17 and Nov 21, 1958. PK fertilizers and 'Nitra-Shell' applied: Mar 31, 1959. Seed sown at 40 lb per acre: Apr 7. Sprayed with DNBP at 9 pints in 80 gallons per acre: June 4. 'Nitra-Shell' applied: 2nd dressing - Aug 31; 3rd dressing - Oct 7. Grazed 3 circuits: June 30 - Oct 30. Seeds mixture: 20 lb S24 Perennial Ryegrass, 11 lb S143 Cocksfoot, 6 lb Late Flowering Red Clover, 3 lb S100 White Clover per acre.

Ley 2nd year. Potash and nitrogen fertilizer applied: Mar 17, June 10 and Aug 31. Grazed 5 circuits: Apr 22 - Aug 29.

Ley 3rd year. Potash and nitrogen fertilizer applied: Mar 17, June 10 and Aug 31. Grazed 5 circuits: Apr 14 - Aug 21.

Lucerne 1st year. Ploughed twice: Sept 17 and Nov 21, 1958. PK fertilizer applied: Mar 31. Seed sown at 25 lb per acre: Apr 7.* Sprayed with dieldrin at 2 pints in 40 gallons per acre against birds: June 4. Cut twice: July 10, Sept 2. Variety: Du Puits.

Lucerne 2nd year. Muriate of potash applied: Apr 13. Cut 3 times: June 12, July 10, Sept 2.

Lucerne 3rd year. Plots 3, 4, 9 and 10 were fallowed because of stem eelworm and received no potash. Ploughed: Apr 30, June 13, Sept 2, 1959.

Arable rotations

Potatoes 1st course. Ploughed twice: Sept 17 and Nov 21, 1958. Compound fertilizer applied: Mar 31, 1959. Potatoes machine planted: Apr 1. Earthed up: June 22. Sprayed with zineb at 2 lb and demeton methyl (against aphids) at 12 fluid oz (50% active ingredients) in 40 gallons per acre: Aug 15. Haulm destroyed mechanically: Sept 22. Lifted: Sept 30. Variety: Majestic.

Rye 2nd course. Ploughed: Oct 16, 1958. Seed drilled at $2\frac{1}{2}$ bushels per acre: Oct 21. 'Nitra-Shell' applied: Apr 13, 1959. Seeds hay mixture undersown on 4 plots: Apr 7. Combine harvested: Aug 18. Variety: King II.

*Sprayed with dieldrin at 2 pints in 40 gallons per acre against weevil: Apr 30.

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Seeds hay 3rd course. Seeds undersown at 30 lb per acre in rye: Apr 19, 1958. Potash and nitrogen fertilizer applied: Mar 17, 1959. Cut once: May 29. 'Nitra-Shell' applied: June 2. Seeds mixture: 19 lb S24 Perennial Ryegrass, 9 lb Late Flowering Red Clover, 2 lb Alsike American per acre.

Carrots 3rd course. Ploughed twice: Sept 15 and Nov 21, 1958. Potash and nitrogen fertilizers applied: Apr 7, 1959. Seed drilled at 5 lb per acre: Apr 14. Sprayed with dieldrin against carrot fly at 2 pints in 40 gallons per acre: June 4 and June 26. Lifted (2 rows per plot): Oct 28. Variety: Scarlet Intermediate.

Test crops

Sugar beet 1st test crop. Dung applied: Nov 19, 1958. Ploughed: Nov 20. Treatment fertilizers applied: Apr 3, 1959. Basal compound fertilizers applied, seed drilled at 12 lb per acre: Apr 6. Sprayed with dieldrin against mangold fly at 2 pints in 40 gallons per acre: May 26. Sprayed with demeton methyl against virus yellow at 12 fluid oz (50% active ingredients) in 40 gallons per acre: June 3 and June 20. Singled: May 26. Lifted: Nov 4. Variety: Klein E.

Barley 2nd test crop. Ground chalk applied at 18 cwt per acre: Dec 24, 1958. Ploughed: Jan 5 - Jan 23, 1959. Muriate of potash applied to sub plots to equalize treatment dressings to 1958 sugar beet test crop; 'Nitra-Shell' applied: Mar 1. Seed drilled at 3 bushels per acre: Mar 13. Combine harvested: Aug 5. Variety: Herta.

Standard errors per plot. Test crops.

Sugar beet.	Total sugar.	Whole plot:	10.10 cwt per acre or 21.0% (4 d.f.)
		½ plot:	6.70 cwt per acre or 14.0% (4 d.f.)
		⅛ plot:	3.68 cwt per acre or 7.7% (24 d.f.)
	Tops	Whole plot:	1.614 tons per acre or 19.9% (4 d.f.)
		½ plot:	1.453 tons per acre or 17.9% (4 d.f.)
		⅛ plot:	0.834 tons per acre or 10.3% (24 d.f.)
Barley.	Grain (at 85% dry matter)	Whole plot:	0.78 cwt per acre or 2.2% (4 d.f.)
		½ plot:	2.05 cwt per acre or 5.9% (4 d.f.)

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Summary of Results

Treatment crops

Ley, sheep days of grazing per acre

1st year	2nd year	3rd year
566	1066	1253

Lucerne, yield of hay (at 85% dry matter): cwt per acre

	1st cut	2nd cut	3rd cut	Total
1st year				
Dung in 1957: tons per acre				
None	9.8	25.8		35.6
15	13.7	29.0		42.7
Difference	+3.9	+3.2		+7.1
Previous rotation				
Lucerne	10.8	28.6		39.4
Arable with roots	12.6	26.1		38.7
Mean	11.7	27.4		39.1
2nd year				
Dung in 1956: tons per acre				
None	21.3	6.6	11.0	38.9
15	32.8	10.4	13.8	57.0
Difference	+11.5	+3.8	+2.8	+18.1
Previous rotation				
Lucerne	22.2	6.3	10.0	38.5
Arable with hay	32.0	10.7	14.7	57.4
Mean	27.1	8.5	12.4	48.0

Treatment crops

	Potatoes		Rye	
	Total tubers: tons per acre	Percentage ware ($1\frac{5}{8}$" riddle)	Grain: (at 85% D.M.) cwt per acre	Straw: (at 85% D.M.) cwt per acre
Dung: tons per acre				
None	11.91	79.0	32.6	34.0
15*	12.49	81.4	35.7	36.4
Difference	+0.58	+2.4	+3.1	+2.4
Previous rotation				
Ley	14.57	84.5	34.8	36.4
Lucerne	12.68	83.9	36.2	36.2
Arable with hay	10.90	76.2	34.2	34.5
Arable with roots	10.64	76.2	31.4	33.8
Mean	12.20	80.2	34.1	35.2

Hay

Yield (at 85% dry matter): cwt per acre

Dung in 1955: tons per acre	
None	58.2
15	61.5
Difference	+3.3
Previous rotation	
Ley	69.3
Arable with hay	50.4
Mean	59.8

Carrots

	Roots washed: tons per acre	Tops tons per acre
Dung in 1955: tons per acre		
None	5.84	2.36
15	6.28	2.42
Difference	0.44	0.06
Previous rotation		
Lucerne	6.91	2.83
Arable with roots	5.22	1.96
Mean	6.06	2.39

*Dung applied: Potatoes for test crop sugar beet in 1957.
Rye - for test crop sugar beet in 1956.

https://doi.org/10.23637/ERADOC-1-179

1st Test crop

Sugar beet

Previous rotation

	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Roots (washed): tons per acre					
Mean	15.88	13.56	12.12	13.00	13.64
Dung: tons per acre					
None	15.43	12.62	10.24	12.04	12.58
15	16.33	14.50	14.01	13.96	14.70
Difference	+0.90	+1.88	+3.77	+1.92	+2.12
Response to additional 0.72 cwt N per acre					
No dung	-2.88	-0.81	-0.70	-1.12	-1.38
Dung 15 tons per acre	-0.14	-0.38	-0.69	+0.01	-0.30
Response to additional 0.9 cwt K_2O per acre					
No dung	+0.88	+1.62	+0.12	+0.74	+0.84
Dung 15 tons per acre	+1.59	+0.58	+0.81	+0.92	+0.97
Sugar Percentage					
Mean	17.4	17.4	17.6	17.8	17.5
Dung: tons per acre					
None	17.6	17.4	17.6	17.7	17.6
15	17.2	17.4	17.5	18.0	17.5
Difference	-0.4	0.0	-0.1	+0.3	-0.1
Response to additional 0.72 cwt N per acre					
No dung	-1.2	-1.2	-1.2	-0.9	-1.1
Dung 15 tons per acre	-0.8	-0.6	-0.6	-0.5	-0.6
Response to additional 0.9 cwt K_2O per acre					
No dung	+0.4	+0.6	0.0	+0.9	+0.5
Dung 15 tons per acre	-0.2	+0.2	+0.2	+0.1	+0.1

1st Test Crop

Sugar beet

Previous rotation

	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Total sugar: cwt per acre					
Mean (±7.14)	55.4	47.4	42.5	46.5	48.0
Dung: tons per acre					
None (±7.89)*	54.6	44.3	36.1	42.8	44.5
15	56.2	50.5	49.0	50.2	51.5
Difference (±6.70)	+1.6	+6.2	+12.9	+7.4	+7.0
					(±3.35)
Response to additional 0.72 cwt N per acre		(±2.60)			(±1.30)
No dung	-13.8	-5.9	-4.9	-6.0	-7.7
Dung 15 tons per acre	-3.4	-3.2	-4.2	-1.6	-3.1
Response to additional 0.9 cwt K_2O per acre		(±2.60)			(±1.30)
No dung	+4.2	+7.2	+0.4	+4.6	+4.1
Dung 15 tons per acre	+5.0	+2.4	+3.2	+3.8	+3.6
Tops: tons per acre					
Mean (±1.142)	8.64	8.46	7.69	7.69	8.12
Dung: tons per acre					
None (±1.353)*	8.75	8.54	7.27	8.17	8.18
15	8.54	8.37	8.10	7.20	8.05
Difference (±1.453)	-0.21	-0.17	+0.83	-0.97	-0.13
					(±0.726)
Response to additional 0.72 cwt N per acre		(±0.590)			(±0.295)
No dung	-0.26	+1.70	+0.54	+0.38	+0.59
Dung 15 tons per acre	+1.12	-0.23	+0.34	+0.21	+0.36
Response to additional 0.9 cwt K_2O per acre		(±0.590)			(±0.295)
No dung	+1.08	+1.58	+0.60	+0.63	+0.97
Dung 15 tons per acre	+0.65	+0.95	+0.46	-0.53	+0.38

*For use in horizontal and diagonal comparisons only.

https://doi.org/10.23637/ERADOC-1-179

1st Test Crop

Sugar beet

Plots receiving no additional N or K

Dung: tons per acre		Previous rotation: Ley	Lucerne	Arable with hay	Arable with roots	Mean
Roots (washed): tons per acre						
Mean		15.98	13.16	12.48	13.50	13.78
None		16.52	12.44	10.54	12.98	13.12
15		15.44	13.89	14.42	14.01	14.44
Difference		-1.08	+1.45	+3.88	+1.03	+1.32
Sugar percentage						
Mean		17.9	17.8	18.0	18.2	18.0
None		18.0	17.8	18.1	18.0	18.0
15		17.7	17.9	17.9	18.4	18.0
Difference		-0.3	+0.1	-0.2	+0.4	0.0
Total sugar: cwt per acre						
Mean	(±5.80)	57.3	47.1	44.8	49.2	49.6
None	(±7.73)*	59.7	44.6	38.1	46.7	47.3
15	(±7.73)*	54.8	49.6	51.6	51.6	51.9
Difference	(±7.42)	-4.9	+5.0	+13.5	+4.9	+4.6
Tops: tons per acre						
Mean	(±1.023)	7.96	7.15	7.24	7.80	7.54
None	(±1.363)*	8.23	7.01	6.76	8.00	7.50
15	(±1.363)*	7.70	7.29	7.73	7.61	7.58
Difference	(±1.622)	-0.53	+0.28	+0.97	-0.39	+0.08

*For use in horizontal and diagonal comparisons only.

2nd Test Crop

Barley

Dung in 1958: tons per acre		Previous rotation: Ley	Lucerne	Arable with hay	Arable with roots	Mean
Grain (at 85% dry matter): cwt per acre						
None	(±1.17)*	36.1	33.9	36.0	33.6	34.9
15		34.2	31.5	36.5	36.5	34.7
Mean	(±0.55)	35.2	32.7	36.2	35.0	34.8
Difference	(±2.05)	-1.9	-2.4	+0.5	+2.9	-0.2 (±1.02)
Straw (at 85% dry matter): cwt per acre						
None		26.7	24.2	22.9	22.3	24.0
15		30.0	28.9	27.9	28.1	28.7
Mean		28.4	26.5	25.4	25.2	26.3
Difference		+3.3	+4.7	+5.0	+5.8	+4.7

*For use in horizontal and diagonal comparisons only.

59/Bf/1.1

WOBURN MARKET GARDEN EXPERIMENT

Organic manures and nitrogen - Lansome Field 1959, the 18th year.

For treatments etc., see "Details of the Classical and Long Term Experiments" 1956.

Note: The results for the 1959-60 leeks will be included in the 1960 report.

Area of each plot (acres): 0.0125. Area harvested: Leeks - 0.0104; globe beet - 0.0104; early potatoes - 0.0084.

Cultivations, etc.:

Leeks 1958-59. Organic manures applied: July 25, 1958. Ploughed: July 28. 'Nitro-Chalk' and basal fertilizers applied: July 30. Planted: Aug 1. Second dressing of 'Nitro-Chalk' applied: Sept 18. Harvested: Mar 4 - Apr 15, 1959. Variety: Musselburgh.

Early potatoes. Ploughed: Sept 24 and Nov 27, 1958. Organic manures applied: Nov 27. Fertilizers applied on the flat: Mar 24, 1959. Machine planted: Mar 27. Earthed up: June 3. Lifted: July 14. Variety: Arran Pilot.

Globe beet. Ground chalk at 18 cwt per acre applied: Apr 16, 1959. Organic manures applied, ploughed: Apr 20. 'Nitra-Shell' and basal fertilizers applied: Apr 29. Seed drilled at 14 lb per acre: May 6. Sprayed with dieldrin at 2 pints in 40 gallons per acre: May 14. Singled: June 8 - 17. Second dressing of 'Nitra-Shell' applied: June 19. Harvested: July 22 - Sept 3. Variety: Detroit.

Standard errors per plot:

Leeks 1958-59.	Saleable produce:	0.552 tons per acre or 10.0%	(17 d.f.)
Early potatoes.	Total tubers:	0.560 tons per acre or 10.2%	(17 d.f.)
Globe beet.	Saleable bulbs:	1.112 tons per acre or 14.2%	(17 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Organic manures	Level of manuring: tons per acre	N: cwt per acre None	0.3	0.6	0.9	Mean
Leeks 1958-59. Saleable produce: tons per acre						
			(±0.390)			(±0.276)
None		1.80	4.04	4.40	4.67	2.92*
Dung	10	5.61	6.18			5.90
	20	6.33	6.64			6.48
Sludge compost	10	5.86	6.13			6.00
	20	6.02	6.19			6.11
Sludge	10	5.33	5.75			5.54
	20	5.61	5.19			5.40
Vegetable compost	10	5.38	6.11			5.75
	20	6.16	6.49			6.32
Mean (±0.138)		5.79+	6.08+			5.49**
Leeks 1958-59. Percentage saleable (by number)						
None		68.5	96.6	97.4	96.8	82.6*
Dung	10	98.2	99.1			98.6
	20	99.1	97.6			98.4
Sludge compost	10	96.5	99.3			97.9
	20	98.7	97.4			98.0
Sludge	10	99.2	97.4			98.3
	20	98.0	97.6			97.8
Vegetable compost	10	98.6	98.3			98.4
	20	98.6	97.6			98.1
Mean		98.4+	98.0+			96.5**
Early potatoes. Total tubers: tons per acre						
			(±0.396)			(±0.280)
None		2.82	4.31	4.96	4.34	3.56*
Dung	10	4.63	6.00			5.32
	20	6.40	6.28			6.34
Sludge compost	10	5.68	5.35			5.52
	20	6.55	7.81			7.18
Sludge	10	5.21	5.30			5.25
	20	5.38	6.43			5.90
Vegetable compost	10	4.58	4.98			4.78
	20	5.68	6.90			6.29
Mean (±0.140)		5.51+	6.13+			5.48**

*Mean over None and 0.3 cwt N per acre only.
+Excluding 'no organics'.
**General mean.

https://doi.org/10.23637/ERADOC-1-179

Globe beet

Organic manures	Level of manuring: tons per acre	N: cwt per acre None	0.3	0.6	0.9	Mean
Saleable bulbs: tons per acre						
			(±0.786)			(±0.556)
None		1.69	3.68	5.76	4.77	2.69*
Dung	10	8.15	8.62			8.39
	20	10.47	11.64			11.05
Sludge compost	10	7.27	8.87			8.07
	20	8.79	9.30			9.05
Sludge	10	6.65	7.53			7.09
	20	8.99	7.86			8.42
Vegetable compost	10	8.01	9.12			8.57
	20	8.99	10.40			9.69
Mean (±0.278)		8.41+	9.17+			7.83**
Total produce (whole plants): tons per acre						
None		3.26	5.87	8.75	7.55	4.57*
Dung	10	10.78	12.04			11.41
	20	13.74	15.64			14.69
Sludge compost	10	10.34	12.09			11.22
	20	12.53	12.64			12.58
Sludge	10	9.68	10.80			10.24
	20	12.55	11.05			11.80
Vegetable compost	10	10.84	12.30			11.57
	20	12.06	14.23			13.15
Mean		11.56+	12.60+			10.94**
Plant number: thousands per acre						
None		61.4	74.2	81.0	71.6	67.8*
Dung	10	79.4	90.3			84.9
	20	88.3	84.1			86.2
Sludge compost	10	86.3	72.4			79.4
	20	81.5	71.5			76.5
Sludge	10	76.0	77.7			76.9
	20	81.7	62.9			72.3
Vegetable compost	10	81.7	80.5			81.1
	20	83.5	93.0			88.3
Mean		82.3+	79.1+			79.0**

*Mean over None and 0.3 cwt N per acre only.
+Excluding 'no organics'.
**General mean.

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59/Bg/1.1

IRRIGATION EXPERIMENT

Third year of revised scheme (the 9th year)

The effects of irrigation and nitrogen - Woburn Butt Close 1959.

For details of previous cropping, treatments etc. see "Details of the Classical and Long Term Experiments" 1956.

In 1959 the number of irrigation treatments on sugar beet was reduced to 2, and demeton methyl spray was applied to give a test of (0 v. full irrigation) × (0 v. insecticide).

As the spring beans had made excessive growth the irrigation treatment (C) was altered after June 29 as follows:

C_1 unchanged; C_2 at about half the rate of C_1; C_3 no further irrigation.

Area of each sub-plot (acres): Cut grass, 0.0264; remainder, 0.0279.

Area harvested (acres): Sugar beet, 0.0176; spring wheat, 0.0095; spring beans, 0.0167; cut grass, 0.0165.

Rainfall and Irrigation: inches

Week ending	Rain-fall	Grass	Sugar beet	Wheat			Beans		
		C	C	A	B	C	C_1	C_2	C_3
May 4	0.63	-	-	-	-	-	-		
11	0.01	0.50	-	-	-	-	-		
18	0.01	0.50	0.50	-	0.50	0.50	0.50		
25	0.27	0.50	-	-	0.50	0.50	-		
June 1	-	0.33	0.33	-	0.33	0.33	0.33		
8	0.14	0.70	0.70	-	0.83	0.83	1.00		
15	0.30	0.50	0.75	-	0.50	0.50	0.75		
22	0.01	0.50	0.75	0.50	-	0.50	0.75		
29	0.48	0.75	0.75	0.75	-	0.75	0.50		
July 6	0.02	-	-	-	-	-	0.50	-	-
13	1.37	0.50	0.50	0.75	-	0.75	0.25	0.25	-
20	0.05	-	-	-	-	-	-		-
27	0.12	1.00	1.00				0.75	0.38	-
Aug 3	1.26	-	-						
10	-	-	-						
17	0.83	-	0.50						
24	-	-	-						
31	-	0.50	0.50						
Sept 7	-	0.50	0.50						
14	-	-	0.50						
21	-	-	-						
28	0.08	-	-						
Total	5.58	6.78	7.28	2.00	2.66	4.66	5.33	4.46	3.83

https://doi.org/10.23637/ERADOC-1-179

Cultivations, etc.:

Sugar beet. Ploughed: Oct 30 and Dec 6, 1958. Ground chalk applied: Dec 4. Salt applied: Mar 12, 1959. Basal fertilizer and 'Nitra-Shell' applied: Apr 1. Seed drilled at 10 lb per acre: Apr 3. Singled: May 19 - 22. Sprayed with dieldrin at 2 pints in 40 gallons per acre: May 26. Sprayed with demeton methyl (50% active ingredients) at 12 fluid oz in 40 gallons per acre: June 4 and June 22. Lifted: Oct 19 - 22. Variety: Klein E.

Spring wheat. Ploughed: Nov 18, 1958. Fertilizers applied: Mar 13, 1959. Seed drilled at 3 bushels per acre: Mar 17. Combine harvested: Aug 21. Variety: Peko.

Spring beans. Ploughed: Sept 15 and Dec 3, 1958. Dung applied: Dec 2. Seed combine drilled at 200 lb per acre: Feb 26, 1959. Combine harvested: Aug 7 and 22. Variety: Garton's Spring Tick.

Grass. Basal fertilizers applied: Nov 24, 1958. 'Nitra-Shell' and 0.6 cwt muriate of potash per acre applied: Mar 24, 1959. Cut six times (all plots): May 6 and 27, June 22, July 14, Aug 11, Sept 9. 'Nitra-Shell' applied after each cut, except the last. 2nd dressing of 0.6 cwt muriate of potash per acre applied after the third cut. Variety: Cocksfoot S37.

Standard errors per plot.

Sugar beet.	Total sugar,	whole plot:	5.88 cwt per acre or 8.0% (6 d.f.)
		sub plot:	4.23 cwt per acre or 5.7% (8 d.f.)
	Tops,	whole plot:	1.467 cwt per acre or 16.5% (6 d.f.)
		sub plot:	0.870 cwt per acre or 9.8% (8 d.f.)
Spring wheat.	Grain (at 85% D.M.),	whole plot:	2.55 cwt per acre or 11.3% (6 d.f.)
		sub plot:	2.74 cwt per acre or 12.1% (8 d.f.)
Cut grass.	Dry matter, Total of cuts 1 - 3	whole plot:	2.10 cwt per acre or 8.0% (6 d.f.)
		sub plot:	1.37 cwt per acre or 5.2% (8 d.f.)
	Total of cuts 4 - 6	whole plot:	2.23 cwt per acre or 10.1% (6 d.f.)
		sub plot:	1.95 cwt per acre or 8.8% (8 d.f.)
	Total of cuts 1 - 6	whole plot:	3.36 cwt per acre or 7.0% (6 d.f.)
		sub plot:	3.18 cwt per acre or 6.6% (8 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Sugar beet

Roots washed: tons per acre

Spray	Irrigation 0	Irrigation C
None	14.64	21.91
Demeton methyl	14.81	22.40

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
0.6	14.90	21.70	18.06	18.54	18.30
1.2	14.55	22.61	18.50	18.67	18.58
Mean	14.73	22.16	18.28	18.61	18.44
Difference	-0.35	+0.91	+0.44	+0.13	+0.28

Sugar percentage

Spray	Irrigation 0	Irrigation C
None	20.1	19.7
Demeton methyl	20.5	19.9

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
0.6	20.8	20.3	20.3	20.8	20.5
1.2	19.8	19.4	19.6	19.6	19.6
Mean	20.3	19.8	19.9	20.2	20.1
Difference	-1.0	-0.9	-0.7	-1.2	-0.9

Total sugar: cwt per acre

Spray	Irrigation 0	Irrigation C
	(±3.40)	
None	58.5	86.4
Demeton methyl	60.8	89.0

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
	(±2.69)*		(±2.69)*	
0.6	61.8	87.8	72.8	76.8	74.8
1.2	57.5	87.6	72.1	73.0	72.6
Mean (±2.40)	59.7	87.7	72.5	74.9	73.7
Difference (±2.44)	-4.3	-0.2	-0.7	-3.8	-2.2 (±1.73)

*for use in horizontal and diagonal comparisons only.

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Sugar beet
Tops: tons per acre

Spray	Irrigation 0	Irrigation C
	(±0.847)	
None	7.79	10.23
Demeton methyl	6.78	10.67

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
		(±0.649)*	
0.6	7.91	7.79	7.85
1.2	10.11	9.66	9.88
Mean (±0.599)	9.01	8.73	8.87
Difference (±0.503)	+2.20	+1.87	+2.03 (±0.355)

Spring wheat
Grain (at 85% dry matter): cwt per acre

N: cwt per acre	Irrigation 0	A	B	C	Mean
			(±1.85)*		(±0.79)
0.4	18.2	18.9	23.9	28.7	22.4
0.8	17.0	16.4	27.8	30.0	22.8
Mean (±1.48)	17.6	17.6	25.9	29.4	22.6
Difference (±2.24)	-1.2	-2.5	+3.9	+1.3	+0.4 (±1.12)

Spring beans
Grain (at 85% dry matter): cwt per acre

Dung: tons per acre	Treatment 0	OS	C_1	C_1S	C_2	C_2S	C_3	C_3S	Mean
None	10.3+	8.9+	28.5	25.6	25.3	23.6	23.0	23.1	17.2
12	11.9+	9.2+	24.6	26.3	23.5	26.4	22.4	24.8	17.6
Mean	11.1	9.1	26.6	26.0	24.4	25.0	22.7	24.0	17.4
Difference	+1.6	+0.3	-3.9	+0.7	-1.8	+2.8	-0.6	+1.7	+0.4

Mean dry matter % as harvested: 84.9

*for use in horizontal and diagonal comparisons only.

+means of 3 sub plots. All other values in body of table are based on 1 sub plot only.

Cut grass

Total of cuts 1 - 3. Dry matter: cwt per acre

K_2O: cwt per acre including basal	Irrigation 0	Irrigation C	K_2O: cwt per acre including basal 1.2	K_2O: cwt per acre including basal 1.8	Mean
	(±1.21)				
1.2	19.8	32.5			
1.8	16.6	35.3			
N: cwt per acre+			1.2	1.8	Mean
	(±0.94)*		←	(±0.94)*	
0.3	15.4	29.3	22.6	22.1	22.4
0.6	20.9	38.5	29.6	29.8	29.8
Mean (±0.86)	18.2	33.9	26.1	26.0	26.1
Difference (±0.79)	+5.5	+9.2	+7.0	+7.7	+7.4 (±0.56)

Total of cuts 4 - 6. Dry matter: cwt per acre

K_2O: cwt per acre including basal	Irrigation 0	Irrigation C	K_2O: cwt per acre including basal 1.2	K_2O: cwt per acre including basal 2.4	Mean
	(±1.29)				
1.2	13.0	27.5			
2.4	13.8	34.6			
N: cwt per acre+			1.2	2.4	Mean
	(±1.07)*		←	(±1.07)*	
0.3	12.4	27.8	18.6	21.6	20.1
0.6	14.5	34.3	22.0	26.8	24.4
Mean (±0.91)	13.4	31.1	20.3	24.2	22.2
Difference (±1.12)	+2.1	+6.5	+3.4	+5.2	+4.3 (±0.79)

*for use in horizontal and diagonal comparisons only.

+for each cut.

Mean dry matter % as cut:
Total of cuts 1 - 3: 23.6
Total of cuts 4 - 6: 24.7

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Cut grass

Total of cuts 1 - 6. Dry matter: cwt per acre

K_2O: cwt per acre including basal	Irrigation 0	Irrigation C	K_2O: cwt per acre including basal 1.2	K_2O: cwt per acre including basal 2.4	Mean
	(±1.94)				
1.2	32.8	60.1			
2.4	30.4	69.9			
N: cwt per acre[+]					
	(±1.65)*		←	(±1.65)*	
0.3	27.8	57.1	41.2	43.7	42.5
0.6	35.4	72.9	51.7	56.6	54.2
Mean (±1.37)	31.6	65.0	46.4	50.2	48.3
Difference (±1.83)	+7.6	+15.8	+10.5	+12.9	+11.7 (±1.30)

*for use in horizontal and diagonal comparisons only.

[+]for each cut.

Mean dry matter % as cut:
Total of cuts 1 - 6: 24.2

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WINTER WHEAT

Seed rates, sowing dates and levels of nitrogen (after non-cereal crop) - Great Field I 1959.

Design: 3 randomized blocks of 9 plots each, plots being split into 2 for the application of nitrogen.

Area of each sub plot: 0.0148 acres. Area harvested: 0.0096 acres.

Treatments. All combinations of:-

Whole plots. Seed rates: 2; 3; 4 bushels per acre.
Sowing dates: Oct 16; Nov 21, 1958; Jan 8*, 1959.

Sub plots. Nitrogen (in addition to basal): 0.47; 0.93 cwt N per acre applied as 'Nitro-Chalk' in two equal parts in February and April.

*Note. Sowing on one block delayed by bad weather until Jan 24, 1959.

Basal dressing: 3 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre broadcast in seed bed, 3 cwt compound fertilizer (5% N, 12½% P_2O_5, 12½% K_2O) per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Sept 12, 1958. Compound fertilizer applied: First sowing - Oct 16; second sowing - Nov 21; third sowing - Jan 8, 1959 (plots 2, 4 and 5 - Jan 26). First dressing of N applied: Feb 16. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: Apr 21. Second dressing of N applied: Apr 22. Combine harvested: Aug 17. Variety: Cappelle. Previous crop: Potatoes.

Note. Counts of plant shoot and ear number, and estimates of plant height and % area lodged were made. Severe lodging occurred in early July and the mean % areas lodged at harvest were:

Sowing date	%	Seed rate bu. p.a.	%	N c.p.a.	%
Oct 16	94	2	46	0.6	42
Nov 21	66	3	57	1.1	73
Jan 8	14	4	70		

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 2.48 cwt per acre or 4.9% (16 d.f.)
Sub plot: 3.38 cwt per acre or 6.7% (18 d.f.)

Errata to 'Results of the Field Experiments' 1958 page 58/Ca/1.2

Rates of N cwt per acre should read '0.6' and '1.2' not '0.4' and '0.8'.
S.E. of means of seed rates and sowing dates should read '0.79' not '0.56'.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Grain (at 85% dry matter): cwt per acre

Seed rate: bushels per acre	Date of sowing: Oct 16th	Nov 21st	Jan 8th	N: cwt per acre (including basal) 0.6	1.1	Diff.	Mean
	(±1.43)			(±1.15)*		(±1.59)	(±0.83)
2	52.8	52.0	48.2	50.5	51.5	+1.0	51.0
3	49.4	51.7	48.3	51.1	48.4	-2.7	49.8
4	49.7	50.0	53.8	53.0	49.3	-3.7	51.1

Date of sowing	(±1.15)*		(±1.59)	(±0.83)
Oct 16th	51.6	49.6	-2.0	50.6
Nov 21st	53.2	49.3	-3.9	51.3
Jan 8th	49.8	50.3	+0.5	50.1
Mean	51.5	49.7	-1.8 (±0.92)	50.6

*For use in vertical and diagonal comparisons.

Mean dry matter % as harvested: 85.6

https://doi.org/10.23637/ERADOC-1-179

59/Ca/2.1

WINTER WHEAT

Seed rates, sowing dates and levels of nitrogen (after cereal crop) - Great Knott III 1959.

Design: 3 randomized blocks of 8 plots each, plots being split into 2 for the application of nitrogen.

Area of each sub plot: 0.0148 acres. Area harvested: 0.0096 acres.

Treatments. All combinations of:-

Whole plots. Seed rates: 2; 4 bushels per acre.
Sowing dates: Oct 21; Nov 11; Nov 25, 1958; Jan 8, 1959.

Sub plots. Nitrogen (in addition to basal): 0.47; 0.93 cwt N per acre applied as 'Nitro-Chalk' in two equal parts in February and April.

Basal dressing: 3 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre broadcast in seed bed, 3 cwt compound fertilizer (5% N, 12½% P_2O_5, 12½% K_2O) per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Sept 20, 1958. Compound fertilizer applied: First sowing - Oct 20; second sowing - Nov 11; third sowing - Nov 25; fourth sowing - Jan 8, 1959. Nitrogen dressings applied: Feb 17 and Apr 22. Sprayed with 2-4D at ¾ pint in 40 gallons per acre: Apr 23. Combine harvested: Aug 12. Variety: Cappelle. Previous crop: Barley.

Note. Counts of plant shoot and ear number, estimates of plant height and incidence of Eyespot (*Cercosporella herpotrichoides*) and Take-All (*Ophiobolus graminis*) were made. There was no lodging.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 2.60 cwt per acre or 6.4% (14 d.f.)
Sub plot: 1.49 cwt per acre or 3.7% (16 d.f.)

https://doi.org/10.23637/ERADOC-1-179

59/Ca/2.2

Summary of Results

Grain (at 85% dry matter): cwt per acre

Seed rate: bushels per acre	Date of sowing: Oct 21st	Nov 11th	Nov 25th	Jan 8th	N: cwt per acre (including basal) 0.6	1.1	Diff.	Mean
	(±1.50)				(±0.81)*		(±0.61)	(±0.75)
2	40.0	41.6	42.4	35.3	36.1	43.6	+7.5	39.8
4	43.1	42.4	43.4	37.3	38.0	45.1	+7.1	41.6
					(±1.14)*		(±0.86)	(±1.06)
Date of sowing								
Oct 21st					37.7	45.3	+7.6	41.6
Nov 11th					38.5	45.5	+7.0	42.0
Nov 25th					39.8	46.0	+6.2	42.9
Jan 8th					32.1	40.4	+8.3	36.3
Mean					37.1	44.3	+7.2 (±0.43)	40.7

*For use in vertical and diagonal comparisons.

Mean dry matter % as harvested: 78.4

https://doi.org/10.23637/ERADOC-1-179

SPRING WHEAT

Row spacing, seed rates and nitrogen - Long Hoos I, II and III 1959.

Design: 2 randomized blocks of 10 plots each, plots being split into 2 for the application of nitrogen.

Area of each sub plot (acres): 0.0148. Area harvested: 0.01 acre approximately (varying with row spacing).

Treatments. All combinations of:-
Whole plots. Row spacing, inches/seed rate, bushels per acre: 7/2; 7/4; 14/1; 14/2; 7B/3, where B = every 4th row blank.
Types of drill: Standard; precision.
Sub plots. Nitrogen: 0.6; 1.2 cwt N per acre as 'Nitra-Shell' in seed bed.

Basal dressing: None.

Cultivations, etc.: Ploughed: Oct 21, 1958. 'Nitra-Shell' applied, seed drilled: Mar 2, 1959. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: May 14 and 27. Combine harvested: Aug 22.
Variety: Koga II. Previous crop: Oats.

Standard error per plot, Grain (at 85% dry matter):
Whole plot: 1.35 cwt per acre or 4.3% (9 d.f.)
Sub plot: 2.68 cwt per acre or 8.5% (10 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Grain (at 85% dry matter): cwt per acre

Row spacing: inches	7	7	14	14	7B	
Seed rate: bushels per acre	2	4	1	2	3	Mean
Mean (±0.68)	33.0	33.6	29.9	30.0	31.8	31.7
Drill						
Standard (±0.95)	33.1	32.7	29.6	27.7	33.1	31.2
Precision	33.0	34.5	30.3	32.4	30.5	32.1
Difference (±1.35)	-0.1	+1.8	+0.7	+4.7	-2.6	±0.9 (±0.60)
N cwt per acre						
0.6 (±1.16)*	31.2	31.7	29.0	29.6	31.9	30.7
1.2	34.9	35.5	30.8	30.5	31.7	32.7
Difference (±1.90)	+3.7	+3.8	+1.8	+0.9	-0.2	+2.0 (±0.85)

	Drill		Difference
	Standard	Precision	
	(±0.74)**		(±1.04)
N cwt per acre			
0.6	30.6	30.7	+0.1
1.2	31.9	33.5	+1.6
Difference (±1.20)	+1.3	+2.8	+1.5 (±1.69)

*For use only in horizontal and diagonal comparisons.

**For use only in diagonal comparisons.

B = every 4th row blank.

SPRING WHEAT

Combine drilling of nitrogen - Rothamsted (R) Deacons Field and Woburn (W) Lansome Field 1959.

Design (each field): 4 randomized blocks of 7 plots each.

Area of each plot:
Deacons Field (R): 0.0212 acres. Area harvested: 0.0141 acres.
Lansome Field (W): 0.0186 acres. Area harvested: 0.0124 acres.

Treatments: None and all combinations of:-
Nitrogen: 0.2; 0.5; 0.8 cwt N per acre.
Method of application: Broadcast as sulphate of ammonia; combine drilled as compound fertilizer:

N_1: 6% N, 15% P_2O_5, 15% K_2O.
N_2: 8% N, 8% P_2O_5, 8% K_2O.
N_3: 12% N, 9% P_2O_5, 9% K_2O.

Basal dressing per acre (each field): 0.54 cwt P_2O_5 and 0.54 cwt K_2O combine drilled
(a) as compound 16% P_2O_5, 16% K_2O on the no nitrogen and broadcast nitrogen plots;
(b) as compounds N_1, N_2, N_3 on the plots receiving drilled nitrogen.

Cultivations, etc.:
Deacons Field (R): Ploughed: Nov 17, 1958. Seed combine drilled at 3 bushels per acre; balance of compound fertilizer (16% P_2O_5, 16% K_2O) and sulphate of ammonia applied: Mar 19, 1959. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: May 6. Combine harvested: Aug 21. Variety: Koga II. Previous crop: Winter wheat.
Lansome Field (W): Ploughed: Nov 5, 1958. Seed combine drilled at $3\frac{1}{3}$ bushels per acre: Mar 21, 1959. Sulphate of ammonia applied: Mar 23. Combine harvested: Aug 21. Variety: Peko. Previous crop: Spring Wheat.

Standard errors per plot, Grain (at 85% dry matter):
Deacons Field (R): 0.90 cwt per acre or 3.8% (18 d.f.)
Lansome Field (W): 1.31 cwt per acre or 5.9% (18 d.f.)

Note: Plant counts at germination were made.

https://doi.org/10.23637/ERADOC-1-179

59/Ca/4.2

Summary of Results

Grain (at 85% dry matter): cwt per acre

N: cwt per acre							
	Broadcast			Combine drilled			
None	0.2	0.5	0.8	0.2	0.5	0.8	Mean
Deacons Field, Rothamsted							
13.1	18.8	25.5	29.7 (±0.45)	20.0	26.3	31.2	23.5

Mean dry matter % as harvested: 86.5

Lansome Field, Woburn							
9.9	19.3	25.9	28.3 (±0.65)	19.4	24.8	27.5	22.2

Mean dry matter % as harvested: 85.9

https://doi.org/10.23637/ERADOC-1-179

59/Ca/5.1

WHEAT

Times of sowing and forms of N - Roadpiece Woburn 1959.

Design: 4 randomized blocks of 5 plots each with 2 blocks sown in winter and 2 in spring.

Area of each plot: 0.0289 acres. Area harvested: 0.0129 acres.

Treatments:
Blocks. Time of sowing: Autumn; spring.
Plots. Fertilizers: None and all combinations of:-
Forms of nitrogen: Calcium nitrate; sulphate of ammonia, each at 100 lb N per acre.
Times of application of N: In autumn; in spring.

Basal dressing: 5 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre broadcast.

Cultivations, etc.: Ploughed: Oct 17, 1958. Autumn nitrogen applied: Oct 23. Compound fertilizer applied to all plots, winter wheat drilled at 3 bushels per acre: Oct 24. Spring wheat drilled at 3 bushels per acre: Mar 17, 1959. Spring nitrogen applied: Mar 20. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre - winter wheat: Apr 29; spring wheat: May 11. Combine harvested: Aug 17. Varieties: Winter wheat - Cappelle; spring wheat - Peko. Previous crop: Potatoes.

Standard error per plot.
Grain (at 85% dry matter): 2.88 cwt per acre or 18.3% (8 d.f.)

Note. The mineral content of the soil and the total nitrogen content of the plants were determined at various stages of growth.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Time of sowing	N: fertilizer applied					
		Autumn		Spring		
	None	C	S	C	S	Mean
Grain (at 85% dry matter): cwt per acre						
			(±2.04)*			
Winter	11.5	16.7	20.4	19.4	24.8	18.6
Spring	13.7	10.8	13.2	15.4	11.5	12.9
Mean (±1.44)	12.6	13.8	16.8	17.4	18.1	15.7
Diff.(±2.88)**	+2.2	-5.9	-7.2	-4.0	-13.3	-5.7

*For use in horizontal comparisons only.

**For use only in testing the difference of two differences.

Mean dry matter % as harvested: 86.2

Straw (at 85% dry matter): cwt per acre						
Winter	10.3	12.3	18.7	23.4	24.1	17.7
Spring	13.3	12.3	16.0	26.9	22.1	18.1
Mean	11.8	12.3	17.3	25.1	23.1	17.9
Diff.	+3.0	0.0	-2.7	+3.5	-2.0	+0.4

Mean dry matter % as harvested: 76.3

C = 100 lb N per acre as calcium nitrate
S = 100 lb N per acre as sulphate of ammonia.

https://doi.org/10.23637/ERADOC-1-179

BARLEY

Combine drilling of nitrogen - Rothamsted (R) Deacons Field and Woburn (W) Lansome Field 1959.

Design: 4 randomized blocks of 7 plots each.

Area of each plot:
Deacons Field (R): 0.0212 acres. Area harvested: 0.0141 acres.
Lansome Field (W): 0.0186 acres. Area harvested: 0.0124 acres.

Treatments: None and all combinations of:-
Nitrogen: 0.2; 0.5; 0.8 (0.7 - Lansome Field) cwt N per acre.
Methods of application: Broadcast as sulphate of ammonia; combine drilled as compound fertilizer:

N_1: 6% N; 15% P_2O_5; 15% K_2O.
N_2: 8% N; 8% P_2O_5; 8% K_2O.
N_3: 12% N; 9% P_2O_5; 9% K_2O.

Basal dressing per acre:-
Deacons Field (R): 0.57 cwt P_2O_5 and 0.57 cwt K_2O
Lansome Field (W): 0.54 cwt P_2O_5 and 0.54 cwt K_2O.
combine drilled
(a) as compound (16% P_2O_5, 16% K_2O) on the no nitrogen and broadcast nitrogen plots,
(b) as compounds N_1, N_2, N_3 on the plots receiving drilled nitrogen.

Cultivations, etc.:
Deacons Field (R): Ploughed: Nov 17-24, 1958. Seed combine drilled at 2 bushels per acre: Mar 19, 1959. Sulphate of ammonia and balance of compound fertilizer (16% P_2O_5, 16% K_2O) broadcast: Mar 20. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: May 6. Combine harvested: Aug 6. Variety: Proctor. Previous crop: Winter wheat.
Lansome Field (W): Ploughed: Nov 5, 1958. Seed combine drilled at 3 bushels per acre: Mar 20, 1959. Sulphate of ammonia broadcast: Mar 23. Combine harvested: Aug 17. Variety: Herta. Previous crop: Barley.

Standard errors per plot, Grain (at 85% dry matter):
Deacons Field (R): 1.69 cwt per acre or 6.0% (18 d.f.)
Lansome Field (W): 1.70 cwt per acre or 6.4% (18 d.f.)

Note: Plant counts at germination were made.

https://doi.org/10.23637/ERADOC-1-179

59/Cb/1.2

Summary of Results

Grain (at 85% dry matter): cwt per acre

	N: cwt per acre						
	Broadcast			Combine drilled			
None	0.2	0.5	0.8*	0.2	0.5	0.8*	Mean
	Deacons Field, Rothamsted						
14.1	22.2	28.9	37.8 (±0.84)	21.9	33.3	39.6	28.3

Mean dry matter % as harvested: 84.3

	Lansome Field, Woburn						
12.7	22.4	29.4	32.5 (±0.85)	23.0	31.2	35.9	26.7

Mean dry matter % as harvested: 85.6

*0.7 on Lansome Field, Woburn.

https://doi.org/10.23637/ERADOC-1-179

BARLEY

Concentrated fertilizers - Rothamsted (R) Deacons Field and Woburn (W) Lansome Field 1959.

Design (each field): 4 randomized blocks of 5 plots each.

Area of each plot:
Deacons Field (R): 0.0212 acres. Area harvested: 0.0141 acres.
Lansome Field (W): 0.0186 acres. Area harvested: 0.0124 acres.

Treatments: None and all combinations of:-
Compound fertilizers: (A) 12% N; 6% P_2O_5; 6% K_2O;
(B) 20% N; 10% P_2O_5; 10% K_2O.
Rates of application in cwt per acre:
Deacons Field (R): (1) 0.3 N; 0.15 P_2O_5; 0.15 K_2O;
(2) 0.6 N; 0.30 P_2O_5; 0.30 K_2O.
Lansome Field (W): (1) 0.35 N; 0.18 P_2O_5; 0.18 K_2O;
(2) 0.66 N; 0.33 P_2O_5; 0.33 K_2O.

Note: All fertilizers were combine drilled with the seed.

Basal dressing: None.

Cultivations, etc.:-
Deacons Field (R): Ploughed: Nov 17-24, 1958. Seed combine drilled at 2 bushels per acre: Mar 20, 1959. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: May 6. Combine harvested: Aug 6. Variety: Proctor. Previous crop: Winter wheat.
Lansome Field (W): Ploughed: Nov 5, 1958. Seed combine drilled at 3 bushels per acre: Mar 20, 1959. Combine harvested: Aug 17. Variety: Herta. Previous crop: Barley.

Standard errors per plot, Grain (at 85% dry matter):
Deacons Field (R): 1.51 cwt per acre or 5.2% (12 d.f.)
Lansome Field (W): 1.36 cwt per acre or 5.4% (12 d.f.)

Note: Plant counts at germination were made.

https://doi.org/10.23637/ERADOC-1-179

59/Cb/2.2

Summary of Results

Grain (at 85% dry matter): cwt per acre

Compound fertilizer					
None	A_1	A_2	B_1	B_2	Mean
Deacons Field, Rothamsted					
14.4	27.6	37.7 (±0.75)	27.6	37.5	29.0

Mean dry matter % as harvested: 84.2

Lansome Field, Woburn					
13.8	24.9	30.8 (±0.68)	24.4	33.0	25.3

Mean dry matter % as harvested: 86.2

Compound fertilizers: (A) 12% N; 6% P_2O_5; 6% K_2O;
(B) 20% N; 10% P_2O_5; 10% K_2O.

Rates of application in cwt per acre:

Deacons Field (R): (1) 0.3 N; 0.15 P_2O_5; 0.15 K_2O;
(2) 0.6 N; 0.30 P_2O_5; 0.30 K_2O.

Lansome Field (W): (1) 0.35 N; 0.18 P_2O_5; 0.18 K_2O;
(2) 0.66 N; 0.33 P_2O_5; 0.33 K_2O.

https://doi.org/10.23637/ERADOC-1-179

SPRING OATS

Varieties and levels of nitrogen - Little Knott I 1959.

Design: 3 randomized blocks of 5 plots each, plots being split into 2 for the application of nitrogen.

Area of each sub plot: 0.0151 acres. Area harvested: 0.0101 acres.

Treatments: All combinations of:-
Whole plots. Varieties: Condor (1); Palu (2); Silva II (3); Sun II (4); Vollbringer (5).
Sub plots. Nitrogen (in addition to basal): None; 0.36 cwt N per acre applied as sulphate of ammonia.

Basal dressing: 3 cwt compound fertilizer (12% N, 9% P_2O_5, 9% K_2O) per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Jan 8, 1959. Seed combine drilled at $3\frac{1}{2}$ bushels per acre: Mar 14. Sulphate of ammonia applied: Mar 23. Sprayed with CMPP at 4 pints in 40 gallons per acre: May 12. Combine harvested: Aug 5. Previous crop: Beans.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.51 cwt per acre or 3.6% (8 d.f.)
Sub plot: 2.50 cwt per acre or 5.9% (10 d.f.)

Summary of Results

Grain (at 85% dry matter): cwt per acre

N: cwt per acre (including basal)	Variety 1	2	3	4	5	Mean
			(±1.34)*			
0.36	43.3	38.7	39.3	41.8	42.6	41.1
0.72	45.1	43.6	38.7	44.7	42.5	42.9
Mean (±0.88)	44.2	41.1	39.0	43.2	42.6	42.0
Difference (±2.04)	+1.8	+4.9	-0.6	+2.9	-0.1	+1.8 (±0.91)

*for use in horizontal and diagonal comparisons only.

Mean dry matter % as harvested: 81.0

https://doi.org/10.23637/ERADOC-1-179

59/Cc/2

SPRING OATS

Frit fly study (sowing dates) - Long Hoos V 1959.

Design: 2 randomized blocks of 3 plots each.

Area of each plot: 0.425 acres. Area harvested: 0.0675 acres.

Treatments:- Sowing dates: Mar 13; Apr 10; Apr 22, 1959.

Basal dressing:- 390 lb compound fertilizer (12% N, 9% P_2O_5, 9% K_2O) per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Sept 22, 1958. Seed combine drilled at 3 bushels per acre: Mar 13, Apr 10 and Apr 22, 1959. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: first and second sowing - May 12; third sowing - May 26. Combine harvested: first sowing - Aug 5; second and third sowing - Aug 17. Variety: Blenda. Previous crop: Winter wheat.

Note. Counts of frit fly and egg numbers, and estimates of grain and tiller damage, and of growth rates were made at frequent intervals.

Summary of Results

Date of sowing

Mar 13	Apr 10	Apr 22	Mean
	Grain (at 85% dry matter): cwt per acre		
20.9	19.2	16.7	18.9
	Straw (at 85% dry matter): cwt per acre		
18.2	16.6	16.3	17.0

Mean dry matter % as harvested

	First sowing	Second and third sowings
Grain	81.4	81.3
Straw	71.5	86.9

https://doi.org/10.23637/ERADOC-1-179

59/Cd/1.1

CEREALS AND BEANS ROTATIONS

The effect of crop sequences on the incidence of cereal foot and root rot diseases - Great Field I 1959 - the 3rd year.

Design: Three series each of 3 randomized blocks of 6 plots, starting in each of the years 1957, 1958 and 1959.

Area of each plot: 0.0305 acres. Area harvested: 0.0201 acres.

Treatments:

Crop sequences for each series:

1st year:	WW	WW	WW	SW	O	B
2nd year:	WW	O	O	WW	WW	WW
3rd year:	SW	SW	Be	SW	SW	B

WW = Winter wheat, SW = Spring wheat, O = Oats, B = Barley, Be = Beans.

In the 4th year the plots will be split for N, and all cropped with winter wheat.

Basal dressing: 2 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed; all blocks received 23 cwt ground chalk per acre in Nov 1956.

Nitrogen for cereals: 2.3 cwt 'Nitra-Shell' (20.5% N) per acre to spring wheat and 1.5 cwt 'Nitra-Shell' per acre to oats and barley, all in seedbed. 4.6 cwt 'Nitra-Shell' per acre to winter wheat as spring top dressing, half applied in March and half in May.

Cultivations, etc.: Ploughed: Oct 24, 1958. Beans combine drilled at 275 lb per acre: Nov 26. Winter wheat combine drilled at 2½ bushels per acre: Jan 23, 1959. Oats combine drilled at 4 bushels per acre: Mar 13. 'Nitra-Shell' applied to oats; barley combine drilled at 2 bushels per acre: Mar 14. 'Nitra-Shell' applied to barley and winter wheat: Mar 16. Spring wheat combine drilled at 3 bushels per acre: Mar 17. 'Nitra-Shell' applied to spring wheat: Mar 18. 2nd application of 'Nitra-Shell' to winter wheat, winter wheat, beans and oats sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: May 7. Beans sprayed with demeton methyl at 12 fluid oz (50% active ingredient) in 60 gallons per acre: June 3. Combine harvested: Oats: Aug 5; barley: Aug 7; winter wheat: Aug 12; spring wheat: Aug 21. Varieties: Beans - S.Q; winter wheat - Cappelle; spring wheat - Koga II; barley - Proctor; oats - Sun II. Previous crop: Series starting in 1959; winter beans.

Note. The stand of winter beans was poor and irregular and yields were not recorded.

https://doi.org/10.23637/ERADOC-1-179

Note. Estimates of plant height, % area lodged, incidence of Eyespot (Cercosporella herpotrichoides) and Take-all (Ophiobolus graminis), and counts of plant shoot and ear number were made.

For details of the previous year's results etc. see 'Results of the Field Experiments' 57/Cd/1 and 58/Cd/1.

Summary of Results

Grain (at 85% dry matter): cwt per acre

Series starting in 1957

Crop in 1957	WW	SW	0	WW	B	WW
1958	WW	WW	WW	0	WW	0
1959	SW	SW	SW	SW	B	Be
	32.0	32.4	29.2	32.0	33.3	*
Mean dry matter % as harvested			85.0		85.1	

Series starting in 1958

Crop in 1958	WW	SW	B	0	WW
1959	WW	WW	WW	WW	0
	37.4	37.5	31.9	41.9	34.7
Mean dry matter % as harvested			76.4		83.7

Series starting in 1959

Crop in 1959	WW	SW	B	0
	41.3	36.3	42.3	37.9
Mean dry matter % as harvested	74.9	85.6	86.1	83.3

*Yields not recorded.

https://doi.org/10.23637/ERADOC-1-179

SPRING BEANS

Effect of seed rates and spraying on aphids (Aphis fabae) - Great Knott I 1959.

Design: 4 randomized blocks of 7 plots each, blocks and plots being split into 2 strips for the application of spray.

Area of each sub plot: 0.0135 acres.

Treatments. All combinations of:-
Seed rate, lb per acre: 50; 100; 200; *300; 400; 600; all at 22 inch row spacing and 600 at 11 inch.
Spray: None; demeton-methyl at 12 fluid oz (50% active ingredients) in 60 gallons per acre.

*Note. The basal dressing was applied to this treatment at double rate.

Basal dressing: 5 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre placement drilled with the seed.

Cultivations, etc.: Ploughed: Sept 22 and Oct 28, 1958. Seed drilled: Mar 18, 1959. Appropriate sub-plots sprayed with demeton-methyl: June 2. Combine harvested: Aug 24.
Variety: Garton's Spring Tic. Previous crop: Wheat.

Note: On 15 of the 28 unsprayed plots the crop was so poor that it had to be harvested by hand. The standard error was estimated from the sprayed plots only.

Standard error per plot.
Grain (at 85% dry matter): 1.34 cwt per acre or 6.6% (18 d.f.)

Note: Periodic counts of plant stem and aphid numbers were made.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Grain (at 85% dry matter): cwt per acre

Seed rate: lb per acre							
50	100	200	300	400	600	600*	Mean
Sprayed with demeton-methyl							
12.4	17.7	19.8	21.6 (±0.66)	23.5	22.5	23.9	20.2
Unsprayed							
3.0	1.6	2.0	3.4	3.0	5.9	9.2	4.0

Mean dry matter % as harvested:
Sprayed plots: 81.5
Unsprayed plots: 76.2**

*at 11 inch row spacing, remainder at 22 inch.

** estimated from combine harvested plots only.

59/Ce/2.1

SPRING BEANS

Control of weeds (Triazine sprays) - Rothamsted (R) Great Knott I and Woburn (W) Broad Mead I 1959.

Design: Great Knott I (R); 3 randomized blocks of 6 plots each.
Broad Mead I (W): 3 randomized blocks of 5 plots each.

Area of each plot (both fields): 0.0318 acres. Area harvested: 0.0139 acres.

Treatments: Pre-emergence sprays:- None: Great Knott I (R) - two plots per block, Broad Mead I (W) - one plot per block.
2-chloro-4-6-bis-ethylamino-s-triazine (Simazine)(S):
at 1 lb in 40 gallons per acre (1);
2 lb in 80 gallons per acre (2);
3 lb in 120 gallons per acre (3);
50% active material
2-chloro-4-ethylamino-6-isopropylamino-s-triazine (Atrazine):
at 2 lb in 80 gallons per acre (A2)

Basal dressing: 5 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre placement drilled with seed.

Cultivations, etc.:
Great Knott I (R): Ploughed: Sept 22 - Oct 28, 1958. Seed placement drilled at 200 lb per acre, with basal fertilizer: Mar 17, 1959. Weedkillers applied: Mar 26. Sprayed with demeton-methyl at 12 fluid oz of 50% active ingredients in 40 gallons per acre: June 2. Combine harvested: Aug 24. Variety: Spring Tick. Previous crop: Winter wheat.
Broad Mead I (W): Ploughed: Feb 13 - 17, 1959. Seed placement drilled at 200 lb per acre, with basal fertilizer: Feb 27. Weedkillers applied: Mar 14. Combine harvested: Aug 6. Variety: Spring Tick. Previous crop: Spring wheat.

Standard errors per plot, Grain (at 85% dry matter):
Great Knott I (R): 2.04 cwt per acre or 10.9% (11 d.f.)
Broad Mead I (W): 1.60 cwt per acre or 9.9% (8 d.f.)

Note: Weed counts were made early in the growing period. Observations were made on winter beans sprayed after emergence with the same materials.

https://doi.org/10.23637/ERADOC-1-179

59/Ce/2.2

Summary of Results

Grain (at 85% dry matter): cwt per acre

		Spray					
		None	S_1	S_2	S_3	A_2	Mean
Great Knott I (R)							
Mean	(±1.18)	17.9(1)	21.1	19.6	18.5	17.7	18.8
Increase	(±1.44)		+3.2	+1.7	+0.6	-0.2	
Broad Mead I (W)							
Mean	(±0.93)	13.5	17.3	19.1	16.0	15.2	16.2
Increase	(±1.31)		+3.8	+5.6	+2.5	+1.7	

(1) ±0.83

Sprays

S = Simazine
A = Atrazine

Levels

1 = 1 lb in 40 gallons per acre
2 = 2 lb in 80 gallons per acre
3 = 3 lb in 120 gallons per acre

50% active material

https://doi.org/10.23637/ERADOC-1-179

59/Ce/3.1

BEANS

Time of sowing, spraying, P and K - Rothamsted (R) Great Knott III and Woburn (W) Mill Dam Close 1959.

Design: 3 blocks of 4 whole plots each, plots being split into 3 for P and K with spraying on pairs of whole plots, time of sowing on whole plots, and PK partially confounded.

Area of each sub plot: 0.0337 acres. Area harvested: 0.0105 acres.

Treatments. All combinations of:-
Time of sowing: Autumn; spring.
Spray: None; demeton-methyl at 12 fluid oz (50% active ingredients) in 60* gallons per acre.
Phosphate: None; 0.5; 1.0 cwt P_2O_5 per acre as superphosphate.
Potash: None; 1.0; 2.0 cwt K_2O per acre as muriate of potash.

*Note: 40 gallons at Woburn.

Basal dressing: None.

Cultivations, etc.:
Great Knott III (R): Ploughed: Sept 20 - Oct 17, 1958. Fertilizers applied for autumn beans: Oct 23. Seed drilled at 275 lb per acre: Oct 24. Fertilizers applied for spring beans: Feb 17, 1959. Seed drilled at 200 lb per acre: Feb 21. Appropriate plots sprayed with demeton-methyl: June 2. Combine harvested: Aug 7. Variety: Winter beans - S.Q.Giant, spring beans - Granton. Previous crop: Spring wheat and barley.
Mill Dam Close (W): Ploughed: Sept 23 - Oct 20, 1958. Seed drilled at 275 lb per acre, fertilizers applied for autumn beans: Oct 22. Fertilizers applied for spring beans, seed drilled at 275 lb per acre: Feb 26, 1959. Appropriate plots sprayed with demeton-methyl: May 30. Combine harvested: Aug 6 - 22. Variety: Winter beans - S.Q.Giant, spring beans - Granton. Previous crop: Spring wheat.

Standard errors per plot, Grain (at 85% dry matter):
Great Knott III (R)
Whole plot: 2.04 cwt per acre or 9.3% (4 d.f.)
Sub plot: 1.63 cwt per acre or 7.4% (12 d.f.)

Mill Dam Close (W)
Whole plot: 2.83 cwt per acre or 11.5% (4 d.f.)
Sub plot: 5.04 cwt per acre or 17.4% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Grain (at 85% dry matter): cwt per acre

	Sown			P_2O_5: cwt per acre			K_2O: cwt per acre			
	Autumn	Spring	Diff.	None	0.5	1.0	None	1.0	2.0	Mean
Great Knott III, Rothamsted										
Spray					(±0.66)*			(±0.66)*		
None	26.6	13.9	-12.7	19.8	20.0	20.8	20.1	19.8	20.8	20.2
Demeton-methyl	28.8	18.8	-10.0	23.7	23.4	24.3	24.2	24.5	22.7	23.8
Diff.	+2.2	+4.9	+2.7	+3.9	+3.4	+3.5	+4.1	+4.7	+1.9	+3.6
			(±2.36)		(±0.94)**			(±0.94)**		
Sown				(1) and (2)			(1) and (2)			
Autumn				26.8	27.9	28.4	27.4	27.9	27.9	27.7
Spring				16.7	15.5	16.8	16.9	16.5	15.6	16.3
Mean (±0.47)				21.8	21.7	22.6	22.1	22.2	21.7	22.0
Diff.(±1.41)				-10.1	-12.4	-11.6	-10.5	-11.4	-12.3	-11.4
										(±1.18)

(1) ±0.99 for use in diagonal comparisons only.
(2) ±0.66 for use in horizontal and interaction comparisons only.

*For use in horizontal comparisons only.

**For use only in testing the difference of two differences.

Mean dry matter % as harvested: Autumn sown, 85.2; spring sown, 85.1.

https://doi.org/10.23637/ERADOC-1-179

Grain (at 85% dry matter): cwt per acre

	Sown			P_2O_5: cwt per acre			K_2O: cwt per acre			
	Autumn	Spring	Diff.	None	0.5	1.0	None	1.0	2.0	Mean
Mill Dam Close, Woburn										
				(±2.06)*			(±2.06)*			
Spray										
None	27.4	23.3	-4.1	24.4	27.9	23.8	25.8	24.3	25.9	25.4
Demeton-methyl	30.0	17.8	-12.2	25.6	26.2	19.9	19.5	24.9	27.2	23.9
Diff.	+2.6	-5.5	-8.1	+1.2	-1.7	-3.9	-6.3	+0.6	+1.3	-1.5
			(±3.26)	(±2.91)**			(±2.91)**			
Sown				(1) and (2)			(1) and (2)			
Autumn				27.4	34.7	24.1	27.3	28.1	30.8	28.7
Spring				22.6	19.4	19.7	18.1	21.2	22.3	20.5
Mean (±1.46)				25.0	27.0	21.9	22.7	24.6	26.6	24.6
Diff.(±2.88)				-4.8	-15.3	-4.4	-9.2	-6.9	-8.5	-8.2
										(±1.63)

(1) ±2.04 for use in diagonal comparisons only.
(2) ±2.06 for use in horizontal and interaction comparisons only.

*For use in horizontal comparisons only.

**For use only in testing the difference of two differences.

Mean dry matter % as harvested: Autumn sown, 75.5; spring sown, 82.9.

https://doi.org/10.23637/ERADOC-1-179

59/Cf/1.1

POTATOES

Forms and levels of K - Rothamsted (R) Sawyers I and Woburn (W) Lansome Field 1959.

Design (each field): 4 blocks of 8 plots with certain high order interactions partially confounded with block differences.

Area of each plot: 0.0141 acres. Area harvested: 0.0071 acres.

Treatments: No potash (2 plots per block) and all combinations of:-
Forms of K: Potassium bi-carbonate, $KHCO_3$ (C);
Potassium sulphate, K_2SO_4 (S);
Potassium chloride, KCl (M);
Levels of K: 1.25; 2.50 cwt K_2O per acre.
All the above in combination with:-
Levels of N: 0.75; 1.50 cwt N per acre as sulphate of ammonia.

Basal dressing (each field): 1.0 cwt P_2O_5 per acre as superphosphate.

Cultivations, etc.:
Sawyers I (R): Ploughed: Feb 19, 1959. Ridged, fertilizers applied by hand: Apr 20. Potatoes hand planted: Apr 21. Earthed up: July 6. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: Aug 24. Sprayed with sulphuric acid at 15% BOV in 100 gallons per acre: Sept 29. Lifted: Oct 12. Variety: Majestic. Previous crop: Barley.
Lansome Field (W): Sprayed with dalapon at 10 lb and 5 lb in 40 gallons per acre: Nov 8, 1958 and Nov 22 respectively. Ploughed: Jan 23 - Feb 2, 1959. Ridged: Apr 4. Fertilizers applied and potatoes hand planted: Apr 10. Earthed up: June 22. Sprayed with zineb at 2 lb and demeton methyl (against aphids) at 12 fluid oz (50% active ingredients) in 40 gallons per acre: Aug 15. Tops destroyed mechanically: Sept 22. Lifted: Sept 29. Variety: Majestic. Previous crop: Barley.

Standard errors per plot. Total tubers:
Sawyers I (R): 1.215 tons per acre or 12.5% (14 d.f.)
Lansome (W): 1.076 tons per acre or 16.4% (13 d.f.)

Note (1): Chemical analyses were made of % N, P, K, Cl and S on haulm and tubers at Rothamsted and on tubers at Woburn.

Note (2): At Woburn the plant was poor and irregular and the yields were adjusted for plant number.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Total tubers: tons per acre

	Form of K				
	0	C	S	M	Mean
Rothamsted					
Mean (±0.430)	7.23	10.75	10.65	10.26	9.72
K: cwt per acre					
1.25 (±0.608)	-	10.55	9.86	9.12	9.84 (±0.351)
2.50	-	10.95	11.44	11.40	11.26
Diff. (±0.859)	-	+0.40	+1.58	+2.28	+1.42 (±0.496)
N: cwt per acre					
0.75 (±0.608)	7.33	10.46	11.01	10.47	9.82
1.50	7.12	11.04	10.28	10.05	9.62
Diff. (±0.859)	-0.21	+0.58	-0.73	-0.42	-0.20 (±0.430)
Woburn					
Mean (±0.380)	6.29	6.69	6.58	6.72	6.57
K: cwt per acre					
1.25 (±0.538)	-	6.05	6.93	5.34	6.11 (±0.334)
2.50	-	7.34	6.16	8.10	7.20
Diff. (±0.818)	-	+1.29	-0.77	+2.76	+1.09 (±0.472)
N: cwt per acre					
0.75 (±0.538)	6.07	6.43	6.92	7.28	6.68
1.50	6.50	6.97	6.19	6.16	6.46
Diff. (±0.818)	+0.43	+0.54	-0.73	-1.12	-0.22 (±0.409)

Forms of K

0 = No potash
C = Potassium bi-carbonate, $KHCO_3$
S = Potassium sulphate, K_2SO_4
M = Potassium chloride, KCl.

https://doi.org/10.23637/ERADOC-1-179

59/Cf/2.1

POTATOES

Concentrated fertilizers - Rothamsted (R) Great Field I and Woburn (W) Lansome Field 1959.

Design (each field): 4 randomized blocks of 5 plots each.

Area of each plot (each field): 0.0212 acres. Area harvested: 0.0141 acres.

Treatments: None and all combinations of:-
Types of fertilizer: A mixture of sulphate of ammonia, superphosphate and muriate of potash (A); concentrated compound fertilizer (15% N, 10% P_2O_5, 20% K_2O) (B).
Rates of application: cwt per acre
(1) 0.75 N; 0.5 P_2O_5; 1.0 K_2O.
(2) 1.5 N; 1.0 P_2O_5; 2.0 K_2O.

Basal dressing: None.

Cultivations, etc.:
Great Field I (R): Ploughed: Oct 23, 1958. Ridged: Apr 14, 1959. Fertilizers applied in the furrows, potatoes hand planted: Apr 20. Earthed up: June 30. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 15. Sprayed with sulphuric acid, 15% BOV in 100 gallons per acre: Sept 21. Lifted: Oct 8. Variety: Ulster Supreme. Previous crop: Wheat.
Lansome Field (W): Sprayed with dalapon at 10 lb in 40 gallons per acre: Nov 8, 1958, and at 5 lb in 40 gallons per acre: Nov 22. Ploughed: Jan 23, 1959. Ridged, fertilizers applied in the furrows, potatoes hand planted: Apr 9. Earthed up: June 22. Sprayed with zineb at 2 lb and demeton methyl at 12 fluid oz (50% active ingredients) in 40 gallons per acre: Aug 15. Haulm destroyed mechanically: Sept 22. Lifted: Sept 29. Variety: Majestic. Previous crop: Barley.

Note: At Woburn the plant was poor and irregular. There was no evidence of association between yield and plant number and the yields were not adjusted.

Standard errors per plot. Total tubers:
Great Field I (R): 0.839 tons per acre or 7.2% (12 d.f.)
Lansome Field (W): 0.683 tons per acre or 10.5% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Fertilizer					
	Mixture		Concentrated		
None	A_1	A_2	B_1	B_2	Mean
Total tubers: tons per acre					
Great Field I (R)					
8.46	11.47	13.41	11.49	13.68	11.70
		(±0.419)			
Lansome Field (W)					
4.03	6.74	7.06	6.64	8.01	6.49
		(±0.341)			
Percentage ware*					
Great Field I (R)					
90.6	90.7	91.6	88.2	89.1	90.0
Lansome Field (W)					
48.3	51.6	42.7	59.6	57.3	51.9

*Riddle size (R) $1\frac{1}{2}$"
(W) $1\frac{3}{8}$".

Treatments

Fertilizer. (A) a mixture of sulphate of ammonia, superphosphate and muriate of potash.
(B) concentrated compound fertilizer (15% N, 10% P_2O_5, 20% K_2O).

Rates of application: cwt per acre
(1) 0.75 N; 0.5 P_2O_5; 1.0 K_2O.
(2) 1.5 N; 1.0 P_2O_5; 2.0 K_2O.

POTATOES

Control of blight (*Phytophthora infestans*) by copper and zinc fungicide sprays and times of spraying - Great Field I 1959.

Design: 4 x 4 Latin square.

Area of each plot: 0.127 acres. Area harvested: 0.0141 acres.

Treatments:-
Sprays: None (0); copper oxychloride (15% copper) at 5 lb in 40 gallons per acre after issue of blight forecast (1); Zineb (zinc ethylene bis dithiocarbamate - 65% active ingredient) at 2 lb in 40 gallons per acre after issue of blight forecast plus copper oxychloride when the previous deposit had been removed (2); Zineb after closure of leaf canopy plus copper oxychloride after issue of blight forecast (3).

Basal dressing: 10 cwt compound fertilizer (10% N, 10% P_2O_5, 18% K_2O) per acre.

Cultivations, etc.: Ploughed: Oct 24, 1958. Basal dressing applied: Mar 31, 1959. Potatoes machine planted: Apr 2. Earthed up: June 18. Appropriate plots sprayed with zineb: July 22 and Aug 14, and with copper fungicide: Aug 14 and Sept 4. Sprayed with sulphuric acid at 15% BOV in 100 gallons per acre: Sept 30. Lifted: Oct 13. Variety: Majestic. Previous crop: Barley.

Standard error per plot.
Total tubers: 1.049 tons per acre or 8.8% (6 d.f.)

Note: Commencing mid July, fortnightly samples of yield, and estimates of foliage destroyed by blight, and of amounts of blight on the tubers at time of sampling and after storage were made.

Summary of Results

	Spray 0	1	2	3	Mean
Total tubers: tons per acre					
Mean (±0.525)	11.81	10.91	11.94	12.97	11.91
Increase (±0.742)		-0.90	+0.13	+1.16	
Percentage ware (1½" riddle)					
Mean	85.5	84.3	84.8	84.2	84.7
Increase		-1.2	-0.7	-1.3	

https://doi.org/10.23637/ERADOC-1-179

59/Cf/4

POTATOES

The control of blight (Phytophthora infestans) by copper and tin fungicides - Great Field II 1959.

Design: 3 randomized blocks of 5 plots each.

Area of each plot: 0.0096 acres. Area harvested: 0.0013 acres.

Treatments.
Unsprayed (0).
Sprayed twice with white oil formulation of copper oxychloride at 120 fluid oz in 60 gallons per acre (1).
Sprayed twice with 0.1% (2); 0.3% (3); 0.6% (4) triphenyltin acetate at 60 gallons per acre.

Basal dressing: 10 cwt compound fertilizer (10% N, 10% P_2O_5, 18% K_2O) per acre.

Cultivations, etc.: Ploughed twice: Oct 27, 1958 and Feb 20, 1959. Basal fertilizer applied: Mar 31. Ridged, potatoes machine planted: Apr 1. Earthed up: June 18. Fungicide treatments applied twice: Aug 11 and Sept 2. Sprayed with sulphuric acid, 15% BOV, 100 gallons per acre: Sept 30. Lifted: Oct 13. Variety: Ulster Supreme. Previous crop: Barley.

Standard error per plot.
Total tubers: 1.940 tons per acre or 20.2% (8 d.f.)

Note: Commencing in August estimates were made at 10 day intervals of incidence of blight and of defoliation.

Summary of Results

Spray 0	1	2	3	4	Mean
		Total tubers: tons per acre			
9.58	8.10	9.87 (±1.120)	10.30	10.21	9.61
		Percentage ware (1½" riddle)			
83.3	87.5	83.2	89.2	91.6	87.0

https://doi.org/10.23637/ERADOC-1-179

POTATOES

The control of weeds by triazine sprays - Rothamsted (R) Great Field I and Woburn (W) Great Hill 1959.

Design (each field): 3 randomized blocks of 4 plots each.

Area of each plot (acres): 0.0318. Area harvested: Great Field I (R) - 0.0141; Great Hill (W) - 0.0182.

Treatments: Pre-emergence sprays:- None;
2-chloro-4-6-bis-ethylamino-s-triazine (Simazine) (S):
at 1 lb in 40 gallons per acre (1);
2 lb in 80 gallons per acre (2);
3 lb in 120 gallons per acre (3).

Basal dressing: 10 cwt compound fertilizer (10% N, 10% P_2O_5, 18% K_2O) per acre.

Cultivations, etc.:
Great Field I (R). Ploughed: Sept 9, 1958. Basal dressing applied: Mar 26, 1959. Potatoes machine planted: Apr 1. Sprays applied to appropriate plots: Apr 14. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 15. Sprayed with sulphuric acid, 15% BOV in 100 gallons per acre: Sept 21. Tops destroyed mechanically: Oct 3. Lifted: Oct 8. Variety: Ulster Supreme. Previous crop: Barley.
Great Hill (W). Ploughed: Jan 24 - Feb 11, 1959. Basal dressing applied: Apr 23. Potatoes machine planted: Apr 28. Sprays applied to appropriate plots: Apr 29. Lifted: Oct 1. Variety: King Edward. Previous crop: Barley.

Standard error per plot: Total tubers.
Great Field I (R): 1.630 tons per acre or 16.5% (6 d.f.)
Great Hill (W): 1.249 tons per acre or 32.7% (6 d.f.)

Note: On Great Hill (W) about half the tubers which would normally have been included in ware were severely shrivelled: the means of percentage ware given in the summary do not include these shrivelled tubers.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Spray 0	S_1	S_2	S_3	Mean
Total tubers: tons per acre				
Great Field I (R)				
4.55	11.91	11.81 (±0.941)	11.16	9.86
Great Hill (W)				
3.16	3.96	4.57 (±0.721)	3.60	3.82
Percentage ware*				
Great Field I (R)				
86.8	90.8	93.2	91.5	90.6
Great Hill (W)				
19.4	26.3	22.8	23.4	23.0
Percentage shrivelled tubers				
Great Hill (W)				
54.6	50.0	54.1	48.0	51.7

*Riddle size (R) $1\frac{1}{2}$"; (W) $1\frac{5}{8}$".

Note: On both fields treated strips outside the experimental area gave the following results.

	Total tubers: tons per acre	% ware ($1\frac{1}{2}$" riddle)	% shrivelled tubers
Great Field I (R); 2-chloro-4-ethylamino-6-isopropylamino-s-triazine (Atrazine) at 2 lb in 80 gallons per acre	12.40	91.1	
Normal mechanical weed control	13.66	91.0	
	Total tubers: tons per acre	% ware ($1\frac{5}{8}$" riddle)	% shrivelled tubers
Great Hill (W) Atrazine	3.64	25.8	43.6
Normal mechanical weed control	9.59	57.1	16.7
Simazine at 4 lb in 160 gallons per acre	4.80	47.8	25.1

https://doi.org/10.23637/ERADOC-1-179

GRASS

Slow acting nitrogenous fertilizers - Harwoods Piece 1959, the second year.

Design: 4 randomized blocks of 16 plots each.

Area of each plot: 0.0087 acres. Area harvested: 0.0035 acres.

Treatments: None (2 plots per block) and all combinations of:-

Materials and methods of application

Ureaformaldehyde (37.2% N) applied: in 1958; in 1959; in 1958 and 1959.

'Nitro-Chalk' (15.5% N) applied: in spring 1959.

'Nitro-Chalk' applied $\frac{1}{3}$ in spring; $\frac{1}{3}$ after each of 1st and 2nd cuts: in 1958; in 1959; in 1958 and 1959.

Rates of application

1.0; 2.0 cwt N per acre

Basal dressing: 5 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre.

Cultivations, etc.: Basal fertilizer applied: Feb 12, 1959. Ureaformaldehyde and 'Nitro-Chalk' applied: Mar 10. 2nd and 3rd dressings of 'Nitro-Chalk' applied: Apr 28 and June 22. Cut 3 times: Apr 28, June 18 and Aug 24. Variety: S22 Italian Ryegrass.

Standard errors per plot. Dry matter:

1st cut:	1.74 cwt per acre or 9.6%	(46 d.f.)
2nd cut:	2.83 cwt per acre or 13.5%	(46 d.f.)
3rd cut:	1.26 cwt per acre or 11.8%	(46 d.f.)
Total of 3 cuts:	4.94 cwt per acre or 9.9%	(46 d.f.)

Note: For details of the previous years results see "Results of the Field Experiments" 58/Cg/1. On page 58/Cg/1.1 the % of K_2O in the basal dressing should read '20' not '10'.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Dry matter: cwt per acre

Rate of application of N: cwt per acre	None	Fertilizer: Ureaformaldehyde applied 1958	Ureaformaldehyde applied 1959	Ureaformaldehyde applied 1958 & 1959	'Nitro-Chalk' applied: As single dressing spring 1959	'Nitro-Chalk' applied: As divided dressing 1958	As divided dressing 1959	As divided dressing 1958 & 1959	Mean
1st cut					(±0.87)				
1.0		8.6	13.1	16.9	30.2	9.6	18.6	22.7	17.1 (±0.33)
2.0		9.7	16.7	24.5	33.7	15.3	26.7	32.1	22.7
Mean (±0.62)	6.2	9.2	14.9	20.7	32.0	12.4	22.6	27.4	18.1
Diff. (±1.23)		+1.1	+3.6	+7.6	+3.5	+5.7	+8.1	+9.4	+5.6 (±0.47)
2nd cut					(±1.42)				
1.0		13.1	17.2	14.3	19.5	12.8	26.4	30.6	19.1 (±0.53)
2.0		13.5	22.5	23.1	34.6	13.1	36.7	36.5	25.7
Mean (±1.00)	10.9	13.3	19.8	18.7	27.0	12.9	31.5	33.5	20.9
Diff. (±2.00)		+0.4	+5.3	+8.8	+15.1	+0.3	+10.3	+5.9	+6.6 (±0.76)

Mean dry matter % as cut:
1st cut: 17.3
2nd cut: 32.5

59/Cg/1.2

Dry matter: cwt per acre

Rate of application of N: cwt per acre	None	Ureaformaldehyde applied: 1958	Ureaformaldehyde applied: 1959	Ureaformaldehyde applied: 1958 & 1959	'Nitro-Chalk' applied: As single dressing spring 1959	'Nitro-Chalk' applied: As divided dressing: 1958	'Nitro-Chalk' applied: As divided dressing: 1959	'Nitro-Chalk' applied: As divided dressing: 1958 & 1959	Mean
3rd cut									
					(±0.63)				
1.0		6.9	7.9	9.0	7.3	6.0	14.1	15.3	9.5 (±0.24) (~~±0.17~~)
2.0		8.4	10.7	13.2	11.0	7.2	22.0	22.2	13.5
Mean (±0.45)	5.3	7.7	9.3	11.1	9.2	6.6	18.0	18.7	10.7
Diff. (±0.89)		+1.5	+2.8	+4.2	+3.7	+1.2	+7.9	+6.9	+4.0 (±0.34)
Total of 3 cuts									
					(±2.47)				
1.0		28.6	38.2	40.2	57.0	28.3	59.0	68.6	45.7 (±0.93) (~~±0.66~~)
2.0		31.6	49.8	60.9	79.3	35.6	85.3	90.8	61.9
Mean (±1.75)	22.3	30.1	44.0	50.5	68.1	31.9	72.2	79.7	49.8
Diff. (±3.49)		+3.0	+11.6	+20.7	+22.3	+7.3	+26.3	+22.2	+16.2 (±1.32)

Mean dry matter % as cut:
3rd cut: 33.4
Total of 3 cuts: 27.7

59/Cg/1.3

GRASS

Levels of N and K - Harwoods Piece 1959 - the 2nd year.

Design: 4 randomized blocks of 12 plots each.

Area of each plot: 0.0087 acres. Area harvested: 0.0035 acres.

Treatments: None and all combinations of:-
Nitrogen: 0.3; 0.6; 0.9 cwt N per acre as 'Nitro-Chalk'.
Potash: None; 0.3; 0.6 cwt K_2O per acre as muriate of potash.
All treatments in the presence of 0.6 cwt P_2O_5 per acre as superphosphate.
In addition 2 plots per block, receiving 0.9 N and 0.6 K, also received phosphate at either None or 1.2 cwt P_2O_5 per acre as superphosphate.

Note (1): N and K dressings are applied for each cut. All P dressings are applied once annually.

Basal dressing: None.

Cultivations, etc.: 1st dressing of fertilizers applied: Mar 10. 2nd and 3rd dressings of N and K applied: Apr 28 and June 22. Cut 3 times: Apr 27, June 17 and Aug 18. Variety: S22 Italian Ryegrass.

Standard errors per plot. Dry matter:

1st cut:	1.48 cwt per acre or 5.8%	(33 d.f.)
2nd cut:	2.38 cwt per acre or 6.2%	(33 d.f.)
3rd cut:	2.48 cwt per acre or 12.3%	(33 d.f.)
Total of 3 cuts:	5.26 cwt per acre or 6.3%	(33 d.f.)

Note (2): For details of the previous year's results see 'Results of the Field Experiments' 58/Cg/2 to which should be added note (1) and the asterisks and footnote in the summary.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Dry matter: cwt per acre

cwt per acre*													
N	0.0	0.3	0.3	0.3	0.6	0.6	0.6	0.9	0.9	0.9	0.9	0.9	
P_2O_5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	1.2	
K_2O*	0.0	0.0	0.3	0.6	0.0	0.3	0.6	0.0	0.3	0.6	0.6	0.6	Mean
1st cut (±0.74)	6.1	20.4	21.0	19.8	29.8	29.9	28.6	31.1	30.6	29.4	28.8	30.6	25.5
2nd cut (±1.19)	13.7	31.5	31.3	33.4	39.4	40.0	42.9	44.4	44.9	46.8	43.7	45.0	38.1
3rd cut (±1.24)	5.4	15.8	14.4	16.1	21.1	23.3	24.4	24.4	24.1	24.7	23.2	24.5	20.1
Total of 3 cuts (±2.63)	25.2	67.7	66.7	69.2	90.3	93.2	95.9	99.8	99.6	100.8	95.7	100.1	83.7

*For each cut.

Mean dry matter % as cut:

1st cut:	15.3	3rd cut:	30.5
2nd cut:	32.1	Total of 3 cuts:	26.0

GRASS

Species and levels of nitrogen - Harwood's Piece.1959, the 2nd year.

Design: 4 randomized blocks of 12 plots each.

Area of each plot: 0.0087 acres. Area harvested: 0.0035 acres.

Treatments. All combinations of:-

Species sown in spring 1958:

- S37 Cocksfoot at 30 lb per acre (C)
- S215 Meadow Fescue at 30 lb per acre (M)
- S24 Perennial Ryegrass at 25 lb per acre (R)
- Timothy "Scotia" at 20 lb per acre (T)

Levels of nitrogen: None; 0.3; 0.6 cwt N per acre as 'Nitro-Chalk', applied for each cut.

Basal dressing: 5 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre.

Cultivations, etc.: Basal fertilizer applied: Feb 12, 1959. Nitrogen dressings applied: Mar 11, May 14, July 17. Cut 3 times: May 13, July 15, Nov 4.

Standard errors per plot. Dry matter:

1st cut:	1.71 cwt per acre or 5.9%	(33 d.f.)
2nd cut:	2.98 cwt per acre or 16.9%	(33 d.f.)
3rd cut:	2.03 cwt per acre or 19.1%	(33 d.f.)
Total of 3 cuts:	4.35 cwt per acre or 7.6%	(33 d.f.)

Note: For details of the previous years results see "Results of the Field Experiments" 58/Cg.3.

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Dry matter: cwt per acre

N: cwt per acre*	Species C	M	R	T	Mean
1st cut					
		(±0.85)			(±0.43)
None	9.1	19.6	20.7	12.9	15.5
0.3	25.1	34.8	39.9	30.1	32.5
0.6	34.0	40.8	45.2	36.0	39.0
Mean (±0.49)	22.7	31.7	35.2	26.3	28.9
2nd cut					
		(±1.49)			(±0.74)
None	6.2	5.5	1.7	10.8	6.0
0.3	24.0	15.3	12.2	27.9	19.9
0.6	31.4	21.5	21.0	33.6	26.8
Mean (±0.85)	20.6	14.1	11.6	24.1	17.5
3rd cut					
		(±1.01)			(±0.50)
None	2.0	1.9	1.3	1.6	1.7
0.3	17.4	9.8	4.2	13.0	11.1
0.6	30.1	17.5	7.8	21.1	19.1
Mean (±0.59)	16.5	9.7	4.4	11.9	10.6
Total of 3 cuts					
		(±2.18)			(±1.09)
None	17.2	26.9	23.6	25.2	23.2
0.3	66.5	59.8	56.3	71.1	63.4
0.6	95.5	79.7	73.9	90.7	84.9
Mean (±1.25)	59.7	55.5	51.2	62.3	57.1

Mean dry matter % as cut:

1st cut:	22.7
2nd cut:	36.7
3rd cut:	30.5
Total of 3 cuts:	30.0

Species

C	S37 Cocksfoot
M	S215 Meadow Fescue
R	S24 Perennial Ryegrass
T	Timothy "Scotia"

*Applied for each cut.

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59/Cg/4.1

CLOVER AND GRASS LEYS

The comparison of clover and grass leys as a preparation for wheat - West Barnfield II, 1959.

Design: 4 randomized blocks of 16 plots each.

Area of each plot: 0.0159 acreas. Area harvested: 0.0068 acres.

Treatments:

Nitrogen to Leys 1959:-

To clover: none(4 plots per block)
To ryegrass: none, R1 and R2 (4 plots per block in each case)
Where R1 = 0.6 cwt N in spring, 0.15 cwt N after 1st hay cut.
R2 = 1.2 cwt N in spring, 0.30 cwt N after 1st hay cut.

The Nitrogen was applied as 'Nitro-chalk'

Note: the experiment is designed to include four rates of N applied to wheat in 1960/61.

Basal Dressings per acre:

To barley nurse crop 1958: 3 cwt compound fertilizer (10% P_2O_5, 20% K_2O) combine drilled; 2 cwt sulphate of ammonia in seedbed.
To leys combine drilled in seedbed 1958: 1 cwt superphosphate.

Cultivations, etc., barley drilled March 25th, 1958: superphosphate applied, leys undersown in barley, ryegrass at 30 lb. and clover at 20 lb. per acre: April 22nd.
'Nitro-chalk' dressings applied: March 12th and May 25th, 1959.
Cut twice for hay: May 20th and July 20th. Varieties: Italian ryegrass S22 and Double cut red clover S151.

Standard errors per plot:

Ryegrass. Dry matter:

1st cut:	3.41 cwt per acre or 7.5%	(42 d.f.)
2nd cut:	0.97 cwt per acre or 7.5%	(42 d.f.)
Total of 2 cuts:	3.78 cwt per acre or 6.5%	(42 d.f.)

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Summary of Results

Clover. Dry matter cwt per acre

mean 49.1

Ryegrass. Dry matter cwt per acre

N to leys 1959

0	R1	R2	Mean
	1st cut		
23.4	54.8 (±0.98)	58.9	45.7
	2nd cut		
7.2	13.7 (±0.28)	17.7	12.9
	Total of 2 cuts		
30.6	68.5 (±1.09)	76.6	58.6

Mean dry matter % as cut

Clover		38.2
Ryegrass	1st cut	25.2
	2nd cut	46.3
	Total of 2 cuts	35.8

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METEOROLOGICAL RECORDS 1959 - ROTHAMSTED

(Departure from long period means in brackets)

Month	Total sunshine: hours	Mean temperature: °F Air(1)	Dew point	In ground 1 ft.	In ground 4 ft.	Ground(2) frosts	Total rainfall: in. 1/1000 acre gauge	Rain(3) days	Drainage through 20 in. soil: in.	Wind(4) m.p.h.
Jan.	79 (+27)	33.6 (-3.7)	30.3	36.4	43.4	24	3.30 (+0.78)	19	2.98	4.6
Feb.	62 (-8)	38.1 (-0.1)	34.6	36.9	40.8	15	0.09 (-1.85)	8	0.09	3.6
Mar.	89 (-29)	44.0 (+2.7)	40.7	43.2	42.9	11	2.63 (+0.74)	16	1.25	4.9
Apr.	135 (-21)	48.7 (+2.9)	42.8	48.5	45.7	3	2.47 (+0.56)	16	0.56	5.1
May	219 (+23)	53.7 (+1.8)	46.1	54.0	49.2	5	1.28 (-0.87)	5	0.26	4.9
June	233 (+31)	58.9 (+1.6)	50.3	59.2	52.8	0	1.15 (-1.06)	13	0.00	4.1
July	277 (+83)	63.3 (+2.6)	54.7	63.5	57.2	0	4.51 (+1.97)	10	2.00	4.1
Aug.	229 (+46)	63.1 (+2.9)	56.2	63.8	59.4	0	1.65 (-0.96)	8	0.08	3.5
Sept.	208 (+63)	59.3 (+3.2)	52.4	59.5	58.9	0	0.16 (-2.23)	3	0.00	3.5
Oct.	150 (+46)	53.6 (+4.7)	48.5	53.9	56.2	1	2.39 (-0.58)	19	0.47	4.2
Nov.	65 (+4)	43.1 (+0.7)	41.1	45.2	51.0	12	2.39 (-0.41)	24	1.82	3.4
Dec.	31 (-14)	40.9 (+2.2)	38.6	42.0	47.2	11	4.68 (+2.10)	26	4.17	6.2
Year*	1777 (+251)	50.0 (+1.8)	44.7	50.5	50.4	82	26.70 (-1.81)	167	13.68	4.3

(1) Mean of maximum and minimum.
(2) Number of nights grass minimum was 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.

59/E/1.1

METEOROLOGICAL RECORDS 1959 - WOBURN

Month	Total sunshine: hours	Mean temperature: °F Air(1)	Mean temperature: °F In ground 1 ft.	Grass minimum: °F	Total rainfall: in. 8" gauge	Rain days(2)
January	74	33.7	35.7	26.2	3.65	16
February	70	38.5	37.3	30.6	0.05	3
March	102	44.5	43.8	35.2	1.97	16
April	147	49.1	49.5	38.8	2.42	16
May	217	53.3	56.7	39.1	0.66	6
June	222	58.7	63.2	44.2	0.99	13
July	259	63.3	66.7	46.7	2.68	10
August	227	63.4	66.1	48.5	0.95	6
September	172	57.9	60.4	39.3	0.09	2
October	146	53.4	53.7	37.7	1.92	13
November	57	43.8	43.8	31.7	2.21	16
December	38	41.8	41.4	33.5	3.73	25
Year*	1731	50.1	51.5	37.6	21.32	142

(1) Mean of maximum and minimum.

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

*Mean or total.

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CONVERSION FACTORS

Factors for the Conversion of Imperial to Metric Units

1 inch (in.)	= 2·540 centimetres (cm)
1 foot (ft) (=12 in.)	= 30·48 cm
1 yard (yd) (=3 ft)	= 0·9144 metre (m)
1 square yard (yd²)	= 0·8361 m²
1 acre (ac) (=4840 yd²)	= 0·4047 hectare (ha)
1 ounce (oz)	= 28·35 grams (g)
1 pound (lb)	= 0·4536 kilogram (kg)
1 hundredweight (cwt) (=112 lb)	= 50·80 kg
1 ton (=2240 lb)	= 1016 kg = 1·016 metric tons (tonnes) (t)
1 pint	= 0·5682 litre (l)
1 gallon (gal) (=8 pints)	= 4·546 litres
1 fluid ounce = 1/20 pint	= 0·02841 litre = 28·41 ml
1 cubic foot	= 28·32 litres

To convert	*Multiply by*
oz ac^{-1} to g ha^{-1}	70·06
lb ac^{-1} to kg ha^{-1}	1·121
cwt ac^{-1} to kg ha^{-1}	125·5
cwt ac^{-1} to t ha^{-1}	0·1255
ton ac^{-1} to kg ha^{-1}	2511
ton ac^{-1} to t ha^{-1}	2·511
gal ac^{-1} to l ha^{-1}	11·233

The following factors are accurate to about 2 parts in 100:

1 lb ac^{-1} = 1·1 kg ha^{-1}
1 gal ac^{-1} = 11 litres ha^{-1}
1 ton ac^{-1} = 2·5 t ha^{-1}

In general reading of the text there will be no great inaccuracy in regarding:

1 lb = 0·5 kg
1 lb ac^{-1} = 1 kg ha^{-1}

Temperatures

To convert °F into °C subtract 32 and multiply by $\frac{5}{9}$ (0.556)
To convert °C into °F multiply by $\frac{9}{5}$ (1·8) and add 32

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CONVERSION FACTORS

Factors for the Conversion of Metric to Imperial Units

1 centimetre (cm)	=	0·3937 inch (in.) = 0·03281 ft
1 metre (m)	=	1·094 yards (yd)
1 square metre (m^2)	=	1·196 square yards (yd^2)
1 hectare (ha)	=	2·471 acres (ac)
1 gram (g)	=	0·03527 ounce (oz)
1 kilogram (kg)	=	2·205 pounds (lb)
1 kg	=	0·01968 hundredweight (cwt) = 0·0009842 ton
1 metric ton (tonne) (t)	=	0·9842 ton
1 litre	=	1·760 pints = 0·2200 gallon (gal)

1 litre = 1000 millilitres (ml) = 35·20 fluid ounces = 0·03531 cubic foot (ft^3)

To convert	*Multiply by*
g ha^{-1} to oz ac^{-1}	0·01427
kg ha^{-1} to lb ac^{-1}	0·8921
kg ha^{-1} to cwt ac^{-1}	0·007966
t ha^{-1} to cwt ac^{-1}	7·966
kg ha^{-1} to tons ac^{-1}	0·0003983
t ha^{-1} to tons ac^{-1}	0·3983
l ha^{-1} to gal ac^{-1}	0·08902

Plant nutrients

Plant nutrients are best stated in terms of amounts of the elements (P, K, Na, Ca, Mg, S); the old 'oxide' terminology (P_2O_5, K_2O, Na_2O, CaO, MgO, SO_3) is still used in work involving fertilisers and liming since Regulations require statements of P_2O_5, K_2O, etc.

For quick conversions

(accurate to within 2%) the following factors may be used:

$2\frac{1}{3} \times P = P_2O_5$	$\frac{3}{7} \times P_2O_5 = P$
$1\frac{1}{5} \times K = K_2O$	$\frac{5}{6} \times K_2O = K$
$1\frac{2}{5} \times Ca = CaO$	$\frac{7}{10} \times CaO = Ca$
$1\frac{2}{3} \times Mg = MgO$	$\frac{3}{5} \times MgO = Mg$

For accurate conversions:

To convert	*Multiply by*	*To convert*	*Multiply by*
P_2O_5 to P	0·4364	P to P_2O_5	2·2915
K_2O to K	0·8301	K to K_2O	1·2047
CaO to Ca	0·7146	Ca to CaO	1·3994
MgO to Mg	0·6031	Mg to MgO	1·6581

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