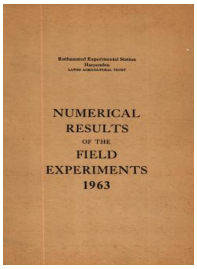
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ROTHAMSTED RESEARCH

Yields of the Field Experiments 1963

Full Table of Content



Yields of the Field Experiments 1963 - Numerical Results

Rothamsted Research

Rothamsted Research (1964) *Yields of the Field Experiments 1963 - Numerical Results ;* Yields Of The Field Experiments 1963, pp 1 - 188 **- DOI: https://doi.org/10.23637/ERADOC-1-183**

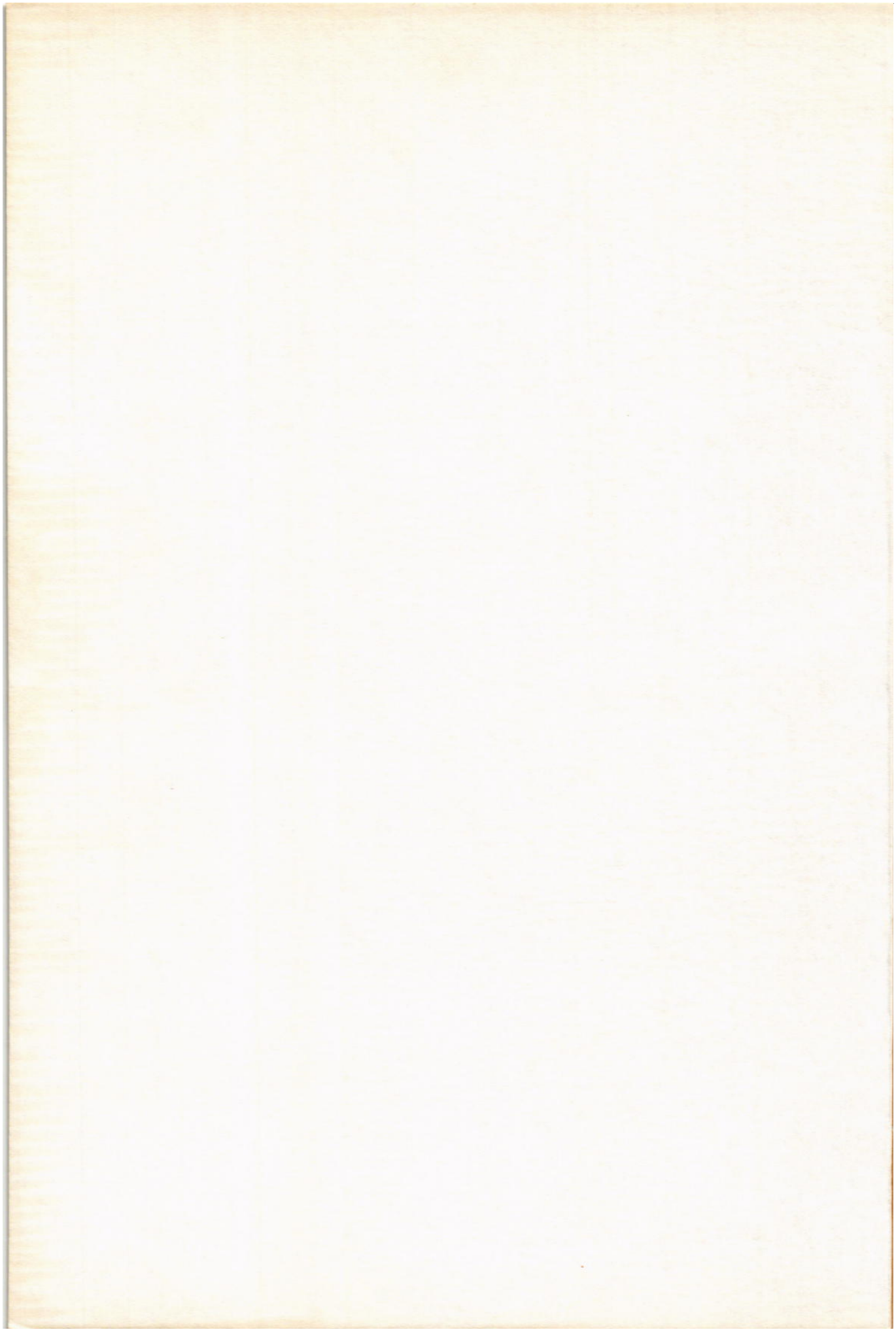
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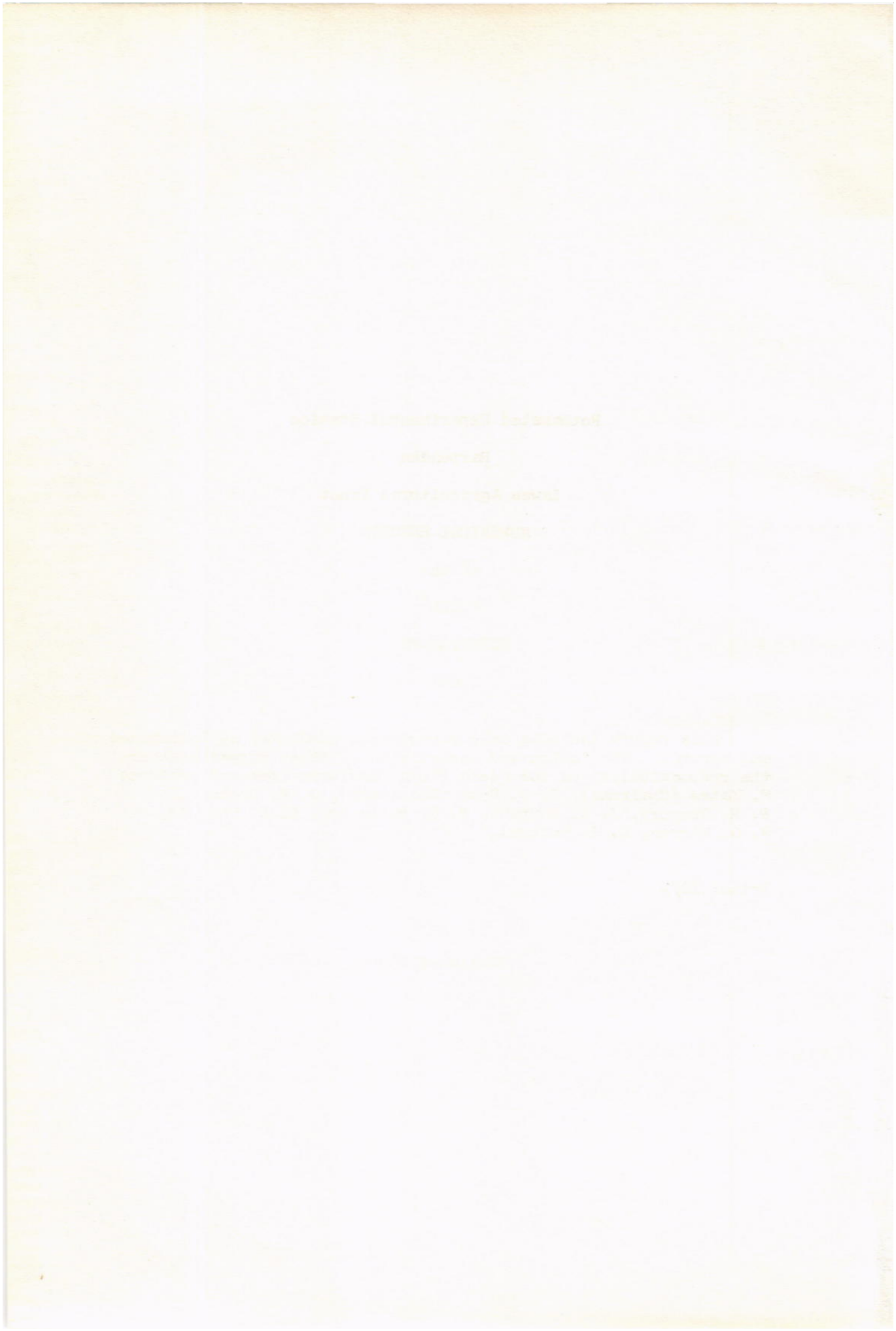
NUMERICAL RESULTS OF THE FIELD EXPERIMENTS 1963

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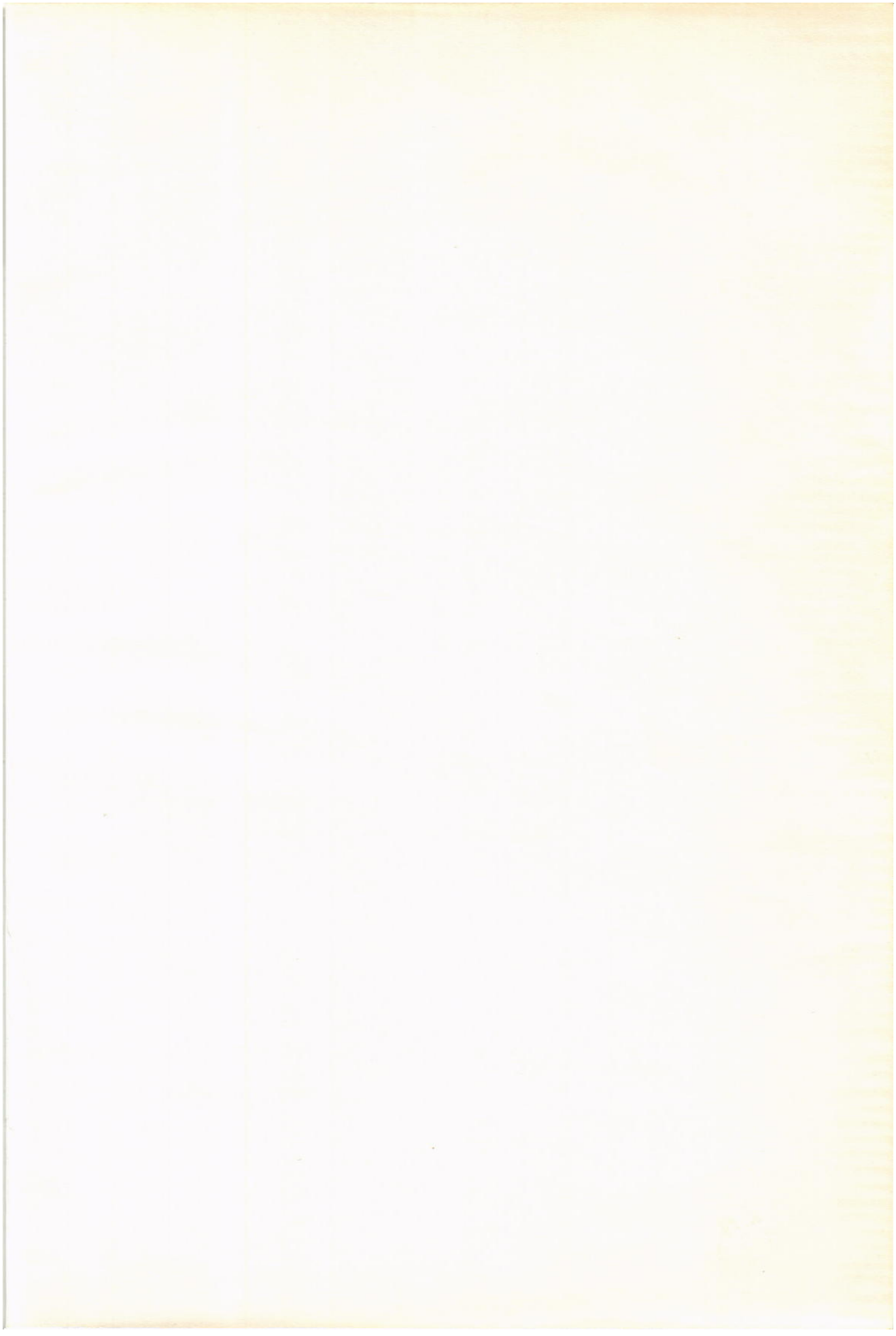
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Rothamsted Experimental Station

Harpenden

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NUMERICAL RESULTS

of the

FIELD

EXPERIMENTS

1963

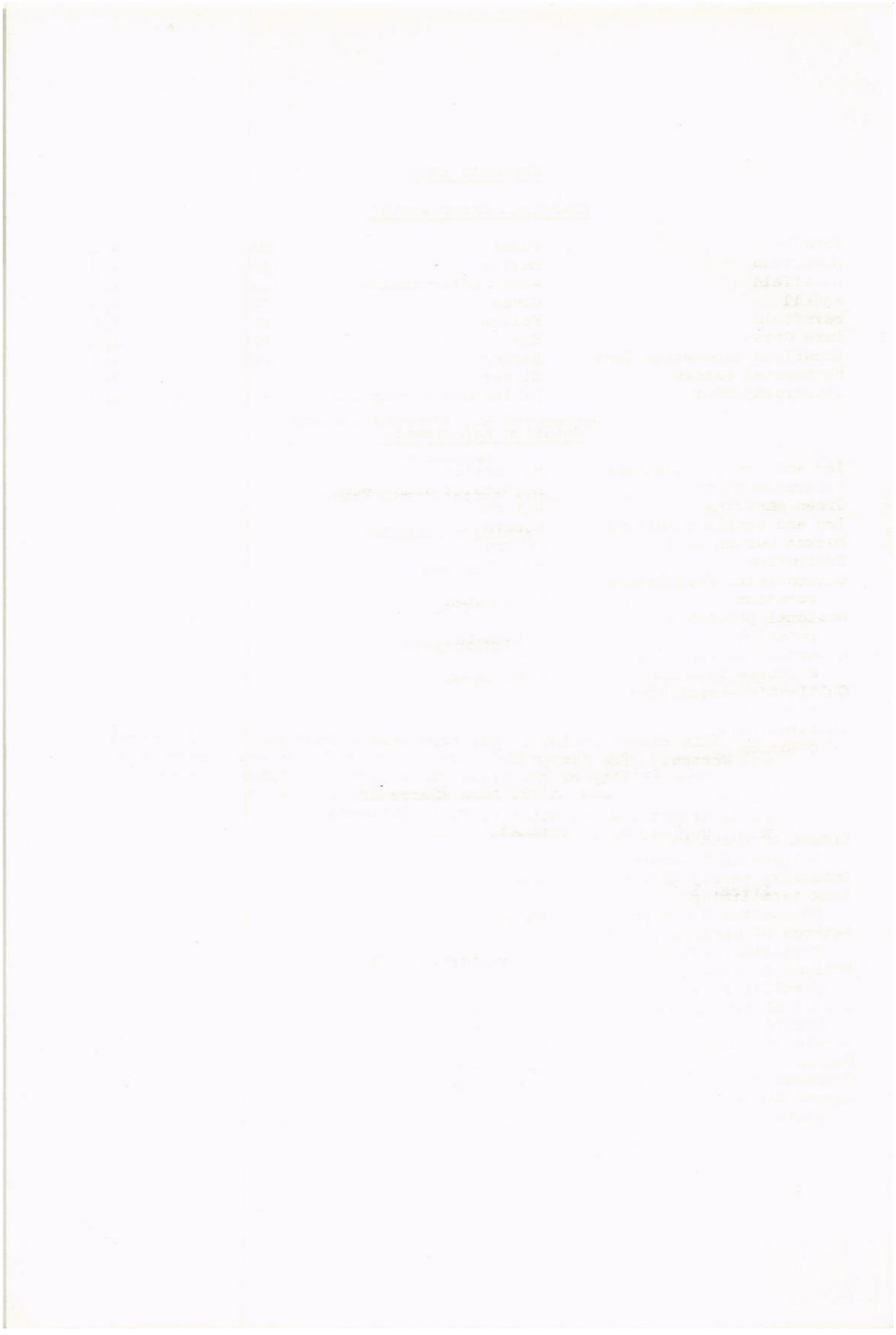
This report includes only experiments conducted at Rothamsted and Woburn. The design and supervision of these experiments are the responsibility of the Field Plots Committee (present members: F. Yates (Chairman), G. V. Dyke (Secretary), G. W. Cooke, P. H. Gregory, J. R. Moffatt, H. D. Patterson, C. A. Thorold, R. G. Warren, D. J. Watson).

Price: 10/-

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*At Rothamsted unless otherwise stated.

Note: In the case of the classical, rotation and crop sequence experiments the letters in brackets are the code letters used on the plan. For the annual experiments the letters and numbers are the first plot number.

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63/A/1.1

WHEAT - BROADBALK 1963

(BK)

The 120th year

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

Cultivations, etc.:

Cropped sections. Ground chalk applied: Sept 27, 1962. Ploughed: Sept 27 - Oct 5. Dung applied: Oct 4. Autumn fertilisers applied: Oct 23. Seed drilled at 3 bushels per acre: Nov 30. Spring fertilisers applied: Apr 24, 1963. Second dressing of nitrate of soda applied to plot 16: May 6. Sections IA and VB sprayed with mecoprop/2,4-D at 7 pints in 40 gallons per acre: May 16. Combine harvested: Sept 13. Variety: Squarehead's Master 13/4 (Rothamsted seed from Broadbalk field).

Fallow section. (NA) Ploughed: Sept 27 - Oct 5, 1962: May 29, 1963: July 16.

Note: There was a heavy attack of wheat bulb fly (Leptohylemia coarctata) on all plots of Section II (1st after fallow). On plots 10, 11, 12 and 14 the rop failed and was not harvested.

Part of plot 19 (Section IV) - the crop was heavily infested with creeping grasses (Holcus mollis and Agrostis stolonifera), and the harvested area was modified.

Broadbalk Wilderness. Cultivations etc.:

Ungrazed meadow (north): Shrubs grubbed out: Mar 26, 1962.

Grazed meadow (centre): Grazed by sheep: Apr 22 - May 7, 1962, June 1 - 14, July 4 - 13, Aug 16 - 21, Sept 3, Nov 4 - 13. Grass topped: May 8, June 13, July 12, Aug 19.

Woodland (south): East and west sides trimmed: July 30 - Aug 6, 1962.

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Summary of Results

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

Section	II	IB	III	IV	VB	IA	
Years after fallow	1	2	3	4	5	12	Mean
2A	27.2	31.1	18.2	19.2	19.9	22.5	22.6
2B	26.8	28.5	18.2	16.9	13.9	25.3	21.0
3	11.4	12.6	10.2	9.9	10.4	6.3	10.5
5	14.2	10.8	11.5	13.1	18.2	11.2	13.2
6	14.8	17.7	13.6	18.6	16.4	15.2	16.0
7	16.2	22.1	17.7	20.1	16.3	22.9	18.6
8	16.7	18.1	20.5	17.1	25.2	32.3	19.8
9	12.7	19.4	17.8	18.3	10.6	19.1	16.1
10	*	12.5	17.9	14.1	9.8	11.0	14.1
11	*	17.1	10.9	15.2	7.2	15.8	13.0
12	*	15.8	12.6	18.3	14.6	17.7	15.5
13	16.8	20.2	19.7	18.0	16.0	23.2	18.4
14	*	18.3	15.6	18.5	15.1	20.1	17.2
15	18.6	17.7	17.0	14.5	14.5	21.5	16.8
16	15.5	21.7	19.8	20.4	19.0	27.6	19.5
17	14.3	10.8	10.8	11.5	11.3	9.7	11.8
18	14.7	19.2	20.3	19.2	19.7	18.6	18.4
19	13.6	19.2	20.5	14.3	19.3	20.5	17.3
20	13.8	18.0				15.1	15.6

Mean dry matter % as harvested: 77.5

* No yields recorded

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63/A/1.3

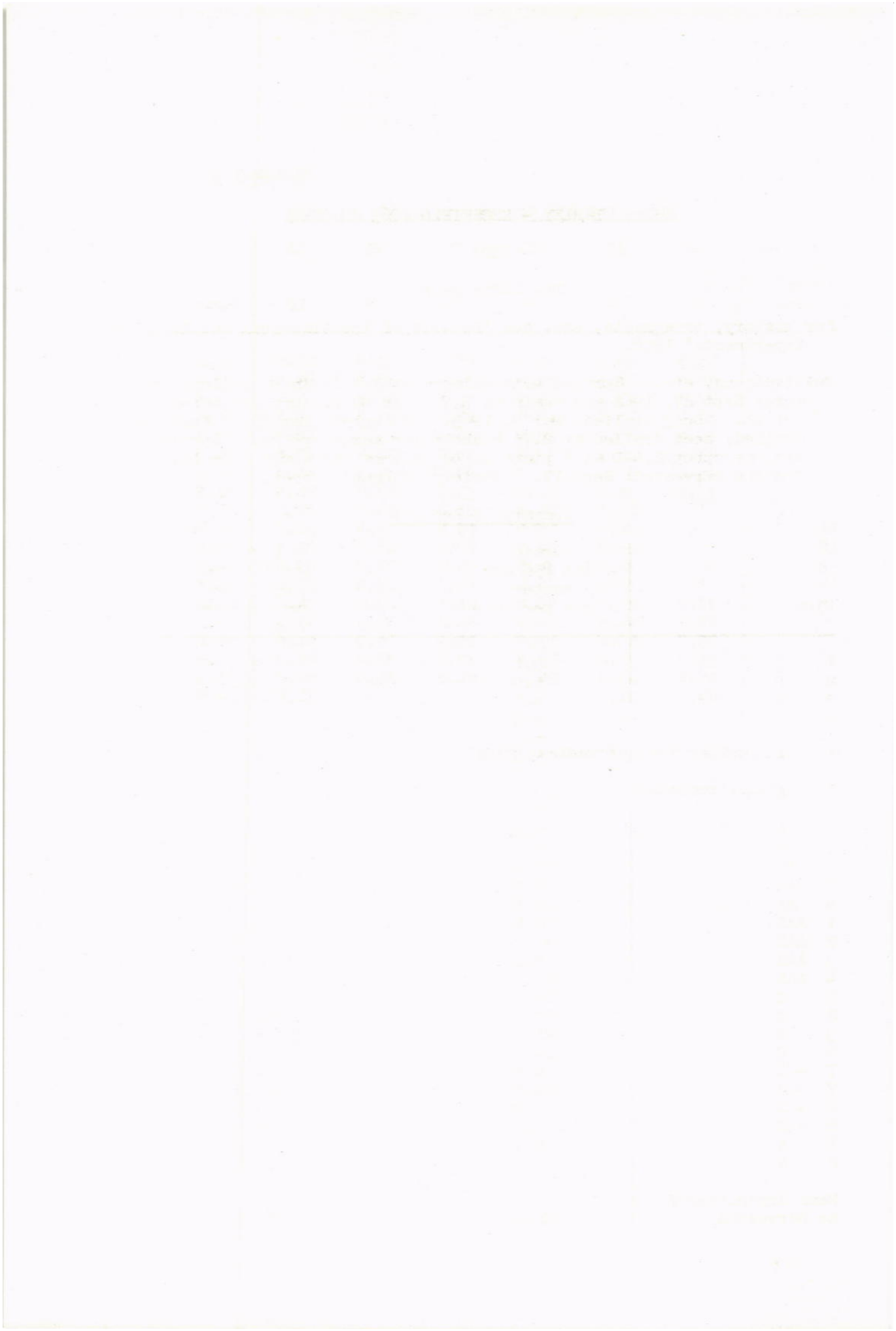
Straw (at 85% dry matter): cwt per acre

Section	II	IB	III	IV	VB	IA	
Years after fallow	1	2	3	4	5	12	Mean
2A	45.5	36.6	32.4	26.2	23.9	27.8	33.2
2B	46.4	38.5	35.9	30.0	35.6	24.1	36.6
3	20.3	17.2	13.9	13.1	10.5	7.0	14.8
5	30.0	18.8	18.0	17.4	23.8	9.5	21.0
6	29.4	29.2	26.9	29.4	23.3	16.8	27.3
7	43.4	38.1	37.2	36.0	28.4	27.6	36.9
8	45.2	39.2	43.7	34.7	35.9	44.6	40.5
9	36.8	35.8	31.6	33.9	23.0	26.9	32.5
10	*	21.5	24.6	21.0	14.5	20.2	21.1
11	*	26.1	18.6	25.4	8.4	20.5	20.4
12	*	23.6	22.2	29.4	16.9	22.7	23.8
13	42.1	34.9	34.5	34.0	22.7	29.6	34.5
14	*	28.8	26.1	26.9	18.6	25.1	25.5
15	37.7	27.9	26.6	26.5	18.0	24.8	28.2
16	45.2	44.5	39.7	45.2	33.5	41.3	42.2
17	25.7	19.0	19.9	19.9	14.9	11.6	20.1
18	33.7	32.4	33.6	37.6	30.0	22.3	33.3
19	28.1	25.4	24.0	24.8	25.8	22.6	25.5
20	24.5	26.7				21.6	24.8

Mean dry matter % as harvested: 89.3

* No yields recorded

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63/A/2

BARLEY - HOOSFIELD 1963

(HB)

The 112th year

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

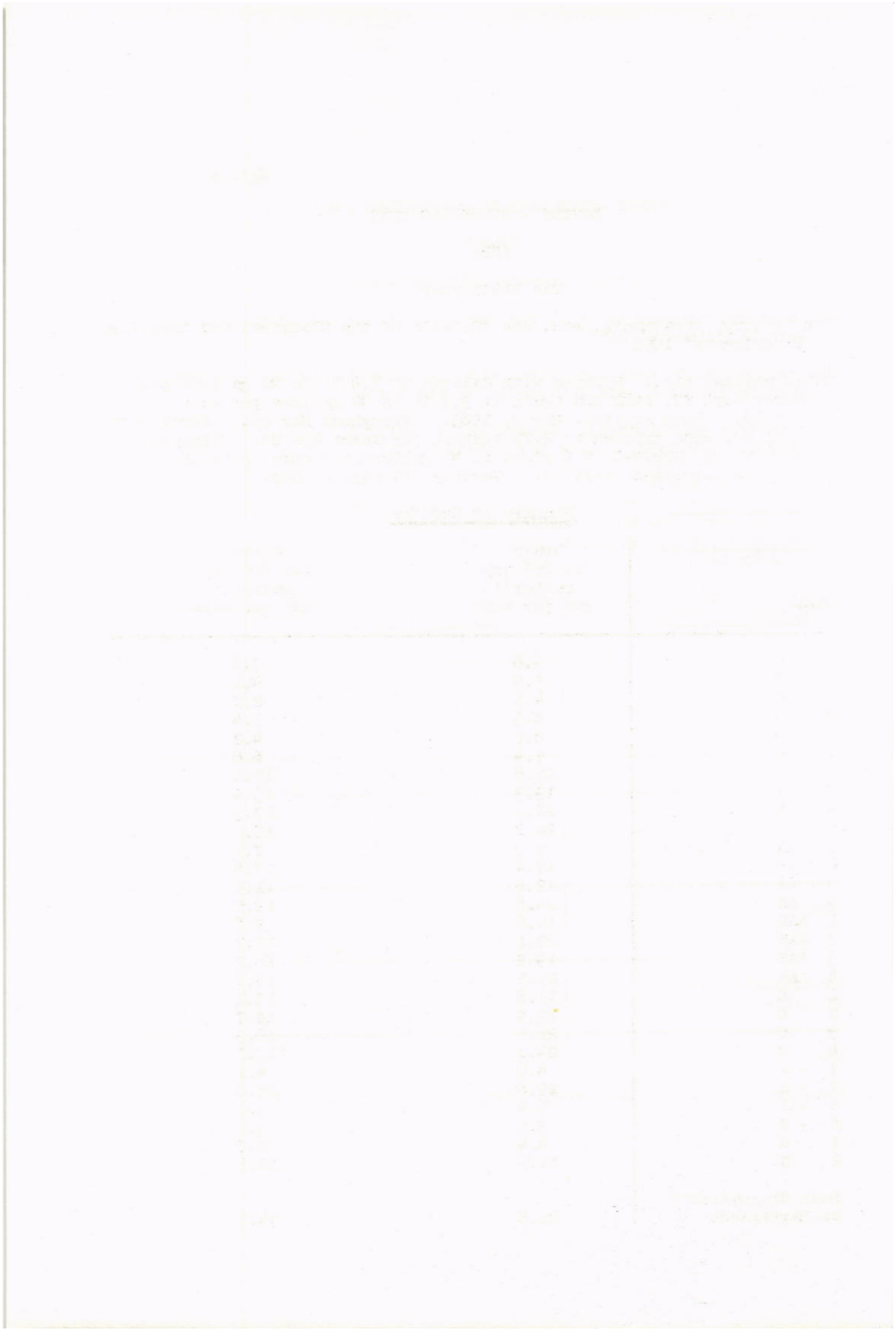
Cultivations, etc.: Sprayed with dalapon at 7.4 lb in 40 gallons per acre: Sept 27, 1962 and again at 3.7 lb in 40 gallons per acre: Oct 16. Dung applied: Mar 9, 1963. Ploughed: Mar 25. Fertilisers applied, seed drilled at 2.75 bushels per acre: Apr 24. Sprayed with mecoprop/2,4-D at 6 pints in 40 gallons per acre: June 11. Combine harvested: Sept 17. Variety: Plumage Archer.

Summary of Results

Plot	Grain (at 85% dry matter): cwt per acre	Straw (at 85% dry matter): cwt per acre
1 0	3.6	3.6
2 0	5.9	4.1
3 0	4.1	2.2
4 0	6.3	3.4
5 0	6.5	4.2
1 A	5.4	6.8
2 A	15.8	15.1
3 A	13.3	13.4
4 A	22.5	17.3
5 A	20.2	19.0
1 AA	5.3	7.1
2 AA	17.4	17.6
3 AA	12.6	11.5
4 AA	24.8	19.5
1 AAS	10.8	9.8
2 AAS	20.1	17.7
3 AAS	19.2	18.2
4 AAS	25.5	19.7
1 C	15.8	13.0
2 C	17.9	12.7
3 C	21.5	16.3
4 C	24.0	15.2
7 - 1	4.8	4.1
7 - 2	29.8	25.8
6 - 1	1.9	3.0
6 - 2	3.5	3.0
1 N	4.4	5.7
2 N	11.5	10.1
Mean dry matter % as harvested:	81.6	74.8

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63/A/3

WHEAT AFTER FALLOW - HOOSFIELD 1963

(HWF)

Without manure 1851 and since

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

The cropped plots were subdivided and Squarehead's Master 13/4 was sown on the South side, Cappelle on the North.

Area of each plot (acres): Squarehead's Master 13/4 - 0.0690. Cappelle - 0.0552. Area harvested: 0.0365.

Cultivations, etc.:
Cropped plots. Ploughed: Oct 24, 1962. Seed drilled at 3 bushels per acre: Nov 23. Combine harvested: Sept 10.
Fallowed plots. Ploughed three times: Oct 24, 1962, May 31, 1963, July 16.

Note: Counts of straw number and estimates of eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis) were made.

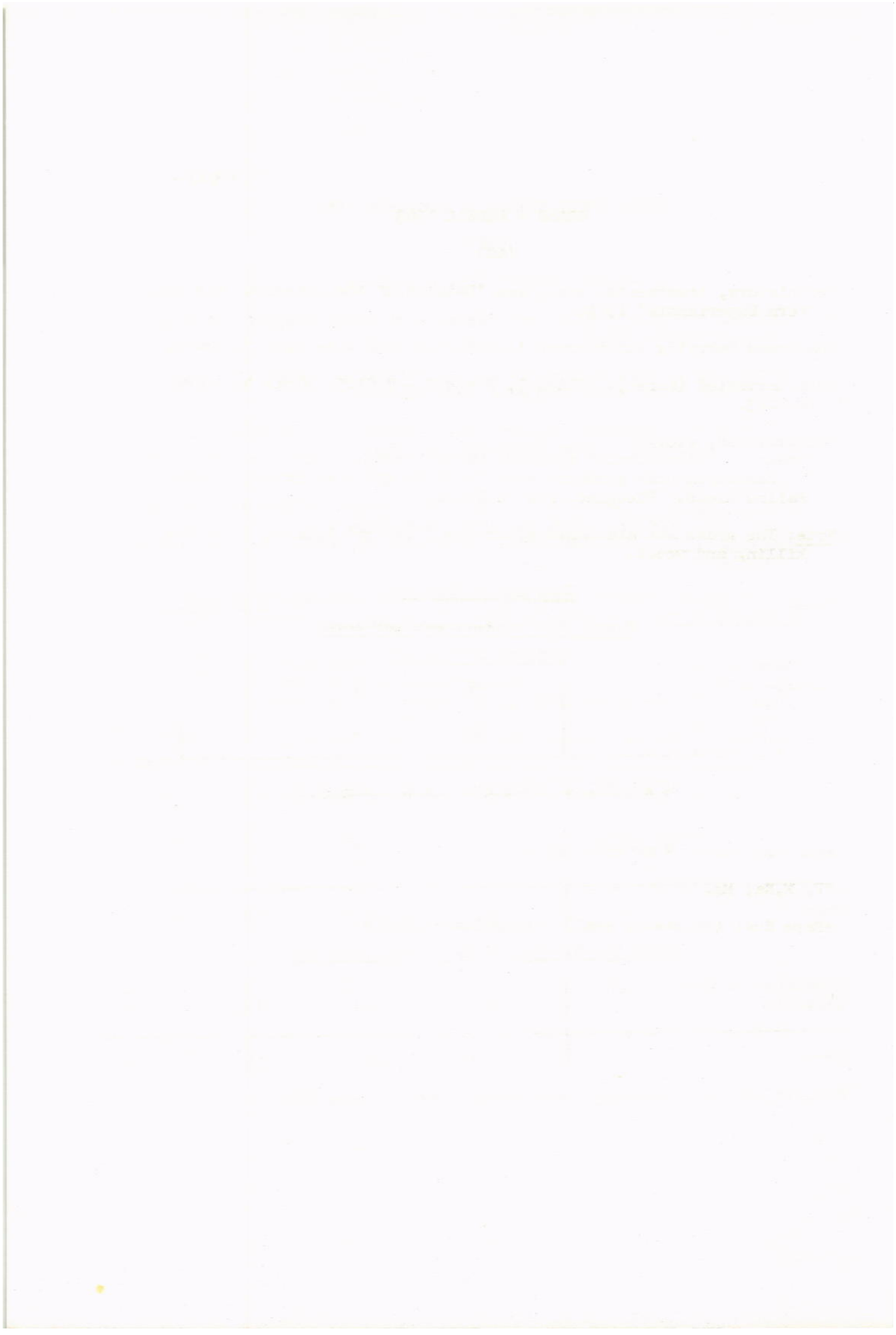
Summary of Results

Plot	B3	B4	B1	
No. of years of fallow	1	1	3	Mean
Grain (at 85% dry matter): cwt per acre				
Variety				
Squarehead's Master 13/4	12.4	7.8	12.4	10.9
Cappelle	11.7	13.3	16.6	13.9
Mean	12.0	10.5	14.5	12.4
Straw (at 85% dry matter): cwt per acre				
Squarehead's Master 13/4	17.4	9.5	16.7	14.5
Cappelle	16.2	15.9	13.7	15.3
Mean	16.8	12.7	15.2	14.9

Mean dry matter % as harvested: Grain 69.8 Straw 76.3

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63/A/4

GRASS - AGDELL 1963

(AG)

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

The areas carrying strip crops in 1961 and 1962 were bare fallowed.

Area harvested (acres): Plots 1, 2 and 3 - 0.0165, plots 4, 5 and 6 - 0.0023.

Cultivations, etc.:
Grass. 'Nitro-Chalk' applied: Mar 25, 1963. Cut: June 6. Grass destroyed with paraquat at 2 lb in 40 gallons per acre: June 15.
Fallow areas. Ploughed: Apr 8, 1963.

Note: The grass was abandoned after the first cut because of winter killing and weeds.

Summary of Results

Grass, Dry matter: cwt per acre

Manure to turnips until 1948	None since 1848		Mineral manure* no nitrogen		Mineral* and nitrogenous manure+		
Plot	5	6	3	4	1	2	
Rotation	Fallow	Clover	Fallow	Clover	Fallow	Clover	Mean
	3.8	2.1	4.5	5.6	2.1	6.1	4.1

Mean dry matter % as cut: 25.2

*P, K,Na, Mg.

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

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63/A/5

FALLOW AND POTATOES - BARNFIELD 1963

(BN)

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

The experiment was fallowed, except for 3 rows of potatoes on the East side of Strip 4, Series N, A, AC and C, coinciding with the 3 outermost mangold guard rows of 1962. These were grown for observations on skinspot (Oospora pustulans) and received 1.2 cwt N per acre, as sulphate of ammonia on Series A, AC and C, as nitrate of soda on Series N. Manures were applied to the whole experiment as before 1962, but excluding the castor meal and inorganic nitrogen. No yields were taken.

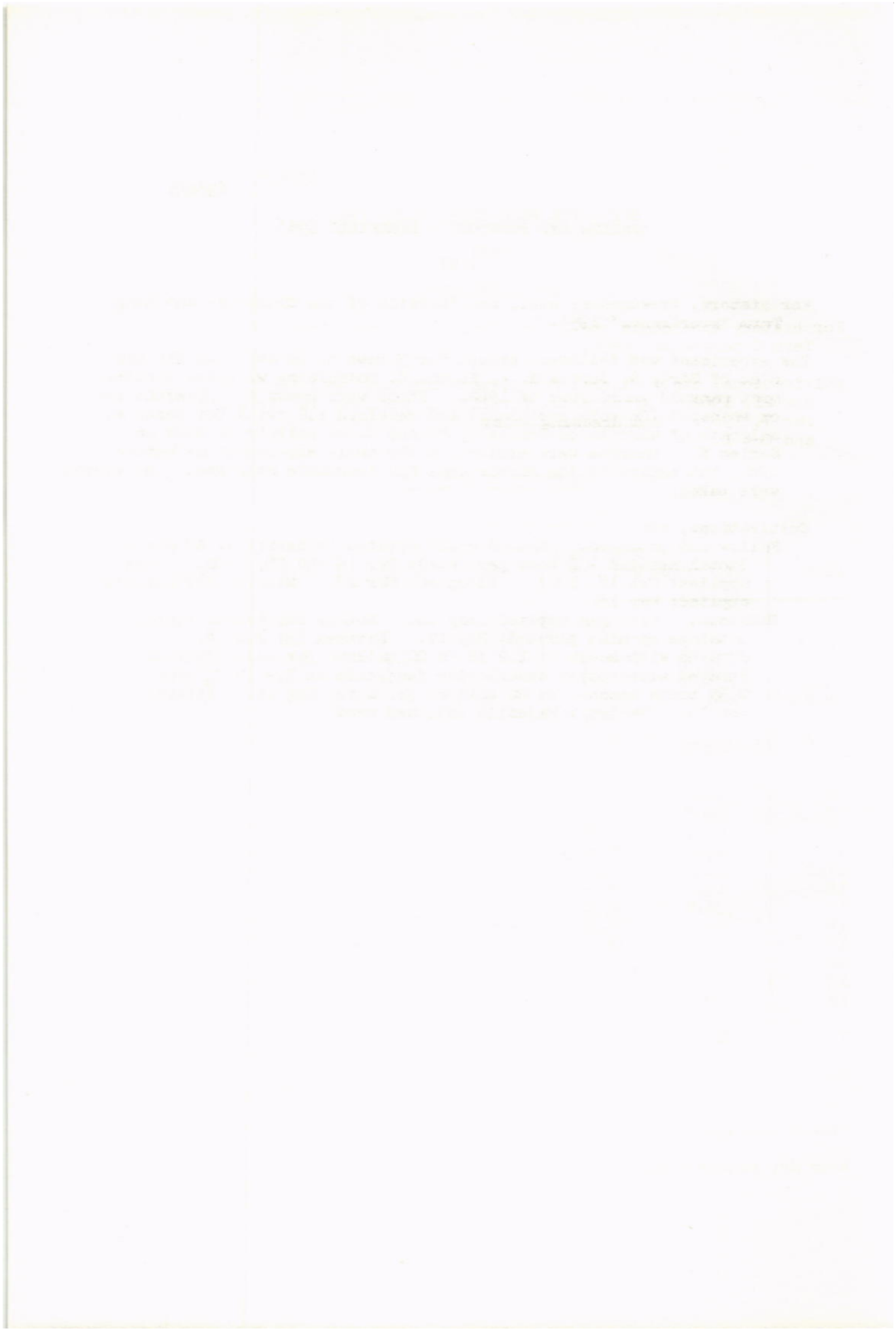
Cultivations, etc.:

Fallow and potatoes. Ground chalk applied to Series A, AC and C (total applied - 2 tons per acre): Dec 19 and 28, 1962. Dung applied: Feb 18, 1963. Ploughed: Mar 28. Mineral fertilisers applied: May 16.

Potatoes. Nitrogen applied: May 16. Rotary cultivated twice, potatoes machine planted: May 17. Earthed up: July 6. Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 12. Sprayed with copper oxychloride fungicide at 2.3 lb Cu plus 0.35 pints menazon in 20 gallons per acre: Aug 14. Lifted: Oct 19. Variety: Majestic (chitted seed).

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63/A/6

HAY - THE PARK GRASS PLOTS 1963

(PG)

The 108th year

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

Cultivations, etc.: Mineral fertilisers and fish meal applied: Nov 21, 1962. Nitrogenous fertilisers applied: 1st dressing - Mar 7, 1963: 2nd dressing - Mar 27. Cut twice: June 27 and Oct 1.

Summary of Results

Dry matter: cwt per acre

Plot	Not limed			Limed		
	1st crop	2nd crop	Total	1st crop	2nd crop	Total
1	5.2	6.8	12.0	15.8	9.4	25.2
2	12.9	11.1	24.0	16.3	11.6	27.9
3	11.4	10.4	21.8	18.2	10.2	28.4
4-1	19.4	14.0	33.4	21.2	11.6	32.8
4-2	22.2	10.5	32.7	26.0	12.5	38.5
5-1	9.6	8.5	18.1			
5-2	23.0	20.5	43.5			
6	30.6	19.6	50.2			
7	32.0	18.8	50.8	42.8	23.4	66.2
8	20.0	17.8	37.8	20.2	15.0	35.2
9	36.8	12.6	49.4	43.2	19.7	62.9
10	24.6	10.8	35.4	29.4	13.2	42.6
11-1	19.3	30.5	49.8	51.7	22.9	74.6
11-2	30.0	29.0	59.0	51.7	28.8	80.5
12	13.1	15.9	29.0			
13	34.2	23.0	57.2	36.7	22.4	59.1
14	45.1	16.8	61.9	37.2	14.2	51.4
15	28.0	16.2	44.2	35.0	19.3	54.3
16	33.7	16.5	50.2	40.1	18.5	58.6
17	15.7	10.6	26.3	21.5	12.1	33.6
18	9.2	9.1	18.3	22.0*	12.1*	34.1*
				21.7+	13.5+	35.2+
19	29.7	21.2	50.9	36.8*	16.4*	53.2*
				37.3+	20.7+	58.0+
20	45.5	23.2	68.7	45.2*	21.4*	66.6*
				43.8+	19.7+	63.5+

*Heavy liming. +Light liming.

Mean dry matter % as cut: 1st crop 24.0: 2nd crop 23.0.

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63/A/7

BARLEY - EXHAUSTION LAND HOOSFIELD 1963

(EX)

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

The 'Nitro-Chalk' was combine drilled.

Cultivations, etc.: Sprayed with dalapon at 7.4 lb in 40 gallons per acre: Sept 27, 1962 and again at 3.7 lb in 40 gallons per acre: Oct 16. Ploughed: Mar 27, 1963. Seed combine drilled at 2 bushels per acre: Apr 8. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: June 11. Combine harvested: Sept 5. Variety: Proctor.

Summary of Results

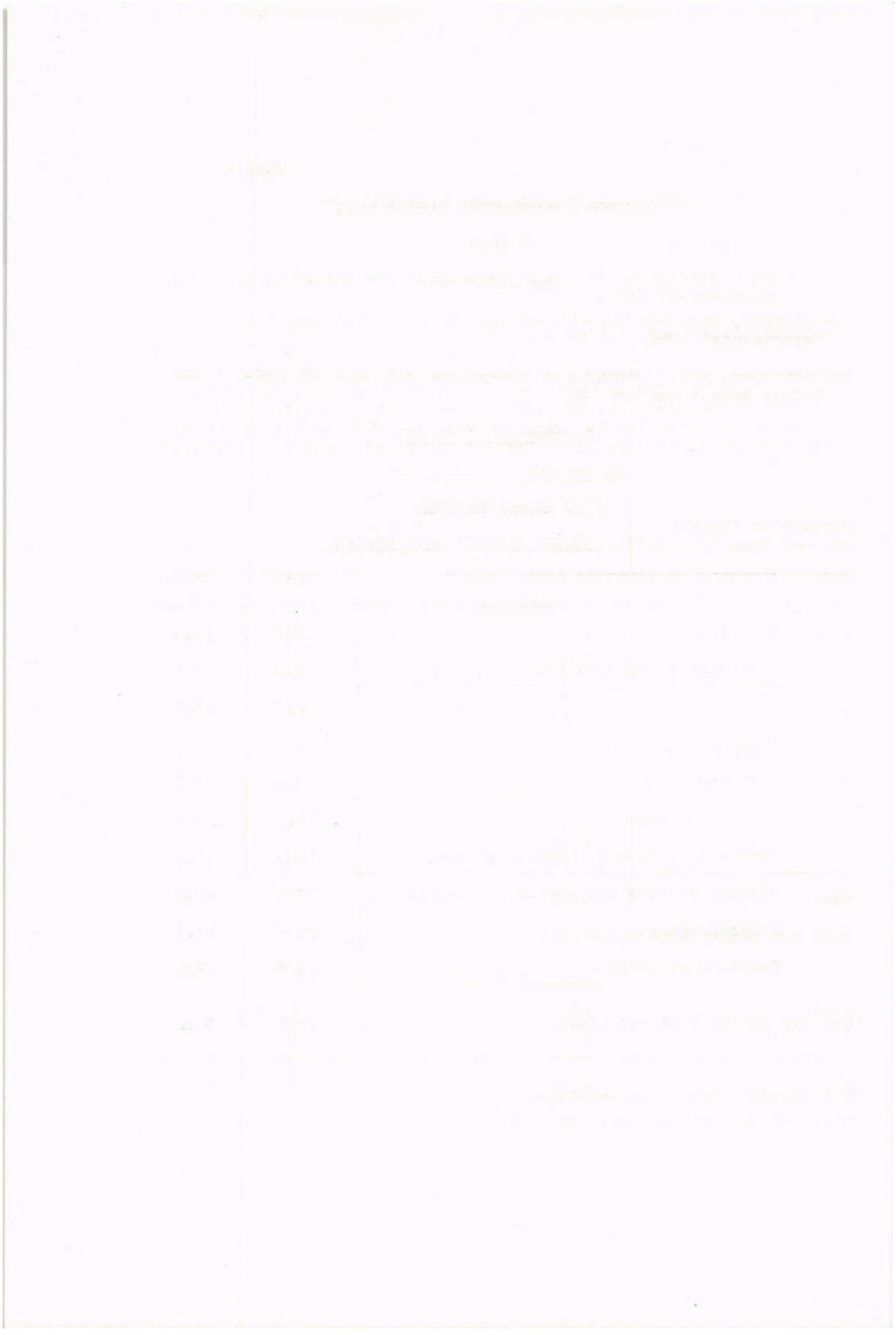
Yields (at 85% dry matter): cwt per acre

Plot	Manuring to potatoes 1876 - 1901*	Grain	Straw
1	Unmanured	18.8	11.4
2	Unmanured after dung 1876 - 81	14.2	9.5
3	Dung	26.9	18.7
4	Dung	25.1	16.8
5	Ammonium salts	13.8	9.4
6	Nitrate of soda	13.7	9.1
7	Ammonium salts and complete minerals	24.9	18.3
8	Nitrate of soda and complete minerals	20.7	14.2
9	Superphosphate	25.6	17.8
10	Complete minerals	23.8	17.5
Mean dry matter % as harvested		72.0	70.1

*For certain changes see history.

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63/A/8

CLOVER - ROTHAMSTED GARDEN 1963

(GC)

The 110th year

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

Cultivations, etc.: Muriate of potash applied: May 18, 1963. Cut twice: July 4 and Oct 14.

Summary of Results

Dry matter: cwt per acre

Muriate of Potash: cwt per acre	Spray in 1961		Mean
	None	Sodium Molybdate	
1st cut			
None	15.9	13.4	14.6
2	39.5	33.9	36.7
Mean	27.7	23.6	25.7

Mean dry matter % as harvested: 14.2

2nd cut			
None	10.3	11.1	10.7
2	28.2	27.8	28.0
Mean	19.2	19.4	19.4

Mean dry matter % as harvested: 23.0

Total of 2 cuts			
None	26.2	24.5	25.4
2	67.7	61.7	64.7
Mean	47.0	43.1	45.0

Mean dry matter % as harvested: 18.6

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63/A/9

FALLOW AND MICROPLOTS, SITES OF CONTINUOUS WHEAT AND BARLEY EXPERIMENTS

WOBURN STACKYARD 1963

(WPW and WPB)

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

In 1963 the sites were fallowed except for a strip of land across the south east end of plot 6 of the Classical Barley site. This area was used for a continuation of the 1962 microplot experiment on soil structure, the crop being red beet.

Cultivations, etc.: Ploughed: Nov 5, 1962. Rotary cultivated: June 13, 1963. Plots 1-10b and 7-11b of both the Classical experiments subsoiled to a depth of 20 ins, 5 ft between strokes: Sept 11, and again across the first strokes to a depth of 18 ins, 5 ft between strokes: Sept 23. Ground chalk applied at 46 cwt per acre: Oct 21.

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LEY AND ARABLE ROTATIONS

(HIA and FIA)

Highfield and Fosters Field 1963, the 15th year.

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

Oats: The variety has now been changed from Sun II to Condor.

Permanent (Reseeded) grass: During the 3 years commencing in Autumn 1962 the plots in blocks coming into wheat are to be ploughed up. Subsequent cropping and treatments are the same as follow the 3 year crops. The plots not mentioned above are split lengthwise for the 'all-grass' and 'clover-grass' treatments already applied to the Permanent (Old) grass.

Note: The 2nd year all grass-ley on Highfield failed during the winter and was resown in spring 1963.

Cultivations, etc.:

HIGHFIELD

1st-year Treatment Crops

All-grass ley. Ploughed twice: Sept 7 and Dec 3, 1962. Basal PK compound applied: Apr 22, 1963. 'Nitro-Chalk' applied, seeds sown at 30 lb per acre: Apr 25. Cut 4 times: July 8, Aug 8, Sept 12, Oct 28. NK compound applied after first 3 cuts.

Clover-grass ley. Ploughed twice: Sept 7 and Dec 3, 1962. Basal PK compound applied: Apr 22, 1963. Seed sown at 33 lb per acre: Apr 25. Cut 4 times: July 8, Aug 8, Sept 20, Oct 28. Muriate of potash applied after first 3 cuts.

Lucerne. Ploughed twice: Sept 7 and Dec 3, 1962. Basal PK compound applied: Apr 22, 1963. Seed drilled at 20 lb per acre: Apr 26. Cut twice: July 25 and Sept 27.

Hay. Seeds undersown in barley: Apr 25, 1962. Basal NPK compound applied: Mar 6, 1963. Cut twice: June 17 and Aug 8. NK compound applied after first cut.

2nd-year Treatment Crops

All-grass ley. Basal PK compound applied: Nov 26, 1962. 'Nitro-Chalk' applied: Mar 15, 1963. Sprayed with paraquat at 2 lb in 40 gallons per acre: May 17 and June 5. Rotary cultivated, seed sown at 30 lb per acre: June 19. Sprayed with mecoprop/2,4-D at 6 pints in 40 gallons per acre: July 30. Cut twice: Sept 12 and Oct 28. NK compound applied after first cut.

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Clover-grass ley. Basal PK compound applied: Nov 26, 1962. Cut 5 times: May 29, June 24, July 24, Sept 20, Oct 28. Muriate of potash applied after first 4 cuts.
Lucerne. Basal PK compound applied: Nov 23, 1962. Cut 3 times: June 12, July 25, Sept 27, 1963.
Sugar beet. Ploughed twice: Aug 24 and Dec 3, 1962. Muriate of potash applied: Feb 14, 1963. Basal NPK compound (10% N, 10% P_2O_5, 10% K_2O) applied: Apr 16. Seed drilled at 5.25 lb per acre: Apr 19. Singled: May 30. Sprayed with DDT emulsion at 0.5 pints DDT in 16 gallons per acre: June 6. Sprayed with menazon at 0.53 pints in 16 gallons per acre: July 31. Lifted: Oct 24. Variety: Klein E.

3rd-year Treatment Crops

Cut grass. Basal PK compound applied: Nov 23, 1962. NK compound applied: Mar 15, 1963 and after every cut except the last. Cut 4 times: May 29, June 24, July 24, Sept 12.
Grazed ley. Basal PK compound applied: Nov 23, 1962. 'Nitro-Chalk' applied: May 18, 1963 and Aug 2, 1963. Grazed: 9 circuits, May 7 - Sept 4.
Lucerne. Basal PK compound applied: Nov 23, 1962. Cut 3 times: June 12, July 25, Sept 9.
Oats. Ploughed: Dec 3, 1962. Seed combine drilled at 4 bushels per acre: Apr 9, 1963. 'Nitro-Chalk' applied: Apr 11. Sprayed with methoxychlorobenzoic acid/MCPA (MBA/MCPA) at 4 pints in 40 gallons per acre: June 5. Combine harvested: Sept 7.

1st Test Crop, Wheat

Ploughed: Sept 26, 1962. Seed combine drilled at 2.75 bushels per acre: Oct 18. Plots following permanent (reseeded) grass sprayed with aldrin at 2.4 pints in 80 gallons per acre: Apr 9, 1963. 'Nitro-Chalk' applied: Apr 26. Sprayed with mecoprop/2,4-D at 7 pints in 40 gallons per acre: May 16. Combine harvested: Sept 9. Variety: Cappelle.

2nd Test Crop, Potatoes

Dung applied: Sept 13, 1962. Ploughed twice: Sept 14 and Dec 18. Fertilisers applied: May 9, 1963. Potatoes machine planted: May 10. Earthed up: June 22. Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 19. Sprayed with copper oxychloride fungicide at 2.3 lb Cu plus 0.35 pints menazon in 20 gallons per acre: Aug 14. Sprayed with undiluted BOV at 16 gallons per acre: Sept 12. Lifted: Oct 10. Variety: Majestic (chitted seed).

3rd Test Crop, Barley

Ground chalk applied: Nov 15, 1962. Additional P and K applied: Nov 16. Ploughed: Nov 20. Seed combine drilled at 2 bushels per acre: Apr 8, 1963. 'Nitro-Chalk' applied: Apr 11. Sprayed with MCPB/MCPA at 5 pints in 40 gallons per acre: June 5. Combine harvested: Sept 7. Variety: Proctor.

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Permanent grasses. 13th, 14th and 15th experimental years permanent (old) grass, all blocks, 13th, 14th and 15th years reseeded grass, blocks 1, 4, 6, 7, 9 and 12. Ground chalk applied to blocks 1 and 4: Nov 15, 1962. Basal PK compound applied: Nov 26. 'Nitro-Chalk' applied to 'all-grass' half plots: Mar 15, 1963. Cut 5 times: May 29, June 26, July 24, Sept 13, Oct 28. Muriate of potash and NK compound applied to appropriate half plots after first 4 cuts.

14th year Reseeded grass, Blocks 5 and 8.

Block 5. Basal PK compound applied: Nov 20, 1962. 'Nitro-Chalk' applied: May 18 and Aug 2, 1963. Grazed: 12 circuits, May 7 - Oct 12.

Block 8. Basal PK compound applied : Nov 23, 1962. 'Nitro-Chalk' applied: Mar 15, 1963. Cut for silage: May 29. 2nd dressing of 'Nitro-Chalk' applied: May 31. Grazed: 8 circuits, June 18 - Oct 11.

15th year Reseeded grass, Blocks 2 and 3.

Block 2. Basal PK compound applied: Nov 20, 1962. 'Nitro-Chalk' applied: May 18 and Aug 2, 1963. Grazed: 10 circuits, May 7 - Sept 12.

Block 3. Basal PK compound applied: Nov 23, 1962. 'Nitro-Chalk' applied: Mar 15, 1963. Cut for silage: May 29. 2nd dressing of 'Nitro-Chalk' applied: May 31. Grazed: 6 circuits, June 18 - Sept 12.

FOSTERS

1st-year Treatment Crops

All-grass ley. Ploughed twice: Sept 7 and Dec 18, 1962. Basal PK compound applied: Apr 22, 1963. 'Nitro-Chalk' applied: Apr 24. Seed sown at 30 lb per acre: Apr 25. Cut 4 times: July 8, Aug 8, Sept 12, Oct 28. NK compound applied after first 3 cuts.

Clover-grass ley. Ploughed twice: Sept 7 and Dec 18, 1962. Basal PK compound applied: Apr 22, 1963. Seed sown at 33 lb per acre: Apr 25. Cut 4 times: July 8, Aug 8, Sept 20, Oct 28. Muriate of potash applied after first 3 cuts.

Lucerne. Ploughed twice: Sept 7 and Dec 18, 1962. Basal PK compound applied: Apr 22, 1963. Seed drilled at 20 lb per acre: Apr 26. Cut twice: July 26 and Sept 27. Variety: Du Puits.

Hay. Seeds undersown in barley: Apr 25, 1962. Basal NPK compound applied: Mar 6, 1963. Cut twice: June 14 and Aug 8. NK compound applied after first cut.

2nd-year Treatment Crops

All-grass ley. Basal PK compound applied: Nov 26, 1962. 'Nitro-Chalk' applied: Mar 16, 1963. Cut 5 times: May 29, June 24, July 24, Sept 12, Oct 28. NK compound applied after first 4 cuts.

Clover-grass ley. Basal PK compound applied: Nov 26, 1962. Cut 5 times: May 29, June 24, July 24, Sept 20, Oct 28, 1963. Muriate of potash applied after first 4 cuts.

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Lucerne. Basal PK compound applied: Nov 20, 1962. Cut 3 times: June 12, July 26, Sept 27, 1963.
Sugar Beet. Ploughed twice: Aug 24 and Dec 18, 1962. Muriate of potash applied: Feb 14, 1963. Basal NPK (10% N, 10% P_2O_5, 10% K_2O) applied: Apr 16. Seed drilled at 5.25 lb per acre: Apr 19. Singled: May 29. Sprayed with DDT emulsion at 0.5 pints DDT in 16 gallons per acre: June 6. Sprayed with menazon at 0.53 pints in 16 gallons per acre: July 31. Lifted: Oct 24. Variety: Klein E.

3rd-year Treatment Crops

Cut grass. Basal PK compound applied: Nov 20, 1962. NK compound applied: Mar 16, 1963 and after every cut except the last. Cut 4 times: May 29, June 24, July 24, Sept 12.
Grazed ley. Basal PK compound applied: Nov 20, 1962. 'Nitro-Chalk' applied: May 18 and Aug 2, 1963. Grazed: 9 circuits, May 7 - Sept 4.
Lucerne. Basal PK compound applied: Nov 20, 1962. Cut 3 times: June 12, July 26, Sept 9, 1963.
Oats. Ploughed: Dec 3, 1962. Seed combine drilled at 4 bushels per acre, 'Nitro-Chalk' applied: Apr 8, 1963. Sprayed with methoxychlorobenzoic acid/MCPA (MBA/MCPA) at 4 pints in 40 gallons per acre: June 5. Combine harvested: Sept 7. Variety: Condor.

1st Test Crop, Wheat

Ploughed: Sept 20, 1962. Seed combine drilled at 2.75 bushels per acre: Oct 18. Plots following permanent (reseeded) grass sprayed with aldrin at 2.4 pints in 80 gallons per acre: Apr 19, 1963. 'Nitro-Chalk' applied: Apr 26. Sprayed with mecoprop/2,4-D at 7 pints in 40 gallons per acre: May 16. Combine harvested: Sept 9. Variety: Cappelle.

2nd Test Crop, Potatoes

Dung applied, plots ploughed: Sept 13, 1962. Ploughed second time: Dec 18. Fertilisers applied, potatoes machine planted: May 9, 1963. Replanted potatoes which were uncovered through grubbing: June 17. Earthed up: June 22. Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 19. Sprayed with copper oxychloride fungicide at 2.3 lb Cu plus 0.35 pints menazon in 20 gallons per acre: Aug 16. Sprayed with undiluted BOV at 16 gallons per acre: Sept 12. Lifted: Oct 9. Variety: Majestic (chitted seed).

3rd Test Crop, Barley

Additional P and K applied: Nov 16, 1962. Ploughed: Nov 19. Seed combine drilled at 2 bushels per acre: Apr 8, 1963. 'Nitro-Chalk' applied: Apr 9. Sprayed with MCPB/MCPA at 5 pints in 40 gallons per acre: June 5. Combine harvested: Sept 6. Variety: Proctor.

Permanent grasses

13th, 14th and 15th years reseeded grass, Blocks 1, 3, 6, 8, 9 and 11. Basal PK compound applied: Nov 26, 1962. 'Nitro-Chalk' applied to 'all-grass' half plots: Mar 16, 1963. Cut 5 times: May 29, June 27,

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July 24, Sept 13, Oct 28. Muriate of potash and NK compound applied to appropriate half plots after first 4 cuts.

14th year reseeded grass, Blocks 5 and 7. Basal PK compound applied: Nov 20, 1962.
Block 5. 'Nitro-Chalk' applied: Mar 16, 1963. Cut for silage: May 29. 2nd dressing of 'Nitro-Chalk' applied: May 31. Grazed: 8 circuits, June 18 - Oct 12.
Block 7. 'Nitro-Chalk' applied: May 18 and Aug 2, 1963. Grazed: 12 circuits, May 7 - Oct 12.

15th year reseeded grass, Blocks 2 and 4. Basal PK compound applied: Nov 20, 1962.
Block 2. 'Nitro-Chalk' applied: Mar 16, 1963. Cut for silage: May 29. 2nd dressing of 'Nitro-Chalk' applied: May 31. Grazed: 6 circuits, June 18 - Sept 14.
Block 4. 'Nitro-Chalk' applied: May 18 and Aug 2, 1963. Grazed: 10 circuits, May 7 - Sept 12.

Standard errors per sub plot. Test crops.

Wheat, grain (at 85% dry matter)	Highfield:	2.62 cwt per acre or 6.3% (55 d.f.)
	Fosters:	3.52 cwt per acre or 7.8% (55 d.f.)
Barley, grain (at 85% dry matter)	Highfield:	4.49 cwt per acre or 11.4% (23 d.f.)
	Fosters:	2.67 cwt per acre or 6.5% (23 d.f.)

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63/B/1.6

Summary of Results

Wheat 1st test crop

N: cwt per acre	Treatment crops 1960 - 1962: Lucerne	Ley	Cut grass	Arable with hay	Reseeded grass	Mean
Grain (at 85% dry matter): cwt per acre						
Highfield						
			(±1.31)*			(±0.59)
To test crop						
None	44.3	40.1	33.7	23.1	40.8	36.4
0.3	48.4	43.4	40.9	35.1	44.7	42.5
0.6	44.6	44.1	43.8	39.6	47.9	44.0
0.9	44.0	44.7	43.5	45.3	45.5	44.6
Mean	45.3	43.1	40.5	35.8	44.7	41.9
Fosters						
			(±1.76)*			(±0.79)
To test crop						
None	44.3	35.0	39.4	27.8	36.4	36.6
0.4	53.1	44.4	43.4	41.3	43.8	45.2
0.8	54.6	47.9	44.5	46.7	47.2	48.2
1.2	53.5	48.2	45.8	49.9	47.8	49.0
Mean	51.4	43.9	43.3	41.4	43.8	44.8

*For use only in vertical and interaction comparisons

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63/B/1.7

Wheat 1st test crop

Treatment crops 1960 - 1962

N: cwt per acre	Lucerne	Ley	Cut grass	Arable with hay	Reseeded grass	Mean
Straw (at 85% dry matter): cwt per acre						
Highfield						
To test crop						
None	37.2	30.3	22.7	19.7	31.1	28.2
0.3	43.3	33.9	30.1	27.5	39.8	34.9
0.6	40.9	33.9	34.9	36.4	41.5	37.5
0.9	42.4	35.7	35.1	38.0	38.6	38.0
Mean	41.0	33.5	30.7	30.4	37.7	34.7
Fosters						
To test crop						
None	31.0	26.8	23.3	18.5	30.0	25.9
0.4	40.3	36.6	32.5	30.3	38.7	35.7
0.8	39.7	39.0	36.0	38.8	45.1	39.7
1.2	39.7	41.6	39.5	39.1	38.1	39.6
Mean	37.7	36.0	32.8	31.7	38.0	35.2

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

	Treatment crops 1959 - 1961				
	Lucerne	Ley	Cut grass	Arable with hay	Mean
	Highfield				
Mean	14.64	13.89	13.73	14.74	14.25
N: cwt per acre to wheat 1962					
None	15.03	14.13	13.91	14.60	14.42
0.3	14.81	13.80	14.14	14.35	14.28
0.6	14.60	13.81	13.64	14.92	14.24
0.9	14.14	13.80	13.25	15.08	14.07
N: cwt per acre 1963*					
0.75	14.54	14.02	13.79	14.73	14.27
1.25	14.75	13.75	13.68	14.74	14.23
Difference	+0.21	-0.27	-0.11	+0.01	-0.04
PK	13.77	13.81	14.11	14.23	13.98
Dung	15.52	13.96	13.36	15.24	14.52
Difference	+1.75	+0.15	-0.75	+1.01	+0.54
P_2O_5: cwt per acre					
0.9	14.81	13.74	13.73	14.29	14.14
1.8	14.48	14.03	13.74	15.19	14.36
Difference	-0.33	+0.29	+0.01	+0.90	+0.22
K_2O: cwt per acre					
0.9	14.83	13.70	13.81	14.80	14.29
1.8	14.46	14.07	13.66	14.67	14.21
Difference	-0.37	+0.37	-0.15	-0.13	-0.08

*Including basal dressing

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

	N: cwt per acre to wheat 1962 None	0.3	0.6	0.9
	Highfield			
N: cwt per acre 1963*				
0.75	14.55	14.19	14.38	13.97
1.25	14.29	14.36	14.10	14.17
Difference	-0.26	+0.17	-0.28	+0.20
PK	14.39	13.62	14.26	13.64
Dung	14.45	14.93	14.22	14.50
Difference	+0.06	+1.31	-0.04	+0.86
P_2O_5: cwt per acre				
0.9	14.34	14.02	14.26	13.94
1.8	14.50	14.53	14.22	14.20
Difference	+0.16	+0.51	-0.04	+0.26
K_2O: cwt per acre				
0.9	14.54	14.24	14.28	14.10
1.8	14.30	14.31	14.21	14.03
Difference	-0.24	+0.07	-0.07	-0.07

	PK	Dung	P_2O_5: cwt per acre 0.9	1.8	K_2O: cwt per acre 0.9	1.8
N: cwt per acre 1963*						
0.75	13.95	14.59	14.12	14.41	14.31	14.23
1.25	14.01	14.45	14.16	14.31	14.26	14.20
PK			13.87	14.08	13.95	14.00
Dung			14.41	14.64	14.62	14.42
P_2O_5: cwt per acre						
0.9					14.13	14.14
1.8					14.44	14.28

*Including basal dressing

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63/B/1.10

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

	Treatment crops 1959 - 1961				
	Lucerne	Ley	Cut grass	Arable with hay	Mean
		Fosters			
Mean	14.76	13.89	13.61	14.90	14.29
N: cwt per acre to wheat 1962					
None	14.30	14.86	13.67	15.16	14.50
0.4	14.73	13.88	13.41	14.39	14.10
0.8	15.23	13.52	13.59	15.28	14.41
1.2	14.79	13.30	13.78	14.78	14.16
N: cwt per acre 1963*					
0.75	14.66	13.78	13.49	14.46	14.10
1.25	14.86	14.00	13.74	15.34	14.48
Difference	+0.20	+0.22	+0.25	+0.88	+0.38
PK	14.53	14.53	13.42	14.56	14.26
Dung	14.99	13.25	13.81	15.25	14.32
Difference	+0.46	-1.28	+0.39	+0.69	+0.06
P_2O_5: cwt per acre					
0.9	14.66	13.88	13.86	14.77	14.29
1.8	14.86	13.90	13.37	15.03	14.29
Difference	+0.20	+0.02	-0.49	+0.26	0.00
K_2O: cwt per acre					
0.9	14.66	13.98	13.58	15.18	14.35
1.8	14.86	13.80	13.64	14.62	14.23
Difference	+0.20	-0.18	+0.06	-0.56	-0.12

*Including basal dressing

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63/B/1.11

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

	N: cwt per acre to wheat 1962			
	None	0.4	0.8	1.2
	Fosters			
N: cwt per acre 1963*				
0.75	14.27	14.02	14.19	13.92
1.25	14.73	14.18	14.63	14.40
Difference	+0.46	+0.16	+0.44	+0.48
PK	14.46	14.11	14.46	14.02
Dung	14.53	14.10	14.36	14.30
Difference	+0.07	-0.01	-0.10	+0.28
P_2O_5: cwt per acre				
0.9	14.93	14.03	13.98	14.23
1.8	14.06	14.18	14.83	14.09
Difference	-0.87	+0.15	+0.85	-0.14
K_2O: cwt per acre				
0.9	14.38	14.13	14.61	14.28
1.8	14.61	14.07	14.20	14.04
Difference	+0.23	-0.06	-0.41	-0.24

	PK	Dung	P_2O_5: cwt per acre 0.9	P_2O_5: cwt per acre 1.8	K_2O: cwt per acre 0.9	K_2O: cwt per acre 1.8
N: cwt per acre 1963*						
0.75	13.97	14.23	14.06	14.14	14.18	14.02
1.25	14.55	14.41	14.53	14.44	14.52	14.45
PK			14.22	14.31	14.37	14.15
Dung			14.37	14.27	14.34	14.31
P_2O_5: cwt per acre						
0.9					14.30	14.28
1.8					14.40	14.18

*Including basal dressing

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Potatoes 2nd test crop. Percentage ware (1.5 inch riddle)

	Treatment crops 1959 - 1961				
	Lucerne	Ley	Cut grass	Arable with hay	Mean
		Highfield			
Mean	91.6	92.6	91.8	91.2	91.8
N: cwt per acre to wheat 1962					
None	91.6	92.0	91.4	91.4	91.6
0.3	92.3	92.3	92.4	90.4	91.8
0.6	91.4	93.2	92.1	91.6	92.1
0.9	91.2	92.9	91.3	91.5	91.7
N: cwt per acre 1963*					
0.75	91.9	92.6	92.0	91.4	92.0
1.25	91.4	92.6	91.6	91.0	91.6
Difference	-0.5	0.0	-0.4	-0.4	-0.4
PK	91.5	92.3	92.4	91.1	91.8
Dung	91.8	92.9	91.3	91.4	91.8
Difference	+0.3	+0.6	-1.1	+0.3	0.0
P_2O_5: cwt per acre					
0.9	91.9	92.7	91.8	91.7	92.0
1.8	91.4	92.5	91.9	90.8	91.6
Difference	-0.5	-0.2	+0.1	-0.9	-0.4
K_2O: cwt per acre					
0.9	91.7	92.6	91.6	91.3	91.8
1.8	91.6	92.6	92.0	91.2	91.8
Difference	-0.1	0.0	+0.4	-0.1	0.0

*Including basal dressing

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63/B/1.13

Potatoes 2nd test crop. Percentage ware (1.5 inch riddle)

	N: cwt per acre to wheat 1962			
	None	0.3	0.6	0.9
	Highfield			
N: cwt per acre 1963*				
0.75	92.0	92.0	92.2	91.7
1.25	91.2	91.7	92.0	91.7
Difference	-0.8	-0.3	-0.2	0.0
PK	91.8	91.2	92.4	91.9
Dung	91.4	92.6	91.8	91.6
Difference	-0.4	+1.4	-0.6	-0.3
P_2O_5: cwt per acre				
0.9	91.9	92.2	92.1	91.8
1.8	91.3	91.5	92.1	91.6
Difference	-0.6	-0.7	0.0	-0.2
K_2O: cwt per acre				
0.9	91.9	91.9	91.8	91.6
1.8	91.4	91.8	92.4	91.8
Difference	-0.5	-0.1	+0.6	+0.2

	PK	Dung	P_2O_5: cwt per acre 0.9	P_2O_5: cwt per acre 1.8	K_2O: cwt per acre 0.9	K_2O: cwt per acre 1.8
N: cwt per acre 1963*						
0.75	91.9	92.1	92.4	91.6	92.0	92.0
1.25	91.7	91.6	91.6	91.7	91.6	91.7
PK			92.0	91.7	91.9	91.7
Dung			92.1	91.6	91.7	92.0
P_2O_5: cwt per acre						
0.9					91.9	92.1
1.8					91.7	91.6

*Including basal dressing

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Potatoes 2nd test crop. Percentage ware (1.5 inch riddle)

	Treatment crops 1959 - 1961				
	Lucerne	Ley	Cut grass	Arable with hay	Mean
		Fosters			
Mean	93.4	92.8	92.8	93.1	93.0
N: cwt per acre to wheat 1962					
None	93.5	93.1	92.4	93.2	93.0
0.4	93.3	92.5	93.0	93.4	93.0
0.8	92.8	92.9	93.3	92.5	92.9
1.2	93.9	92.6	92.7	93.4	93.2
N: cwt per acre 1963*					
0.75	93.4	92.8	93.0	93.0	93.0
1.25	93.4	92.8	92.7	93.2	93.0
Difference	0.0	0.0	-0.3	+0.2	0.0
PK	93.0	93.5	93.5	93.4	93.4
Dung	93.7	92.1	92.2	92.8	92.7
Difference	+0.7	-1.4	-1.3	-0.6	-0.7
P_2O_5: cwt per acre					
0.9	93.2	92.7	93.3	93.2	93.1
1.8	93.6	92.9	92.4	93.0	93.0
Difference	+0.4	+0.2	-0.9	-0.2	-0.1
K_2O: cwt per acre					
0.9	93.6	93.0	92.7	92.9	93.1
1.8	93.1	92.6	93.0	93.3	93.0
Difference	-0.5	-0.4	+0.3	+0.4	-0.1

*Including basal dressing

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63/B/1.15

Potatoes 2nd test crop. Percentage ware (1.5 inch riddle)

	N: cwt per acre to wheat 1962			
	None	0.4	0.8	1.2
	Fosters			
N: cwt per acre 1963*				
0.75	93.0	93.1	93.0	93.1
1.25	93.1	92.9	92.7	93.2
Difference	+0.1	-0.2	-0.3	+0.1
PK	93.3	93.3	93.1	93.7
Dung	92.9	92.8	92.6	92.6
Difference	-0.4	-0.5	-0.5	-1.1
P_2O_5: cwt per acre				
0.9	93.0	93.2	93.0	93.2
1.8	93.1	92.9	92.8	93.1
Difference	+0.1	-0.3	-0.2	-0.1
K_2O: cwt per acre				
0.9	92.9	93.1	92.8	93.4
1.8	93.2	92.9	92.9	92.9
Difference	+0.3	-0.2	+0.1	-0.5

			P_2O_5: cwt per acre		K_2O: cwt per acre	
	PK	Dung	0.9	1.8	0.9	1.8
N: cwt per acre 1963*						
0.75	93.4	92.7	93.0	93.1	93.1	93.0
1.25	93.2	92.8	93.2	92.9	93.0	93.0
PK			93.5	93.2	93.4	93.3
Dung			92.7	92.8	92.8	92.7
P_2O_5: cwt per acre						
0.9					93.1	93.0
1.8					93.0	92.9

*Including basal dressing

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

	Treatment crops 1958 - 1960				
	Lucerne	Ley	Cut grass	Arable with hay	Mean
		Highfield			
Mean	40.1	38.8	40.6	38.6	39.5
N: cwt per acre			(±2.24)*		(±1.12)
None	41.2	40.9	39.6	33.9	38.9
0.1	39.6	40.8	41.5	39.3	40.3
0.2	41.3	37.4	38.5	40.4	39.4
0.3	38.6	36.1	43.0	40.8	39.6
Dung to potatoes 1962: tons per acre					
None	38.9	36.6	40.6	37.1	38.3
12	41.4	40.9	40.6	40.0	40.8
Difference (±2.24)	+2.5	+4.3	0.0	+2.9	+2.5 (±1.12)

Dung to potatoes 1962: tons per acre	N: cwt per acre None	0.1	0.2	0.3
		(±1.59)		
None	36.4	39.5	38.5	38.8
12	41.3	41.0	40.2	40.5
Difference (±2.24)	+4.9	+1.5	+1.7	+1.7

*For use in vertical and interaction comparisons

Mean dry matter % as harvested: 68.1

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

	Treatment crops 1958 - 1960				
	Lucerne	Ley	Cut grass	Arable with hay	Mean
		Fosters			
Mean	41.9	40.7	41.1	41.5	41.3
N: cwt per acre		(±1.34)*			(±0.67)
None	40.3	39.0	38.3	39.4	39.2
0.2	43.6	42.5	42.5	-	-
0.4	41.2	41.4	43.5	43.5	42.1
0.6	42.4	40.0	39.9	42.2	41.1
0.8	-	-	-	40.9	-
Dung to potatoes 1962: tons per acre					
None	41.8	40.1	40.3	40.4	40.6
12	41.9	41.3	41.8	42.6	41.9
Difference (±1.34)	+0.1	+1.2	+1.5	+2.2	+1.3 (±0.67)

Dung to potatoes 1962: tons per acre	Excluding arable with hay N: cwt per acre None	0.2	0.4	0.6	Mean
		(±1.09)			
None	38.2	40.9	42.1	41.8	40.7
12	40.3	44.9	42.0	39.7	41.7
Mean (±0.77)	39.2	42.9	42.0	40.8	41.2
Difference (±1.54)	+2.1	+4.0	-0.1	-2.1	+1.0 (±0.77)

*For use in vertical and interaction comparisons

Mean dry matter % as harvested: 69.8

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63/B/1.18

Treatment crops Arable and Hay rotation

	Hay (dry matter): cwt per acre				
	N to barley 1962				
	0	1	2	3	Mean
	Highfield				
No dung	81.7	82.8	79.4	81.4	81.3
Dung in 1961	78.2	91.0	82.0	86.9	84.5
Mean	79.9	86.9	80.6	84.2	82.9
	Fosters				
No dung	81.6	84.0	78.8	74.6	79.8
Dung in 1961	81.4	75.8	84.0	75.8	79.3
Mean	81.5	79.9	81.4	75.2	79.5

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63/B/1.19

Treatment crops Arable and Hay rotation

	Highfield Mean	Fosters Mean
Sugar beet		
Roots washed: tons per acre	16.66	14.49
Sugar percentage	17.1	18.5
Total sugar: cwt per acre	57.2	53.6
Tops: tons per acre	17.38	12.70
Plant no: thousands per acre	29.2	30.3
Oats		
Grain (at 85% dry matter): cwt per acre	39.4	42.4

Oats, grain, mean dry matter % as harvested, Highfield: 76.5
Fosters: 76.6

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63/B/1.20

Cut grass. Dry matter: cwt per acre

	Highfield Mean	Fosters Mean
3rd year (4 cuts)	62.8	63.6

Lucerne. Dry matter: cwt per acre

	Highfield			Fosters		
	Dung to potatoes 1961: tons per acre			Dung to potatoes 1961: tons per acre		
	None	12	Mean	None	12	Mean
1st year (2 cuts)	44.5	49.7	47.1	44.0	46.4	45.2
2nd year (3 cuts)			61.3			76.8
3rd year (3 cuts)			39.0			46.3

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Grazed ley. Dry matter: cwt per acre

	Highfield Mean	Fosters Mean
3rd year	35.4	31.0

All-grass ley. Dry matter: cwt per acre

	Highfield Dung to potatoes 1961: tons per acre None	12	Mean	Fosters Dung to potatoes 1961: tons per acre None	12	Mean
1st year (4 cuts)	63.8	63.3	63.6	61.5	65.8	63.7
2nd year (Highfield 2 cuts) (Fosters 5 cuts)			23.2			83.9

Clover-grass ley. Dry matter: cwt per acre

	Highfield Dung to potatoes 1961: None	12	Mean	Fosters Dung to potatoes 1961: None	12	Mean
1st year (4 cuts)	41.7	41.3	41.5	35.8	32.8	34.4
2nd year (5 cuts)			66.6			71.0

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63/B/1.22

Permanent grass, cut for silage

Dry matter: cwt per acre

	N: cwt per acre (per cut)		
	None(1)	0.6(2)	Mean
	Highfield		
13th exptl. year			
Blocks 9 and 12	47.6	81.9	64.8
Blocks 10 and 11	48.2	85.4	66.8
14th exptl. year			
Blocks 5 and 8	42.9	84.4	63.6
Blocks 6 and 7	45.9	87.6	66.7
15th exptl. year			
Blocks 1 and 4	53.1	86.2	69.6
Blocks 2 and 3	46.6	85.6	66.1

(1) 'Clover-grass' management
(2) 'All-grass' management

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63/B/1.23

Reseeded grass. Dry matter: cwt per acre

	Highfield N: cwt per acre (per cut) None(1)	0.6(2)	Mean	Fosters N: cwt per acre (per cut) None(1)	0.6(2)	Mean
13th exptl year	47.0	95.9	71.5	43.5	87.8	65.7
14th exptl year	48.6	90.8	69.7	52.0	91.0	71.5
15th exptl year	52.9	91.1	72.0	55.0	90.8	72.9

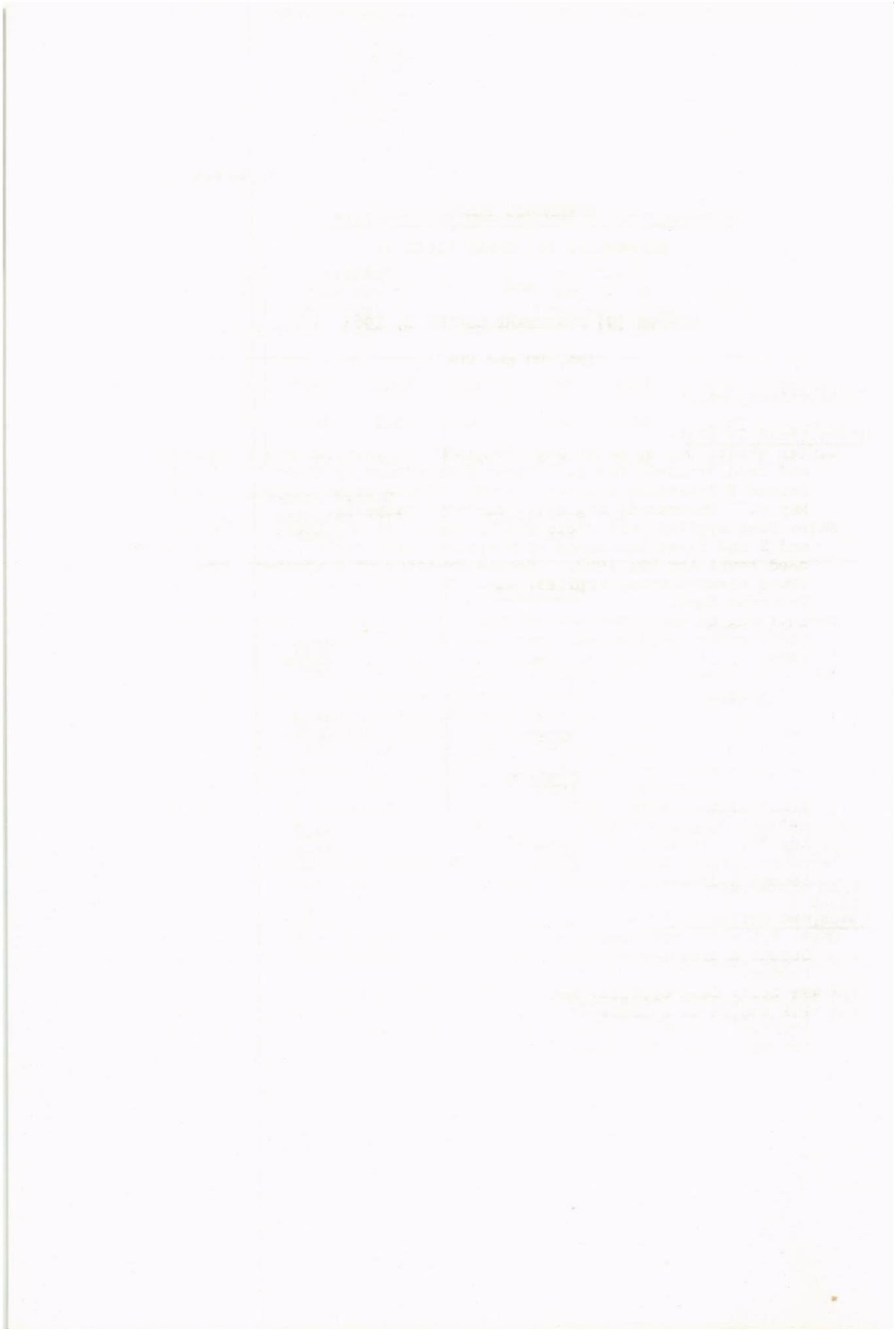
	Cut for silage Mean	Grazed estimated from sampling cuts Mean
	Highfield	
14th exptl year		
Block 5		52.6
Block 8	30.7	20.2*
15th exptl year		
Block 2		36.6
Block 3	31.1	15.4*
	Fosters	
14th exptl year		
Block 7		37.1
Block 5	25.1	20.6*
15th exptl year		
Block 4		26.1
Block 2	31.6	18.9*

*Aftermath grazing.

(1) 'Clover-grass' management
(2) 'All-grass' management

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63/B/2.1

REFERENCE PLOTS

ROTHAMSTED (R) GREAT FIELD IV

and

WOBURN (W) STACKYARD SERIES C, 1963

(RA, RG and WRA)

Cultivations, etc.:

Great Field IV (R):-

Winter wheat: Dug by hand: Sept 19, 1962. P,K,Mg,Ca and S applied and seed drilled: Oct 5. First N dressings applied: Apr 8, 1963. Second N dressings applied: May 2. Trace element spray applied: May 9. Harvested: Aug 23. Variety: Cappelle.

Kale: Dung applied, all plots dug by hand: Oct 31, 1962. P,K,Mg,Ca and S and first dressings of N applied, all plots rotary cultivated, seed sown: Apr 22, 1963. Second dressing of N applied: June 5. Trace element spray applied: June 10. Harvested: Nov 4. Variety: Thousand Head.

Barley: Dug by hand: Nov 6 - 26, 1962. N,P,K,Ca and S applied, all plots rotary cultivated, seed sown: Apr 20, 1963. Trace element spray applied: June 10. Harvested: Aug 30. Variety: Proctor.

Grass - clover ley: Undersown in barley: Mar 20, 1962. N,P,K,Ca and S applied: Apr 9, 1963. Trace element spray applied: May 9. Cut four times: Oct 10, 1962, June 5, July 22 and Oct 3, 1963. Varieties: S22 Italian Ryegrass and Dorset Marl Red Clover.

Potatoes: Dung applied, all plots dug by hand: Oct 30, 1962. P,K,Mg, Ca and S and first dressing of N applied, all plots rotary cultivated setts planted: Apr 30, 1963. Second dressing of N applied: June 5. Trace element spray applied: June 10. Harvested: Plots receiving neither dung nor K (where haulm died early) - Aug 9, remainder - Aug 28. Variety: King Edward.

Permanent grass: Dung, P, K and first N dressing applied: Mar 6, 1963. Second N dressing applied: June 5. Cut twice: June 5 and Oct 10.

Stackyard Series C (W):-

Oats: P,K and first dressing of N applied, seed drilled: Mar 21, 1963. Second N dressing applied: May 23. Harvested: Aug 19. Variety: Condor.

Sugar beet: Dung applied: Mar 8, 1963. Plots dug by hand: Mar 13. P,K and first N dressing applied all plots rotary cultivated, seed drilled: Apr 22. Second N dressing applied: June 6. Harvested: Oct 22. Variety: Klein E.

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Barley: P, K and first N dressing applied, seed drilled: Apr 22, 1963. Second N dressing applied: May 23. Harvested: Aug 19. Variety: Proctor.

Grass - clover ley: Undersown in barley: Mar 5, 1962. N,P and K applied: Mar 21, 1963. Cut four times: Sept 22, 1962, June 7, July 25 and Oct 11, 1963. Varieties: Italian Ryegrass and Dorset Marl Red Clover.

Potatoes: Dung applied: Mar 8, 1963. Plots dug by hand: Mar 13. P, K and first N dressing applied and rotary cultivated in, setts planted: Apr 26. Second N dressing applied: June 6. Harvested: Plots receiving neither dung nor K (where haulm died early) - Aug 9, remainder - Aug 28. Variety: King Edward.

Permanent grass: Dung applied: Mar 8, 1963. P, K and first N dressing applied: Mar 13. Second N dressing applied: June 6. Cut three times: June 6, Aug 14 and Oct 25.

Soft fruit: New strawberries planted: Oct 22, 1962. Dung, N, P and K applied: Mar 8, 1963. Varieties: Blackcurrants - Wellington XXX, Gooseberry - Careless, Strawberry - Cambridge Vigour.

Note : For details of the previous years' results, and for rates of fertilisers etc., see 'Results of the Field Experiments' 58/Bc/1, 59/Bc/1, 60/B/3, 61/B/2, 62/B/2.

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Summary of Results

Great Field IV (R): Original plots

Treatment	cwt per acre Winter wheat Grain (at 85% D.M.)	Straw	tons per acre Kale: Total weight	cwt per acre Barley Grain (at 85% D.M.)	Straw	cwt per acre Ley: dry matter 1st cut	2nd cut	3rd cut	4th cut	Total of 4 cuts	tons per acre Potatoes Total tubers	cwt per acre Permanent grass: dry matter 1st cut	2nd cut	Total of 2 cuts
None	29.6	33.6	9.20	20.5	16.4	2.6	21.7	17.1	12.5	53.9	5.18	9.5	32.3	41.8
N1	30.0	34.7	9.38	19.6	19.1	1.8	24.5	22.6	18.0	66.9	5.78	13.2	26.9	40.1
P	28.7	36.4	14.41	22.6	19.8	6.0	28.8	19.5	13.2	67.5	3.68	8.9	25.0	33.9
N1P	28.1	43.3	21.18	22.5	22.8	2.0	26.8	16.2	11.9	56.9	4.28	26.7	32.1	58.8
K	32.7	37.2	10.42	19.5	18.4	6.4	29.5	27.3	19.0	82.2	9.12	8.9	20.1	29.0
N1K	41.1	50.4	14.58	24.4	23.4	3.6	29.8	27.0	21.3	81.7	9.94	22.8	42.0	64.8
PK	33.9	41.1	10.42	21.4	17.9	9.0	32.1	32.4	20.2	93.7	11.04	11.6	29.5	41.1
N1PK	45.1	55.5	21.36	37.1	45.6	8.1	37.9	30.3	21.8	98.1	13.18	36.2	33.6	69.8
N2PK	56.5	60.5	29.17	44.0	41.9	4.3	40.5	28.0	22.5	95.3	16.26	40.6	47.5	88.1
D	39.2	46.2	17.36	27.5	25.1	5.9	32.8	33.2	24.1	96.0	13.28	34.7	33.4	68.1
N1PKD	51.2	66.5	27.96	42.1	43.1	8.0	45.0	32.7	26.1	111.8	16.60	46.6	37.4	84.0
N2PKD	54.9	73.9	34.03	38.5	61.9	6.1	46.0	34.2	26.5	112.8	20.99	52.0	46.5	98.5
Mean dry matter % as harvested	74.3	60.4		68.8	50.4	16.1	18.2	19.4	17.4	17.8		21.4	22.6	22.0

63/E/2.3

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Great Field IV (R): Additional plots

Treatment	cwt per acre Winter wheat Grain (at 85% D.M.)	Straw	tons per acre Kale: total weight	Barley Grain (at 85% D.M.)	Straw	cwt per acre Ley: dry matter 1st cut	2nd cut	3rd cut	4th cut	Total of 4 cuts	tons per acre Potatoes: total tubers
None	34.0	41.1	14.06	23.9	21.4	2.9	19.8	19.1	15.9	57.7	8.12
N2PK	53.5	67.2	37.16	36.6	34.7	4.3	35.8	23.4	21.2	84.7	15.93
N2PK Mg Ca	52.5	72.9	36.12	38.7	48.6	2.7	37.1	30.4	20.7	90.9	14.65
N2PK Mg S	53.9	71.3	35.07	37.6	42.1	3.2	36.4	24.2	20.8	84.6	14.37
N2PK Ca S	51.5	71.8	31.25	36.0	49.8	3.3	38.4	29.1	22.8	93.6	14.84
N2PK Mg Ca S	50.9	66.7	38.20	41.8	48.1	2.7	37.0	27.3	20.8	87.8	14.58
N2PK Mg Ca S TE	55.1	70.2	35.76	36.4	43.2	3.0	36.9	25.4	20.3	85.6	14.30
Mean dry matter % as harvested	75.6	67.6		73.7	52.8	16.4	19.8	18.2	16.2	17.6	

63/B/2.4

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Stackyard Series C (W)

Treatment	cwt per acre Oats Grain (at 85% D.M.)	Oats Straw (at 85% D.M.)	tons per acre Sugar beet roots (washed)	cwt per acre Barley Grain (at 85% D.M.)	Barley Straw (at 85% D.M.)	Ley: dry matter 1st cut	Ley: dry matter 2nd cut	Ley: dry matter 3rd cut	Ley: dry matter 4th cut	Total of 4 cuts	tons per acre Potatoes Total tubers	cwt per acre Permanent grass: dry matter 1st cut	Permanent grass: dry matter 2nd cut	Permanent grass: dry matter 3rd cut	Total of 3 cuts
None	21.3	17.4	8.36	11.9	10.1	10.2	26.0	21.9	12.1	70.2	5.68	22.7	13.2	3.7	39.6
N1	35.4	28.0	10.62	23.9	20.2	7.0	32.1	19.7	12.1	70.9	5.50	32.0	21.2	8.6	61.8
P	16.2	14.8	9.20	14.5	11.4	11.6	28.7	18.8	11.4	70.5	5.38	20.5	11.9	3.2	35.6
N1P	34.4	26.8	9.36	23.2	18.1	6.9	33.1	18.6	11.7	70.3	5.65	31.3	20.1	8.5	59.9
K	17.9	16.7	10.44	15.6	13.2	12.6	31.9	26.1	18.6	89.2	9.49	26.1	21.8	7.9	55.8
N1K	36.7	31.1	14.27	22.8	19.4	7.8	31.1	25.6	18.7	83.2	12.42	43.0	27.4	8.0	78.4
PK	21.6	18.5	9.58	14.9	12.1	14.9	35.4	26.5	17.5	94.3	11.04	26.3	18.1	6.8	51.2
N1PK	39.5	35.6	13.67	30.9	23.4	9.4	31.1	23.1	15.9	79.5	13.04	41.9	28.4	8.5	78.8
N2PK	39.9	38.5	14.26	35.3	34.6	7.1	38.2	24.2	16.8	86.3	13.96	45.8	32.4	17.6	95.8
D	20.2	17.2	13.22	16.9	13.2	14.6	36.2	25.0	15.1	90.9	14.82	29.2	16.6	9.1	54.9
N1PKD	36.6	32.8	16.82	34.7	31.3	10.5	32.5	25.6	18.5	87.1	18.06	46.0	33.3	10.3	89.6
N2PKD	44.7	41.2	17.08	39.2	40.1	7.2	37.3	27.9	18.4	90.8	21.22	48.4	32.7	22.5	103.6
Mean dry matter % as harvested:	74.2	43.0		68.7	50.7	14.9	27.9	23.5	18.3	21.2		32.3	23.7	20.2	25.4

63/B/2.5

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63/B/2.6

WOBURN STACKYARD SERIES C

Sitka spruce seedbeds 1961 - 63

N, P, K, Mg, Compost, Norway spruce litter and formalin applied to one year seedbeds of Sitka spruce (Picea sitchensis).

The site, which adjoins those under arable crops and soft fruit, has had a similar history, except that it did not receive a dressing of lime. The experiment was started a year later than the agricultural crops.

Design: 2 blocks of 12 plots each.

Area of each plot: 0.00021 acres (1 square yard)

Treatments (spruce litter applied in 1961 and 1962 only, all other treatments applied annually)

None (2 plots per block)
PK Mg
NK Mg
NP Mg
NPK
NPK Mg (2 plots per block)
NPK Mg F
C
C NPK Mg
L NPK Mg

Symbols, rates and forms of materials applied (per sq. yd.)

N: 'Nitro-Chalk' applied in three summer top dressings at 4.5 g.N per occasion
P: superphosphate at 9 g.P
K: potassium chloride at 9 g.K
Mg: kieserite at 3 g.Mg
C: compost made from bracken and hop waste
4.5 kg. in 1961 and 1962
7 kg. in 1963
L: Norway spruce litter, 10 kg. in 1961 and 1962, 5 kg. in 1963
F: formalin drench, 250 ml. of commercial formalin (38% formaldehyde) applied in 5 l. water

Note: 1 g. per square yard = 0.0953 cwt per acre

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Cultivations etc.	1961	1962	1963
formalin applied:	Feb 9 1961	Dec 14 1961	Dec 12 1962
all manures (other than N) dug in:	March 6	Mar 9 1962	Mar 22 1963
seed sown:	March 14	March 16	April 9
T.V.O. pre-emergent spray*:	April 7	April 6	April 30
N top dressed:	June 16	July 5	July 1
	July 21	August 1	August 8
	August 23	August 22	August 30

*Subsequently weed removed by hand.

Notes: (1) In 1963 on plots without Mg, seedlings showed the yellowing characteristics of Mg deficiency.
(2) In 1961, 1962 and 1963 samples were taken for the determinations of dry matter of tops and roots separately, and for N, P, K, Ca, Mg in total crop.

Standard errors per plot.

1961	Mean height:	0.332 inches	or 28.4% (13 d.f.)
	Plant number:	93.6 per sq yard	or 11.5% (13 d.f.)
1962	Mean height:	0.179 inches	or 15.0% (13 d.f.)
	Plant number:	82.9 per sq yard	or 12.3% (13 d.f.)
1963	Mean height:	0.128 inches	or 7.7% (13 d.f.)
	Plant number:	164.3 per sq yard	or 11.9% (13 d.f.)

Summary of Results

Treatment	1961 Mean height: inches	1961 Plant number: per sq yard
	(±0.235)	(±66.2)
None	0.33(1)	998(2)
PK Mg	0.98	738
NK Mg	0.34	882
NP Mg	1.36	747
NPK	1.34	876
NPK Mg	1.33(1)	834(2)
NPK Mg F	2.11	588
C	1.02	885
C NPK Mg	1.81	687
L NPK Mg	1.77	702
Mean	1.17	814
(1) (±0.166)	(2) (±46.8)	

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1962

Treatment	Mean height: inches	Plant number: per sq yard
	(±0.127)	(±58.6)
None	0.56(3)	832(4)
PK Mg	0.88	741
NK Mg	0.64	693
NP Mg	1.72	606
NPK	1.40	702
NPK Mg	1.34(3)	696(4)
NPK Mg F	1.68	696
C	0.92	567
C NPK Mg	1.55	606
L NPK Mg	1.78	444
Mean	1.19	676

1963

Treatment	Mean height: inches	Plant number: per sq yard
	(±0.091)	(±116.2)
None	0.89(5)	1368(6)
PK Mg	1.03	1302
NK Mg	1.52	1407
NP Mg	2.01	1416
NPK	1.82	1413
NPK Mg	2.03(5)	1377(6)
NPK Mg F	2.19	1572
C	1.42	1269
C NPK Mg	1.95	1425
L NPK Mg	2.24	1323
Mean	1.67	1385

(3) (± 0.090) (4) (±41.4) (5) (±0.064) (6) (±82.2)

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63/B/3.1

GREEN MANURING EXPERIMENT

(WGM)

Woburn Stackyard - 1963, the 10th year of the revised scheme.

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

Area of each sub-plot (acres): 0.0195. Area harvested: Sugar beet - 0.0109, barley - 0.0146.

The early potato crop is now replaced by sugar beet. The tops are carted off.

Revised manurial treatments (in cwt N per acre): All plots are split (half-length) to test 2 rates of nitrogen per plot as follows:-

Barley: Either none v 0.6, or 0.3 v 0.9.

Sugar beet: Either none v 1.33, or 0.67 v 2.0.

All nitrogen as 'Nitro-Chalk'.

Basal dressing per acre: 1.5 cwt P_2O_5, 3.0 cwt K_2O per acre as compound fertiliser, 14% P_2O_5, 28% K_2O, to sugar beet, none to barley.

Cultivations, etc.:

Green manures after barley 1962 (for sugar beet 1963): Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, undersown: Apr 28, 1962. Varieties: Trefoil - English, Ryegrass - Italian.

Sugar beet: Straw applied (green manure and 'fallow' plots): Aug 31, 1962. 'Fallow' plots ploughed: Oct 12. Ryegrass and trefoil plots ploughed: Mar 8, 1963. Basal fertiliser applied: Apr 3. 'Nitro-Chalk' applied: Apr 20. Seed drilled at 5.4 lb per acre: Apr 22. Singled: May 27. Sprayed with demeton-methyl at 6 fluid oz in 40 gallons per acre (against leaf miner and first appearance of aphids): June 5. Lifted: Nov 4. Variety: Klein E.

Green manures after early potatoes 1962 (for barley 1963): Ground chalk applied at 20 cwt per acre: July 20, 1962. Trefoil sown at 30 lb per acre: July 21. Ryegrass sown at 40 lb per acre: July 23. Varieties: Trefoil - English, Ryegrass - Western Wolths.

Barley: 'Fallow' plots and 'early' green manure plots ploughed: Nov 8, 1962. 'Late' green manure plots ploughed: Mar 8, 1963. 'Nitro-Chalk' applied: Apr 3. Seed drilled at 2.25 bushels per acre: Apr 8. Trefoil and ryegrass undersown: May 6. Combine harvested: Sept 12. Variety: Proctor.

Note: One sub-plot, which should have received no nitrogen, received 2 cwt N per acre in error. Estimated values were used in the analysis.

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Standard errors per plot.

Sugar beet.	Roots (washed)	Whole plot:	1.236 tons per acre or 10.1% (14 d.f.)
		Sub plot:	1.081 tons per acre or 8.8% (29 d.f.)
	Total sugar	Whole plot:	4.64 cwt per acre or 11.1% (14 d.f.)
		Sub plot:	3.98 cwt per acre or 9.5% (29 d.f.)
	Tops	Whole plot:	1.546 tons per acre or 13.5% (14 d.f.)
		Sub plot:	1.188 tons per acre or 10.4% (29 d.f,)
Barley.	Grain (at 85% dry matter)	Whole plot:	3.68 cwt per acre or 13.0%(16 d.f.)
		Sub plot:	3.27 cwt per acre or 11.5%(26 d.f.)

(Excluding plots fallow under old scheme)

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

	Green manures	Ploughed in	Dry matter	Nitrogen
For sugar beet	Trefoil		17.5	0.504
	Ryegrass		15.4	0.221
For barley	Trefoil	Early	35.0	0.932
	Ryegrass	Early	39.3	0.762
	Trefoil	Late	6.2	0.184
	Ryegrass	Late	15.5	0.390

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Summary of Results

Sugar beet. Roots (washed): tons per acre

	Straw: tons per acre		N: cwt per acre				Dung to cabbages 1953: tons per acre		Mean
	None	1.5	None	0.67	1.33	2.00	None	10	
Excluding plots fallow under old scheme									
Undersown green manures for sugar beet	(±0.437)			(1) and (2)			(±0.437)		(±0.309)
None	11.67	11.48	6.66	11.62	13.84	14.18	11.45	11.70	11.58
	(±0.618)			(3) and (4)			(±0.618)		(±0.437)
Trefoil	13.25	14.05	11.51	14.31	14.40	14.39	13.28	14.02	13.65
Ryegrass	12.83	13.19	8.86	13.36	15.04	14.77	12.16	13.85	13.01
Straw: tons per acre				(5) and (6)			(±0.437)		(±0.309)
None			8.36	12.76	14.08	14.22	11.78	12.93	12.35
1.5			8.49	12.70	14.47	14.53	12.40	12.69	12.55
N: cwt per acre							(5) and (6)		(7) and (8)
None							8.22	8.63	8.42
0.67							12.23	13.22	12.73
1.33							13.73	14.82	14.28
2.00							14.17	14.58	14.38
Mean (±0.309)							12.09	12.81	12.45

(1) (±0.382) (2) (±0.540) (3) (±0.514) (4) (±0.727) (5) (±0.382) (6) (±0.514)
(7) (±0.270) (8) (±0.363)

63/B/3.3

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Sugar beet. Roots (washed): tons per acre

	N: cwt per acre				Dung to cabbages 1953: tons per acre		Mean
	None	0.67	1.33	2.00	None	10	
Plots fallow under old scheme							
Straw: tons per acre	(1) and (2)				(±0.874)		(±0.618)
None	6.09	11.17	13.54	14.82	11.71	11.10	11.40
1.5	6.13	11.03	13.83	14.59	11.41	11.38	11.39
N: cwt per acre					(1) and (2)		(±0.540)
None					5.69	6.53	6.11
0.67					11.63	10.57	11.10
1.33					14.23	13.14	13.68
2.00					14.69	14.72	14.71
Mean (±0.618)					11.56	11.24	11.40

Undersown green manures for sugar beet

Old scheme	None Fallow	None	Trefoil	Ryegrass	Mean
		Excluding fallow			
	11.40 (±0.618)	11.58 (±0.309)	13.65 (±0.437)	13.01	12.24

(1) (±0.764) (2) (±1.027)

Note: On all summary sheets - Standard errors 1, 3, 5 and 7 are for use in comparisons within the same whole plot treatment. 2, 4, 6 and 8 are for use in comparisons involving different whole plot treatments, (all except N, None v 1.33 or 0.67 v 2.00).

63/B/3.4

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Sugar beet. Sugar percentage

	Straw: tons per acre		N: cwt per acre				Dung to cabbages 1953: tons per acre		Mean
	None	1.5	None	0.67	1.33	2.00	None	10	
Excluding plots fallow under old scheme									
Undersown green manures for sugar beet									
None	17.0	17.1	17.4	17.7	17.1	16.2	17.0	17.2	17.1
Trefoil	16.9	17.1	17.9	17.5	16.7	16.0	16.9	17.2	17.0
Ryegrass	17.4	17.3	18.0	17.9	17.0	16.4	17.2	17.5	17.3
Straw: tons per acre									
None			17.7	17.6	16.9	16.2	17.0	17.2	17.1
1.5			17.5	17.7	17.1	16.3	17.1	17.3	17.2
N: cwt per acre									
None							17.5	17.7	17.6
0.67							17.6	17.7	17.7
1.33							16.8	17.1	17.0
2.00							16.1	16.3	16.2
Mean							17.0	17.2	17.1

63/B/3.5

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Sugar beet. Sugar percentage

	N: cwt per acre				Dung to cabbages 1953: tons per acre		
	None	0.67	1.33	2.00	None	10	Mean
Plots fallow under old scheme							
Straw: tons per acre							
None	17.7	18.0	17.3	17.2	17.5	17.6	17.5
1.5	17.4	17.8	17.1	16.6	17.3	17.0	17.2
N: cwt per acre							
None					17.8	17.3	17.5
0.67					17.9	17.9	17.9
1.33					17.4	17.0	17.2
2.00					16.6	17.1	16.9
Mean					17.4	17.3	17.4

Undersown green manures for sugar beet

Old scheme	None Fallow	None	Trefoil	Ryegrass	Mean
		Excluding fallow			
	17.4	17.1	17.0	17.3	17.2

63/B/3.6

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Sugar beet. Total sugar: cwt per acre

	Straw: tons per acre		N: cwt per acre				Dung to cabbages 1953: tons per acre		Mean
	None	1.5	None	0.67	1.33	2.00	None	10	
Excluding plots fallow under old scheme									
Undersown green manures for sugar beet	(±1.64)			(1) and (2)			(±1.64)		(±1.16)
None	39.5	39.2	23.0	41.0	47.2	46.0	38.8	39.8	39.3
	(±2.32)			(3) and (4)			(±2.32)		(±1.64)
Trefoil	44.7	47.9	41.1	50.0	48.1	46.1	44.7	48.0	46.3
Ryegrass	44.4	45.2	31.9	47.9	51.0	48.5	41.5	48.2	44.8
Straw: tons per acre				(5) and (6)			(±1.64)		(±1.16)
None			29.7	44.9	47.5	46.0	39.8	44.2	42.0
1.5			29.8	45.0	49.3	47.3	42.1	43.7	42.9
N: cwt per acre							(5) and (6)		(7) and (8)
None							28.8	30.7	29.8
0.67							43.1	46.9	45.0
1.33							46.1	50.7	48.4
2.00							45.8	47.6	46.7
Mean (±1.16)							40.9	44.0	42.5

(1) (±1.41) (2) (±1.99) (3) (±1.92) (4) (±2.71) (5) (±1.41) (6) (±1.92)
(7) (±0.99) (8) (±1.36)

63 /B/3.7

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Sugar beet. Total sugar: cwt per acre

	N: cwt per acre				Dung to cabbages 1953: tons per acre		Mean
	None	0.67	1.33	2.00	None	10	
Plots fallow under old scheme							
Straw: tons per acre	(1) and (2)				(±3.28)		(±2.32)
None	21.6	40.2	46.9	50.8	40.7	39.0	39.9
1.5	21.2	39.2	47.2	48.3	39.3	38.6	38.9
N: cwt per acre					(1) and (2)		(3) and (4)
None					20.2	22.6	21.4
0.67					41.7	37.7	39.7
1.33					49.4	44.7	47.0
2.00					48.7	50.4	49.5
Mean (±2.32)					40.0	38.8	39.4

Undersown green manures for sugar beet

Old scheme	None Fallow	None	Trefoil	Ryegrass	Mean
		Excluding fallow			
	39.4 (±2.32)	39.3 (±1.16)	46.3	44.8 (±1.64)	41.9

(1) (±2.81) (2) (±3.83) (3) (±1.99) (4) (±2.71)

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Sugar beet. Tops: tons per acre

	Straw: tons per acre		N: cwt per acre				Dung to cabbages 1953: tons per acre		
	None	1.5	None	0.67	1.33	2.00	None	10	Mean
Excluding plots fallow under old scheme									
Undersown green manures for sugar beet	(±0.547)			(1) and (2)			(±0.547)		(±0.387)
None	10.65	10.14	4.38	8.14	13.16	15.90	10.51	10.28	10.40
	(±0.773)			(3) and (4)			(±0.773)		(±0.547)
Trefoil	14.04	15.10	8.34	12.94	17.67	19.35	14.80	14.34	14.57
Ryegrass	12.01	12.38	5.46	9.39	15.11	18.83	11.55	12.84	12.20
Straw: tons per acre				(5) and (6)			(±0.547)		(±0.387)
None			5.41	9.61	15.00	17.33	11.82	11.86	11.84
1.5			5.87	9.70	14.55	17.66	11.87	12.02	11.94
N: cwt per acre							(5) and (6)		(7) and (8)
None							5.54	5.74	5.64
0.67							9.55	9.76	9.65
1.33							14.21	15.34	14.77
2.00							18.09	16.90	17.49
Mean (±0.387)							11.84	11.94	11.89

(1) (±0.420) (2) (±0.594) (3) (±0.622) (4) (±0.880) (5) (±0.420) (6) (±0.622)
(7) (±0.297) (8) (±0.440)

63/B/3.9

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Sugar beet. Tops: tons per acre

	N: cwt per acre				Dung to cabbages 1953: tons per acre		Mean
	None	0.67	1.33	2.00	None	10	
Plots fallow under old scheme							
Straw: tons per acre		(1) and (2)			(±1.093)		(±0.773)
None	4.34	7.65	12.84	16.52	10.58	10.09	10.33
1.5	4.28	6.75	11.00	14.73	9.57	8.81	9.19
					(1) and (2)		(3) and (4)
N: cwt per acre							
None					4.03	4.58	4.31
0.67					7.12	7.28	7.20
1.33					12.61	11.23	11.92
2.00					16.55	14.70	15.62
Mean (±0.773)					10.08	9.45	9.76

Undersown green manures for sugar beet

Old scheme	None Fallow	None	Trefoil	Ryegrass	Mean
		Excluding fallow			
	9.76 (±0.773)	10.40 (±0.387)	14.57 (±0.547)	12.20	11.46

(1) (±0.840) (2) (±1.244) (3) (±0.594) (4) (±0.880)

63/B/3.10

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

	Green manures: In barley: None	In barley: Undersown	After potatoes for barley: Trefoil	After potatoes for barley: Ryegrass	N: cwt per acre: None	0.3	0.6	0.9	Dung to cabbages 1952: tons per acre: None	10	Mean
Excluding plots fallow under old scheme											
Green manures ploughed in	(±1.30)		(±1.30)		(1) and (2)				(±1.30)		(±0.92)
Early	27.4	28.9	29.2	27.1	20.1	29.2	31.4	31.8	27.5	28.7	28.1
Late	27.0	29.9	29.0	27.8	20.9	29.4	31.7	31.7	27.2	29.6	28.4
Green manures in barley											
None			27.1	27.2	19.9	27.8	30.3	30.8	25.6	28.7	27.2
Undersown			31.1	27.7	21.1	30.8	32.7	32.8	29.1	29.6	29.4
Green manures after potatoes for barley											
Trefoil					22.0	30.9	32.3	31.1	28.4	29.8	29.1
Ryegrass					19.0	27.7	30.7	32.4	26.4	28.5	27.4
N: cwt per acre									(1) and (2)		(±0.82)
None									20.3	20.7	20.5
0.3									27.7	30.9	29.3
0.6									30.8	32.2	31.5
0.9									30.7	32.8	31.8
Mean (±0.92)									27.4	29.2	28.3

(1) (±1.16) For use in comparisons within the same whole plot treatment.
(2) (±1.54) For use in comparisons involving different whole plot treatments.

63/B/3.11

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

Old scheme	Green manures after potatoes for barley: None Fallow	Trefoil Excluding fallow	Ryegrass fallow	Mean
	16.9	29.1	27.4	26.0

Plots fallow under old scheme

N: cwt per acre	Dung to cabbages 1952: tons per acre: None	10	Mean
None	4.4	4.7	4.5
0.3	14.0	16.0	15.0
0.6	21.5	22.3	21.9
0.9	24.7	27.4	26.0
Mean	16.1	17.6	16.9

Mean dry matter % as harvested: 75.4

63/B/3.12

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63/B/4.1

LEY AND ARABLE ROTATIONS

(WIA)

Woburn Stackyard 1963 - the 26th year.

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

Corrective K dressings (in cwt K_2O per acre, applied to sugar beet).
In 1962/3 two thirds of each dressing was applied in autumn before ploughing and one third broadcast on the plough furrow in February.

Continuous rotations	Fertiliser plots	Dung plots
Rotation		
Arable	6.0	6.0
Arable with hay	6.0	6.0
Lucerne	6.0	6.0
Grazed ley	3.0	0.0

Alternating rotations	Fertiliser plots	Dung plots
Last two rotations in order		
Arable/Ley	3.0	3.0
Lucerne/Arable with hay	6.0	6.0
Arable with hay/Lucerne	6.0	6.0
Ley/Arable	6.0	6.0

Revised NPK basal dressings (in cwt N, P_2O_5 and K_2O per acre)

	Fertilisers* and time of application	N	P_2O_5	K_2O
Hay	'Nitro-Chalk' and 0/14/28 in spring	1.0	0.6	1.2
	16/0/16 after 1st cut	0.6	-	0.6
Lucerne				
1st year	'Nitro-Chalk', superphosphate and muriate of potash in seedbed	0.5	1.5	1.0
2nd and 3rd year	'Nitro-Chalk' and muriate of potash in spring	0.5	-	1.5
Grazed ley				
1st year	'Nitro-Chalk', superphosphate and muriate of potash in seedbed	0.3	1.5	1.0
	16/0/16 in 2 equal dressings in early and late summer. Total:	0.6	-	0.6
2nd and 3rd year	16/0/16 in 3 equal dressings in spring, early and late summer. Total:	0.9	-	0.9

* Granular compound fertilisers are described thus - 0/14/28 etc. to show percentages of N, P_2O_5 and K_2O in order.

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Cultivations, etc.,
Treatment crops

Ley rotations

Ley 1st year. Ploughed twice: Sept 3 and Dec 18, 1962. Seedbed fertilisers applied, seed sown: Apr 19, 1963. Compound fertiliser applied: June 14 and Aug 28. Grazed 5 circuits: July 5 - Oct 14.

Ley 2nd year. Compound fertiliser applied: Mar 15, June 6 and Aug 15, 1963. Grazed 6 circuits: Apr 30 - Oct 4.

Ley 3rd year. Compound fertiliser applied: Mar 15, June 14 and Aug 15, 1963. Grazed 5 circuits: May 8 - Sept 14.

Lucerne 1st year. Ploughed: Sept 3, 1962. Treated for control of stem eelworm by injection of 'D.D' soil fumigant at 600 lb per acre: Oct 25. Ploughed second time: Dec 18. Fertilisers applied, fumigated and inoculated seed drilled at 20 lb per acre: Apr 19, 1963. Cut 3 times: June 18, Aug 2, Sept 25.

Lucerne 2nd year. 'Nitro-Chalk' and muriate of potash applied: Mar 15, 1963. Cut 3 times: June 19, Aug 2, Sept 25.

Lucerne 3rd year. 'Nitro-Chalk' and muriate of potash applied: Mar 15, 1963. Cut 3 times: June 18, Aug 2, Sept 25.

Arable rotations

Potatoes. Ploughed twice: Sept 3 and Dec 18, 1962. Fertilisers applied, potatoes machine planted: Apr 19, 1963. Earthed up: June 19. Sprayed with copper oxychloride fungicide at 2.3 lb copper in 20 gallons per acre: July 25, and again at the same rate in 30 gallons plus 0.35 pints menazon per acre: Aug 22. Sprayed with undiluted BCV at 16 gallons per acre: Sept 13. Lifted: Oct 8.

Rye. Ploughed: Oct 11, 1962. Seed combine drilled at 3 bushels per acre with PK compound: Oct 22. 'Nitro-Chalk' applied, seeds hay mixture undersown on 4 plots: Apr 19, 1963. Combine harvested: Sept 14.

Seeds hay. Seeds undersown in rye at 30 lb per acre: Apr 10, 1962. 'Nitro-Chalk' and PK compound applied: Mar 15, 1963. Cut twice: June 18 and Aug 19. Compound fertiliser applied: June 21.

Carrots. Ploughed twice: Sept 10 and Nov 13, 1962. Fertilisers applied: Apr 22, 1963. Seed drilled at 2.25 lb per acre: Apr 23. Sprayed with demeton-methyl at 6 fluid oz in 40 gallons per acre: May 31. Thinned: June 12. Sprayed with demeton-methyl at 6 fluid oz in 40 gallons per acre: June 27. Lifted: Sept 16.

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Test crops

Sugar beet. Dung equivalent K* and two thirds of corrective K applied: Nov 22, 1962. Dung applied, all plots ploughed: Dec 19. One third of corrective K*, basal superphosphate, muriate of potash and magnesium sulphate applied: Mar 21, 1963. 'Nitro-Chalk' and 'test' muriate of potash applied: Apr 22. Seed drilled at 4.9 lb per acre: Apr 23. Singled: May 27. Sprayed with demeton-methyl at 6 fluid oz in 40 gallons per acre: June 5. Lifted: Nov 4.

Barley. Ground chalk applied at 40 cwt per acre: Oct 27, 1962. Ploughed: Oct 29. 'Balancing' muriate of potash applied: Mar 14, 1963. Basal superphosphate applied: Mar 19. 'Nitro-Chalk' applied: Mar 28. Seed drilled at 2.25 bushels per acre: Apr 8. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: May 21. Combine harvested: Sept 13.

* The dung equivalent K for plot 58, which receives no dung, was applied in error to dung plot 56. With the spring application of corrective K, this error was rectified on plot 58, but no correction is to be made to plot 56. In calculating the means and analysis of variance no allowance has been made for this error.

Standard errors per plot. Test crops.

Sugar beet.	Roots (washed)	Whole plot:	0.206 tons per acre or 1.1% (4 d.f.)
		1/2 plot:	1.152 tons per acre or 6.2% (4 d.f.)
		1/4 plot:	0.206 tons per acre or 1.1% (24 d.f.)
		1/16 plot:	1.026 tons per acre or 5.5% (32 d.f.)
	Total sugar	Whole plot:	0.82 cwt per acre or 1.2% (4 d.f.)
		1/2 plot:	3.55 cwt per acre or 5.2% (4 d.f.)
		1/4 plot:	2.47 cwt per acre or 3.6% (24 d.f.)
		1/16 plot:	4.03 cwt per acre or 5.9% (32 d.f.)
	Tops	Whole plot:	0.405 tons per acre or 2.6% (4 d.f.)
		1/2 plot:	1.650 tons per acre or 10.6% (4 d.f.)
		1/4 plot:	0.923 tons per acre or 5.9% (24 d.f.)
		1/16 plot:	1.232 tons per acre or 7.9% (32 d.f.)
Barley.	Grain (at 85% dry matter)	Whole plot:	1.26 cwt per acre or 3.8% (4 d.f.)
		1/2 plot:	1.40 cwt per acre or 4.2% (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
1482	1807	1301

Lucerne, dry matter: cwt per acre

	1st cut	2nd cut	3rd cut	Total
1st year				
Dung in 1958: tons per acre				
None	1.0	13.6	12.8	27.4
15	2.0	18.1	15.6	35.8
Difference	+1.0	+4.5	+2.8	+8.4
Previous rotation				
Lucerne	0.9	13.4	12.4	26.6
Arable with hay	2.2	18.3	16.0	36.4
Mean	1.6	15.8	14.2	31.5
2nd year				
Dung in 1960: tons per acre				
None	15.2	15.1	16.9	47.2
15	18.8	17.4	19.6	55.8
Difference	+3.6	+2.3	+2.7	+8.6
Previous rotation				
Lucerne	18.5	15.9	18.8	53.2
Arable with hay	15.5	16.6	17.6	49.7
Mean	17.0	16.2	18.2	51.4
3rd year				
Dung in 1959: tons per acre				
None	24.5	11.8	1.8	38.1
15	29.2	9.2	3.5	41.9
Difference	+4.7	-2.6	+1.7	+3.8
Previous rotation				
Lucerne	24.1	11.8	2.4	38.3
Arable with roots	29.6	9.2	2.9	41.7
Mean	26.8	10.5	2.6	40.0

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Treatment crops

	Potatoes		Rye	
	Total tubers: tons per acre	Percentage ware (1.625 in.riddle)	Grain: (at 85% dry matter) cwt per acre	Straw: cwt per acre
Dung: tons per acre				
None	9.07	81.5	29.8	19.7
15*	9.73	82.6	30.0	19.8
Difference	+0.66	+1.1	+0.2	+0.1
Previous rotation				
Ley	12.30	87.5	33.0	23.2
Lucerne	12.10	91.6	29.2	19.8
Arable with hay	6.51	71.0	29.2	18.4
Arable with roots	6.69	78.1	28.4	17.5
Mean	9.40	82.1	30.0	19.7

Hay

Yield, dry matter: cwt per acre

	1st cut	2nd cut	Total
Dung in 1959: tons per acre			
None	44.9	19.5	64.4
15	50.0	19.4	69.4
Difference	+5.1	-0.1	+5.0
Previous rotation			
Ley	53.9	19.6	73.4
Arable with hay	41.0	19.4	60.4
Mean	47.5	19.4	66.9

*Dung applied: Potatoes for test crop sugar beet in 1961
Rye for test crop sugar beet in 1960

Mean dry matter % as harvested: Rye, Grain: 79.2
Straw: 81.9

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63/B/4.6

Carrots

	Roots (washed): tons per acre	Tops: tons per acre
Dung in 1959: tons per acre		
None	18.26	5.96
15	19.71	6.40
Difference	+1.45	+0.44
Previous rotation		
Lucerne	18.89	6.34
Arable with roots	19.08	6.02
Mean	18.98	6.18

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63/B/4.7

1st Test crop

Sugar beet

Roots (washed): tons per acre

	Previous rotation				
	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Mean (±0.145)	18.66	19.50	16.89	19.41	18.61
Dung: tons per acre					
None (±1.680)*	17.94	18.42	15.63	17.71	17.42
15	19.38	20.58	18.15	21.11	19.80
Difference (±1.152)	+1.44	+2.16	+2.52	+3.40	+2.38
Response to additional 0.72 cwt N per acre					
		(±0.146)			(±0.073)
No dung	-0.71	+0.56	+1.61	+2.43	+0.97
Dung 15 tons per acre	-0.31	-0.07	-0.20	+1.27	+0.17
Response to additional 0.9 cwt K_2O per acre					
		(±0.146)			(±0.073)
No dung	+0.03	+0.54	+0.52	-0.92	+0.04
Dung 15 tons per acre	+0.41	-0.79	-0.32	+0.54	-0.04

*For use in horizontal and diagonal comparisons only.

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63/B/4.8

1st Test crop

Sugar beet

Sugar Percentage

	Previous rotation				
	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Mean	18.2	17.9	19.0	18.6	18.4
Dung: tons per acre					
None	18.5	18.3	19.3	18.8	18.7
15	17.9	17.6	18.6	18.3	18.1
Difference	-0.6	-0.7	-0.7	-0.5	-0.6
Response to additional 0.72 cwt N per acre					
No dung	-0.7	-0.6	-0.4	-0.7	-0.6
Dung 15 tons per acre	-0.5	-0.8	-0.7	-0.2	-0.6
Response to additional 0.9 cwt K_2O per acre					
No dung	-0.3	+0.3	+0.2	+0.1	+0.1
Dung 15 tons per acre	0.0	-0.2	+0.1	-0.1	0.0

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63/B/4.9

1st Test crop

Sugar beet

Total sugar: cwt per acre

	Previous rotation				
	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Mean (±0.58)	67.7	69.9	63.9	71.9	68.4
Dung: tons per acre					
None (±5.28)*	66.2	67.4	60.2	66.6	65.1
15	69.2	72.4	67.6	77.2	71.6
Difference (±3.55)	+3.0	+5.0	+7.4	+10.6	+6.5
Response to additional 0.72 cwt N per acre					
		(±1.75)			(±0.87)
No dung	-5.2	-0.3	+5.1	+6.6	+1.6
Dung 15 tons per acre	-3.1	-3.2	-3.4	+3.8	-1.4
Response to additional 0.9 cwt K_2O per acre					
		(±1.75)			(±0.87)
No dung	-0.6	+3.0	+2.4	-2.8	+0.6
Dung 15 tons per acre	+1.5	-3.2	-1.0	+1.4	-0.4

*For use in horizontal and diagonal comparisons only.

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63/B/4.10

1st Test crop

Sugar beet

Tops: tons per acre

	Previous rotation				
	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Mean (±0.286)	17.61	17.74	13.30	13.80	15.61
Dung: tons per acre					
None (±2.470)*	17.34	15.29	11.08	12.05	13.94
15	17.88	20.20	15.52	15.55	17.29
Difference (±1.650)	+0.54	+4.91	+4.44	+3.50	+3.35
Response to additional 0.72 cwt N per acre					
		(±0.653)			(±0.326)
No dung	+4.23	+3.83	+3.48	+4.92	+4.12
Dung 15 tons per acre	+1.67	+1.81	+5.01	+2.88	+2.85
Response to additional 0.9 cwt K_2O per acre					
		(±0.653)			(±0.326)
No dung	+0.13	+0.40	+0.28	+0.11	+0.22
Dung 15 tons per acre	-0.27	-0.42	+0.61	+0.42	+0.09

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63/B/4.11

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	(±0.425)	18.65	19.43	16.29	18.38	18.19
None	(±0.820)*	18.36	17.89	14.32	16.57	16.78
15		18.94	20.97	18.26	20.20	19.59
Difference	(±1.402)	+0.58	+3.08	+3.94	+3.63	+2.81
Sugar percentage						
Mean		18.6	18.2	19.2	18.8	18.7
None		18.9	18.3	19.4	19.2	18.9
15		18.3	18.1	19.0	18.4	18.4
Difference		-0.6	-0.2	-0.4	-0.8	-0.5
Total sugar: cwt per acre						
Mean	(±1.62)	69.3	70.4	62.3	68.9	67.7
None	(±2.84)*	69.4	65.2	55.4	63.4	63.3
15		69.3	75.6	69.2	74.4	72.1
Difference	(±4.66)	-0.1	+10.4	+13.8	+11.0	+8.8
Tops: tons per acre						
Mean	(±0.634)	16.14	15.89	11.07	11.92	13.75
None	(±1.184)*	15.17	12.89	9.09	9.59	11.68
15		17.11	18.89	13.06	14.24	15.82
Difference	(±2.001)	+1.94	+6.00	+3.97	+4.65	+4.14

*For use in horizontal and diagonal comparisons only.

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1st Test crop

Sugar beet

Magnesium sulphate: lb per acre	Previous rotation: Ley	Lucerne	Arable with hay	Arable with roots	Mean
Roots (washed): tons per acre					
		(±0.232)*			
None	18.43	19.39	16.40	19.41	18.41
500	18.88	19.61	17.38	19.40	18.82
Difference (±0.363)	+0.45	+0.22	+0.98	-0.01	+0.41 (±0.181)
Sugar percentage					
None	18.2	17.9	18.9	18.6	18.4
500	18.2	18.0	19.1	18.5	18.4
Difference	0.0	+0.1	+0.2	-0.1	0.0
Total sugar: cwt per acre					
		(±0.92)*			
None	66.9	69.4	61.8	72.0	67.5
500	68.6	70.4	66.1	71.8	69.2
Difference (±1.42)	+1.7	+1.0	+4.3	-0.2	+1.7 (±0.71)
Tops: tons per acre					
		(±0.360)*			
None	17.77	17.74	13.22	13.86	15.64
500	17.46	17.75	13.38	13.74	15.58
Difference (±0.436)	-0.31	+0.01	+0.16	-0.12	-0.06 (±0.218)

*For use in horizontal and diagonal comparisons only.

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2nd Test crop

Barley

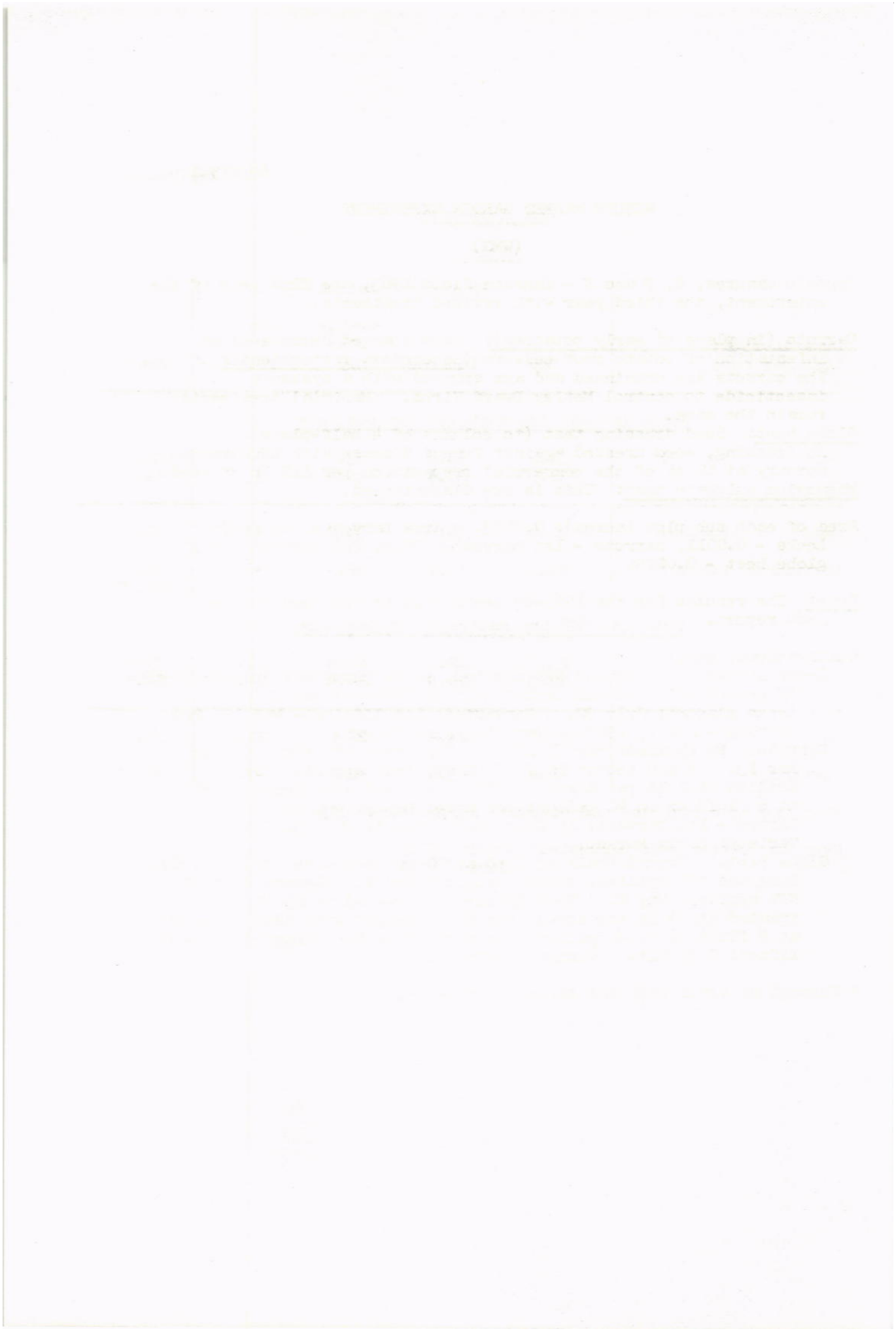
Dung in 1962: tons per acre	Previous rotation: Ley	Lucerne	Arable with hay	Arable with roots	Mean
Grain (at 85% dry matter): cwt per acre					
None (±1.13)*	31.0	33.8	33.0	33.8	32.9
15	32.5	35.4	35.4	33.7	34.3
Mean (±0.89)	31.8	34.6	34.2	33.8	33.5
Difference (±1.40)	+1.5	+1.6	+2.4	-0.1	+1.4 (±0.70)
Straw (at 85% dry matter): cwt per acre					
None	23.7	22.5	22.4	21.8	22.6
15	22.3	25.9	24.6	21.5	23.5
Mean	23.0	24.2	23.5	21.6	23.0
Difference	-1.4	+3.4	+2.2	-0.3	+0.9

*For use in horizontal and diagonal comparisons only.

Mean dry matter % as harvested: Grain 77.5
Straw 85.4

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WOBURN MARKET GARDEN EXPERIMENT

(WMG)

Organic manures, N, P and K - Lansome Field 1963, the 22nd year of the experiment, the third year with revised treatments.

Carrots (in place of early potatoes): Crop changed because of an infestation of potato root eelworm (Heterodora rostochiensis). The carrots are unthinned and are sprayed with a systemic insecticide to control Motley Dwarf Virus. Manurial treatments remain the same.

Globe beet: Seed dressing test (to columns of 4 half-plots): No dressing, seed dressed against fungus disease with BHC/organo-mercury at 10 oz of the commercial preparation per 112 lb of seed.

Magnesium sulphate test: This is now discontinued.

Area of each sub plot (acres): 0.0063. Area harvested (acres): Leeks - 0.0011, carrots - 1st harvest 0.0012, 2nd harvest 0.0017, globe beet - 0.0009.

Note: The results for the 1963-64 leeks will be included in the 1964 report.

Cultivations, etc.:

Leeks 1962-63. Dung and NPK applied, plots ploughed: July 25, 1962. Magnesium sulphate and second half of NPK applied: July 27. Leeks planted: July 30. Harvested: 1st lifting - Mar 12, 2nd lifting - Apr 1, 1963. Variety: Musselburgh.

Carrots. PK applied: Mar 7, 1963. Dung applied, plots ploughed: Mar 13. N and second half of PK applied: Apr 11. Seed drilled at 2 lb per acre: Apr 21. Sprayed with demeton methyl at 6 fluid oz in 40 gallons per acre: May 31 and June 27. Lifted - 1st harvest: 15 July, 2nd harvest: 30 - 31 July. Variety: Early Market.

Globe beet. Ground chalk applied at 20 cwt per acre: May 3, 1963. Dung and NPK applied, plots ploughed: May 7. Second half of NPK applied: May 8. Seed drilled (untreated at 13 lb and treated at 14 lb per acre): May 9. Sprayed with demeton methyl at 6 fluid oz in 40 gallons per acre: June 6. Singled: June 14. Lifted: July 22*. Variety: Detroit.

* Through an error only one harvest was taken.

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Summary of Results

Leeks 1962 - 1963. 1st Lifting. Saleable produce: tons per acre

Dung: tons per acre	Organic** manure applied 1942-62	Mean	Mag.sulph. lb p.a. None	500	Diff.	Fertiliser None	NlPlKl	Diff.
10	D1	4.31	4.32	4.30	-0.02	3.87	4.75	+0.88
20	D2	4.25	4.07	4.42	+0.35	3.70	4.80	+1.10
10	C1	3.86	4.04	3.67	-0.37	3.52	4.20	+0.68
20	C2	4.26	4.24	4.27	+0.03	3.64	4.87	+1.23
Mean		4.17	4.17	4.16	-0.01	3.68	4.65	+0.97

Mag.sulph. lb per acre		
None	3.64	4.70
500	3.72	4.61

NPK				
111	3.72	3.42	4.02	+0.60
111*	3.67	3.82	3.52	-0.30
211	3.06	3.22	2.91	-0.31
211*	4.37	4.32	4.42	+0.10
112	3.37	3.12	3.62	+0.50
112*	2.92	3.12	2.71	-0.41
212	3.72	4.02	3.42	-0.60
212*	4.12	4.12	4.12	0.00
Mean	3.62	3.64	3.59	-0.05

* NPK half ploughed in, half in seedbed.

** Last applied to early potatoes 1962.

63/B/5.2

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Leeks 1962 - 1963. 2nd Lifting. Saleable produce: tons per acre

Dung: tons per acre	Organic** manure applied 1942-62	Mean	Mag.sulph. lb p.a. None	500	Diff.	Fertiliser None	N1P1K1	Diff
10	D1	4.64	4.62	4.67	+0.05	4.52	4.77	+0.25
20	D2	4.43	4.35	4.52	+0.17	4.04	4.82	+0.78
10	C1	4.32	4.45	4.20	-0.25	3.77	4.88	+1.11
20	C2	4.37	4.60	4.14	-0.46	3.59	5.15	+1.56
Mean		4.44	4.50	4.38	-0.12	3.98	4.90	+0.92

NPK	Mean	Mag.sulph. lb per acre None	500	Diff.
		None	4.01	5.00
		500	3.96	4.81
111	3.77	3.82	3.72	-0.10
111*	3.92	3.82	4.02	+0.20
211	3.42	3.62	3.22	-0.40
211*	4.78	5.13	4.42	-0.71
112	3.36	3.72	3.01	-0.71
112*	3.67	3.72	3.62	-0.10
212	4.42	4.42	4.42	0.00
212*	4.17	4.22	4.12	-0.10
Mean	3.94	4.06	3.82	-0.24

* NPK half ploughed in, half in seedbed.
** Last applied to early potatoes 1962.

63/B/5.3

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Leeks 1962 - 1963. Mean of 2 Liftings. Saleable produce: tons per acre

Dung: tons per acre	Organic** manure applied 1942-62	Mean	Mag.sulph. lb p.a. None	500	Diff.	Fertiliser None	N1P1K1	Diff.
10	D1	4.48	4.47	4.48	+0.01	4.20	4.76	+0.56
20	D2	4.34	4.21	4.47	+0.26	3.87	4.81	+0.94
10	C1	4.09	4.24	3.93	-0.31	3.64	4.54	+0.90
20	C2	4.31	4.42	4.21	-0.21	3.62	5.01	+1.39
Mean		4.30	4.34	4.27	-0.07	3.83	4.78	+0.95

	Mag.sulph. lb per acre		
	None	3.83	4.85
	500	3.84	4.71

NPK				
111	3.74	3.62	3.87	+0.25
111*	3.80	3.82	3.77	-0.05
211	3.24	3.42	3.06	-0.36
211*	4.57	4.72	4.42	-0.30
112	3.37	3.42	3.32	-0.10
112*	3.29	3.42	3.16	-0.26
212	4.07	4.22	3.92	-0.30
212*	4.14	4.17	4.12	-0.05
Mean	3.78	3.85	3.71	-0.14

* NPK half ploughed in, half in seedbed.
** Last applied to early potatoes 1962.

63/B/5.4

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Carrots. Graded produce. Roots: tons per acre

Dung: tons per acre	Organic manure applied 1942-61	Mean	Fertiliser None	Fertiliser N1P1K1	Diff.
			1st Harvest		
10	D1	3.78	3.58	3.97	+0.39
20	D2	5.33	5.24	5.42	+0.18
10	C1	4.02	4.65	3.40	-1.25
20	C2	4.00	4.84	3.15	-1.69
Mean		4.28	4.58	3.98	-0.60
			2nd Harvest		
10	D1	5.90	5.94	5.84	-0.10
20	D2	7.09	7.84	6.33	-1.51
10	C1	6.14	6.10	6.17	+0.07
20	C2	6.73	7.84	5.62	-2.22
Mean		6.46	6.94	5.99	-0.95

Treatment NPK	
111	3.68
111*	4.26
211	2.42
211*	3.68
112	1.74
112*	5.04
212	1.94
212*	2.62
Mean	3.17
111	5.56
111*	5.30
211	3.75
211*	3.88
112	3.23
112*	5.04
212	3.94
212*	3.49
Mean	4.27

*PK half ploughed in, half in seedbed.

63/B/5.5

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Carrots. Graded produce. Roots: tons per acre

Dung: tons per acre	Organic manure applied 1942-61	Mean	Fertiliser None	Fertiliser N1P1K1	Diff.
		Mean of 1st and 2nd Harvest			
10	D1	5.05	5.00	5.09	+0.09
20	D2	6.39	6.80	5.97	-0.83
10	C1	5.29	5.52	5.06	-0.46
20	C2	5.64	6.64	4.63	-2.01
Mean		5.59	6.00	5.19	-0.81

Treatment NPK	
111	4.81
111*	4.88
211	3.22
211*	3.80
112	2.63
112*	5.04
212	3.14
212*	3.14
Mean	3.83

* PK half ploughed in, half in seedbed

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Carrots. Tops: tons per acre

Dung: tons per acre	Organic manure applied 1942-61	Mean	Fertiliser None	Fertiliser N1P1K1	Diff.
			1st Harvest		
10	D1	4.22	3.68	4.75	+1.07
20	D2	6.76	7.52	6.01	-1.51
10	C1	4.60	5.14	4.07	-1.07
20	C2	5.84	6.69	4.99	-1.70
Mean		5.36	5.76	4.95	-0.81
			2nd Harvest		
10	D1	4.91	4.16	5.66	+1.50
20	D2	7.45	7.56	7.34	-0.22
10	C1	5.22	5.20	5.24	+0.04
20	C2	6.77	7.50	6.04	-1.46
Mean		6.09	6.10	6.07	-0.03

Treatment NPK	
111	3.10
111*	4.26
211	2.52
211*	4.65
112	1.55
112*	4.46
212	2.04
212*	2.33
Mean	3.11
111	3.62
111*	3.62
211	3.04
211*	2.97
112	2.13
112*	3.42
212	3.81
212*	2.84
Mean	3.18

* PK half ploughed in, half in seedbed.

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Carrots. Tops: tons per acre

Dung: tons per acre	Organic manure applied 1942-61	Mean	Fertiliser None	Fertiliser N1P1K1	Diff.
		Mean of 1st and 2nd Harvest			
10	D1	4.63	3.97	5.30	+1.33
20	D2	7.17	7.54	6.81	-0.73
10	C1	4.97	5.18	4.77	-0.41
20	C2	6.40	7.18	5.62	-1.56
Mean		5.80	5.96	5.62	-0.34

Treatment NPK	
111	3.41
111*	3.88
211	2.83
211*	3.64
112	1.90
112*	3.84
212	3.10
212*	2.64
Mean	3.16

* PK half ploughed in, half in seedbed.

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Globe beet. Total produce: tons per acre

Dung: tons per acre	Organic manure applied 1942-62**	Mean	Fungicide 0	Fungicide F	Diff.	Fertiliser None	Fertiliser N1P1K1	Diff.
10	D1	12.94	12.21	13.66	+1.45	10.88	14.99	+4.11
20	D2	15.51	14.16	16.86	+2.70	14.47	16.55	+2.08
10	C1	13.41	13.45	13.37	-0.08	9.87	16.96	+7.09
20	C2	15.53	14.65	16.41	+1.76	15.36	15.70	+0.34
Mean		14.35	13.62	15.08	+1.46	12.65	16.05	+3.40
					Fungicide			
					0	12.27	14.97	
					F	13.02	17.13	
NPK								
111		6.40	5.23	7.56	+2.33			
111*		11.28	10.53	12.02	+1.49			
211		8.86	9.63	8.08	-1.55			
211*		7.30	6.98	7.62	+0.64			
112		12.44	12.92	11.95	-0.97			
112*		***	***	***	***			
212		7.36	5.62	9.11	+3.49			
212*		14.76	14.47	15.05	+0.58			
Mean excluding 112*		9.77	9.34	10.20	+0.86			

* NPK half ploughed in, half in seedbed.
** Last applied to early potatoes 1962.
*** Results omitted because of discrepancy between plant counts immediately after singling and at harvest.

63/B/5.9

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Globe beet. Total saleable roots: tons per acre

Dung: tons per acre	Organic manure applied 1942-62**	Mean	Fungicide 0	Fungicide F	Diff.	Fertiliser None	Fertiliser N1P1K1	Diff.
10	D1	5.90	5.86	5.95	+0.09	5.06	6.75	+1.69
20	D2	7.76	7.34	8.20	+0.86	7.57	7.96	+0.39
10	C1	6.31	6.34	6.28	-0.06	4.41	8.20	+3.79
20	C2	7.53	7.29	7.76	+0.47	7.70	7.35	-0.35
Mean		6.88	6.70	7.05	+0.35	6.19	7.56	+1.37
					Fungicide			
					0	6.22	7.19	
					F	6.16	7.94	
NPK								
111		1.93	1.51	2.35	+0.84			
111*		4.55	4.26	4.84	+0.58			
211		3.79	4.42	3.16	-1.26			
211*		2.16	1.91	2.41	+0.50			
112		5.32	5.57	5.08	-0.49			
112*		***	***	***	***			
212		2.64	2.01	3.28	+1.27			
212*		6.10	6.10	6.10	0.00			
Mean excluding 112*		3.79	3.68	3.89	+0.2			

63/B/5.10

* NPK half ploughed in, half in seedbed.
** Last applied to early potatoes 1962.
*** Results omitted because of discrepancy betweenplant counts immediately after singling and at harvest.

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Globe beet. Plant number: thousands per acre

Dung: tons per acre	Organic manure applied 1942-62**	Mean	Fungicide 0	Fungicide F	Diff.	Fertiliser None	Fertiliser N1P1K1	Diff.
10	D1	126.9	109.2	144.6	+35.4	133.3	120.6	-12.7
20	D2	126.5	113.2	139.9	+26.7	131.1	122.0	-9.1
10	C1	131.8	126.9	136.8	+9.9	130.7	133.0	+2.3
20	C2	123.8	111.7	135.9	+24.2	128.2	119.4	-8.8
Mean		127.3	115.3	139.3	+24.0	130.8	123.7	-7.1
					Fungicide			
					0	119.9	110.6	
					F	141.8	136.8	
NPK								
111		104.0	80.5	127.4	+46.9			
111*		145.0	127.4	162.7	+35.3			
211		106.5	99.0	114.0	+15.0			
211*		120.4	123.9	116.9	-7.0			
112		129.1	134.3	123.9	-10.4			
112*		***	***	***	***			
212		87.2	71.8	102.5	+30.7			
212*		135.2	127.9	142.4	+14.5			
Mean excluding 112*		118.2	109.3	127.1	+17.8			

* NPK half ploughed in, half in seedbed.
** Last applied to early potatoes 1962.
*** Results omitted because of discrepancy between plant counts immediately after singling and at harvest.

63/B/5.11

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63/B/6.1

IRRIGATION EXPERIMENT

(WIR)

Revised 1963, the 13th year

The effects of irrigation and nitrogen - Woburn Butt Close, 1963.

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

The 3 course rotation is now as follows:-
1st year: sugar beet (following spring beans 1962).
2nd year: barley - undersown (following early potatoes 1962).
3rd year: clover (following barley 1962) - Crimson clover in 1963, double-cut red clover in following years.

Revised treatments.
Sugar beet: A test of early v normal singling is applied on strips of 4 half plots, north v south.
The original nitrogen test to sub plots (as for early potatoes) is continued at the following rates: None, 0.75 cwt N as sulphate of ammonia (in addition to basal dressing).
The trefoil green manure sown after early potatoes for barley and the comparison of normal and chemical weed control to early potatoes are discontinued.
Lucerne: Irrigation treatments are now: nil (O), early (A), late (B), full (C).

Revised basal dressing per acre:
Sugar beet: 0.75 cwt each of N, P_2O_5 and K_2O as compound fertiliser (10% N, 10% P_2O_5, 10% K_2O), 5 cwt agricultural salt, applied in winter and ploughed in in spring (applied in spring after ploughing in 1963).
Clover: 0.75 cwt P_2O_5, 1.5 cwt K_2O as compound fertiliser (14% P_2O_5, 28% K_2O), applied in winter (in spring 1963 to Crimson clover).

Area harvested (acres): Sugar beet, sub sub plot - 0.0056, Barley, whole plot - 0.0092, Clover, whole plot - 0.0117, Lucerne, sub plot - 0.0165.

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63/B/6.2

Rainfall and Irrigation: inches

Week ending	Rain-fall	Barley C	Sugar beet A	Sugar beet B	Sugar beet C	Clover A	Clover B	Clover C	Lucerne A	Lucerne B	Lucerne C
May 6	0.55										
13	0.35										
20	0.12										
27	0.48								0.50		0.50
June 3	0.03	0.50	0.50		0.50	0.50		0.50			
10	0.03								0.50		0.50
17	0.19	1.00	1.00		1.00	1.00		1.00	1.00		1.00
24	0.41	0.75	0.75		0.75	0.75		0.75			
July 1	0.63	0.50	0.50		0.50	0.50		0.50		0.75	0.75
8	0.80										
15	0.37										
22	0.23			1.00							
29	0.08			1.00	0.50		0.50	0.50		0.50	0.50
Aug 5	1.01										
12	0.26										
19	0.51										
26	0.63										
Sept 2	1.03										
9	0.98										
16	0.15										
23	0.03										
30	0.65										
Total	9.52	2.75	2.75	2.00	3.25	2.75	0.50	3.25	2.00	1.25	3.25

Cultivations, etc.:

Sugar beet. Ploughed: Oct 10, 1962. Salt applied: Mar 4, 1963. Basal compound and sulphate of ammonia applied: Apr 8. Seed drilled at 6 lb per acre: Apr 22. Singled: early - May 27, late - June 7. Sprayed with demeton methyl at 6 fluid oz in 40 gallons per acre (against leaf miner and first appearance of aphids): June 5. Lifted: Nov 5. Variety: Klein E.

Barley. Ground chalk applied at 40 cwt per acre: Feb 15, 1963. Ploughed: Mar 13. Basal compound and 'Nitro-Chalk' applied: Apr 9. Seed drilled at 2.3 bushels per acre, clover sown at 30 lb per acre: Apr 18. Combine harvested: Sept 10. Variety: Proctor.

Clover. Ploughed twice: Aug 27, Nov 1, 1962. Basal compound fertiliser applied: Apr 8, 1963. Seed sown at 30 lb per acre: Apr 18. Cut: July 10. Samples cut for estimation of dry matter ploughed in: Aug 19. Variety: Crimson clover (inoculated seed).

Lucerne. Ground chalk applied at 20 cwt per acre: Feb 15, 1963. 'Nitro-Chalk', muriate of potash and basal P applied: Mar 7. Cut 3 times: June 19, July 29, Sept 27. Muriate of potash applied after first 2 cuts. Variety: Du Puits.

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Standard errors per plot.

Sugar beet.	Roots (washed)	Whole plot:	0.724 tons per acre or 4.1% (6 d.f.)
		Sub plot:	0.606 tons per acre or 3.4% (8 d.f.)
		Strip:	0.989 tons per acre or 5.6% (16 d.f.)
	Total sugar	Whole plot:	2.63 cwt per acre or 4.0% (6 d.f.)
		Sub plot:	2.16 cwt per acre or 3.3% (8 d.f.)
		Strip:	4.61 cwt per acre or 7.0% (16 d,f.)
	Tops	Whole plot:	1.382 tons per acre or 12.2% (6 d.f.)
		Sub plot:	1.007 tons per acre or 8.9% (8 d.f.)
		Strip:	0.928 tons per acre or 8.2% (16 d.f.)
Clover, dry matter			1.51 cwt per acre or 7.1% (8 d.f.)

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Summary of Results

Sugar beet

	Irrigation 0	A	B	C	Mean
	Roots (washed): tons per acre				
Mean (±0.418)	16.94	17.12	18.85	17.73	17.66
N: cwt per acre including basal		(1) and (2)			(±0.175)
0.75	16.35	16.30	18.47	16.47	16.90
1.50	17.54	17.93	19.24	19.00	18.43
Singled		(±0.404)*			
Early	16.47	16.56	18.88	17.81	17.43
Late	17.42	17.67	18.82	17.65	17.89
	Sugar percentage				
Mean	18.6	18.7	18.7	18.8	18.7
N: cwt per acre including basal					
0.75	19.0	18.8	18.9	19.1	19.0
1.50	18.2	18.5	18.5	18.5	18.4
Singled					
Early	18.6	18.6	18.6	18.8	18.7
Late	18.6	18.7	18.7	18.8	18.7

* For use in interaction comparisons only

(1) (±0.350). For use in horizontal and interaction comparisons only
(2) (±0.485). For use in vertical and diagonal comparisons only

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63/B/6.5

Sugar beet

	Irrigation 0	A	B	C	Mean
	Total sugar: cwt per acre				
Mean (±1.52)	63.0	64.0	70.5	66.6	66.0
N: cwt per acre including basal		(1) and (2)			(±0.62)
0.75	62.3	61.4	69.8	62.9	64.1
1.50	63.7	66.5	71.3	70.4	68.0
Singled		(±1.88)*			
Early	61.3	61.8	70.6	67.1	65.2
Late	64.7	66.2	70.5	66.2	66.9
	Tops: tons per acre				
Mean (±0.798)	11.51	11.32	11.98	10.53	11.34
N: cwt per acre including basal		(3) and (4)			(±0.291)
0.75	9.36	9.47	10.32	8.99	9.54
1.50	13.65	13.17	13.65	12.06	13.13
Singled		(±0.379)*			
Early	11.38	10.74	11.96	10.16	11.06
Late	11.64	11.90	12.01	10.90	11.61

* For use in interaction comparisons only

(1) (±1.25). For use in horizontal and interaction comparisons only
(2) (±1.75). For use in vertical and diagonal comparisons only
(3) (±0.581). For use in horizontal and interaction comparisons only
(4) (±0.897). For use in vertical and diagonal comparisons only

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63/B/6.6

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

Weed control**	Irrigation O	Irrigation C
Normal cultivation	22.9	28.3
Trietazine spray	25.6	27.2

Green manure	Weed control** Normal cultivation	Weed control** Trietazine spray
None	24.2	23.9
Trefoil	26.2	27.6

N: cwt per acre including basal	Irrigation O	Irrigation C	Weed control** Normal cultivation	Weed control** Trietazine spray	Green manure None	Green manure Trefoil	Mean
0.3	20.1	23.3	21.3	22.1	18.7	23.2	21.7
0.6	28.3	32.2	29.9	30.7	29.4	30.8	30.3
Mean	24.2	27.8	25.6	26.4	24.1	27.0	26.0

Mean dry matter % as harvested: 79.7

Clover. Dry matter: cwt per acre

Irrigation O	Irrigation C	Mean
17.0 (±0.62)	25.8	21.4

Mean dry matter % as cut: 11.2

** To early potatoes 1962

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63/B/6.7

Lucerne. Dry matter: cwt per acre

	Irrigation 0	A	B	C	Mean
		1st cut			
Mean	26.0	28.6	27.7	25.9	27.0
N: cwt per acre					
None	23.6	27.9	27.1	25.8	26.1
0.3	28.4	29.2	28.2	25.9	27.9
K_2O: cwt per acre*					
0.3	26.5	27.7	25.9	22.9	25.8
0.9	25.5	29.4	29.4	28.8	28.3
		2nd cut			
Mean	18.2	16.6	19.1	12.5	16.6
N: cwt per acre					
None	17.1	17.0	19.0	12.4	16.4
0.3	19.3	16.3	19.3	12.7	16.9
K_2O: cwt per acre*					
0.3	18.3	16.2	17.9	10.1	15.6
0.9	18.1	17.0	20.4	15.0	17.7
		3rd cut			
Mean	19.9	19.8	20.2	17.0	19.2
N: cwt per acre					
None	19.3	20.2	20.0	16.8	19.1
0.3	20.6	19.4	20.4	17.3	19.4
K_2O: cwt per acre*					
0.3	20.3	19.9	19.5	15.9	18.9
0.9	19.6	19.6	20.9	18.2	19.6

Mean dry matter % as cut:
- 1st cut 19.4
- 2nd cut 19.6
- 3rd cut 19.8

* For each cut

Note: For 1st cut O = B
A = C.

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63/B/6.8

Lucerne. Dry matter: cwt per acre

	Irrigation				Mean
	0	A	B	C	
	Total of 3 cuts				
Mean	64.1	65.0	67.0	55.5	62.8
N: cwt per acre					
None	60.0	65.1	66.0	55.0	61.5
0.3	68.3	64.8	68.0	55.9	64.3
K_2O: cwt per acre					
0.3	65.1	63.9	63.3	48.9	60.3
0.9	63.2	66.1	70.8	62.0	65.5

Mean dry matter % as cut:
Total of 3 cuts 19.6

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63/B/7.1

CONCENTRATED FERTILISERS ROTATION

(CF)

Concentrated compound fertiliser and forms of N - West Barnfield I 1963, the fourth year - Barley.

Rotation: 1960 - 1962: kale, ryegrass, barley in all phases.
1963: All blocks sown to barley.

Design (each phase): 2 randomised blocks of 14 plots each.

Area of each plot: 0.0174 acres. Area harvested: 0.0105 acres.

Treatments. 1960 - 1962 (per acre):

No fertiliser	(0)
P_2O_5 and K_2O each at 0.3 cwt to barley and each at 1.0 cwt to kale and ryegrass, as triple superphosphate and potassium bicarbonate	(B)
Compound fertiliser, 20% N, 10% P_2O_5, 10% K_2O at 0.3(1), 0.6(2) cwt N to barley and 1.0(1), 2.0(2) cwt N to kale and ryegrass	(F)
Sulphate of ammonia, granular superphosphate and muriate of potash at rates equivalent to treatments F(1) and (2)	(P)
PK as treatment B plus	
Sulphate of ammonia	(S)
Calcium nitrate	(C)
Urea	(U)
Ammonium nitrate	(A)
each at rates 1 and 2 of N.	

Basal dressing to barley 1963: 0.6 cwt N per acre as 'Nitro-Chalk' combine drilled.

Cultivations, etc.: Ploughed (after barley): Sept 13, 1962. Ploughed (after kale and ryegrass): Mar 20, 1963. Seed drilled at 2 bushels per acre: Apr 19. Undersown with grass and clover: May 8. Combine harvested: Sept 14. Variety: Proctor.

Note: For details of the previous years' results see 'Results of the Field Experiments' 60/B/8, 61/B/7 and 62/B/7.

Standard error per plot.
Grain (at 85% dry matter): 2.21 cwt per acre or 5.9% (39 d.f.)

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Summary of Results

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

1960 1961 1962	Previous crop Kale Ryegrass Barley	 Ryegrass Barley Kale	 Barley Kale Ryegrass	Mean
Fertiliser		(±1.57)*		(±0.90)
0	37.2	39.6	27.3	34.7
B	39.4	38.3	27.7	35.1
F1	38.5	39.9	30.7	36.4
F2	40.8	37.3	36.3	38.2
P1	41.5	40.2	29.8	37.2
P2	38.7	39.1	36.3	38.0
S1	44.1	37.8	29.7	37.2
S2	39.0	36.4	34.9	36.8
C1	43.2	38.0	30.7	37.3
C2	41.4	41.2	36.1	39.6
U1	43.8	41.0	30.2	38.3
U2	41.1	40.7	34.1	38.6
A1	41.3	38.9	28.7	36.3
A2	39.5	42.5	36.8	39.6
Mean	40.7	39.4	32.1	37.4

*For use in vertical and interaction comparisons only.

Mean dry matter % as harvested: 82.1

For explanation of treatment symbols see page 63/B/7.1

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63/B/8.1

RESIDUAL PHOSPHATE ROTATION

(RP)

The long term and residual effects of a number of phosphate fertilisers compared with superphosphate - Great Field IV and Sawyers I 1963, the fourth year.

Rotation: Potatoes, barley, swedes.

Note: Swede tops are ploughed in.

Design: Great Field IV: 1 randomised block of 12 plots per crop.
Sawyers I: 2 randomised blocks of 12 plots per crop.

Area of each plot (acres):
Great Field IV: 0.0193. Area harvested: Potatoes and barley - 0.0129, swedes - 0.0096.
Sawyers I: 0.0212. Area harvested: Potatoes and barley - 0.0141, swedes - 0.0106.

Treatments:
Granular superphosphate treatments broadcast in spring before sowing or ridging:-

1. No phosphate.
2. 0.25 cwt P_2O_5 per acre per year.
3. 0.50 cwt P_2O_5 per acre per year.
4. 0.75 cwt P_2O_5 per acre in 1962.
5. 1.50 cwt P_2O_5 per acre in 1962.

Phosphate fertilisers ploughed in at 3.0 cwt P_2O_5 per acre in September 1959.

6. Nitrophosphate I (17.1% P_2O_5, none water soluble).
7. Nitrophosphate II (18.8% P_2O_5, one quarter water soluble).
8. Nitrophosphate III (22.4% P_2O_5, half water soluble).
9. Gafsa rock phosphate (28.9% P_2O_5).
10. Bessemer basic slag (15.2% P_2O_5).
11. Potassium metaphosphate (57.9% P_2O_5, 38.8% K_2O).
12. Granular superphosphate (20.4% P_2O_5).

Note: To balance the K_2O content of potassium metaphosphate, all the other treatments included 2.0 cwt K_2O per acre as sulphate of potash in autumn 1959.

Basal dressings per acre: Broadcast in spring before sowing or ridging:
N as 'Nitro-Chalk' 21:-
To potatoes: 1.2 cwt, to barley: None on Great Field IV, 0.6 cwt on Sawyers I, to swedes: 0.5 cwt.
K_2O as sulphate of potash:-
To potatoes: 1.0 cwt, to barley: 1.0 cwt, to swedes: 1.0 cwt.

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Cultivations, etc. (both fields, except as indicated): Ploughed:
Great Field IV - Mar 27, 1963, Sawyers I - Apr 3.
Potatoes: Fertilisers applied, potatoes planted: May 7, 1963.
Earthed up: Great Field IV - June 28, Sawyers I - July 4.
Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 10.
Great Field IV sprayed with copper oxychloride fungicide at 2.3 lb copper plus 0.35 pints menazon in 20 gallons per acre: Aug 14.
Sawyers I sprayed with copper oxychloride fungicide at 2.3 lb copper in 40 gallons per acre: Sept 3. Sprayed with undiluted BOV at 16 gallons per acre: Sept 23. Lifted: Oct 14. Variety: Majestic.
Barley: Fertilisers applied: Apr 11, 1963. Seed drilled at 2 bushels per acre: Apr 13. Sprayed with mecoprop/2,4-D at 6 pints in 40 gallons per acre: June 12. Combine harvested: Sept 13. Variety: Proctor.
Swedes: Ground chalk applied to Sawyers I at 23 cwt per acre: Apr 23, 1963. Fertilisers applied: Sawyers I - May 18, Great Field IV - May 21. Seed drilled at 1.5 lb per acre: May 22. Singled: July 3. Lifted: Nov 6. Variety: Wilhelmsburger.

Note: For details of previous years' results see 'Results of the Field Experiments' 60/B/9, 61/B/8 and 62/B/8.

Standard errors per plot.
Sawyers I
Potatoes, Total tubers: 0.695 tons per acre or 7.7% (11 d.f.)
Barley, Grain (at 85% dry matter): 1.71 cwt per acre or 4.4% (11 d.f.)
Swedes, Roots: 2.125 tons per acre or 11.1% (11 d.f.)

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63/B/8.3

Summary of Results

Potatoes

Phosphate		Total tubers: tons per acre				Percentage ware (1.5 inch riddle)			
		Great Field IV		Sawyers I		Great Field IV		Sawyers I	
		Mean	Increase	Mean	Increase	Mean	Increase	Mean	Increase
				(±0.491)	(±0.695)				
None	1	11.26		7.75		95.5		93.7	
	2	12.35	+1.09	9.01	+1.26	93.2	-2.3	93.5	-0.2
	3	13.49	+2.23	8.97	+1.22	94.5	-1.0	94.6	+0.9
	4	10.81	-0.45	8.05	+0.30	95.0	-0.5	94.3	+0.6
	5	12.45	+1.19	8.88	+1.13	93.6	-1.9	93.0	-0.7
	6	13.11	+1.85	9.52	+1.77	93.4	-2.1	94.3	+0.6
	7	12.42	+1.16	9.09	+1.34	93.0	-2.5	94.0	+0.3
	8	12.49	+1.23	9.65	+1.90	93.9	-1.6	94.7	+1.0
	9	12.75	+1.49	9.03	+1.28	94.8	-0.7	94.8	+1.1
	10	12.93	+1.67	9.25	+1.50	96.0	+0.5	95.6	+1.9
	11	12.40	+1.14	9.35	+1.60	94.5	-1.0	94.2	+0.5
	12	11.55	+0.29	9.31	+1.56	95.6	+0.1	93.4	-0.3
Mean		12.33		8.99		94.4		94.1	

Barley

		Grain (at 85% dry matter): cwt per acre				Straw (at 85% dry matter): cwt per acre			
				(±1.21)	(±1.71)				
None	1	25.1		35.5		21.9		22.9	
	2	33.9	+8.8	40.1	+4.6	29.6	+7.7	29.3	+6.4
	3	27.9	+2.8	38.5	+3.0	30.6	+8.7	27.8	+4.9
	4	34.2	+9.1	37.7	+2.2	30.6	+8.7	26.7	+3.8
	5	35.5	+10.4	38.3	+2.8	31.1	+9.2	26.0	+3.1
	6	30.3	+5.2	36.9	+1.4	27.0	+5.1	25.2	+2.3
	7	30.6	+5.5	39.6	+4.1	29.6	+7.7	30.1	+7.2
	8	25.8	+0.7	39.9	+4.4	29.9	+8.0	27.7	+4.8
	9	34.5	+9.4	39.7	+4.2	32.4	+10.5	26.6	+3.7
	10	25.8	+0.7	38.9	+3.4	24.4	+2.5	28.9	+6.0
	11	32.0	+6.9	38.2	+2.7	31.3	+9.4	30.6	+7.7
	12	33.4	+8.3	39.4	+3.9	27.2	+5.3	27.4	+4.5
Mean		30.8		38.5		28.8		27.4	

Mean dry matter % as harvested	78.8	80.1	62.2	75.6

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Phosphate		Great Field IV Mean	Great Field IV Increase	Sawyers I Mean	Sawyers I Increase
		Swedes, Roots: tons per acre			
				(±1.503)	(±2.125)
None	1	11.81		11.24	
	2	20.65	+8.84	19.87	+8.63
	3	25.28	+13.47	23.24	+12.00
	4	18.20	+6.39	16.06	+4.82
	5	28.75	+16.94	21.66	+10.42
	6	24.40	+12.59	21.47	+10.23
	7	25.56	+13.75	21.51	+10.27
	8	23.89	+12.08	21.20	+9.96
	9	23.66	+11.85	17.24	+6.00
	10	22.18	+10.37	19.89	+8.65
	11	21.44	+9.63	18.69	+7.45
	12	23.80	+11.99	17.49	+6.25
Mean		22.47		19.13	

For explanation of treatment symbols see page 63/B/8.1

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63/B/9.1

N LEVELS AND RESIDUES ROTATION

(NL)

Direct and residual effects of sulphate of ammonia - Long Hoos III 1963, the fourth year.

Rotation: Wheat, potatoes.

Design (each crop): 3 x 3 x 3 in 3 blocks of 9 plots each.

Area of each plot: 0.0212 acres. Area harvested: 0.0141 acres.

Treatments. All combinations of:-
Nitrogen at 3 levels in 1963.
Nitrogen at 3 levels in 1960, and repeated on the same plots in 1962.
Nitrogen at 3 levels in 1961.
To wheat: None, 0.5, 1.0 cwt N per acre.
To potatoes: None, 0.75, 1.50 cwt N per acre.
The nitrogen was applied as sulphate of ammonia.

Note: Ground chalk in addition to basal dressing was applied at 1 cwt for each cwt of sulphate of ammonia applied during the years 1960, 1961 and 1962.

Basal dressings (per acre):
To wheat: 2.25 cwt compound fertiliser (14% P_2O_5, 28% K_2O), combine drilled.
To potatoes: 5 cwt compound fertiliser (14% P_2O_5, 28% K_2O), broadcast on flat.

Cultivations, etc.:
Wheat: Corrective dressings of ground chalk applied: Oct 11, 1962. Basal ground chalk applied at 30 cwt per acre: Oct 22. Ploughed: Nov 15. Seed drilled at 3.25 bushels per acre: Dec 17. Sulphate of ammonia applied: Apr 26, 1963. Sprayed with mecoprop/2,4-D at 3.2 pints in 40 gallons per acre: May 21. Combine harvested: Sept 10. Variety: Cappelle.
Potatoes: Corrective dressings of ground chalk applied: Oct 11, 1962. Basal ground chalk applied at 30 cwt per acre: Oct 22. Ploughed: Nov 14. Basal fertiliser broadcast on flat: Apr 30, 1963. Sulphate of ammonia applied: May 4. Potatoes planted: May 6. Earthed up:

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June 27. Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 11. Sprayed with copper oxychloride fungicide at 2.3 lb copper in 20 gallons per acre: Sept 3. Sprayed with undiluted BOV at 16 gallons per acre: Sept 12. Lifted: Oct 8. Variety: Majestic.

Note: For details of the previous years' results see 'Results of the Field Experiments' 60/B/10, 61/B/9 and 62/B/9.

Standard errors per plot.
Wheat, Grain (at 85% dry matter): 2.60 cwt per acre or 7.9% (15 d.f.)
Potatoes, Total tubers: 0.566 tons per acre or 4.8% (15 d.f.)

Summary of Results

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

N: cwt per acre in 1961	N: cwt per acre in 1960 and 1962			N: cwt per acre in 1963			Mean
	None	0.75	1.50	None	0.5	1.0	
	(±1.50)			(±1.50)			(±0.87)
None	29.8	30.7	36.8	25.1	33.2	38.9	32.4
0.5	28.3	32.5	36.7	26.0	30.5	41.1	32.5
1.0	28.2	35.0	38.2	27.9	34.8	38.8	33.8
	N: cwt per acre in 1960 and 1962						
	None			19.9	30.7	35.7	28.8
	0.75			27.2	32.1	38.9	32.7
	1.50			31.9	35.7	44.2	37.3
	Mean (±0.87)			26.3	32.8	39.6	32.9

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Potatoes

N: cwt per acre in 1961	N: cwt per acre in 1960 and 1962			N: cwt per acre in 1963			Mean
	None	0.5	1.0	None	0.75	1.50	
Total tubers: tons per acre							
	(±0.327)			(±0.327)			(±0.189)
None	11.19	11.54	12.06	8.62	12.44	13.72	11.59
0.75	11.44	11.89	12.26	8.80	12.52	14.27	11.86
1.50	12.35	11.54	12.43	8.84	13.45	14.03	12.10
N: cwt per acre in 1960 and 1962							
None				8.21	12.43	14.34	11.66
0.5				8.67	12.87	13.42	11.65
1.0				9.38	13.11	14.26	12.25
Mean (±0.189)				8.75	12.80	14.01	11.85
Percentage ware (1.5 inch riddle)							
None	95.1	94.3	94.9	93.2	95.3	95.9	94.8
0.75	94.6	95.7	95.5	94.0	95.8	95.9	95.2
1.50	94.7	96.1	95.3	94.1	95.7	96.2	95.3
N: cwt per acre in 1960 and 1962							
None				93.7	95.3	95.3	94.8
0.5				93.8	95.8	96.5	95.4
1.0				93.8	95.7	96.1	95.2
Mean				93.8	95.6	96.0	95.1

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63/B/10.1

CULTIVATION - WEEDKILLER ROTATION

(CW)

Great Harpenden I 1963, the third year

A comparison of weed control by various cultivation methods and by pre-emergence weedkillers.

For previous history, rotation treatments etc., see 'Numerical Results of the Field Experiments' 61/B/10 and 62/B/10.

Area harvested (acres): Winter beans - 0.0201. Spring wheat, potatoes, barley - 0.0107.

The weedkiller used on potatoes is now a mixture of 2 lb prometryne and 0.75 lb paraquat in 40 gallons per acre. X and Y treatments for potatoes were identical.

Basal dressings per acre: Spring wheat and barley: 2.5 cwt compound fertiliser, 20% N, 10% P_2O_5, 10% K_2O. Potatoes and beans, as 1961.

Operations in 1963

Note: Spring wheat was again sown instead of winter wheat.

Cultivations, etc.:

Winter beans: R plots rotary cultivated, T plots rigid-tine cultivated 3 times: Oct 22, 1962. R plots rotary cultivated second time: Oct 23. P and reserve plots ploughed: Oct 25. T, P and reserve plots spring-tine cultivated twice: Oct 29, Nov 30. Seed drilled at 275 lb per acre, all plots spring-tine cultivated: Dec 1. X and Y* plots sprayed with simazine: Dec 19. Y* plots sprayed with simazine: Apr 19, 1963. M and reserve plots tractor hoed twice: May 21, May 29. All plots sprayed with menazon at 5.6 fluid oz in 40 gallons per acre: June 22. Combine harvested: Oct 5. Variety: Pedigree.

Spring wheat: Sprayed with dalapon at 7.4 lb in 40 gallons per acre: Oct 20, 1962 and again at 3.7 lb in 40 gallons per acre: Oct 30. T plots rigid-tine cultivated twice, P and reserve plots ploughed: Apr 3, 1963. T, P and reserve plots spring-tine cultivated: Apr 18. R plots rotary cultivated, T, P and reserve plots spring-tine harrowed, seed drilled at 3 bushels per acre: Apr 19. Rolled: May 8. H sub plots and reserve plots sprayed with methoxychloro-benzoic acid/MCPA (MBA/MCPA) at 4 pints in 40 gallons per acre: June 6. Combine harvested: Sept 19. Variety: Jufy I.

Potatoes: R plots rotary cultivated, T plots rigid-tine cultivated twice: Oct 22, 1962. P and reserve plots ploughedd: Oct 25. T, P and reserve plots spring-tine cultivated: Apr 25, 1963. R plots

* half-rate

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rotary cultivated: Apr 27. Basal compound fertiliser applied: Apr 30. T, P and reserve plots spring-tine cultivated, seed machine planted: May 3. Rolled: May 6. X and Y plots sprayed with prometryne at 2 lb plus paraquat at 0.75 lb in 40 gallons per acre, M plots chain harrowed: May 31. M and reserve plots grubbed: June 7. M and reserve plots mechanially weeded and grubbed: June 17. Reserve plots earthed up: June 26. M and ME sub-plots earthed up (round and pointed ridges), E sub-plots of X and Y plots grubbed twice and earthed up: June 28. Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 19. Sprayed with copper oxyhloride fungicide at 2.3 lb Cu in 20 gallons per acre: Sept 4. Sprayed with undiluted BOV at 16 gallons per acre: Sept 13. Lifted: Oct 23. Variety: Majestic.

Barley: All plots spring-tine cultivated twice: Nov 27, 1962, Mar 27, 1963. T plots rigid-tine cultivated: Apr 3. P and reserve plots ploughed: Apr 4. All plots except R plots disc-harrowed: Apr 11. R plots rotary ultivated, P and reserve plots spring-tine cultivated: Apr 19. T, P and reserve plots spring-tine harrowed, seed drilled at 2 bushels per acre: Apr 20. Rolled: May 8. H sub-plots and reserve plots sprayed with methoxychloro-benzoic aid/MCPA (MBA/MCPA) at 4 pints in 40 gallons per acre: June 6. Combine harvested: Sept 7. Variety: Proctor.

Standard errors per plot:

Winter beans, grain (at 85% dry matter): 3.63 cwt per acre or 10.9% (9 d.f.)

Spring wheat, grain (at 85% dry matter):
- Whole plot: 2.42 cwt per acre or 6.6% (15 d.f.)
- Sub plot: 2.00 cwt per are or 5.4% (18 d.f.)

Potatoes, total tubers:
- Whole plot: 0.752 tons per acre or 5.5% (15 d.f.)
- Sub plot: 0.456 tons per acre or 3.3% (18 d.f.)

Barley, grain (at 85% dry matter):
- Whole plot: 1.91 cwt per acre or 4.5% (12 d.f.)
- Sub plot: 3.28 cwt per acre or 7.8% (15 d.f.)

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63/B/10.3

Summary of Results

Beans, grain (at 85% dry matter): cwt per acre

Treatment after planting	Initial cultivation P	R	T	Mean
		(±2.57)		(±1.48)
M	39.1	27.5	31.5	32.7
X	33.8	33.9	29.7	32.4
Y	33.0	32.5	34.8	33.4
Mean (±1.48)	35.3	31.3	32.0	32.8

Reserve plots: 36.5 (±1.82)
General mean: 33.5

Mean dry matter % as harvested: 68.2

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

	Initial cultivation P	R	T	Mean
Mean (±0.99)	36.3	36.7	35.6	36.2
Treatment in 1962				
M (±1.71)	35.4	36.4	36.4	36.1 (±0.99)
X (±1.21)	36.8	36.8	35.2	36.2 (±0.70)
Spray in 1963				
		(±1.14)*		
-	37.5	36.3	35.4	36.4
H	35.2	37.1	35.7	36.0
Diff (±1.15)	-2.3	+0.8	+0.3	-0.4 (±0.67)

Reserve plots: 38.8 (±0.99)
General mean: 36.8

Mean dry matter % as harvested: 79.0

* For use in horizontal and diagonal comparisons only

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63/B/10.4

Potatoes

Treatment after planting	Initial cultivation P	R	T	Mean	Not earthed up	Earthed up
				Total tubers: tons per acre		
					(±0.186)(1)	(±0.293)(2)
M (±0.532)	14.58	13.37	13.88	13.94 (±0.307)	13.90	13.98
X (±0.376)	13.40	13.90	13.84	13.70 (±0.217)	13.48	13.94
					(±0.132)(1)	(±0.262)(2)
Mean (±0.307)	13.79	13.72	13.85	13.79		

Reserve plots: 13.77 (±0.307)
General mean: 13.78

Percentage ware (1.5 inch riddle)

M	94.8	95.6	95.8	95.4	95.1	95.7
X	95.0	94.8	95.2	95.0	94.7	95.2
Mean	94.9	95.1	95.4	95.1		

Reserve plots: 95.9
General mean: 95.3

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

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63/B/10.5

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

	Initial cultivation			
	P	R	T	Mean
Mean (±0.78)	42.9	39.8	41.9	41.5
Treatment in 1962		(±1.35)		(±0.78)
M	42.8	39.2	43.6	41.8
X	41.4	40.8	41.6	41.2
Y	44.6	39.4	40.5	41.5
Spray in 1963		(±1.22)*		
-	42.8	40.7	40.2	41.2
H	43.0	38.8	43.6	41.8
Diff (±1.89)	+0.2	-1.9	+3.4	+0.6 (±1.09)

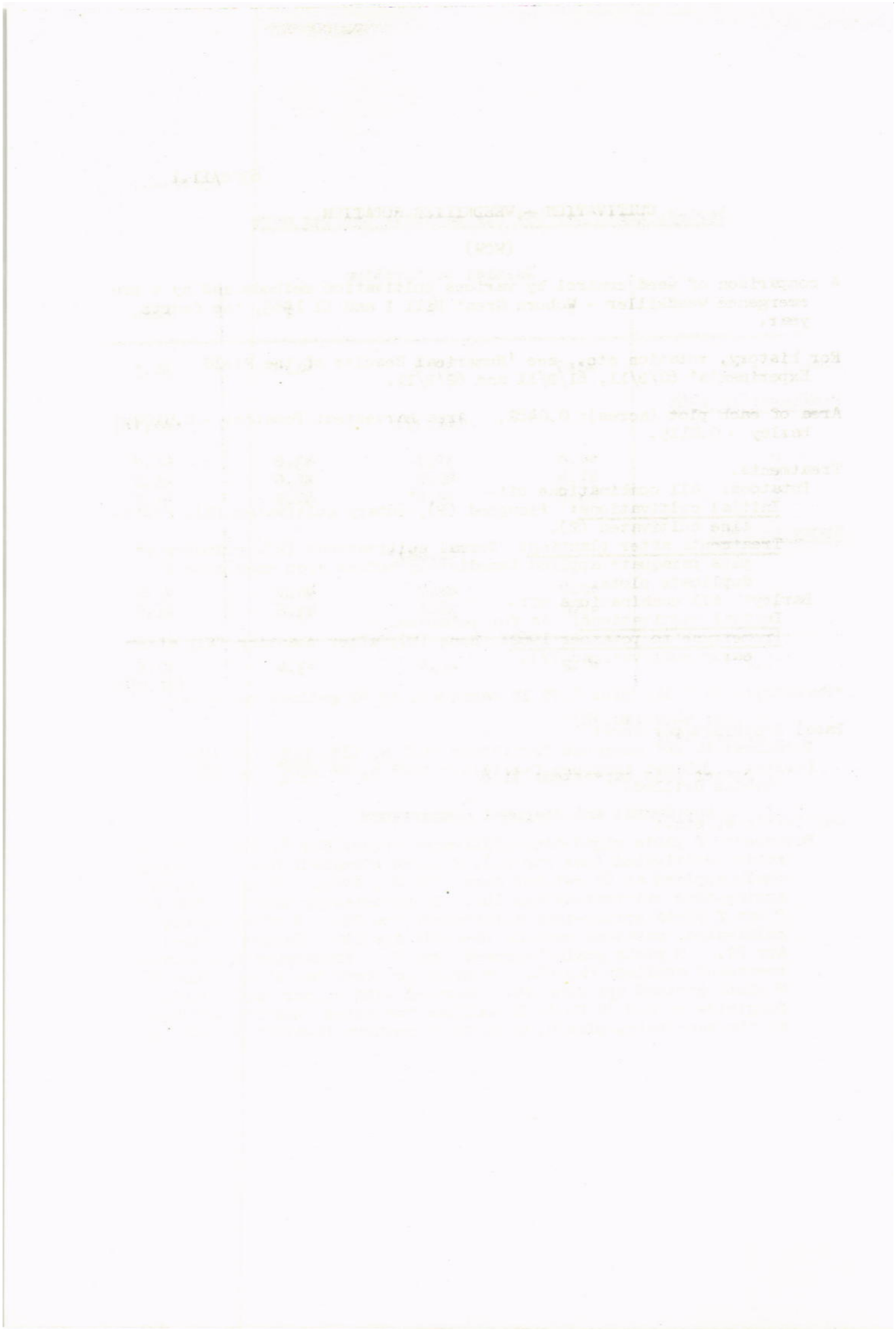
Reserve plots: 44.0 (±0.78)
General mean: 42.1

Mean dry matter % as harvested: 71.8

* For use in horizontal and diagonal comparisons

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CULTIVATION - WEEDKILLER ROTATION

(WCW)

A comparison of weed control by various cultivation methods and by a pre-emergence weedkiller - Woburn Great Hill I and II 1963, the fourth year.

For history, rotation etc., see 'Numerical Results of the Field Experiments' 60/B/11, 61/B/11 and 62/B/11.

Area of each plot (acres): 0.0482. Area harvested: Potatoes - 0.0107, barley - 0.0115.

Treatments.

Potatoes: All combinations of:-

Initial cultivations: Ploughed (P), rotary cultivated (R), rigid-tine cultivated (T).

Treatments after planting: Normal cultivations (M), prometryne* plus paraquat* applied immediately before crop emergence (S) - duplicate plots.

Barley: All combinations of:-

Initial cultivations: As for potatoes.

Prometryne to potatoes 1962: None (0), after planting (X), after early cultivations (Y).

*Prometryne at 2 lb, plus 0.75 lb paraquat, in 40 gallons per acre.

Basal dressings per acre:

Potatoes: 10 cwt compound fertiliser (17% N, 11% P_2O_5, 22% K_2O).

Barley: 3.5 cwt compound fertiliser (16% N, 9% P_2O_5, 9% K_2O) combine drilled.

Cultivations, etc.:

Potatoes: T plots rigid-tine cultivated twice: Nov 6, 1962. R plots rotary cultivated (one stroke), P plots ploughed: Nov 9. Ground chalk applied at 62 cwt per acre: Feb 20, 1963. P and T plots spring-tine cultivated: Apr 18. Basal dressing applied: Apr 22. P and T plots spring-tine cultivated: Apr 23. R plots rotary cultivated, potatoes machine planted: Apr 24. Ridges rolled: Apr 27. M plots chain harrowed: May 9. Prometryne and paraquat treatment applied: May 24. M plots grubbed: May 25 and June 18. M plots earthed up: June 24. Sprayed with copper oxychloride fungicide at 2.3 lb Cu in 20 gallons per acre: July 25, and again at the same rate, plus 0.35 pints of menazon (against aphids) in

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30 gallons per acre: Aug 22. Haulm destroyed with diquat at 0.9 pints in 40 gallons per acre: Sept 23. Lifted: Oct 10. Variety: Majestic.

Barley: T plots rigid-tine cultivated on 2 occasions: Nov 6 and 9, 1962. R plots rotary cultivated, P plots ploughed: Nov 9. Ground chalk applied at 62 cwt per acre: Feb 20, 1963. P and T plots spring-tine cultivated, R plots rotary cultivated: Apr 11. Seed drilled at 2.3 bushels per acre: Apr 18. Sprayed with mecoprop/2,4-D at 6 pints in 40 gallons per acre: May 21. Combine harvested: Sept 9. Variety: Proctor.

Standard errors per plot.

Potatoes, total tubers: 1.702 tons per acre or 13.5% (11 d.f.)

Barley, grain (at 85% dry matter): 1.63 cwt per acre or 6.7% (8 d.f.)

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Summary of Results

Potatoes

Treatments after planting	Initial cultivation P	R	T	Mean
Total tubers: tons per acre				
M (±1.204)	11.48	11.86	10.89	11.41 (±0.695)
S (±0.851)	13.04	12.54	14.14	13.24 (±0.491)
Mean (±0.695)	12.52	12.31	13.05	12.63
Percentage ware (1.5 inch riddle)				
M	81.0	80.5	80.5	80.6
S	82.9	81.4	85.8	83.4
Mean	82.3	81.1	84.0	82.4

Barley

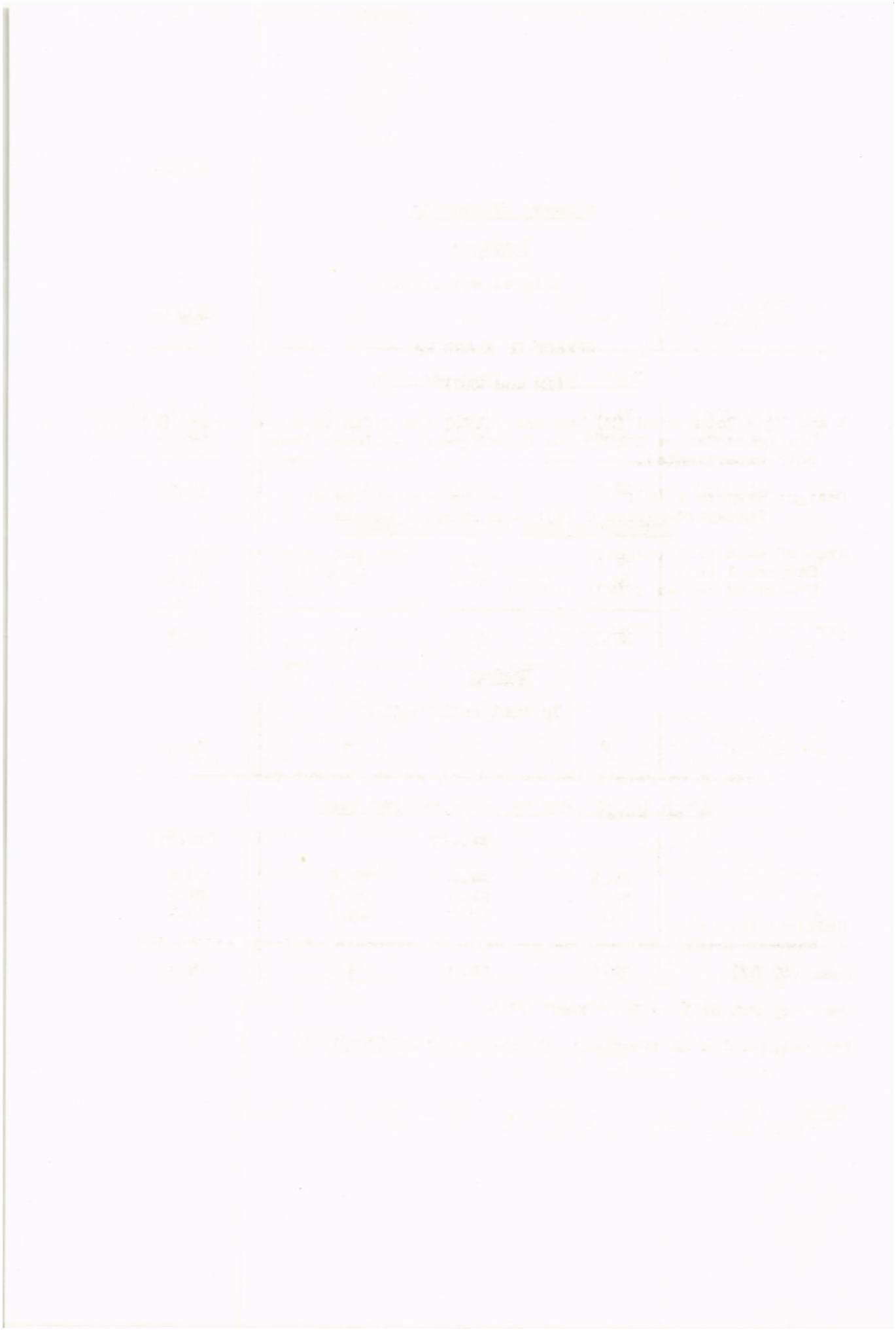
Prometryne to potatoes 1962	Initial cultivation P	R	T	Mean
Grain (at 85% dry matter): cwt per acre				
		(±1.15)		(±0.67)
0	24.4	24.4	23.6	24.2
X	25.8	24.8	24.3	25.0
Y	23.6	23.7	23.1	23.5
Mean (±0.67)	24.6	24.3	23.7	24.2

Mean dry matter % as harvested: 79.4

For explanation of treatment symbols see page 63/B/11.1

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63/C/1.1

EFFECT OF K AND Mg

(LM and WAC)

K and Mg - Rothamsted (R) Sawyers I 1963 the fifth year and Woburn (W) Stackyard Series C 1963 the fourth year, - clover (sown in 1962 on both experiments).

Design: Sawyers I (R): 8 randomised blocks of 9 plots each.
Stackyard Series C (W): 4 randomised blocks of 9 plots each.

	Area of each plot (acres):	Area harvested (acres):
Sawyers I (R):	0.0209	0.0045
Stackyard Series C (W):	0.0011	0.0003 - 0.0005

Treatments. All combinations of-:
Mg: None, 29, 58 lb Mg per acre applied as magnesium sulphate on Sawyers I (R) and as kieserite on Stackyard Series C (W).
K: Sawyers I (R): 24, 95, 165 lb K per acre in 1962.
None, 71, 142 lb K per acre in 1963.
Stackyard Series C (W): None, 95, 190 lb K per acre.
All K as sulphate of potash, applied in 1962 and 1963.
In addition in 1962 magnesium-free calcium carbonate was applied to blocks on Sawyers I (R) as in 1959, at 38, 76 cwt per acre.

Basal dressings per acre:
Sawyers I (R): 1.0 cwt P_2O_5 as triple superphosphate applied in seedbed 1962, None in 1963.
Stackyard Series C (W): 1.0 cwt P_2O_5 as triple superphosphate in spring 1963.

Cultivations, etc.:
Sawyers I (R): Magnesium-free calcium carbonate applied: At 30, 60 cwt per acre - Nov 21, 1961, at 8, 16 cwt per acre - Feb 19, 1962. Magnesium sulphate and sulphate of potash applied: Mar 13, 1963. Cut 3 times: June 11, July 29, Sept 26. Variety: Dorset Marl Red Clover.
Stackyard Series C (W): Treatments and basal dressing applied: Mar 21, 1963. Cut 3 times: June 13, July 25, Oct 11. Variety: Dorset Marl Red Clover.

Note: For details of the previous years' results see 'Results of the Field Experiments' 60/C1/3, 61/C/7 and 62/C/6.

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Standard errors per plot. Clover, dry matter:

Sawyers I (R)

1st cut:	2.73 cwt per acre	or 8.5% (48 d.f.)
2nd cut:	1.90 cwt per acre	or 9.0% (48 d.f.)
3rd cut:	1.38 cwt per acre	or 18.9% (48 d.f.)
Total of 3 cuts:	4.51 cwt per acre	or 7.4% (48 d.f.)

Stackyard Series C (W)

1st cut:	2.98 cwt per acre	or 10.8% (24 d.f.)
2nd cut:	1.33 cwt per acre	or 9.1% (24 d.f.)
3rd cut:	0.91 cwt per acre	or 9.1% (24 d.f.)
Total of 3 cuts:	3.98 cwt per acre	or 7.6% (24 d.f.)

Summary of Results

Sawyers I (R)

Clover, Dry matter: cwt per acre

K: lb per acre 1962	24	95	165	Mg: lb per acre			
K: lb per acre 1963	None	71	142	None	29	58	Mean
1st cut							
Calcium carbonate cwt per acre		(±0.79)*			(±0.79)*		
38	27.4	34.2	36.3	32.8	33.1	32.0	32.6
76	24.5	34.0	37.3	31.0	32.9	31.9	31.9
Diff.	-2.9	-0.2 (±1.12)**	+1.0	-1.8	-0.2 (±1.12)**	-0.1	-0.7
		K: lb per acre			(±0.97)		(±0.56)
		1962	1963				
		24	None	25.1	27.7	25.0	26.0
		95	71	33.8	34.5	34.0	34.1
		165	142	36.8	36.9	36.7	36.8
		Mean (±0.56)		31.9	33.0	31.9	32.3

*For use in horizontal and interaction comparisons only.
** For use only in testing the differences of 2 differences.

Mean dry matter % as cut: 1st cut 19.4

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63/C/1.3

Sawyers I (R)

Clover, Dry matter: cwt per acre

K: lb per acre 1962	24	95	165	Mg: lb per acre			
K: lb per acre 1963	None	71	142	None	29	58	Mean
		2nd cut					
Calcium carbonate cwt per acre		(±0.55)*			(±0.55)*		
38	17.2	22.6	24.7	21.6	21.5	21.4	21.5
76	16.1	21.9	23.9	20.0	21.4	20.5	20.7
Diff.	-1.1	-0.7 (±0.78)**	-0.8	-1.6	-0.1 (±0.78)**	-0.9	-0.8
		K: lb per acre			(±0.67)		(±0.39)
		1962	1963				
		24	None	16.2	17.2	16.5	16.6
		95	71	22.8	21.9	22.2	22.3
		165	142	23.6	25.4	24.1	24.3
		Mean (±0.39)		20.8	21.5	20.9	21.1

* For use in horizontal and interaction comparisons only.
** For use only in testing the difference of 2 differences.

Mean dry matter % as cut: 2nd cut 21.6

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63/C/1.4

Sawyers I (R)

Clover, Dry matter: cwt per acre

K: lb per acre 1962	24	95	165	Mg: lb per acre			
K: lb per acre 1963	None	71	142	None	29	58	Mean
		3rd cut					
Calcium carbonate cwt per acre		(±0.40)*			(±0.40)*		
38	6.6	7.9	8.2	7.8	7.7	7.2	7.5
76	5.0	7.4	8.5	6.7	6.9	7.4	7.0
Diff.	-1.6	-0.5	+0.3	-1.1	-0.8	+0.2	-0.5
		(±0.56)**			(±0.56)**		
	K: lb per acre				(±0.49)		(±0.28)
	1962	1963					
	24	None		5.8	6.1	5.5	5.8
	95	71		7.6	7.6	7.8	7.7
	165	142		8.4	8.1	8.6	8.4
	Mean (±0.28)			7.2	7.3	7.3	7.3

* For use in horizontal and interaction comparisons only.
** For use only in testing the difference of 2 differences.

Mean dry matter % as cut: 3rd cut 16.9

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63/C/1.5

Sawyers I (R)

Clover, Dry matter: cwt per acre

K: lb per acre 1962	24	95	165	Mg: lb per acre			
K: lb per acre 1963	None	71	142	None	29	58	Mean
Total of 3 cuts							
Calcium carbonate cwt per acre		(±1.30)*			(±1.30)*		
38	51.1	64.7	69.3	62.2	62.3	60.6	61.7
76	45.7	63.3	69.7	57.7	61.2	59.8	59.6
Diff.	-5.4	-1.4 (±1.84)**	+0.5	-4.5	-1.1 (±1.84)**	-0.8	-2.1
	K: lb per acre				(±1.59)		(±0.92)
	1962	1963					
	24	None		47.1	51.1	47.1	48.4
	95	71		64.1	63.9	64.0	64.0
	165	142		68.7	70.3	69.5	69.5
	Mean (±0.92)			60.0	61.8	60.2	60.6

* For use in horizontal and interaction comparisons only.
** For use only in testing the difference of 2 differences.

Mean dry matter % as cut: Total of 3 cuts 19.3

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63/C/1.6

Stackyard Series C (W)

Clover, Dry matter: cwt per acre

K: lb per acre in 1962 and 1963	Mg: lb per acre None	29	58	Mean	Mg: lb per acre None	29	58	Mean
	1st cut				2nd cut			
		(±1.49)		(±0.85)		(±0.66)		(±0.38)
None	15.6	17.5	17.7	16.9	8.1	8.4	7.8	8.1
95	32.5	32.3	33.4	32.7	17.6	16.6	17.1	17.1
190	31.5	33.3	33.5	32.7	17.4	18.8	19.5	18.6
Mean	26.5	27.7 (±0.85)	28.2	27.5	14.4	14.6 (±0.38)	14.8	14.6
	3rd cut				Total of 3 cuts			
		(±0.45)		(±0.26)		(±1.99)		(±1.15)
None	4.9	3.7	3.9	4.2	28.6	29.5	29.4	29.2
95	10.4	11.6	11.6	11.2	60.5	60.6	62.1	61.0
190	14.6	15.0	14.4	14.7	63.5	67.1	67.4	66.0
Mean	10.0	10.1 (±0.26)	10.0	10.0	50.8	52.4 (±1.15)	53.0	52.1

Mean dry matter % as cut:

1st cut	16.2
2nd cut	16.8
3rd cut	17.8
Total of 3 cuts	16.9

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63/C/2.1

INTENSIVE BARLEY GROWING EXPERIMENT

(IB)

Little Knott I - 1963, the third year

For treatments etc., see 'Numerical Results of the Field Experiments' 61/C/8.

Area of each plot (acres): 0.0212. Area harvested: 0.0139.

Cultivations, etc.: Ploughed: Sept 26, 1962.
Spring beans: Seed placement drilled at 200 lb per acre: Apr 9, 1963. Sprayed with demeton methyl at 6 fluid oz in 40 gallons per acre: June 14. Combine harvested: Oct 3. Variety: Tick 30B.
Oats: Seed combine drilled at 4 bushels per acre: Apr 9, 1963. 'Nitro-Chalk' applied: Apr 18. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: May 22. Combine harvested: Sept 9. Variety: Condor.
Spring wheat: Seed combine drilled at 3 bushels per acre: Apr 11, 1963. 'Nitro-Chalk' applied: Apr 18. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: May 22. Combine harvested: Sept 12. Variety: Jufy I.
Barley: Seed combine drilled at 2.5 bushels per acre: Apr 9, 1963. 'Nitro-Chalk' applied: Apr 18. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: May 22. Combine harvested: Sept 9. Variety: Proctor.
Winter wheat: Seed combine drilled at 2.5 bushels per acre: Oct 31, 1962. 'Nitro-Chalk' applied: Mar 13, 1963. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: May 22. Combine harvested: Sept 10. Variety: Cappelle.
Potatoes: Basal compound fertiliser applied: Apr 30, 1963. Potatoes machine planted: May 6. Earthed up: June 26. Sprayed with undiluted BCV at 16 gallons per acre: Sept 14. Lifted: Sept 23. Variety: Majestic.

Notes: (1) Yields were only taken for sequences 1, 4, 7, 8 and 9.
(2) For details of the previous years' results see 'Numerical Results of the Field Experiments' 61/C/8 and 62/C/7.

Standard errors per plot. Grain (at 85% dry matter)
Spring wheat (4 and 8): 1.37 cwt per acre or 4.2% (9 d.f.)
Barley (1 and 7): 2.05 cwt per acre or 5.8% (6 d.f.)

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Summary of Results

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

Winter wheat 9

Crop in 1961 Crop in 1962	Spring wheat Winter wheat				
N: cwt per acre	None	0.3	0.6	0.9	Mean
	19.5	23.8	28.0	30.6	25.5

Mean dry matter % as harvested: 77.2

Spring wheat 4 and 8

Crop in 1961 Crop in 1962	Spring wheat Spring wheat				Beans Oats	
N: cwt per acre	None	0.3	0.6	0.9	0.6	Mean
	22.1	27.4	32.9	30.7	37.6	32.9

Mean dry matter % as harvested: 73.0

Barley 1 and 7

Crop in 1961 1962	N: cwt per acre				
	None	0.3	0.6	0.9	Mean
		(±1.45)			(±0.73)
Barley Barley	26.2	33.3	35.9	39.7	33.7
Oats Beans	35.0	41.8	40.5	33.1	37.6
Mean (±1.03)	30.6	37.5	38.2	36.4	35.6

Mean dry matter % as harvested: 73.2

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63/C/3.1

LONG TERM LIMING EXPERIMENT - SPRING BEANS 1963

(LL and WLL)

Effect of lime on the yield and composition of crops and on the status of P and K in soils - Rothamsted (R) Sawyers I and Woburn (W) Stackyard Series C 1963, the second year.

Design (each field): 2 randomised blocks of 16 plots each.

Area of each plot (acres): 0.0289. Area harvested: 0.0121.

Treatments. All combinations of:-

Ground chalk (tons per acre): Sawyers I (R): None, 2, 4 applied in March 1962 (0, A and B), 8 (6 in March 1962, 2 in winter 1962 - 63 in divided dressings) (C). Stackyard Series C (W): None, 2 applied in Spring 1962 (0 and A), 4.75 (4 in spring, 0.75 in October 1962) (B), 7.5 (6 in spring, 1.5 in October 1962) (C).

P: None, 0.5 cwt P_2O_5 per acre as superphosphate (cumulative).

K: None, 1.0 cwt K_2O per acre as muriate of potash (cumulative).

The pH ranges between plots after harvest 1962 were as follows:-

Field	Chalk per acre (Spring 1962)	pH range
Sawyers I (R)	None	4.8 - 5.2
	2 tons	6.0 - 6.4
	4 tons	6.8 - 7.2
	6 tons	7.1 - 7.4
Stackyard Series C (W)	None	5.7 - 6.2
	2 tons	6.7 - 7.1
	4 tons	7.1 - 7.4
	6 tons	7.2 - 7.4

Cultivations, etc.

Sawyers I (R): Ground chalk applied at 1 ton per acre to 'C' plots: Dec 4, 1962. Ploughed: Mar 27, 1963. Ground chalk applied at 1 ton per acre to 'C' plots: Apr 1. Superphosphate and muriate of potash applied: Apr 3. Seed drilled at 200 lb per acre: Apr 8. Sprayed with simazine at 1 lb in 40 gallons per acre: Apr 18. Sprayed with demeton-methyl at 6 fluid oz in 40 gallons per acre: June 14. Combine harvested: Oct 18. Variety: Tick 30B. Previous crops: Potatoes and fallow 1960, potatoes and fallow 1961.

Stackyard Series C (W): Ploughed: Oct 12, 1962. Ground chalk applied at 0.75 tons per acre to 'B' plots and at 1.5 tons per acre to 'C' plots: Oct 19. Superphosphate and muriate of potash applied: Mar 13, 1963. Seed drilled at 200 lb per acre: Mar 27. Sprayed with simazine at 1 lb in 40 gallons per acre: Apr 8. Sprayed with demeton-methyl at 6 fluid oz in 40 gallons per acre: June 13. Combine harvested: Sept 21. Variety: Tick 30B. Previous crops: Barley 1960, sugar beet 1961.

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Notes: (1) Samples were taken for counts of pods and beans.
(2) For details of the previous year's results see 'Numerical Results of the Field Experiments' 62/C/8.

Standard errors per plot. Grain (at 85% dry matter):
Sawyers I (R) 3.42 cwt per acre or 17.8% (15 d.f.)
Stackyard Series C(W) 2.37 cwt per acre or 15.1% (15 d.f.)

Summary of Results

Sawyers I (R)

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

	Ground chalk: tons per acre				
	None	2	4	8	Mean
Mean (±1.21)	10.7	20.7	23.0	22.5	19.2
P_2O_5: cwt per acre		(±1.71)			
None	10.3	22.5	22.5	21.1	19.1
0.5	11.1	18.8	23.5	23.9	19.3
Diff. (±2.42)	+0.8	-3.7	+1.0	+2.8	+0.2 (±1.21)
K_2O: cwt per acre					
None	10.5	19.1	21.9	20.8	18.0
1.0	11.0	22.3	24.1	24.2	20.4
Diff. (±2.42)	+0.5	+3.2	+2.2	+3.4	+2.4 (±1.21)

	P_2O_5: cwt per acre	
	None	0.5
K_2O cwt per acre	(±1.21)	
None	18.4	17.7
1.0	19.8	20.9

Mean dry matter % as harvested: 68.7

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63/C/3.3

Sawyers I (R)

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

	Ground chalk: tons per acre				
	None	2	4	8	Mean
Mean	7.6	14.1	17.3	14.8	13.5
P_2O_5: cwt per are					
None	7.3	14.4	17.0	14.2	13.2
0.5	7.9	13.8	17.6	15.4	13.7
Diff.	+0.6	-0.6	+0.6	+1.2	+0.5
K_2O: cwt per acre					
None	7.4	13.1	15.4	11.8	11.9
1.0	7.8	15.1	19.2	17.9	15.0
Diff.	+0.4	+2.0	+3.8	+6.1	+3.1

	P_2O_5: cwt per acre	
	None	0.5
K_2O: cwt per acre		
None	12.0	11.8
1.0	14.4	15.6

Mean dry matter % as harvested: 46.2

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63/C/3.4

Stackyard Series C (W)

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

	Ground chalk: tons per acre				
	None	2.00	4.75	7.50	Mean
Mean (±0.84)	12.4	17.5	16.5	16.5	15.7
P_2O_5: cwt per acre		(±1.18)			
None	11.2	15.8	17.0	15.4	14.9
0.5	13.7	19.2	16.0	17.7	16.6
Diff. (±1.68)	+2.5	+3.4	-1.0	+2.3	+1.7 (±0.84)
K_2O: cwt per acre					
None	11.6	14.3	14.7	15.2	13.9
1.0	13.3	20.7	18.3	17.9	17.5
Diff. (±1.68)	+1.7	+6.4	+3.6	+2.7	+3.6 (±0.84)

	P_2O_5: cwt per acre	
	None	0.5
K_2O: cwt per acre	(±0.84)	
None	13.4	14.5
1.0	16.4	18.7

Mean dry matter % as harvested: 76.5

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63/C/4.1

METHODS OF APPLICATION OF FERTILISER 1962 - 63

(AN)

Methods of application of fertiliser - Great Knott I 1963, the second year - Winter wheat.

Design: 3 x 3 x 3 in 3 blocks of 9 plots each together with 3 additional plots per block.

Area of each plot: 0.0199 acres. Area harvested: 0.0129 acres.

Treatments:

3 x 3 x 3: All combinations of:

To wheat 1963. NPK: None (F0), 0.66 (F1), 1.32 (F2) cwt N per acre as spring top dressings of 'Nitro-Chalk', each with superphosphate and muriate of potash applied in autumn in the seedbed in the proportion 13 N, 13 P_2O_5, 20 K_2O.

To potatoes 1962:

Levels of compound fertiliser (13% N, 13% P_2O_5, 20% K_2O) to supply (cwt per acre):

N	P_2O_5	K_2O	
0.66	0.66	1.02	(1)
1.32	1.32	2.03	(2)
2.00	2.00	3.07	(3)

Methods of application: Broadcast (B), placed (P), broadcast and rotary cultivated in (BR).

Additional plots:

To wheat 1963. NPK: F0, F1, F2 as above to plots receiving no treatment in 1962.

Basal dressing: None.

Cultivations, etc.: Chisel ploughed: Oct 29, 1962. PK applied, seed drilled at 3 bushels per acre: Nov 14. 'Nitro-Chalk' applied - 1st half dressing: Apr 24, 1963, 2nd half dressing: May 9. Sprayed with mecoprop/2,4-D at 7 pints in 40 gallons per acre: May 17. Combine harvested: Sept 10. Variety: Cappelle. Previous crops: Barley 1961, potatoes 1962.

Note: For details of the previous year's results see 'The Numerical Results of the Field Experiments' 62/C/9.

Standard error per plot. Winter wheat:

Grain (at 85% dry matter): 3.97 cwt per acre or 10.6% (18 d.f.)

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Summary of Results

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

NPK 1963	Method of application of compound fertiliser to potatoes 1962			Levels of compound fertiliser to potatoes 1962			Mean
	B	P	BR	1	2	3	
	(±2.29)			(±2.29)			(±1.32)
F0	33.1	34.1	32.5	28.4	32.2	39.1	33.2
F1	38.4	38.7	40.9	38.9	39.4	39.8	39.3
F2	45.7	45.3	40.1	40.5	45.2	45.5	43.7
					(±2.29)		
		B		37.4	40.0	39.8	39.1
		P		34.6	37.7	45.7	39.4
		BR		35.7	39.0	38.8	37.8
		Mean (±1.32)		35.9	38.9	41.5	38.8 (±0.76)

Plots untreated in 1962

NPK 1963 F0	NPK 1963 F1	NPK 1963 F2	Mean
26.1	34.3 (±2.29)	39.9	33.4 (±1.32)

General mean: 37.5

Mean dry matter % as harvested: 78.5

For explanation of treatment symbols see 63/C/4.1

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63/C/4.3

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

NPK 1963	Method of application of compound fertiliser to potatoes 1962			Levels of compound fertiliser to potatoes 1962			Mean
	B	P	BR	1	2	3	
F0	15.2	17.3	15.6	14.1	15.4	18.6	16.0
F1	28.2	23.2	23.1	24.8	28.4	21.2	24.8
F2	24.7	29.2	26.0	27.1	28.4	24.4	26.6
		B		25.2	23.5	19.3	22.7
		P		22.0	25.8	21.9	23.2
		BR		18.7	23.0	23.0	21.6
		Mean		22.0	24.1	21.4	22.5

Plots untreated in 1962

NPK 1963 F0	NPK 1963 F1	NPK 1963 F2	Mean
13.2	22.6	26.3	20.7

General mean: 22.0

Mean dry matter % as harvested: 63.8

For explanation of treatment symbols see 63/C/4.1

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METHODS OF APPLICATION OF FERTILISER 1963 - 64.

(AR)

Methods of application of fertiliser - Great Knott II 1963, the first year - potatoes.

Design: 3 randomised blocks of 12 plots each.

Area of each plot: 0.0212 acres. Area harvested: 0.0133 acres.

Treatments. None (0) (3 plots per block), and all combinations of:-
Levels of compound fertiliser (13% N, 13% P_2O_5, 20% K_2O) to supply (cwt per acre):-

N	P_2O_5	K_2O	
0.66	0.66	1.02	(1)
1.32	1.32	2.03	(2)
2.00	2.00	3.07	(3)

Methods of application: Broadcast (B), placed (P), broadcast and rotary cultivated in (BR).

Note: The experiment is designed to include an additional factor applied to the 1964 wheat crop, viz. PK broadcast on seedbed and 'Nitro-Chalk' as spring top dressing to supply:-
N, P_2O_5 and K_2O at levels as (0), (1), (2) above.

Basal dressing: None.

Cultivations, etc.: Ploughed: Mar 28 - Apr 10, 1963. Rotary cultivated, potatoes planted: May 7. Earthed up: June 27. Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 10. Sprayed with copper fungicide at 2.3 lb copper in 20 gallons per acre: July 29, and again at the same rate plus 0.35 pint menazon per acre: Aug 15. Sprayed with undiluted BOV at 16 gallons per acre: Sept 23. Lifted: Oct 21. Variety: King Edward. Previous crops: Barley 1961, spring beans 1962.

Standard error per plot.
Total tubers: 0.786 tons per acre or 7.3% (24 d.f.)

Erratum to 'Numerical Results of the Field Experiments' 1962 page 62/C/9.1, 'Total tubers: tons per acre'. Delete the standard error '(±0.181)' under the general mean.

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63/C/5.2

Summary of Results

Method of application of fertiliser	Level of compound fertiliser 0	1	2	3	Mean
Total tubers: tons per acre					
		(±0.454)			(±0.262)
Broadcast		10.86	12.40	13.10	12.12
Placed		10.08	11.93	13.83	11.95
Broadcast and rotovated in		9.51	12.42	13.98	11.97
Mean (±0.262)	7.23	10.15	12.25	13.64	10.81*
Percentage ware (1.5 inch riddle)					
Broadcast		96.3	94.8	95.3	95.5
Placed		93.4	94.1	93.7	93.7
Broadcast and rotovated in		95.4	95.8	95.6	95.6
Mean	93.8	95.1	94.9	94.9	94.6*

Level of compound fertiliser

	cwt per acre N	P_2O_5	K_2O
(0)		None	
(1)	0.66	0.66	1.02
(2)	1.32	1.32	2.03
(3)	2.00	2.00	3.07

* General mean

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63/C/6.1

EFFECT OF SUBSOILING

(WAW)

Woburn Roadpiece and Great Hill. Test crops, Roadpiece: early potatoes, Great Hill: barley - the second year 1963.

Design: 3 randomised blocks of 2 plots each.

Area of each plot (acres):		Area harvested (acres):
Roadpiece:	0.0810	0.0180
Great Hill:	0.0762	0.0579

Treatments: None, subsoiled in October 1961, 7 strokes per plot, 3 feet apart, 18 inches deep.

Basal dressings per acre:
Roadpiece: 8 cwt compound fertiliser, 17% N, 11% P_2O_5, 22% K_2O.
Great Hill: 3 cwt compound fertiliser, 21% N, 14% P_2O_5, 14% K_2O combine drilled.

Cultivations, etc.:
Roadpiece: Ploughed: Sept 17 - Oct 17, 1962. Basal dressing applied: Apr 11, 1963. Potatoes machine planted: Apr 19. Earthed up: June 15. Haulm destroyed mechanically: July 23. Lifted: July 24. Variety: Arran Pilot.
Great Hill: Ploughed: Nov 12, 1962. Seed drilled at 2 bushels per acre: Apr 8, 1963. Combine harvested: Sept 9. Variety: Proctor.

Previous crops:-
Roadpiece: Spring wheat 1961, barley, spring wheat and sugar beet 1962.
Great Hill: Spring wheat and barley 1961, spring wheat, barley and sugar beet 1962.

Note: For the previous year's results see 'Numerical Results of the Field Experiments' 62/C/10.

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63/C/6.2

Summary of Results

Treatment: None	Subsoiled	Mean
Roadpiece		
Early Potatoes, total tubers: tons per acre		
8.76	9.19	8.98
Great Hill		
Barley, Grain (at 85% dry matter): cwt per acre		
21.3	22.5	21.9

Mean dry matter % as harvested: 79.2

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63/C/7.1

GRASS

(AF)

Levels of N and K - Harwoods Piece 1963, the 6th year.

Design: 4 randomised blocks of 12 plots each.

Area of each plot: 0.0087 acres. Area harvested: 0.0059 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 the above in the presence of 0.6 cwt P_2O_5 per acre as superphosphate.
In addition 2 plots per block, receiving 0.9 cwt N and 0.6 cwt K_2O per acre, 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.
(2) All treatments were applied to the same plots as in the previous seasons.

Basal dressing: None.

Cultivations, etc.: P and first dressings of N and K applied: Apr 4, 1963. Cut four times: May 29, July 16, Aug 22, Oct 29.
Variety: S37 Cocksfoot.

Note: For details of the previous years' results see 'Results of the Field Experiments' 58/Cg/2, 59/Cg/2, 60/C1/1, 61/Dg/1 and 62/C/11.

Standard errors per plot. Dry matter:

1st cut:	2.99 cwt per acre or 6.7%	(33 d.f.)
2nd cut:	2.65 cwt per acre or 8.5%	(33 d.f.)
3rd cut:	1.40 cwt per acre or 10.0%	(33 d.f.)
4th cut:	1.25 cwt per acre or 7.4%	(33 d.f.)
Total of 4 cuts:	5.76 cwt per acre or 5.4%	(33 d.f.)

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 (±1.49)	14.0	37.0	39.1	36.9	43.4	51.3	53.8	44.9	52.0	55.1	53.1	55.1	44.6
2nd cut (±1.33)	9.2	25.6	27.0	27.4	29.6	34.0	37.7	30.5	35.8	40.5	38.9	40.1	31.3
3rd cut (±0.70)	3.6	13.4	14.4	14.4	13.8	17.2	17.4	13.7	16.0	14.1	15.9	15.0	14.1
4th cut (±0.63)	1.4	11.1	11.6	11.4	16.7	19.9	19.4	18.8	24.0	22.6	23.1	22.8	16.9
Total of 4 cuts (±2.88)	28.2	87.0	92.0	90.1	103.5	122.4	128.3	107.8	127.7	132.2	130.9	133.0	106.9

*For each cut

Mean dry matter % as harvested:
1st cut: 19.2
2nd cut: 18.4
3rd cut: 16.5
4th cut: 21.3
Total of 4 cuts: 18.8

63/C/7.2

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63/C/8.1

DECLINE OF TAKE-ALL

(AO)

The effect of crop sequences on the decline of take-all (Ophiobolus graminis) - Great Field I 1963, the first year.

Design: 3 randomised blocks of 6 plots each (5 of winter wheat, 1 of oats), using the plots of Series III of the Cereals and Beans Rotations Experiment (see 'Numerical Results of the Field Experiments' 61/C/1).

Area of each plot: 0.0305 acres. Area harvested: 0.0200 acres.

Treatments: Crop sequences:-

	1959	1960	1961	1962	1963	1964	1965	1966
1	W	W	WS	W	W	W	W	W
2	W	O	Be	W	W	W	W	W
3	WS	W	WS	W	O	W	W	W
4	B	W	B	W	W	W	O	W
5	W	O	WS	W	W	W	W	W
6	O	W	WS	W	W	O	W	W

O = Oats, Be = Spring beans, WS = Spring wheat, W = Winter wheat, B = Barley.

Basal dressings per acre: 2.5 cwt compound fertiliser (20% P_2O_5, 20% K_2O) combine drilled. 1.0 cwt N to wheat and 0.4 cwt N to oats applied in spring as 'Nitro-Chalk'.

Cultivations, etc.: Ploughed: Oct 29, 1962. Winter wheat drilled at 2.5 bushels per acre: Nov 14. 'Nitro-Chalk' applied to winter wheat: Mar 25, 1963. Oats drilled at 4 bushels per acre, 'Nitro-Chalk' applied to oats: Apr 9. Winter wheat sprayed with mecoprop/2,4-D at 7 pints in 40 gallons per acre: May 16. Oats sprayed with MCPA/dichlorprop at 3.2 pints in 40 gallons per acre: May 27. Combine harvested: Sept 10. Varieties: winter wheat - Cappelle, oats - Condor.

Notes: (1) Yields were only taken for winter wheat.
(2) Estimates were made on 5 occasions of the incidence of take-all on wheat.

Standard error per plot. Winter wheat.
Grain (at 85% dry matter): 1.91 cwt per acre or 7.3% (8 d.f.)

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63/C/8.2

Summary of Results

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

Crop in 1959	W	O	W	B	W	
1960	W	W	O	W	O	
1961	WS	WS	WS	B	Be	
1962	W	W	W	W	W	Mean
	28.1	27.0	24.4	25.9	25.5	26.2
			(±1.10)			

Mean dry matter % as harvested: 81.4

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63/C/9

CHEMICAL CONTROL OF TAKE-ALL

(AP)

The chemical control of take-all (Ophiobolus graminis) in winter wheat - Highfield Drive 1963, the first year.

Design: 3 randomised blocks of 5 plots each.

Area of each plot: 0.0072 acres.

Treatments: None (3 plots per block*), sprayed with heptachlor at 4 lb in 70 gallons per acre (H4), at 8 lb in 140 gallons per acre (H8).

*2 of these will be treated with heptachlor in 1964.

Basal dressings per acre: 2.5 cwt compound fertiliser (20% P_2O_5, 20% K_2O) combine drilled. 1 cwt N as 'Nitro-Chalk' applied as spring top dressing.

Cultivations, etc.: Ploughed: Sept 4, 1962. Ground chalk applied at 25 cwt per acre: Oct 17. Heptachlor treatments applied, all plots rotary cultivated: Oct 23. Seed drilled at 2.5 bushels per acre: Nov 13. 'Nitro-Chalk' applied: Apr 26, 1963. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: May 22. Combine harvested: Sept 10. Variety: Cappelle. Previous crops: Barley 1961, barley 1962.

Note: Estimates were made of the incidence of take-all on 3 occasions.

Standard error per plot.
Grain (at 85% dry matter): 2.40 cwt per acre or 9.4% (10 d.f.)

Summary of Results

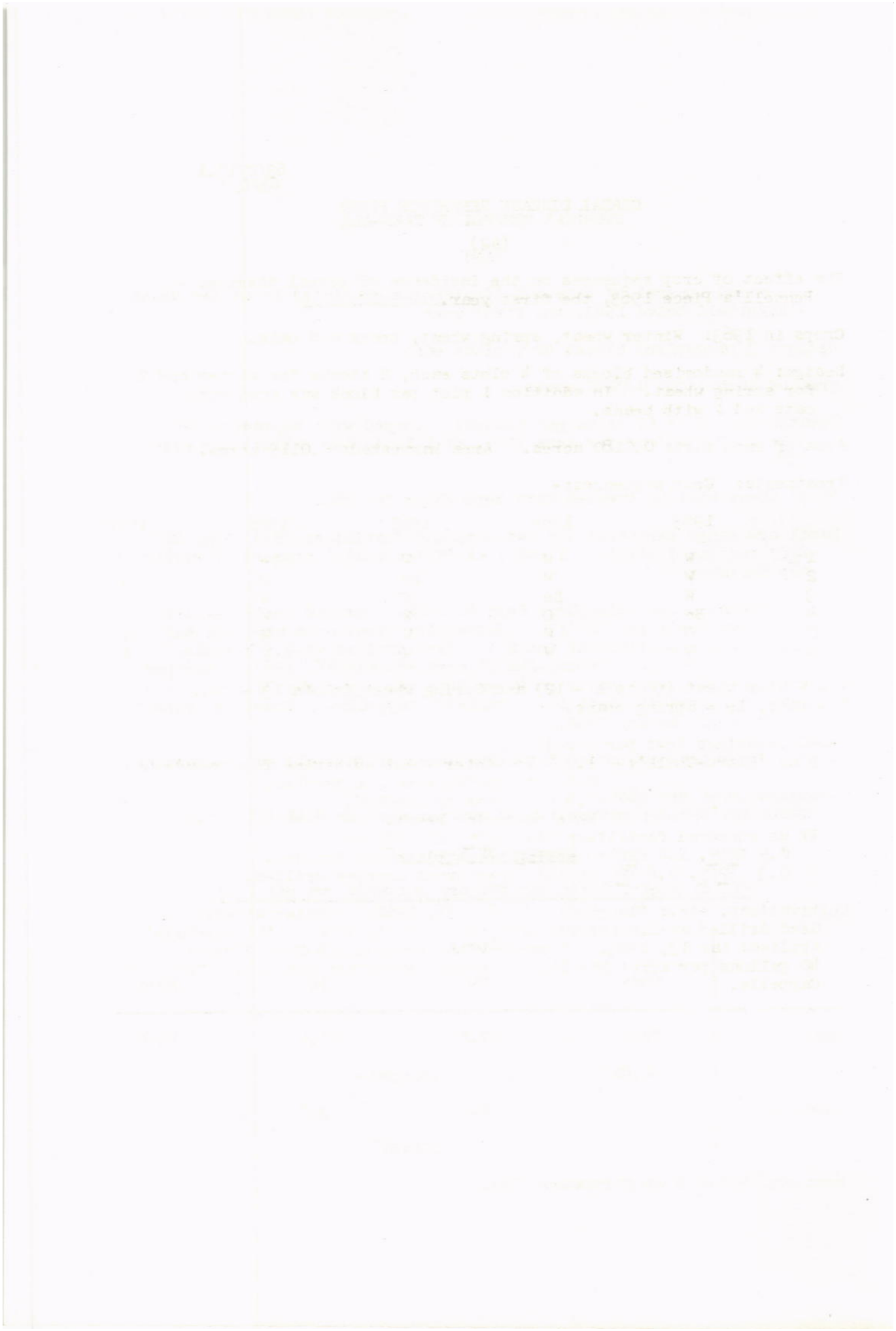
Winter wheat, Grain (at 85% dry matter): cwt per acre

	Spray			
	None	H4	H8	Mean
Mean	24.5	27.2	27.5	25.6
	(±0.80)	(±1.39)		
Increase		2.7	3.0	
		(±1.60)		

Mean dry matter % as harvested: 79.1

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63/C/10.1

CEREAL DISEASE REFERENCE PLOTS

(AQ)

The effect of crop sequences on the incidence of cereal diseases - Pennell's Piece 1963, the first year.

Crops in 1963: Winter wheat, spring wheat, beans and oats.

Design: 4 randomised blocks of 4 plots each, 2 blocks for winter and 2 for spring wheat. In addition 1 plot per block was sown with oats and 1 with beans.

Area of each plot: 0.0180 acres. Area harvested: 0.0119 acres.

Treatments: Crop sequences:-

	1963	1964	1965	1966	1967
1	W	W	W	Be	O
2	W	W	Be	O	W
3	W	Be	O	W	W
4	Be	O	W	W	W
5	O	W	W	W	Be
6	W	W	W	W	W

W = Winter wheat (plots 1 - 12) and Spring wheat (plots 13 - 24),
O = Oats, Be = Spring beans.

Basal dressings (cwt per acre):
N as 'Nitro-Chalk':- 1.0 N to winter wheat as spring top dressing.
0.6 N to spring wheat in seedbed.
0.4 N to oats in seedbed.
None to spring beans.
PK as compound fertiliser (14% P_2O_5, 28% K_2O):-
0.5 P_2O_5, 1.0 K_2O to spring beans placement drilled.
0.3 P_2O_5, 0.6 K_2O to all other crops combine drilled.

Cultivations, etc.: Ploughed: Oct 18 - 26, 1962. Winter wheat:- Seed drilled at 2.5 bushels per acre: Oct 31, 1962. 'Nitro-Chalk' applied: Mar 13, 1963. Sprayed with mecoprop/2,4-D at 7 pints in 40 gallons per acre: May 16. Combine harvested: Sept 10. Variety: Cappelle.

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Spring wheat: Seed drilled at 3 bushels per acre: Apr 11, 1963. 'Nitro-Chalk' applied: Apr 18. Sprayed with methoxychlorobenzoic acid/MCPA (MBA/MCPA) at 4 pints in 40 gallons per acre: June 6. Combine harvested: Sept 12. Variety: Jufy I.

Oats: Seed drilled at 4 bushels per acre: Apr 9, 1963. 'Nitro-Chalk' applied: Apr 18. Sprayed with methoxychlorobenzoic acid/MCPA (MBA/MCPA) at 4 pints in 40 gallons per acre: June 6. Combine harvested: Sept 9. Variety: Condor.

Spring beans: Seed drilled at 200 lb per acre: Apr 9, 1963. Sprayed with demeton-methyl at 6 fluid oz in 40 gallons per acre: June 14. Combine harvested: Oct 3. Variety: Tick 30B.

Previous crops: Sugar beet 1961, spring wheat 1962.

Note: (1) Yields were only taken for winter and spring wheat.
(2) Estimates of the incidence of take-all (*Ophiobulus graminis*), eyespot (*Cercosporella herpotrichoides*) and sharp eyespot (*Corticium solani*) were made on 4 occasions for winter and 2 for spring wheat.

Standard errors per plot. Grain (at 85% dry matter):
Winter wheat: 7.72 cwt per acre or 24.2% (6 d.f.)
Spring wheat: 2.80 cwt per acre or 8.7% (6 d.f.)

Summary of Results

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

Winter wheat	Spring wheat
31.9	32.3
(±2.73)	(±0.99)

Mean dry matter % as harvested: Winter wheat 78.6
Spring wheat 73.1

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63/Da/1

WINTER WHEAT

(RW 101)

Effects of nitrogen and inoculation with Azotobacter - Great Field I 1963.

Design: 4 x 4 Latin square.

Area of each plot: 0.0145 acres. Area harvested: 0.0096 acres.

Treatments. All combinations of:-
Nitrogen: None, 0.6 cwt N per acre applied as 'Nitro-Chalk'.
Azotobacter inoculation: None (sterile medium, no carbon source), Azotobacter culture applied to seed.

Basal dressing per acre: 2.5 cwt compound fertiliser (20% P_2O_5, 20% K_2O) broadcast in seedbed. 40 cwt ground chalk.

Cultivations, etc.: Ground chalk applied at 20 cwt per acre: Sept 26, 1962. Ploughed: Oct 29. Ground chalk applied at 20 cwt per acre, seed drilled at 2 1/2 bushels per acre, basal dressing applied by hand: Nov 14. 'Nitro-Chalk' applied by hand: Apr 27, 1963. Sprayed with mecoprop/2:4-D at 7 pints in 40 gallons per acre: May 16. Combine harvested: Sept 10. Variety: Cappelle. Previous crops: Winter wheat 1961, barley 1962.

Note: Crop samples were taken throughout the season for counts of Azotobacter. Measurements of the height of the crop were made on May 9. Estimates of ear number were made on July 17 and August 13.

Standard error per plot.
Grain (at 85% dry matter): 1.13 cwt per acre or 6.8% (6 d.f.)

Summary of Results

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

Inoculation	N: cwt per acre None	0.6	Mean
	(±0.57)		(±0.40)
None	13.0	20.6	16.8
Azotobacter	11.9	21.3	16.6
Mean (±0.40)	12.5	21.0	16.7

Mean dry matter % as harvested: 79.7

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63/Da/2.1

WINTER WHEAT

(WW 101)

Levels and times of application of nitrogen - Woburn Butt Close 1963.

Design: 4 replicates of 20 treatments (4 x 5 factorial) arranged in 8 randomised blocks of 10 plots each, with one extra plot per block receiving no nitrogen other than basal.

Area of each plot: 0.0206 acres. Area harvested: 0.0137 acres.

Treatments: None and all combinations of:-
Nitrogen: 0.5, 1.0, 1.5, 2.0 cwt N per acre as 'Nitro-Chalk'.
Times of application (intended): February* (F), April (A), May (M), in two equal divided dressings (FM), in three (FAM).

*See cultivations.

Basal dressing: 300 lb compound fertiliser (6% N, 15% P_2O_5, 15% K_2O) per acre combine drilled.

Cultivations, etc.: Ploughed (after beans): Oct 10 1962, (after carrots): Oct 30. Seed drilled at 2.75 bushels per acre: Nov 1. 'Nitro-Chalk' applied: F - Mar 14, 1963, A - Apr 10, M - May 10. Sprayed with TBA/MCPA at 4 pints in 40 gallons per acre: May 9. Combine harvested: Sept 13. Variety: Cappelle. Previous crops: Plots 101 - 144, barley 1961, carrots 1962: plots 145 - 188, barley 1961, spring beans 1962.

Standard error per plot.
Grain (at 85% dry matter): 5.13 cwt per acre or 16.5% (53 d.f.)

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63/Da/2.2

Summary of Results

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

	N: cwt per acre (in addition to basal)				
	0.5	1.0	1.5	2.0	Mean
Time of application		(±2.56)			(±1.28)
F	34.0	37.9	31.3	29.6	33.2
A	31.4	34.0	27.6	30.7	30.9
M	23.5	30.0	24.7	31.2	27.4
FM	27.8	37.3	35.0	26.9	31.8
FAM	25.5	35.1	34.5	32.2	31.8
Mean (±1.15)	28.4	34.9	30.6	30.1	31.0

Mean of plots receiving no nitrogen other than basal: 11.0

Mean dry matter % as harvested (all plots): 79.8

Time of application of N

F = Mar 14
A = Apr 10
M = May 10

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WHEAT

(RW 201)

Varieties and nitrogen - Long Hoos V 1963.

Design: 4 randomised blocks of 24 plots each, blocks being divided into 2 sub-blocks each, one of 15 winter wheat and one of 9 spring wheat plots.

Area of each plot: 0.0193 acres. Area harvested: 0.0129 acres.

Treatments: All combinations of:-
Varieties: Winter wheat:- Cappelle (Ca), Champlein (Ch), Prestige (Pr), Squarehead's Master (Sq).
Spring wheat:- Jufy I (Ju), Opal (Op), Prestige (Pr).
Nitrogen: None (to winter wheat except Champlein), 0.5, 0.75, 1.0 cwt N per acre as 'Nitro-Chalk'.

Basal dresssiinngg: 2.5 cwt per acre compound fertiliser (20% P_2O_5, 20% K_2O) combine drilled.

Cultivations, etc.: Ploughed: Nov 13, 1962. Winter wheat drilled at 2.75 bushels per acre: Dec 17. Spring wheat drilled at 3 bushels per acre: Apr 19, 1963. 'Nitro-Chalk' applied: Spring wheat - Apr 23, winter wheat - Apr 27. Sprayed with mecoprop/2,4-D: Winter wheat at 7 pints in 40 gallons per acre - May 16, spring wheat at 6 pints in 40 gallons per acre - May 24. Combine harvested: Winter wheat - Sept 10, spring wheat - Sept 13. Previous crops: Spring wheat 1961, potatoes 1962.

Standard errors per plot. Grain (at 85% dry matter):
Winter wheat 3.72 cwt per acre or 11.0% (39 d.f.)
Spring wheat 1.33 cwt per acre or 3.6% (24 d.f.)

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63/Da/3.2

Summary of Results

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

Winter wheat

N: cwt per acre	Variety Ca	Ch	Pr	Sq	Mean
		(±1.86)			(±0.93)
None	25.7		21.0	24.5	23.7 (1)
0.50	34.7	36.3	34.9	27.1	33.2
0.75	39.5	42.1	39.9	29.5	37.7
1.00	39.9	44.7	41.3	28.8	38.7
Mean (excl. none) (±1.07)	38.0	41.0	38.7	28.4	36.5*

(1) (±1.07)

*Mean of plots receiving N. General mean 33.9

Mean dry matter % as harvested: 79.2

Spring wheat

N: cwt per acre	Variety Ju	Op	Pr	Mean
		(±0.66)		(±0.38)
0.50	37.6	37.7	30.8	35.3
0.75	38.2	41.1	31.6	37.0
1.00	40.3	42.7	31.4	38.1
Mean (±0.38)	38.7	40.5	31.2	36.8

Mean dry matter % as harvested: 73.7

Varieties

Winter wheat

Ca = Cappelle, Ch = Champlein, Pr = Prestige, Sq = Squarehead's Master.

Spring wheat

Ju = Jufy I, Op = Opal, Pr = Prestige

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63/Db/1

BARLEY

(RB 101)

The effect of insecticides on thrips, aphids and the spread of virus - Hoosfield (Old Four Course) 1963.

Design: 6 randomised blocks of 4 plots each.

Area of each plot: 0.0206 acres. Area harvested: 0.0137 acres.

Treatments. Rogor spray: None (O), 4* early applications (E), 4 late applications (L), 8* applications (EL). Rate of application 16 fluid oz in 40 gallons per acre.

* Intended number. Actually treatment E received 3 and treatment EL 7 applications.

Basal dressing: 3 cwt compound fertiliser (20% N, 10% P_2O_5, 10% K_2O) per acre combine drilled.

Cultivations, etc.: Ploughed twice: Aug 28 and Nov 15, 1962. Seed drilled at 2 bushels per acre: Apr 8, 1963. E and EL plots sprayed with Rogor: May 9 and 30, June 11. Sprayed with mecoprop/2,4-D at 6 pints in 40 gallons per acre: May 24. EL and L plots sprayed with Rogor: June 27, July 8, 17 and 25. Combine harvested: Sept 5. Variety: Proctor. Previous crops: Spring wheat 1961, oats 1962.

Note: Water traps were used and trapping records of thrips and aphids made throughout most of the season. Crop samples were taken throughout most of the season for thrips extraction.

Standard error per plot.
Grain (at 85% dry matter): 1.63 cwt per acre or 5.4% (15 d.f.)

Summary of Results

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

Rogor spray				
O	E	L	EL	Mean
30.8	29.6	29.0	29.9	29.8
	(±0.66)			

Mean dry matter % as harvested: 71.1

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63/Db/2

BARLEY

(RB 201)

Varieties - Stackyard 1963.

Design: 4 randomised blocks of 3 plots each.

Area of each plot: 0.0193 acres. Area harvested: 0.0129 acres.

Treatments.
Varieties: Impala, Proctor, Swallow.

Basal dressing: 3 cwt per acre compound fertiliser (20% N, 10% P_2O_5, 10% K_2O) combine drilled.

Cultivations, etc.: Ploughed: Mar 15 - 23, 1963. Rotary cultivated: Apr 26. Seed drilled at 2.5 bushels per acre (Proctor at 2.25): May 2. Sprayed with mecoprop/2,4-D at 6 pints in 40 gallons per acre: June 12. Combine harvested: Sept 9. Previous crops: Barley and potatoes 1961, barley 1962.

Standard error per plot.
Grain (at 85% dry matter): 1.66 cwt per acre or 4.4% (6 d.f.)

Summary of Results

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

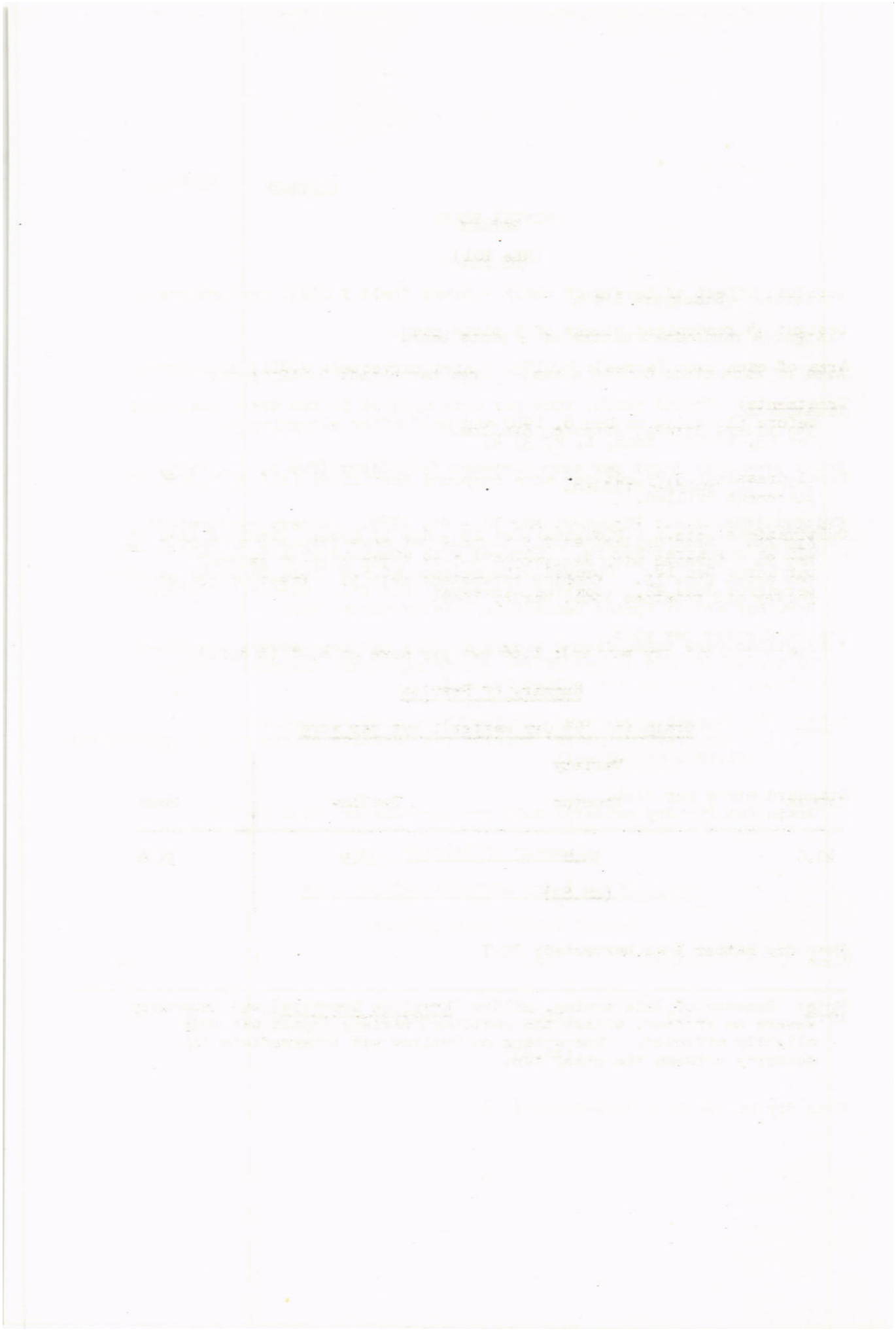
Variety			
Impala	Proctor	Swallow	Mean
40.0	34.0 (±0.83)	38.9	37.6

Mean dry matter % as harvested: 73.7

Note: Because of late sowing, mildew (Erysiphe Graminis) was unusually severe on Proctor, whilst the resistant variety Impala was only slightly affected. The attack on Swallow was intermediate in severity between the other two.

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63/Dc/1

WINTER BEANS

(RBe 101)

Residual effect of levels of chalk - Great Field I 1963, the 3rd year.

Design: 4 randomised blocks of 5 plots each.

Area of each plot (acres): 0.0193. Area harvested: 0.0117 or 0.0023.

Treatments: Ground chalk, tons per acre applied in two dressings, half before ploughing on Dec 6, 1960 and half after ploughing on Dec 13, 1960:- None, 1, 2, 3, 4.

Basal dressing: 3.25 cwt per acre compound fertiliser (14% P_2O_5, 28% K_2O) placement drilled.

Cultivations, etc.: Ploughed: Oct 29 - Nov 1, 1962. Seed drilled at 275 lb per acre: Nov 14. Sprayed with simazine at 1 lb in 40 gallons per acre: Dec 18. Sprayed with menazon at 5.6 fluid oz in 40 gallons per acre: June 22. Combine harvested: Oct 9*. Variety: Pedigree. Previous crops: Spring beans 1961, winter beans 1962.

* No yields were taken from 2 blocks as they had been severely checked by the winter and on one of the remaining blocks the yields were estimated from one row pulled by hand.

Notes: (1) Samples were taken for counts of pods and beans.
(2) For previous years' results see 'Results of the Field Experiments' 61/Dd/1 and 62/Dc/1.

Standard error per plot.
Grain (at 85% dry matter): 4.00 cwt per acre or 19.9% (4 d.f.)

Summary of Results

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

Ground chalk: tons per acre					
None	1	2	3	4	Mean
10.3	16.7	18.5 (±2.83)	27.3	27.7	20.1

Mean dry matter % as harvested: 66.6

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63/Dc/2.1

SPRING BEANS

(RBe 201)

Control of virus by systemic insecticides - Claycroft 1963.

Design: 4 randomised blocks of 8 plots each.

Area of each plot: 0.0217 acres. Area harvested: 0.0090 acres.

Treatments. All combinations of:-
Systemic insecticides: None (0), 1 lb (S1), 3 lb per acre menazon as seed dressing (S3), 1 lb per acre disulfoton broadcast on young foliage in granular form (B).
Demeton-methyl systemic insecticide spray: None (0), 6 fluid oz in 80 gallons per acre (M).

Basal dressing: 3.25 cwt per acre compound fertiliser (14% P_2O_5, 28% K_2O) placement drilled.

Cultivations, etc.: Ploughed: Nov 27 - Dec 3, 1962. Seed drilled at 200 lb per acre: Apr 9, 1963. Sprayed with simazine at 1 lb in 40 gallons per acre: Apr 19. Treatment B applied: June 11. Treatment M applied: June 27. Combine harvested: Sept 30. Variety: Herz Freya. Previous crops: Spring wheat 1961 and 1962.

Note: Counts of virus infected plants and estimates of numbers of aphids were made.

Standard error per plot.
Grain (at 85% dry matter): 2.03 cwt per acre or 6.4% (21 d.f.)

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63/Dc/2.2

Summary of Results

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

Demeton-methyl spray	Systemic insecticide 0	S1	S3	B	Mean
		(±1.01)			(±0.50)
0	25.0	30.6	33.0	28.8	29.4
M	33.7	34.7	34.5	34.3	34.3
Mean (±0.71)	29.4	32.7	33.7	31.6	31.8

Mean dry matter % as harvested: 72.4

Systemic insecticide
0 = None
S1 = 1 lb per acre menazon as seed dressing
S3 = 3 lb per acre menazon as seed dressing
B = 1 lb per acre disulfoton broadcast on young foliage in granular form

Demeton-methyl spray
0 = None
M = 6 fluid oz in 80 gallons per acre

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63/Dd/1.1

POTATOES

(RP 101)

Effect of chloride on uptake of other ions - Sawyers II 1963.

Design: 3 randomised blocks of 12 plots each.

Area of each plot (acres): 0.0141. Area harvested: 0.0065.

Treatments. All combinations of:-

Fertilisers:

No nitrogen, potassium sulphate and calcium carbonate	(O)
No nitrogen, potassium chloride and calcium sulphate	(C)
Urea, potassium sulphate and calcium carbonate	(A)
Urea, potassium chloride and calcium sulphate	(AC)
Potassium nitrate and calcium sulphate	(N)
Calcium nitrate, potassium chloride and calcium sulphate	(NC)

Methods of placement: Broadcast, placed in one band 2.5 - 3 inches to the side of the seed.

Rates of application:

A, N: 0.81 cwt N per acre.
C: 2.15 cwt Cl per acre.
Also 3.0 cwt K_2O, 1.7 cwt Ca and 1.0 cwt S per acre broadcast or placed according to treatment.

Basal dressing per acre: 1.5 cwt P_2O_5 as triple superphosphate, placed.

Cultivations, etc.: Ploughed: Sept 27 - Oct 3, 1962. Rotary cultivated, fertilisers applied, potatoes planted: May 8, 1963. Earthed up: July 3. Sprayed with maneb at 1.2 lb in 20 gallons per acre: July 11. Sprayed with diquat at 1.2 pints in 40 gallons per acre: Sept 25. Lifted: Oct 16. Variety: Majestic. Previous crops: Fallow 1961, spring wheat 1962.

Note: Leaf samples were taken in July for chemical analysis and tuber samples at harvest for chemical analysis and assessment of quality by the Low Temperature Research Station.

Standard error per plot.
Total tubers: 0.515 tons per acre or 4.5% (22 d.f.)

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Summary of Results

Method of placement	Fertiliser 0	C	A	AC	N	NC	Mean
Total tubers: tons per acre							
	(±0.298)						
Broadcast	9.02	9.77	12.30	12.69	11.81	13.21	11.47
Placed	8.91	9.82	12.20	12.67	12.75	12.28	11.44
Mean (±0.210)	8.96	9.80	12.25	12.68	12.28	12.74	11.45
Diff. (±0.420)	-0.11	+0.05	-0.10	-0.02	+0.94	-0.93	-0.03 (±0.172)
Percentage ware (1.5 inch riddle)							
Broadcast	91.5	94.6	94.4	95.4	94.2	95.1	94.2
Placed	92.6	94.2	95.8	96.9	95.1	96.4	95.2
Mean	92.0	94.4	95.1	96.2	94.7	95.7	94.7
Diff.	+1.1	-0.4	+1.4	+1.5	+0.9	+1.3	+1.0

For details of treatment symbols see page 63/Dd/1.1

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63/Dd/2.1

POTATOES

(RP 301)

Time of burning off haulm - Great Knott II 1963.

Design: 4 randomised blocks of 10 plots each.

Area of each plot: 0.0848 acres. Area harvested: 0.0141 acres.

Treatments. All combinations of:-
Fungicide sprays: None (0), sprayed on 3 occasions, the first with mancozeb*, the second and third with commercial copper oxychloride wettable powder** (Cu).
Burning off haulm***: None (0), haulm burnt off when mean destruction on sprayed plots was 2.5% (A), when haulm on sprayed plots was 20% destroyed by blight and almost all dead (B) - 2 plots per block.
In addition two plots per block (Cu 2B, MB) were sprayed as follows:-
Cu 2B: As 'Cu', but all sprays applied later (first and second on dates of second and third sprayings of 'Cu' plots).
MB: As 'Cu', but all sprayings with mancozeb.
Both were burnt off at date B.

* 1.5 lb fungicide, containing 80% mancozeb, in 20 gallons per acre.
** At 2.3 lb Cu in 20 gallons per acre.
*** With undiluted BOV at 16 gallons per acre.

Basal dressing: 8 cwt per acre compound fertiliser (17% N, 11% P_2O_5, 22% K_2O).

Cultivations, etc.: Sprayed with dalapon at 7.4 lb in 40 gallons per acre: Oct 18, 1962, and again at 3.7 lb in 40 gallons per acre: Oct 30. Ploughed: Mar 28 - Apr 10, 1963. Basal dressing applied: part Apr 30, part May 8. Rotary cultivated: May 9. Potatoes machine planted: May 10. Earthed up: July 3. Cu and MB plots sprayed with mancozeb: July 9. Cu plots sprayed with copper oxychloride, MB and Cu 2B plots with mancozeb: July 22. Cu, Cu 2B plots sprayed with copper oxychloride, MB plots with mancozeb: Aug 13. Cu 2B plots sprayed with copper oxychloride: Sept 3. A plots sprayed with BOV: Sept 7. B plots sprayed with BOV: Sept 23. Lifted: Oct 29. Variety: King Edward. Previous crops: Barley 1961, spring beans 1962.

Note: (1) Periodic samples were taken for the weight of tubers, and an assessment of blight on foliage and in tubers was made weekly.
(2) The almost complete death of the haulm by late September resulted mostly from a massive infestation of aphids commencing in late July.

Standard error per plot.
Total tubers: 0.813 tons per acre or 9.0% (29 d.f.)

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Erratum to 'The Numerical Results of the Field Experiments' 1962 page 62/Dd/2.2.

Date of burning off. The next 4 lines should read:-

0 = None
A = Haulm burnt off when 1-5% blighted on Cu plots
B = Haulm burnt off when 10-20% blighted on Cu plots
C = Haulm burnt off when 50% blighted on Cu plots.

Summary of Results

Total tubers: tons per acre

Spray	Date of burning off 0	A	B	Mean
	(±0.406)		(±0.287)	(±0.203)
0	9.05	9.10	9.29	9.18
Cu	8.24	7.89	9.11	8.59
Mean (±0.287)	8.64	8.50	9.20 (±0.203)	8.88 (±0.144)

Cu 2B 9.66 (±0.418) MB 9.65

General mean: 9.04

Percentage ware (1.5 inch riddle)

0	92.2	92.3	92.0	92.1
Cu	91.7	89.4	90.2	90.4
Mean	92.0	90.8	91.1	91.2

Cu 2B 91.9 MB 92.9

General mean: 91.5

For explanation of treatment symbols see 63/Dd/2.1.

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63/Dd/3.1

POTATOES

(RP 401)

Control of blight (*Phytophthora infestans*) by copper and tin fungicides - Stackyard 1963.

Design: 6 x 6 Latin square.

Area of each plot (acres): 0.0129. Area harvested: 0.0077.

Treatments: No fungicide (0)
Commercial copper oxychloride wettable powder at 2.5 lb Cu per acre (1)
Copper oxychloride at 2.5 lb Cu per acre with 10 lb wax (2)
As treatment 2 with sodium thiobenzoate at 1 lb per acre (3)
Commercial triphenyltin acetate wettable powder at 0.3 lb triphenyltin acetate per acre (4)
Triphenyltin acetate at 0.3 lb per acre in 10 lb wax (5)
All sprays applied in 100 gallons per acre.

Basal dressing: 7 cwt per acre compound fertiliser, 17% N, 11% P_2O_5, 22% K_2O.

Cultivations, etc.: Ploughed: Mar 15 - 23, 1963. Basal dressing applied, rotary cultivated: Apr 26. Rotary cultivated 2nd time, potatoes machine planted: May 6. Earthed up: June 27. Copper and tin fungicides applied: July 18 and 31. Haulm destroyed with diquat at 1.2 pints in 40 gallons per acre: Sept 28. Lifted: Dec 5. Variety: King Edward. Previous crops: 1 year ley 1961, winter wheat 1962.

Note: A severe attack of aphids prevented the estimation of foliage blight, and because of slug damage following the very late harvest, tuber blight was not estimated.

Standard error per plot.
Total tubers: 0.577 tons per acre or 7.7% (20 d.f.)

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Summary of Results

	Fungicide 0	1	2	3	4	5	Mean
Total tubers: tons per acre							
Mean (±0.236)	8.06	6.58	6.39	6.34	9.10	8.24	7.45
Increase (±0.333)		-1.48	-1.67	-1.72	+1.04	+0.18	
Percentage ware (1.5 inch riddle)							
Mean	90.9	83.9	85.8	82.5	92.7	89.8	87.6
Increase		-7.0	-5.1	-8.4	+1.8	-1.1	

For explanation of treatment symbols see page 63/Dd/3.1

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63/Dd/4.1

POTATOES

(RP 501, WP 301)

Control of weeds by herbicide sprays - Rothamsted (R) Highfield IV and Woburn (W) Butt Furlong 1963.

Design: 4 randomised blocks of 6 plots each, plots on Highfield IV (R) being split for 0 v N.

Area of each plot (acres).	Area harvested (acres).
Highfield IV (R): 0.0258	0.0074
Butt Furlong (W): 0.0145	0.0096

Treatments (in lb active material in 40 gallons per acre):-

None (until weed counts were made)	(0)
Mechanical cultivations	(M)
Paraquat: 0.75 lb	(P)
Paraquat: 0.75 lb + prometryne: 2 lb	(PrP)
Paraquat: 0.75 lb + simazine: 0.50 lb	(SP)
Paraquat: 0.75 lb + trietazine: 1 lb	(TP)

Plots on Highfield IV (R) were split for 0 v 0.6 cwt N per acre as 'Nitro-Chalk' in addition to basal dressing.

Basal dressing per acre: Highfield IV (R): 6 cwt compound fertiliser (17% N, 11% P_2O_5, 22% K_2O), 6 tons dung. Butt Furlong (W): 8 cwt compound fertiliser (17% N, 11% P_2O_5, 22% K_2O).

Cultivations, etc.:

Highfield IV (R): Dung applied: Mar 8, 1963. Ploughed: Mar 22. Basal compound applied at 4 cwt per acre, all plots rotary cultivated: Apr 30. Spring-tine cultivated: May 4. Basal compound applied at 2 cwt per acre: May 7. All plots rotary cultivated, potatoes planted: May 8. 'Nitro-Chalk' applied: May 10. Ridges rolled: May 13. M plots chain harrowed: May 30. Herbicide sprays applied: June 4. M plots grubbed: June 6. M plots weeded and then grubbed: June 15. M and 0 plots grubbed: July 2. M and 0 plots earthed up: July 4. Sprayed with maneb at 0.8 lb in 20 gallons per acre: July 9, and again at 1.2 lb in 20 gallons per acre: July 29. Sprayed with copper fungicide at 2.3 lb copper plus 0.35 pints menazon in 20 gallons per acre: Aug 14. Sprayed with maneb at 1.2 lb in 20 gallons per acre: Sept 5. Sprayed with undiluted BCV at 16 gallons per acre: Sept 12. Lifted: Oct 23. Variety: King Edward. Previous crops: Barley undersown with ryegrass 1961, barley 1962.

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Butt Furlong (W): Ploughed twice: Nov 1, 1962 and Mar 8, 1963. Basal dressing applied: Apr 23. Rotary cultivated: Apr 25. Potatoes planted: Apr 26. Ridges rolled: Apr 27. M plots chain harrowed: May 13. Herbicide sprays applied: May 24. M plots grubbed: May 25, and earthed up: June 17. O plots hand-weeded, grubbed and earthed up: June 22. Sprayed with copper fungicide at 2.3 lb copper in 20 gallons per acre: July 25, and again at 2.3 lb copper plus demeton methyl at 4 fluid oz in 30 gallons per acre: Aug 23. Sprayed with undiluted BCV at 16 gallons per acre: Sept 13. Lifted: Oct 9. Variety: Majestic. Previous crops: Sugar beet 1961, barley 1962.

Note: Plots receiving treatment O were included mainly for weed counts and have been omitted from the analysis of variance.

Standard errors per plot. Total tubers:

Highfield IV (R):	Whole plot:	0.788 tons per acre or 8.2% (12 d.f.)
	Sub plot:	0.835 tons per acre or 8.6% (15 d.f.)
Butt Furlong (W):		1.746 tons per acre or 16.3% (12 d.f.)

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63/Dd/4.3

Summary of Results

N: cwt per acre including basal	Treatments M	P	PrP	SP	TP	Mean	0
Total tubers: tons per acre							
Highfield IV (R)							
	(1) and (2)						
1.0	9.13	10.34	9.59	9.40	9.45	9.58	9.76
1.6	10.15	10.03	9.12	8.91	10.50	9.74	10.40
Mean (±0.394)	9.64	10.18	9.35	9.15	9.97	9.65	10.08
Diff (±0.590)	+1.02	-0.31	-0.47	-0.49	+1.05	+0.16 (±0.264)	+0.64
Butt Furlong (W)							
Mean (±0.873)	10.54	11.40	10.54	9.60	11.64	10.74	9.81
Percentage ware (1.5 inch riddle)							
Highfield IV (R)							
1.0	90.8	89.8	88.7	91.0	90.3	90.1	90.0
1.6	91.3	91.0	91.4	91.6	92.1	91.5	91.1
Mean	91.0	90.4	90.1	91.3	91.2	90.7	90.5
Diff	+0.5	+1.2	+2.7	+0.6	+1.8	+1.4	+1.1
Butt Furlong (W)							
Mean	58.0	66.0	70.2	65.5	70.4	66.0	66.4

(1) ±0.418 (2) ±0.491

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

Treatments (in lb active material in 40 gallons per acre)
0 = None (until weed counts were made)
M = Mechanical cultivations
P = Paraquat: 0.75 lb
PrP = Paraquat: 0.75 lb + prometryne: 2 lb
SP = Paraquat: 0.75 lb + simazine: 0.50 lb
TP = Paraquat: 0.75 lb + trietazine: 1 lb

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63/Dd/5.1

POTATOES

(WP 201)

Control of tuber blight (Phytophthora infestans) by fungicide sprays and haulm destruction - Woburn Lansome Field 1963.

Design: 6 randomised blocks of 4 plots each.

Area of each plot: 0.0848 acres. Area harvested: 0.0141 acres.

Treatments: None (O)
Mancozeb* followed by one spraying with copper oxychloride fungicide** (Cu)
Mancozeb* applied twice (M)
As treatment Cu but haulm burnt off*** when foliage 1% blighted on sprayed plots (Cu A)

* At 1.5 lb fungicide, containing 80% mancozeb, in 20 gallons per acre.
** At 2.3 lb Cu in 20 gallons per acre.
*** With undiluted BOV at 16 gallons per acre.

Basal dressing: 8 cwt per acre compound fertiliser (17% N, 11% P_2O_5, 22% K_2O).

Cultivations, etc.: Ploughed: Mar 8, 1963. Basal dressing applied: Apr 23. Rotary cultivated: Apr 24. Potatoes planted: Apr 25. Earthed up: June 19. Cu and M plots sprayed with mancozeb: July 11. Cu plots sprayed with copper oxychloride, M plots with mancozeb: July 23. A plots sprayed with BOV: Sept 13. Lifted: Oct 22. Variety: King Edward. Previous crops: Barley 1961, sugar beet 1962.

Note: Periodic samples were taken for the weight of tubers and an assessment of blight on foliage and in tubers was made. The haulm died early, mostly as a result of a severe aphid attack.

Standard error per plot.
Total tubers: 1.083 tons per acre or 14.3% (15 d.f.)

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63/Dd/5.2

Summary of Results

Treatment				
O	Cu	M	Cu A	Mean
Total tubers: tons per acre				
8.51	6.72 (±0.441)	7.94	7.14	7.58
Percentage ware (1.5 inch riddle)				
83.5	69.8	79.6	73.3	76.6

Treatments

O = None
Cu = Mancozeb* followed by one spraying with copper oxychloride fungicide**
M = Mancozeb* applied twice
Cu A = As treatment Cu but haulm burnt off*** when foliage 1% blighted on sprayed plots

* At 1.5 lb fungicide, containing 80% mancozeb, in 20 gallons per acre.
** At 2.3 lb Cu in 20 gallons per acre.
*** With undiluted BCV at 16 gallons per acre.

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63/De/1.1

CARROTS

(WCt 101)

The effect of systemic insecticides on yield through control of motley dwarf virus - Woburn Lansome Field 1963.

Design: A plaid rectangle of 4 rows and 8 columns.

Area of each plot: 0.0212 acres. Area harvested: 0.0016 acres.

Treatments. All combinations of:-
Granular systemic insecticide (to columns): None, 0.75 lb per acre menazon drilled just below the seed.
Early spraying: None, sprayed twice*. (E)
Midseason spraying: None, sprayed twice. (M)
Late spraying: None, sprayed twice*. (L)
The spray used was demeton-methyl at 6 fluid oz in 40 gallons per acre.

*Intended treatments, only one application was made.

Basal dressing: 8 cwt compound fertiliser (10% N, 10% P_2O_5, 18% K_2O) per acre.

Cultivations, etc.: Ploughed: Mar 8, 1963. Basal compound fertiliser applied: Apr 22. Menazon granules applied, seed drilled at 2.25 lb per acre: Apr 23. Demeton-methyl treatments applied: E - May 31, M - June 27 and July 8, L - July 22. Lifted: Sept 12. Variety: Scarlet Intermediate. Previous crops: Barley 1961, sugar beet 1962.

Note: Aphid counts and estimates of virus infection were made.

Standard errors per plot.
Roots: 2.328 tons per acre or 11.3% (14 d.f.)
Tops: 0.995 tons per acre or 14.0% (14 d.f.)

https://doi.org/10.23637/ERADOC-1-183

Summary of Results

Systemic Insecticide	Times of spraying: -	E	M	EM	L	EL	ML	EML	Mean
Roots: tons per acre									
	(±1.646)								
None	21.78	20.31	20.86	22.06	21.83	19.70	21.22	20.31	21.01
Menazon	19.06	18.17	19.56	20.73	20.67	22.25	20.03	22.19	20.33
Mean (±1.164)	20.42	19.24	20.21	21.39	21.25	20.98	20.63	21.25	20.67
Diff. (±2.328)*	-2.72	-2.14	-1.30	-1.33	-1.16	+2.55	-1.19	+1.88	-0.68
Tops: tons per acre									
	(±0.704)								
None	7.44	7.42	6.86	7.44	7.70	5.91	7.86	6.31	7.12
Menazon	6.45	5.91	7.44	7.70	6.89	7.70	6.59	7.86	7.07
Mean (±0.498)	6.95	6.67	7.15	7.57	7.29	6.81	7.22	7.09	7.09
Diff. (±0.995)*	-0.99	-1.51	+0.58	+0.26	-0.81	+1.79	-1.27	+1.55	-0.05

*For use only in testing the difference of 2 differences.

Times of spraying
E = Early spraying: None, sprayed once
M = Midseason spraying: None, sprayed twice
L = Late spraying: None, sprayed once

63/De/1.2

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63/E/1.2

METEOROLOGICAL RECORDS 1963 - WOBURN

Month	Total sunshine: hours	Mean temperature: °F Air(1)	Mean temperature: °F In ground 1 ft.	Grass minimum: °F	Total rainfall: in 8 in. gauge	Rain(2) days
January	63	25.1	32.5	21.3	1.22	11
February	58	28.7	32.0	24.5	0.53	13
March	96	42.3	38.1	32.6	2.89	19
April	117	47.1	46.2	37.5	2.15	17
May	180	50.7	51.7	38.6	1.31	17
June	197	58.3	59.8	46.0	1.31	14
July	199	58.3	61.8	45.1	1.53	12
August	119	57.3	60.2	45.3	2.86	18
September	128	54.7	56.9	43.7	2.31	13
October	85	51.4	52.7	41.4	1.40	13
November	56	46.7	48.0	37.2	4.15	22
December	49	35.3	38.5	25.5	0.40	11
Year*	1347	46.3	48.2	36.6	22.06	180

(1) Mean of maximum and minimum

(2) Number of days rainfall was 0.01 inches or more

*Mean or total

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METEOROLOGICAL RECORDS 1963 - ROTHAMSTED

(Departure from long period means in brackets)

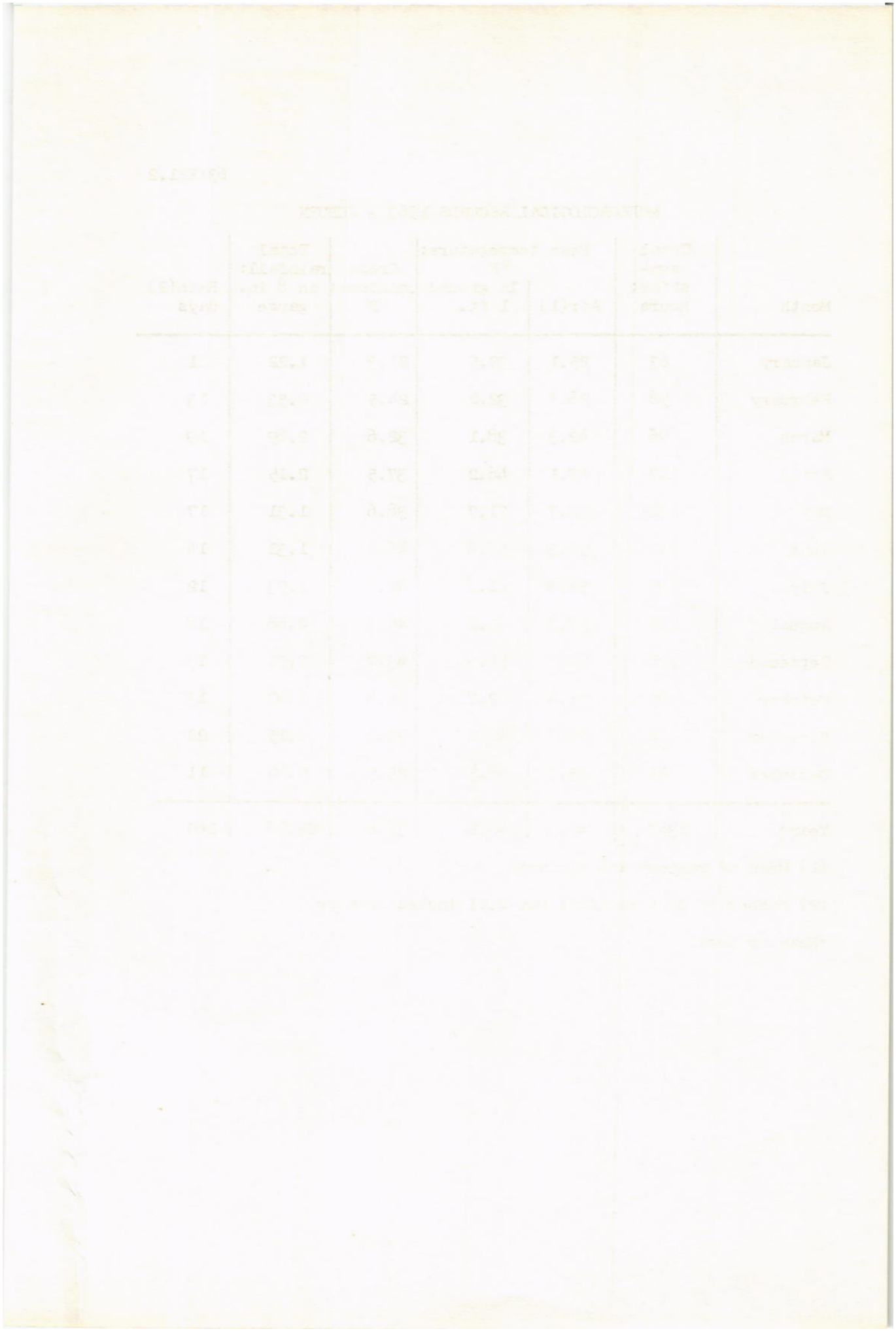
Month	Total sunshine: hours	Mean temperature: °F Air(1)	Dew point	In ground 1 ft.	In ground 4 ft.	Ground(2) frosts	Total rainfall: in. 1/1000 acre gauge	Rain(3) days	Drainage through 20 in. soil: in.	Wind(4) m.p.h.
Jan.	59 (+6.3)	25.9(-11.4)	23.4	33.9	40.6	31	1.34 (-1.21)	14	-	6.0
Feb.	68 (-0.7)	28.9 (-9.4)	27.3	33.3	38.2	28	0.87 (-1.06)	14	0.13	4.7
Mar.	87 (-29.7)	41.9 (+0.6)	38.1	39.1	38.5	10	4.07 (+2.19)	19	4.86	6.0
Apr.	115 (-40.5)	47.1 (+1.2)	42.0	45.8	42.2	9	2.36 (+0.44)	18	0.63	5.8
May	189 (-7.5)	50.3 (-1.6)	42.1	50.9	46.6	3	1.67 (-0.45)	15	0.06	6.2
June	183 (-21.4)	57.9 (+0.6)	51.3	58.5	51.4	0	3.88 (+1.71)	17	1.20	5.2
July	186 (-7.3)	58.7 (-2.0)	52.7	60.3	54.6	0	1.60 (-0.95)	14	0.65	3.4
Aug.	119 (-64.2)	57.4 (-2.8)	52.0	59.3	56.5	0	3.38 (+0.78)	20	0.47	4.1
Sept.	125 (-19.6)	55.1 (-1.0)	50.2	56.3	55.5	0	2.34 (-0.06)	14	1.08	4.0
Oct.	72 (-32.4)	50.7 (+1.6)	47.5	52.4	53.1	2	1.76 (-1.22)	14	0.36	3.9
Nov.	44 (-16.9)	45.6 (+3.2)	43.3	47.9	51.3	8	4.64 (+1.84)	22	3.94	5.3
Dec.	41 (-4.3)	34.9 (-3.7)	32.3	38.8	46.7	23	0.72 (-1.90)	12	0.45	4.3
Year*	1288(-238.2)	46.2 (-2.1)	41.9	48.0	47.9	114	28.63 (+0.11)	193	13.83	4.9

(1) Mean of maximum and minimum.
(2) Number of nights grass minimum was below 32 °F.
(3) Number of days rainfall was 0.01 in. or more.
(4) At 2 metres above ground level.

*Mean or total

63/E/1.1

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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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