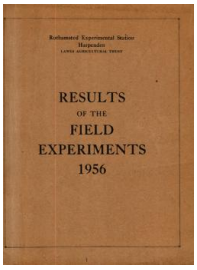
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1956

Full Table of Content



Short-term Experiments

Rothamsted Research

Rothamsted Research (1957) *Short-term Experiments ;* Yields Of The Field Experiments 1956, pp 70 - 115 **- DOI: https://doi.org/10.23637/ERADOC-1-176**

WINTER WHEAT

The effects of crop sequences, varieties, seed rates, nitrogen and sulphuric acid spray on the incidence of Eyespot (Cercosporella herpotrichoides) - Long Hoos I, II and III, 1956. The 3rd (final) year.

Details of treatments and crop sequences etc., are as stated in "Results of the Field Experiments" 1954, Section 54/Ca/2.1, modified as follows:

1. Seed rates in 1955 and 1956,
   Holdfast: 1½, 3 bushels per acre
   Cappelle: 2, 4 bushels per acre.
2. In 1956 only, 8 of the 16 blocks were sprayed with sulphuric acid (12½% BOV in 80 gallons per acre).

Area of each plot: 0.0146 acres. Area harvested: 0.0095 acres.

Basal dressing in spring: 1 cwt per acre of compound granular fertilizer (12% N, 12% P_2O_5, 15% K_2O) combine drilled with seed.

Note: In 1956 each plot was reduced in length to allow the growing of a small area of winter oats but these failed and were abandoned.

Cultivations, etc.: Ploughed: Oct 5, 1955. Seed combine drilled: Oct 26. Acid spray applied: Mar 14, 1956. Nitrochalk applied: Mar 16, May 10. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 15. Combine harvested: Sept 1.

Standard errors per plot: Grain (at 85% dry matter): cwt per acre.
Block: 1.27 cwt per acre or 4.0% (6 d.f.)
Plot: 1.83 cwt per acre or 5.8% (23 d.f.)

Note (1) Germination on the Holdfast plots was very uneven.
(2) Records of incidence of disease (Eyespot and Take-All), estimates of % area lodged, and counts of plant, shoot and straw numbers were made.
(3) In 1955 the potatoes (Majestic) received 10 tons dung and 12 cwt compound fertilizer (7% N, 7% P_2O_5, 10½% K_2O) per acre.

https://doi.org/10.23637/ERADOC-1-176

Summary of Results

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

Previous rotation 1954	1955	Spray: None	Spray: Sulphuric acid	Diff.	Seed Rate: Single	Seed Rate: Double	Diff.	N: cwt per acre 0.46	N: cwt per acre 0.93	Diff.	Mean
Holdfast		(±1.10)		(± 1.56)	(±1.01)*		(± 1.29)	(±1.01)*		(± 1.29)	(± 0.78)
Wheat	wheat	18.8	18.6	-0.2	18.5	18.9	+0.4	16.0	21.4	+5.4	18.7
Potatoes	wheat	24.2	23.3	-0.9	21.6	25.8	+4.2	21.2	26.2	+5.0	23.7
Wheat	potatoes	29.6	25.7	-3.9	23.8	31.6	+7.8	26.0	29.4	+3.4	27.7
Beans	potatoes	37.0	32.7	-4.3	31.6	38.2	+6.6	34.6	35.2	+0.6	34.9
Mean		27.4	25.1	-2.3 (± 0.78)	23.9	28.6	+4.7 (± 0.65)	24.4	28.0	+3.6 (± 0.65)	26.2 (± 0.32)
								(±0.65)**		(± 1.10)	
					Seed rate Single			22.4	25.3	+2.9	
						Double		26.5	30.8	+4.3	
					Difference (±1.10)			+4.1	+5.5	+1.4	(± 1.56)
Cappelle		(±1.10)		(± 1.56)	(±1.01)*		(± 1.29)	(±1.01)*		(± 1.29)	(± 0.78)
Wheat	wheat	24.2	20.8	-3.4	23.6	21.4	-2.2	20.4	24.7	+4.3	22.5
Potatoes	wheat	35.6	36.0	+0.4	34.7	36.9	+2.2	31.2	40.4	+9.2	35.8
Wheat	potatoes	39.6	39.3	-0.3	36.6	42.3	+5.7	37.6	41.3	+3.7	39.5
Beans	potatoes	49.3	49.8	+0.5	47.0	52.1	+5.1	48.4	50.7	+2.3	49.6
Mean		37.2	36.5	-0.7 (± 0.78)	35.5	38.2	+2.7 (± 0.65)	34.4	39.3	+4.9 (± 0.65)	36.8 (± 0.32)
								(±0.65)**		(± 1.10)	
					Seed rate Single			33.0	38.0	+5.0	
						Double		35.8	40.6	+4.8	
					Difference (±1.10)			+2.8	+2.6	-0.2	(± 1.56)

Mean dry matter % as harvested: 73.8

*for use in comparisons other than horizontal

**for use in diagonal comparisons only

Note. The standard errors are for use only in comparisons within the same variety.

56/Ca/1.2

WINTER WHEAT

Control of wheat bulb fly by insecticides - Pennell's Piece 1956.

Design: 5 randomized blocks of 6 plots each.

Area of each plot: 0.00643 acres. Area harvested: 0.00621 acres.

Treatments: Insecticides:-

None (2 plots per block).	(0)
4% Dieldrin dust at 1 cwt per acre combine drilled with seed.	(1)
4% Dieldrin dust at 1 cwt per acre broadcast on surface.	(2)
Sprayed early with Parathion 0.1% v/v at 100 gallons per acre.	(3)
Sprayed late with Parathion 0.1% v/v at 100 gallons per acre.	(4)

Basal dressing: 3 cwt 'Nitro-Chalk' per acre.

Note: all seed dressed with organo-mercurial fungicide.

Cultivations, etc.:
Ploughed: Sept 5, 1955. Seed drilled at 2 bushels per acre: Nov 1. Dieldrin dust broadcast: Feb 16, 1956. Sprayed with Parathion: '3' plots - Mar 8, '4' plots - Apr 12. 'Nitro-Chalk' applied: Apr 30. Combine harvested: Sept 4. Variety: Cappelle. Previous crop: Bare fallow.

Standard error per plot:
Grain (at 85% dry matter): 4.29 cwt per acre or 9.2% (21 d.f.)

Counts of numbers of plants, tillers, damaged tillers and of wheat bulb fly larvae were made.

Summary of Results

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

	Insecticides 0	1	2	3	4	Mean
Mean (±1.92)	43.9(1)	47.3	52.5	46.1	47.2	46.8
Increase (±2.35)		3.4	8.6	2.2	3.3	

(1) ±1.36

Mean dry matter % as harvested: 69.8

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56/Ca/3.1

WINTER WHEAT

Seed rates in relation to control of wheat bulb fly - Long Hoos VII the 3rd (final) year.

Design: 4 4×4 squares with treatments on rows in 1954 and on columns in 1955.

Area of each plot: 0.0151 acres. Area harvested: 0.0050 acres.

Treatments to spring wheat 1954 and to winter wheat 1955.
Bare fallow.
Seed rates: $\frac{1}{3}$; 1; 3 bushels per acre.

Basal dressings per acre for 1956 crop: 1 cwt compound granular fertilizer (12% N, 12% P_2O_5, 15% K_2O) combine drilled with seed; 0.8 cwt N as "Nitro-Chalk".

Cultivations, etc.:
Ploughed: Sept 14, 1955. Seed combine drilled (all at $2\frac{3}{4}$ bushels per acre): Oct 28. 'Nitro-Chalk' applied: Apr 30, 1956.
Combine harvested: Aug 31. Variety: Cappelle.

Note: seed treated with organo-mercurial fungicide only.

Standard errors per plot. Grain (at 85% dry matter):
Row: 1.94 cwt per acre or 5.7% (9 d.f.)
Column: 2.65 cwt per acre or 7.8% (9 d.f.)
Plot: 2.03 cwt per acre or 6.0% (27 d.f.)

Records were made of:
Number of wheat bulb fly larvae, weight per ear, number of grains per ear and plant number.

https://doi.org/10.23637/ERADOC-1-176

Summary of Results

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

1954 Treatments		1955 Treatments: Fallow	Seed rate: bushels per acre ⅓	1	3	Mean
		(1) (2) (3) and (4)				(± 0.97)
Seed rate: bushels per acre	Fallow	50.4	37.1	37.7	36.2	40.4
	⅓	47.7	30.8	28.4	23.3	32.6
	1	47.3	28.1	27.8	20.5	30.9
	3	47.5	31.1	26.6	23.1	32.1
Mean (±1.32)		48.2	31.8	30.1	25.8	34.0

(1) ±1.59 for use in horizontal comparisons only.
(2) ±1.31 for use in vertical comparisons only.
(3) ±1.79 for use in diagonal comparisons only.
(4) ±1.01 for use in interaction comparisons only.

Mean dry matter % as harvested: 74.9

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WINTER WHEAT

Varieties, seed rates, levels and times of application of N - Woburn, Roadpiece 1956, the 3rd year.

Design: 4 randomized blocks of 8 plots each, certain high order interactions being confounded with block differences. In addition each block contained 2 plots with no nitrogen, the variety × seed rate interaction being confounded.

Area of each plot: 0.0182 acres. Area harvested: 0.0138 acres.

Treatments: All combinations of:-
Varieties: Holdfast; Cappelle.
Seed rates: Holdfast, 1½; 3 bushels per acre.
Cappelle, 2; 4 bushels per acre.
Nitrogen: 0.5; 1.0 cwt N per acre applied as 'Nitro-Chalk'.
Time of application of N: half dressing in March and again in May; whole dressing mid March; mid April; mid May.

Basal dressing: 1 cwt per acre compound granular fertilizer (12% N, 12% P_2O_5, 15% K_2O) combine drilled with seed.

Cultivations, etc.: Ploughed: Sept 29, 1955. Combine drilled: Oct 26. March top dressing applied: Mar 8, 1956. April top dressing applied: Apr 12. All plots sprayed with DNOC at 8 lb in 90 gallons per acre: May 1. May top dressing applied: May 17. Combine harvested: Sept 13. Previous crop: Wheat.

Standard error per plot.
Grain (at 85% dry matter): 1.82 cwt per acre or 17.6% (12 d.f.)

Note (1) The experiment is a repetition on the same plots of the ones carried out in 1955 and 1954 (see "Results of the Field Experiments" 55/Ca/4 and 54/Ca/7.)

(2) The crop was severely and irregularly infested with weeds particularly twitch(Agrostis gigantea) and Mayweed (Matricaria).

(3) Records of incidence of disease (Take-all and Eyespot) and weeds and counts of plant, shoot and ear numbers were made.

https://doi.org/10.23637/ERADOC-1-176

Summary of Results

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

	T_1	T_2	T_3	T_4	Mean	
Mean (±0.65)	12.1	12.8	14.7	6.9	11.6	
		(±0.91)				
V_1	10.7	10.2	12.8	6.8	10.1	
V_2	13.5	15.5	16.5	6.9	13.1	
Difference (±1.29)	+2.8	+5.3	+3.7	+0.1	+3.0	(±0.65)
R_1	10.1	12.0	11.9	4.7	9.7	
R_2	14.0	13.7	17.5	9.0	13.6	
Difference (±1.29)	+3.9	+1.7	+5.6	+4.3	+3.9	(±0.65)
N_1	11.2	10.9	10.6	7.8	10.1	
N_2	12.9	14.8	18.7	5.9	13.1	
Difference (±1.29)	+1.7	+3.9	+8.1	-1.9	+3.0	(±0.65)

	R_1	R_2	N_0	N_1	N_2	Mean
			(±0.65)	(± 0.46)		
Mean			5.3	10.1	13.1	10.3
	(± 0.65)		(±0.91)	(± 0.65)		(±0.41)
V_1	9.0	11.2	5.1	8.7	11.6	9.1
V_2	10.3	15.9	5.5	11.6	14.6	11.6
R_1			5.3	8.4	10.9	8.8
R_2			5.3	11.8	15.3	11.9

Mean dry matter % as harvested: 78.7

Treatments

V_1 Holdfast
V_2 Cappelle

R_1, R_2 1½, 3 bushels per acre
R_1, R_2 2, 4 bushels per acre

N_0 No N
N_1 0.46 cwt N per acre
N_2 0.93 cwt N per acre

T_1 'Nitro-Chalk' half in March half in May
T_2 'Nitro-Chalk' all in mid March
T_3 'Nitro-Chalk' all in mid April
T_4 'Nitro-Chalk' all in mid May

The V × R table does not include the plots receiving no nitrogen.

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SPRING WHEAT

Rates and times of application of nitrogen - Rothamsted (R) Little Hoos and Woburn (W) Stackyard, Series C.

Design (each field): 22 treatments arranged in 4 blocks of 13 plots each, the control and 3 of the treatments occurring in every block, the other 18 treatments occurring in 2 blocks. The total amounts of N applied per block were equal.

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

Treatments: None, and all combinations of:-
Nitrogen: 0.3; 0.6; 0.9 cwt N per acre as 'Nitro-Chalk'.
Times of application: All in seed bed (S); all as early top dressing (E); all as late top dressing (L); $\frac{1}{2}$ S & $\frac{1}{2}$ E; $\frac{1}{2}$ S & $\frac{1}{2}$ L; $\frac{1}{2}$ E & $\frac{1}{2}$ L; $\frac{1}{3}$ S, $\frac{1}{3}$ E & $\frac{1}{3}$ L.

Basal dressing:
Rothamsted: 1 cwt superphosphate per acre combine drilled with seed.
Woburn: 1 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.:
Little Hoos (R). Ploughed: Oct 14, 1955 and Jan 24, 1956. Seed bed 'Nitro-Chalk' applied, seed combine drilled at $2\frac{3}{4}$ bushels per acre: Mar 17. Early 'Nitro-Chalk' top dressing applied: Apr 16. Sprayed with DNOC 6 lb in 90 gallons per acre: May 4. Late 'Nitro-Chalk' top dressing applied: May 17. Combine harvested: Sept 20. Variety: Koga II. Previous crop: Potatoes.
Stackyard (W). Ploughed: Nov 12, 1955. Seed bed 'Nitro-Chalk' applied: Mar 14, 1956. Seed combine drilled at 3 bushels per acre: Mar 16. Early 'Nitro-Chalk' top dressing applied: Apr 16. Late 'Nitro-Chalk' top dressing applied: May 16. Sprayed with MCPA, 3 pints in 20 gallons per acre: May 31. Combine harvested: Sept 12. Variety: Peko. Previous crop: Wheat.

Standard errors per plot. Grain (at 85% dry matter): cwt per acre.
Little Hoos (R): 1.87 cwt per acre or 5.7% (27 d.f.)
Stackyard (W): 1.53 cwt per acre or 7.1% (27 d.f.)

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Summary of Results

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

Rothamsted Little Hoos

N: cwt per acre	Time of application S	E	L	½S½E	½S½L	½E½L	⅓S⅓E⅓L	Mean
			(±1.41)				(±0.94)	(±0.47)
None								26.3 (1)
0.3	32.6	31.0	33.1	33.7	33.1	30.7	31.6	32.2
0.6	35.6	36.4	34.4	31.0	33.4	32.6	34.3	34.0
0.9	34.2	33.3	32.9	34.4	33.5	32.5	36.0	34.1
Mean (±0.78)	34.1	33.6	33.5	33.0	33.3	31.9	34.0 (2)	32.9

(1) ±0.94 (2) ±0.54

Mean dry matter % as harvested: 80.2

Woburn Stackyard Field

N: cwt per acre	Time of application S	E	L	½S½E	½S½L	½E½L	⅓S⅓E⅓L	Mean
			(±1.15)				(±0.77)	(±0.38)
None								11.4 (1)
0.3	19.6	18.0	18.3	19.4	18.5	20.7	20.6	19.4
0.6	23.6	21.6	20.7	24.9	24.0	22.4	25.0	23.4
0.9	23.0	22.0	22.8	25.8	25.0	23.8	25.1	24.1
Mean (±0.64)	22.1	20.5	20.6	23.4	22.5	22.3	23.5 (2)	21.5

(1) ±0.77 (2) ±0.44

Mean dry matter % as harvested: 68.0

Time of application

S In seedbed.
E Early top dressing.
L Late top dressing.

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56/Ca/6

SPRING WHEAT

Varieties and levels of nitrogen - Little Hoos 1956.

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

Area of each sub plot: 0.0101 acres. Area harvested: 0.0067 acres.

Treatments: All combinations of:
Whole plots. Varieties: Atle (1); Atson (2); Bersee (3), Koga II (4); Miana (5); Peko (6); Progress (7); Svenno (8).
Sub plots. Nitrogen: 0.3; 0.6 cwt N per acre applied as 'Nitro-Chalk'.

Basal dressing: 1 cwt superphosphate per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Oct 14, 1955 and again Jan 24, 1956. 'Nitro-Chalk' applied, seed combine drilled at 2¾ bushels per acre: Mar 19. Sprayed with DNOC at 6 lb in 90 gallons: May 4. Combine harvested: Sept 20. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.74 cwt per acre or 5.7% (14 d.f.)
Sub plot: 1.76 cwt per acre or 5.8% (16 d.f.)

Summary of Results

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

N: cwt per acre	Variety 1	2	3	4	5	6	7	8	Mean
				(±1.24)*					
0.3	29.5	32.2	24.6	33.5	25.3	34.3	30.6	28.7	29.8
0.6	29.9	33.8	26.9	33.2	26.6	33.5	31.2	32.0	30.9
Mean (±1.01)	29.7	33.0	25.8	33.4	25.9	33.9	30.9	30.3	30.4
Difference (±1.43)	+0.4	+1.6	+2.3	-0.3	+1.3	-0.8	+0.6	+3.3	+1.1 (±0.51)

*for use in comparisons other than vertical.

Mean dry matter % as harvested: 80.5

https://doi.org/10.23637/ERADOC-1-176 *pp 11*

BARLEY

Rates and times of application of nitrogen - Rothamsted (R) Little Hoos and Woburn (W) Stackyard, Series C.

Design (each field): 22 treatments arranged in 4 blocks of 13 plots each, the control and 3 treatments occurring in every block, the other 18 treatments occurring in 2 blocks. The total amounts of N applied per block were equal.

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

Treatments: None and all combinations of:-
Nitrogen: N_1; N_2; N_3 applied as 'Nitro-Chalk'.
Times of application: All in seedbed (S); all as early top dressing (E); all as late top dressing (L); $\frac{1}{2}$ S & $\frac{1}{2}$ E; $\frac{1}{2}$ S & $\frac{1}{2}$ L; $\frac{1}{2}$ E & $\frac{1}{2}$ L; $\frac{1}{3}$ S, $\frac{1}{3}$ E & $\frac{1}{3}$ L.
Where N_1; N_2; N_3 =

Little Hoos (R): 0.23; 0.46; 0.69 cwt N per acre.
Stackyard (W): 0.3; 0.6; 0.9 cwt N per acre.

Basal dressing:
Rothamsted: 1 cwt superphosphate per acre combine drilled with seed.
Woburn: Ground chalk to part area. 1 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.:
Little Hoos (R). Ploughed: Oct 14, 1955 and Jan 24, 1956. Seed combine drilled at 2 bushels per acre: Mar 17. Seed bed 'Nitro-Chalk' applied: Mar 19. Early 'Nitro-Chalk' top dressing applied: Apr 16. Sprayed with DNOC 6 lb in 90 gallons per acre: May 4. Late 'Nitro-Chalk' top dressing applied: May 17. Combine harvested: Sept 20. Variety: Herta. Previous crop. Potatoes.
Stackyard (W). Ploughed: Nov 12, 1955. Seed bed 'Nitro-Chalk' applied; seed combine drilled at 2 bushels per acre: Mar 16, 1956. Early 'Nitro-Chalk' top dressing applied: Apr 12. Late 'Nitro-Chalk' top dressing: May 16. Sprayed with MCPA, 3 pints in 20 gallons per acre: May 31. Combine harvested: Sept 8. Variety: Herta. Previous crop: Wheat.

Standard errors per plot. Grain (at 85% dry matter):
Little Hoos (R): 2.50 cwt per acre or 6.3% (27 d.f.)
Stackyard (W): 2.56 cwt per acre or 11.8% (27 d.f.)

https://doi.org/10.23637/ERADOC-1-176 *pp 12*

Summary of Results

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

Rothamsted Little Hoos

N: cwt per acre	Time of application S	E	L	½S½E	½S½L	½E½L	⅓S⅓E⅓L	Mean
			(±1.88)				(±1.25)	(±0.63)
None								32.8(1)
0.23	37.1	39.6	36.8	38.9	39.5	38.9	38.3	38.4
0.46	42.7	42.4	39.8	41.3	41.0	42.2	39.3	41.0
0.69	41.9	38.1	40.7	41.7	40.1	42.0	41.7	41.0
Mean (±1.05)	40.6	40.0	39.1	40.6	40.2	41.1	39.7(2)	39.6

(1) ±1.25 (2) ±0.72

Mean dry matter % as harvested: 79.8

Woburn Stackyard Field

N: cwt per acre	Time of application S	E	L	½S½E	½S½L	½E½L	⅓S⅓E⅓L	Mean
			(±1.93)				(±1.28)	(±0.64)
None								9.6(1)
0.3	16.4	17.2	19.0	17.7	18.5	18.9	19.8	18.4
0.6	22.2	24.9	21.4	20.8	24.4	26.2	22.4	23.1
0.9	26.7	26.8	28.6	27.0	25.6	23.2	28.1	26.8
Mean (±1.07)	21.8	23.0	23.0	21.8	22.9	22.8	23.4(2)	21.8

(1) ±1.28 (2) ±0.74

Mean dry matter % as harvested: 77.3

Time of application
- S In seedbed
- E Early top dressing
- L Late top dressing

https://doi.org/10.23637/ERADOC-1-176

SPRING OATS

Varieties and levels of nitrogen - Pastures 1956.

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

Area of each sub plot: 0.0101 acres. Area harvested: 0.0067 acres.

Treatments: All combinations of:
Whole plots. Varieties: Blenda (1); Deva (2); Flamande (3); Milford (4); Opus (5); Palu (6); Sun II (7); de Wattines (8).
Sub plots. Nitrogen: None; 0.36 cwt N per acre applied as 'Nitro-Chalk'.

Basal dressing: 4 cwt compound granular fertilizer (9% N, 9% P_2O_5, 15% K_2O) per acre.

Cultivations, etc.: Ploughed: Nov 15 - Dec 3, 1955. Basal fertilizer applied: Mar 13, 1956. 'Nitro-Chalk' applied: Mar 20. Seed drilled at 3½ bushels per acre: Mar 22. Grass seed undersown at 30 lb per acre: Apr 26. Combine harvested: Sept 15. Previous crop: Barley.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.79 cwt per acre or 7.5% (14 d.f.)
Sub plot: 1.19 cwt per acre or 5.0% (16 d.f.)

Summary of Results

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

N: cwt per acre (including basal)	Variety 1	2	3	4	5	6	7	8	Mean
				(±1.14)*					
0.36	22.9	24.2	26.9	12.9	19.1	25.6	25.4	26.5	22.9
0.72	23.6	25.6	26.9	14.1	20.2	30.2	25.3	29.9	24.5
Mean (±1.03)	23.2	24.9	26.9	13.5	19.7	27.9	25.3	28.2	23.7
Difference (±0.97)	+0.7	+1.4	0.0	+1.2	+1.1	+4.6	-0.1	+3.4	+1.6
									(±0.34)

*for use in comparisons other than vertical.

Mean dry matter % as harvested: 75.2

https://doi.org/10.23637/ERADOC-1-176 *pp 14*

SPRING BEANS

The control of Aphids (Aphis Fabae) by time of sowing and spraying - Great Knott I 1956.

Design: 4 × 4 Latin square, plots being split into 4 for the application of sprays.

Area of each sub plot: 0.0194 acres. Area harvested: 1st sowing, 0.0097; later sowings, 0.0194 acres.

Treatments. All combinations of:-
Whole plots. Times of sowing: Mar 10 (A); Apr 3 (B); Apr 24 (C); May 15 (D).
Sub plots. Spray: None; June 22; July 11; June 22 and July 11.

The insecticide spray was Metasystox, 12 oz. in 80 gallons per acre.

Basal dressing: 7 cwt compound granular fertilizer (10% P_2O_5, 20% K_2O) per acre.

Cultivations, etc.: Ploughed: Nov 26, 1955 and Jan 18, 1956. Basal fertilizer applied: Mar 6. Seed drilled at 200 lb per acre: Mar 10, Apr 3, Apr 24, May 15. Sprayed with miscible DDT: June 2. Sprayed with Metasystox, early application: June 22. Late spray application: July 11. Combine harvested: A - Oct 5; B & C - Oct 15; D - Oct 29. Variety: Spring Tick. Previous crop: Barley.

Standard errors per plot. Grain (at 85% dry matter):
Whole plot: 1.08 cwt per acre or 4.8% (6 d.f.)
Sub plot: 1.24 cwt per acre or 5.4% (36 d.f.)

Note: Counts of aphids were made at weekly intervals from early June to end of September: the infestation was very light on all plots.

Summary of Results

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

Time of Spraying	Time of Sowing Mar 10	Apr 3	Apr 24	May 15	Mean
	(1) & (2)				(± 0.31)
None	26.7	26.9	20.9	13.7	22.1
June 22	28.5	29.5	21.6	13.9	23.4
July 11	27.6	28.9	22.1	12.9	22.9
June 22 and July 11	26.1	28.3	20.7	14.7	22.4
Mean (±0.54)	27.2	28.4	21.3	13.8	22.7

(1) ±0.62 for use in vertical and interaction comparisons.
(2) ±0.76 for use in horizontal and diagonal comparisons.

Mean dry matter % as harvested	72.3	70.9	54.6	43.1	60.2

https://doi.org/10.23637/ERADOC-1-176 *pp 15*

56/Cd/2.1

SPRING BEANS

Control of weeds by spraying and cultivations - Great Field 1 1956.

Design: 4 randomized blocks of 7 plots each, 2 blocks being sprayed and 2 unsprayed.

Area of each plot: 0.0194 acres. Area harvested: 0.0139 acres.

Treatments: All combinations of:-
Spraying (on blocks): None; DNBP 5 pints in 80 gallons per acre.
Treatment cultivations:

	Additional cultivations	
With inter-row cultivations	None	(1)
	Harrowed once	(2)
	Harrowed three times	(3)
	Mechanical weeder once	(4)
	Mechanical weeder three times	(5)
Without inter-row cultivations	Harrowed as required	(6)
	Mechanical weeder as required	(7)

Basal dressing: 6 cwt compound granular fertilizer (10% P_2O_5, 20% K_2O) per acre.

Cultivations, etc.: Ploughed: Nov 15, 1955. Basal fertilizer applied: Mar 13, 1956. Seed drilled at 200 lb per acre: Mar 14.
Appropriate blocks sprayed with DNBP, 5 pints in 80 gallons per acre: May 7. Inter-row cultivated: Treatments (2), (3), (4), (5) - May 23, (1) - June 6. Combine harvested: Oct 12. Variety: Spring Tick.
Previous crop: Barley.
Additional treatment cultivations:
(2) and (4): Apr 27.
(3), (5) and (6): Apr 27, May 4, May 9.
(7): Apr 27, May 4 (twice), May 9.

Standard error per plot:
Grain (at 85% dry matter): 1.52 cwt per acre or 7.1% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-176

Summary of Results

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

Spray	Treatment cultivations 1	2	3	4	5	6	7	Mean
				(±1.07)*				
None	21.3	20.6	18.8	17.9	20.7	21.1	19.1	19.9
DNBP	20.6	23.2	23.2	25.0	22.7	22.5	21.7	22.7
Mean (±0.76)	21.0	21.9	21.0	21.4	21.7	21.8	20.4	21.3
Diff. (±1.52)+	-0.7	+2.6	+4.4	+7.1	+2.0	+1.4	+2.6	+2.8

*for use in horizontal comparisons only.

+for use in the comparison of two differences only.

Mean dry matter % as harvested: 73.9

Treatment cultivations:

(1) None — With inter-row cultivations
(2) Harrowed once — " " " " "
(3) Harrowed three times — " " " " "
(4) Mechanical weeder once — " " " " "
(5) Mechanical weeder three times — " " " " "
(6) Harrowed as required — Without inter-row cultivations
(7) Mechanical weeder as required — " " " " " "

https://doi.org/10.23637/ERADOC-1-176 *pp 17*

SPRING BEANS

Flower drop - hormone sprays - Great Field I 1956.

Design: 4 randomized blocks of 6 plots each.

Area of each plot: 0.0064 acres. Area harvested: 0.0046 acres.

Treatments: Hormone sprays
None (2 plots per block) (0)
2; 4 applications of 4-chlorophenoxyacetic acid (1) & (2)
2; 4 applications of ∝(2, 4, 5 trichlorophenoxy) propionic acid (3) & (4)

The sprays were applied at a concentration of 5 p.p.m.

Basal dressing: 6 cwt compound granular fertilizer (10% P_2O_5, 20% K_2O) per acre.

Cultivations, etc.: Ploughed: Nov 10 - 15, 1955. Basal fertilizer applied: Mar 13, 1956. Seed drilled at 200 lb per acre: Mar 14. All plots (except control) sprayed with hormone sprays at approx. 150 gallons followed by 250 gallons per acre: June 18 and June 25. Appropriate plots sprayed again with hormone sprays at 350 gallons per acre: July 4 and July 10. Combine harvested: Oct 12. Variety: Spring Tick. Previous crop: Barley.

Standard error per plot:
Grain (at 85% dry matter): 1.61 cwt per acre or 6.6% (16 d.f.)

Note: Counts of numbers of pods were made.

Summary of Results

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

	Treatment 0	1	2	3	4	Mean
Mean (±0.80)	24.4 (1)	25.7	27.0	23.0	22.7	24.5
Increase (±0.99)		+1.3	+2.6	-1.4	-1.7	

(1) ±0.57

Mean dry matter % as harvested: 72.7

https://doi.org/10.23637/ERADOC-1-176

BEANS

Time of sowing, spraying, P and K - Rothamsted (R) Great Harpenden II and Woburn (W) Broadmead I 1956.

Design: 3 blocks of 4 whole plots each split into 3, with spraying on pairs of whole-plots and PK partially confounded.

Area of each sub-plot: Rothamsted, 0.0283 acres; Woburn, 0.0337 acres.
Area harvested: Rothamsted, 0.0088 acres; Woburn, 0.0105 acres.

Treatments. All combinations of:
Time of sowing: Autumn; spring.
Spray: None; "Metasystox" at 2 pints in 80 gallons per acre.
Phosphate: None; 0.5; 1.0 cwt P_2O_5 per acre as superphosphate.
Potash: None; 1.0; 2.0 cwt K_2O per acre as muriate of potash.

Basal dressing: None.

Note. At Woburn the autumn sown beans failed because of bird damage.

Cultivations, etc.:
Rothamsted. Ploughed: Oct 3, 1955. Fertilizers applied for autumn beans, seed drilled at 300 lb per acre: Oct 18. Fertilizers applied for spring beans: Mar 7, 1956. Spring beans sown at 200 lb per acre: Mar 10. Appropriate plots sprayed: June 23. Combine harvested: Oct 4. Previous crop: Barley.
Woburn. Ploughed: Oct 21, 1955. Fertilizers applied for winter beans: Nov 1. Ground chalk at 18 cwt per acre applied: Nov 14. Seed drilled at 275 lb per acre: Nov 15. Fertilizers applied for spring beans: Mar 20, 1956. Seed drilled at 200 lb per acre: Mar 22. Appropriate plots sprayed: June 26. Combine harvested: Oct 23. Variety: Winter-S.Q.Giant, Spring-Albyn.

Standard errors per plot. Grain (at 85% dry matter): cwt per acre.

Great Harpenden II (R),	whole plot:	3.06 cwt per acre or 17.3%	(4 d.f.)
	sub plot:	2.59 cwt per acre or 14.6%	(12 d.f.)
Broadmead I (W), Spring beans	sub plot:	2.28 cwt per acre or 13.7%	(4 d.f.)

https://doi.org/10.23637/ERADOC-1-176

178

56/Cd/4.2

Summary of Results

Great Harpenden II (Rothamsted)

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

	Sown Autumn	Sown Spring	Difference	P_2O_5: cwt per acre None	0.5	1.0	K_2O: cwt per acre None	1.0	2.0	Mean
					(± 1.06)*			(± 1.06)*		
Spray										
None	17.9	16.1	-1.8	17.5	17.6	15.8	15.7	17.6	17.7	17.0
Metasystox	19.0	17.8	-1.2	17.9	18.8	18.5	15.6	20.6	19.0	18.4
Difference	+1.1	+1.7	+0.6	+0.4	+1.2	+2.7	-0.1	+3.0	+1.3	+1.4
			(± 3.53)		(± 1.49)**			(± 1.49)**		
					(1) & (2)			(1) & (2)		
Sown										
Autumn				17.8	19.6	17.8	15.0	20.4	19.9	18.4
Spring				17.6	16.8	16.5	16.3	17.8	16.8	17.0
Mean				17.7	18.2	17.2	15.7	19.1	18.3	17.7
					(± 0.75)			(± 0.75)		
Difference				-0.2	-2.8	-1.3	+1.3	-2.6	-3.1	-1.4
(± 2.15)										(± 1.77)

Mean dry matter % as harvested: 72.2

*For use in horizontal comparisons only

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

(1) ±1.52 for use in diagonal comparisons only
(2) ±1.06 for use in horizontal comparisons only

56/Cd/4.3

Broadmead I (Woburn)

Spring beans

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

Spray	P_2O_5: cwt per acre None	0.5	1.0	K_2O: cwt per acre None	1.0	2.0	Mean
	(± 1.32)*			(± 1.32)*			
None	15.4	15.7	15.0	10.9	15.4	19.9	15.4
Metasystox	20.6	17.5	15.6	14.0	17.0	22.7	17.9
Mean (±0.93)	18.0	16.6	15.3	12.5	16.2	21.3	16.7
Difference (±1.86)**	5.2	1.8	0.6	3.1	1.6	2.8	2.5

*For use in horizontal comparisons only

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

Mean dry matter % as harvested: 66.5

https://doi.org/10.23637/ERADOC-1-176 *pp 21*

POTATOES

Placement of nitrogen and potash - West Barnfield I 1956.

Design: 4 randomized blocks of 18 plots each.

Area of each plot: 0.0140 acres. Area harvested: 0.0057 acres.

Treatments: None (2 plots per block) and all combinations of:-
Nitrogen: 0.5; 1.0 cwt N per acre as sulphate of ammonia.
Potash: 0.75; 1.5 cwt K_2O per acre as sulphate of potash.
Methods of placement: Broadcast on flat before planting; Fertilizer placed 3" to side and 1" below seed at planting.

Basal dressing: 1.0 cwt P_2O_5 per acre as superphosphate placement drilled.

Cultivations, etc.: Ploughed: Nov 1, 1955. Broadcast fertilizers applied: Apr 11, 1956. Potatoes machine planted with placed fertilizers: Apr 12. Earthed up: June 28. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 24. Sprayed again at 5 lb in 90 gallons per acre: Aug 25. Sprayed with sulphuric acid, 20% B.O.V.: Sept 14. Lifted: Oct 16 - 20. Variety: King Edward. Previous crop: Wheat.

Standard error per plot:
Total tubers: 0.750 tons per acre or 6.4% (52 d.f.)

Summary of Results

Total tubers: tons per acre

K_2O: cwt per acre	N: cwt per acre				Mean
	Broadcast		Placed		
	0.5	1.0	0.5	1.0	
	(± 0.375)				(± 0.187)
Broadcast					
0.75	10.28	12.55	9.94	10.81	10.90
1.5	12.06	14.34	11.82	12.86	12.77
Placed					
0.75	11.68	12.98	12.23	12.43	12.33
1.5	12.77	14.48	13.48	14.32	13.76
Mean (±0.187)	11.70	13.59	11.87	12.61	12.44 (±0.094)
No N or K_2O					6.72 (±0.265)
General mean					11.80

https://doi.org/10.23637/ERADOC-1-176

POTATOES

Control of virus spread by insecticide - Great Knott III 1956.

Design: 5 × 5 Latin square.

Area of each plot: 0.0602 acres. Area harvested: 0.0120 acres.

Treatments: No insecticide; high; low volume spraying of DDT emulsion, 2 lb active ingredient per acre per application.
High volume: 80 gallons per acre. 4; 6 times applied during season.
Low volume: 25 gallons per acre. 4; 6 times applied during season.

Infector plants: 6 leaf roll and 6 virus Y infected plants planted in each plot.

Note: The tractor used for spraying was driven over all plots on each occasion always passing over the same rows. Yields were taken from the undamaged rows and an estimate of the loss of the yield due to tractor damage was made from an area of 0.0602 acres.

Basal dressing per acre: 8 tons dung; $10\frac{1}{2}$ cwt compound granular fertilizer (9% N, 9% P_2O_5, 15% K_2O).

Cultivations, etc.: Dung applied: Sept 24, 1955. Ploughed: Sept 26. Basal fertilizers applied on the flat: Apr 4, 1956. Potatoes machine planted: Apr 7 - 10. Earthed up: June 26. Sprayed with copper fungicide, 3 lb in 80 gallons per acre: Aug 8. Sprayed with sulphuric acid, 20% BOV: Sept 13. Lifted: Oct 23 - 24. Variety: Majestic. Previous crop: Wheat.

Dates of DDT sprayings (both high and low volume):
4 times: June 14; June 26; July 12; Aug 8.
6 times: May 30 and Aug 29 in addition to above dates.

Standard error per plot:
Total tubers: 1.25 tons per acre or 8.9% (12 d.f.)

Note: Aphid counts were made and tuber samples taken to assess virus spread.

https://doi.org/10.23637/ERADOC-1-176

Summary of Results

	Number of sprayings with DDT					
		High volume		Low volume		
	None	4	6	4	6	Mean
Total tubers: tons per acre						
Mean (±0.559)	13.35	13.97	14.62	14.41	13.63	14.00
Increase (±0.791)		+0.62	+1.27	+1.06	+0.28	
Percentage ware ($1\frac{1}{2}$" riddle)						
Mean	76.2	80.4	75.1	79.1	78.8	77.9
Increase		+4.2	-1.1	+2.9	+2.6	

Estimated loss of yield in damaged rows due to

6 passages of the tractor: 6.4%

Estimated loss of yield in whole crop due to

6 passages of the tractor along 4 rows out of 8: 3.2%

https://doi.org/10.23637/ERADOC-1-176

56/Ce/3.1

POTATOES

The control of blight by copper and sulphuric sprays - Great Knott III. 1956.

Design: 4 × 4 Latin square, plots being split into 2 for determination of the effect of tractor damage.

Area of each sub plot: 0.0140 acres.

Treatments:

Whole Plots: No spray; copper fungicide sprayed twice; sulphuric acid, sprayed to destroy haulm; copper fungicide and sulphuric acid sprayed as above. The tractor used for spraying was driven over all the plots on each occasion.

Sub plots: 4 rows damaged by two passages of the tractor during copper spray operations were compared with 4 undamaged rows.

Basal dressing per acre: 8 tons dung; $10\frac{1}{2}$ cwt compound granular fertilizer (9% N, 9% P_2O_5, 15% K_2O).

Cultivations, etc.: Dung applied, ploughed in: Sept 28, 1955. Basal fertilizer applied on flat: Apr 4, 1956. Potatoes machine planted: Apr 5 - 6. Earthed up: June 25. Fungicide treatment 3 lb in 80 gallons per acre applied: Aug 15 and again at 5 lb in 90 gallons per acre: Aug 25. Sprayed with sulphuric acid 20% B.O.V., 80 gallons per acre: Sept 17. Lifted: Oct 22. Previous crop: Wheat.

Standard errors per plot: Total tubers.
Whole plot: 0.938 tons per acre or 6.0% (6 d.f.)
Sub plot: 0.801 tons per acre or 5.1% (12 d.f.)

Note: Estimates were made of the rate of bulking, destruction of foliage by blight, amount of blight on the tubers.

https://doi.org/10.23637/ERADOC-1-176

Summary of Results

	Spray				
	None	Copper fungicide	Sulphuric acid	Copper fungicide and sulphuric acid	Mean
Total tubers: tons per acre					
		(±0.548)*			
Undamaged rows	14.65	18.26	14.73	16.79	16.11
Damaged rows	14.10	16.12	14.46	16.57	15.31
Mean (±0.469)	14.38	17.19	14.60	16.68	15.71
Difference (±0.566)	-0.55	-2.14	-0.27	-0.22	-0.80 (±0.283)
Percentage ware (1½" riddle)					
Undamaged rows	87.5	85.9	87.2	88.6	87.3
Damaged rows	85.6	86.0	84.6	88.8	86.2
Mean	86.6	85.9	85.9	88.7	86.8
Difference	-1.9	+0.1	-2.6	+0.2	-1.1

*For use in comparisons other than vertical.

https://doi.org/10.23637/ERADOC-1-176

POTATOES

Dung, N, P and K - Rothamsted (R) Great Field II and Woburn (W) Butt Close 1956.

Design (each field): 4 randomized blocks of 16 plots each, a high order interaction being confounded with block differences.

Area of each plot: 0.0200 acres. Area harvested: 0.0133 acres.

Treatments: All combinations of:-
Dung: None; 5; 10; 20 tons per acre ploughed in.
N: None; 0.9 cwt N per acre as sulphate of ammonia.
P: None; 0.75 cwt P_2O_5 per acre as superphosphate.
K: None; 1.5 cwt K_2O per acre as muriate of potash.

Basal dressing: None

Cultivations, etc.:
Great Field II (R).
Ploughed: Nov 12, 1955. Dung applied, ploughed: Apr 9, 1956. Fertilizers applied: Apr 20. Potatoes machine planted: Apr 23. Earthed up: June 30. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 24. Sprayed again at 3 lb in 80 gallons: Aug 14. Sprayed with sulphuric acid, 20% BOV, 80 gallons per acre: Sept 24. Lifted: Oct 15 - 16. Variety: Majestic. Previous crop: Wheat.
Butt Close (W).
Ploughed: Nov 9, 1955. Dung applied: Apr 17 - 18, 1956. Ploughed: Apr 19. Fertilizers applied: Apr 20. Potatoes machine planted: Apr 23. Earthed up: June 21. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 23. Sprayed with sodium arsenite, 1 gallon in 40 gallons per acre: Sept 1. Lifted: Oct 1. Variety: Majestic. Previous crop: Barley.

Standard errors per plot. Total tubers: tons per acre.
Great Field II (R): 0.960 tons per acre or 6.6% (29 d.f.)
Butt Close (W): 1.47 tons per acre or 13.1% (30 d.f.)

Notes:
Great Field II (R). The yields of total tubers were adjusted to allow for tractor damage to some of the rows during spraying.
Butt Close (W). The crop was infested by potato root eelworm (Heterodera Rostochiensis), the symptoms being more severe on the plots receiving no dung or 5 tons per acre. No adjustment was made.

https://doi.org/10.23637/ERADOC-1-176 *pp 27*

Summary of Results

Total tubers: tons per acre

	Dung: tons per acre None	5	10	20	Mean
Great Field (Rothamsted)					
Mean (±0.240)	12.62	14.20	15.43	15.89	14.54
		(±0.339)			
N: cwt per acre					
None	11.77	13.09	14.69	15.51	13.76
0.9	13.48	15.33	16.17	16.27	15.31
Difference (±0.480)	+1.71	+2.24	+1.48	+0.76	+1.55 (±0.240)
P_2O_5: cwt per acre					
None	11.33	13.01	14.41	14.84	13.40
0.75	13.91	15.41	16.46	16.95	15.68
Difference (±0.480)	+2.58	+2.40	+2.05	+2.11	+2.28 (±0.240)
K_2O: cwt per acre					
None	11.88	13.39	14.92	15.72	13.98
1.5	13.37	15.03	15.94	16.06	15.10
Difference (±0.480)	+1.49	+1.64	+1.02	+0.34	+1.12 (±0.240)
Butt Close (Woburn)					
Mean (±0.368)	9.33	10.50	11.59	13.60	11.25
		(±0.520)			
N: cwt per acre					
None	6.25	6.98	8.28	11.80	8.33
0.9	12.40	14.02	14.90	15.40	14.18
Difference (±0.736)	+6.15	+7.04	+6.62	+3.60	+5.85 (±0.368)
P_2O_5: cwt per acre					
None	9.02	10.28	11.52	13.63	11.11
0.75	9.64	10.72	11.66	13.57	11.40
Difference (±0.736)	+0.62	+0.44	+0.14	-0.06	+0.29 (±0.368)
K_2O: cwt per acre					
None	8.75	10.95	11.62	14.17	11.37
1.5	9.90	10.05	11.56	13.04	11.14
Difference (±0.736)	+1.15	-0.90	-0.06	-1.13	-0.23 (±0.368)

https://doi.org/10.23637/ERADOC-1-176 *pp 28*

Percentage Ware

	Dung: tons per acre None	5	10	20	Mean
Great Field (Rothamsted)(1)					
Mean	88.7	88.6	84.9	86.3	87.1
N: cwt per acre					
None	89.2	90.0	86.5	89.7	88.8
0.9	88.3	87.2	83.3	82.9	85.4
Difference	-0.9	-2.8	-3.2	-6.8	-3.4
P_2O_5: cwt per acre					
None	89.6	88.8	86.7	87.0	88.0
0.75	87.8	88.4	83.0	85.6	86.2
Difference	-1.8	-0.4	-3.7	-1.4	-1.8
K_2O: cwt per acre					
None	88.5	88.3	85.0	86.4	87.1
1.5	88.9	88.8	84.7	86.2	87.2
Difference	+0.4	+0.5	-0.3	-0.2	+0.1
Butt Close (Woburn)(2)					
Mean	69.1	76.7	79.4	82.9	77.0
N: cwt per acre					
None	58.5	66.8	72.7	79.2	69.3
0.9	79.6	86.6	86.1	86.6	84.7
Difference	+21.1	+19.8	+13.4	+7.4	+15.4
P_2O_5: cwt per acre					
None	70.1	75.5	79.3	82.9	76.9
0.75	68.1	77.9	79.5	82.9	77.1
Difference	-2.0	+2.4	+0.2	0.0	+0.2
K_2O: cwt per acre					
None	67.5	77.1	77.6	82.1	76.1
1.5	70.7	76.3	81.3	83.7	78.0
Difference	+3.2	-0.8	+3.7	+1.6	+1.9

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

https://doi.org/10.23637/ERADOC-1-176

Total tubers: tons per acre

Response to	Responses to treatments cwt per acre N None	N 0.9	P_2O_5 None	P_2O_5 0.75	K_2O None	K_2O 1.5
Great Field (Rothamsted)			(± 0.339)			
N	-	-	+0.72	+2.38	+1.50	+1.60
P_2O_5	+1.45	+3.11	-	-	+1.80	+2.76
K_2O	+1.07	+1.17	+0.64	+1.60	-	-
Butt Close (Woburn)			(± 0.520)			
N	-	-	+5.88	+5.82	+5.49	+6.21
P_2O_5	+0.32	+0.26	-	-	+1.15	-0.57
K_2O	-0.60	+0.12	+0.62	-1.10	-	-

Percentage Ware

Response to	Responses to treatments cwt per acre N None	N 0.9	P_2O_5 None	P_2O_5 0.75	K_2O None	K_2O 1.5
Great Field (Rothamsted)(1)						
N	-	-	-1.9	-4.9	-3.9	-2.9
P_2O_5	-0.3	-3.3	-	-	-2.2	-1.4
K_2O	-0.4	+0.6	-0.3	+0.5	-	-
Butt Close (Woburn)(2)						
N	-	-	+17.0	+13.8	+16.5	+14.3
P_2O_5	+1.8	-1.4	-	-	+ 2.2	- 1.8
K_2O	+3.1	+0.9	+ 4.0	0.0	-	-

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

https://doi.org/10.23637/ERADOC-1-176

POTATOES

Control of skin spot (Cospora pustulans) by fungicides - Great Knott III 1956.

Design: 3 randomized blocks of 15 plots each.

Area of each plot: 0.0140 acres. Area harvested: 0.0070 acres.

Treatments:
None (3 plots per block).
PCNB, 20% Parachloronitro benzene dust applied: to seed at 3 oz. per cwt (S); to furrows before planting at 300 lb per acre (F); (S) and (F).
Calomel, 4% dust applied: to seed at 12 oz. per cwt (S); to furrows before planting at 100 lb per acre (F); (S) and (F).
Nomersan, 10% Thiram dust applied: to seed at 3 oz. per cwt (S); to furrows before planting at 100 lb per acre (F); (S) and (F).
Griseofulvin applied: to seed as 50% glycerol paste at 0.6 g. per tuber (S); to furrows before planting as 0.4% suspension at 100 gallons per acre (F); to foliage as 0.04% suspension at 50 gallons per acre (L).

Basal dressing: 8 tons dung per acre ploughed in; 10½ cwt compound granular fertilizer (9% N, 9% P_2O_5, 15% K_2O) per acre before ridging.

Cultivations, etc.: Dung applied, ploughed in: Sept 28, 1955. Basal fertilizer applied on flat: Apr 4, 1956. Ridged: Apr 16. Potatoes hand planted: Apr 17. Earthed up: June 29. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 23. Sprayed again at 3 lb in 80 gallons per acre: Aug 15. Sprayed with sulphuric acid, 20% BOV, 80 gallons per acre: Sept 12. Lifted: Oct 9. Variety: Majestic. Previous crop: Wheat.

Standard error per plot:
Total tubers: 1.12 tons per acre or 7.5% (30 d.f.)

Note: Emergence counts and records of incidence of root browning and skin spot (Oospora pustulans), black scurf and stem canker (Corticium solani) and common scab (Actinomyces scabies) were made.

https://doi.org/10.23637/ERADOC-1-176 *pp 31*

Summary of Results

Method of Application	Fungicide None	P	C	N	A	Mean
Total tubers: tons per acre						
			(± 0.649)			(± 0.324)
S		13.67	14.73	15.31	12.95	14.16
F		14.31	16.77	14.97	16.07	15.53 (1)
SF		14.69	14.97	14.50		14.72 (2)
L					15.48	15.48
Mean (±0.375)	15.11	14.22	15.49	14.92	14.83	14.92

(1) ±0.375 (2) ±0.649

Percentage ware ($1\frac{1}{2}$" riddle)						
S		88.1	84.1	91.4	80.5	86.0
F		85.3	87.2	86.2	88.0	86.7
SF		90.1	85.9	86.5		87.5
L					87.5	87.5
Mean	86.2	87.9	85.7	88.0	85.3	86.6

Fungicide

P = PCNB (Parachloronitro benzene) 20% dust.
C = Calomel 4% dust.
N = Nomersan 10% thiram dust.
A = Griseofulvin.

Methods of application

S = Seed treated.
F = Applied to furrows before planting.
L = Applied as spray to foliage.

https://doi.org/10.23637/ERADOC-1-176 pp 32

SUGAR BEET

Dung, N, P, K and Salt - Rothamsted (R) Great Field II and Woburn (W) Butt Close 1956.

Design (each field): 4 randomized blocks of 16 plots each, certain high order interactions being confounded with block differences.

Area of each plot: Rothamsted, 0.0158 acres; Woburn, 0.0167 acres.
Area harvested: Rothamsted, 0.0106 acres; Woburn, 0.0110 acres.

Treatments. All combinations of:
Dung: None; 5; 10; 20 tons per acre ploughed in.
N: None; 0.9 cwt N per acre as sulphate of ammonia.
P: None; 0.75 cwt P_2O_5 per acre as superphosphate.
K: None; 1.5 cwt K_2O per acre as muriate of potash.
Salt: None; 5 cwt per acre agricultural salt.

Basal dressing:
Rothamsted: Ground chalk at various rates to bring plots to uniform pH.
Woburn: Ground chalk at 10 cwt per acre.

Cultivations, etc.:
Great Field (R). Ploughed: Nov 12, 1955. Salt applied: Apr 5, 1956. Dung applied, all plots ploughed: Apr 9. Ground chalk applied: Apr 11. Fertilizers applied, seed drilled at 18 lb per acre: Apr 20. Singled: June 13 - 16. Lifted: Dec 12 - 19. Variety: Klein E. Previous crop: Wheat.
Butt Close (W). Ploughed: Nov 9, 1955. Salt applied: Apr 11, 1956. Dung applied, all plots ploughed: Apr 18 - 19. Ground chalk applied: Apr 19. Fertilizers applied: Apr 23. Seed drilled at 12 lb per acre: Apr 26. Sprayed with parathion, $\frac{1}{2}$ pint in 40 gallons per acre: May 25. Singled: June 11 - 14. Lifted: Nov 21 - 23. Variety: Klein E. Previous crop: Wheat.

Standard errors per plot.
Great Field (R). Total sugar, 4.50 cwt per acre or 9.7% (32 d.f.)
Butt Close (W). Total sugar, 6.27 cwt per acre or 12.0% (32 d.f.)
Great Field (R). Tops, 2.46 tons per acre or 10.0% (32 d.f.)
Butt Close (W). Tops, 1.12 tons per acre or 10.9% (32 d.f.)

https://doi.org/10.23637/ERADOC-1-176

Summary of Results

Roots (washed): tons per acre

	Dung: tons per acre None	5	10	20	Mean
Great Field II (Rothamsted)					
Mean	12.58	14.29	15.59	15.98	14.61
N: cwt per acre					
None	12.72	13.90	15.28	16.03	14.48
0.9	12.44	14.69	15.89	15.93	14.74
Difference	-0.28	+0.79	+0.61	-0.10	+0.26
P_2O_5: cwt per acre					
None	10.59	12.43	14.73	14.54	13.08
0.75	14.56	16.15	16.44	17.42	16.14
Difference	+3.97	+3.72	+1.71	+2.88	+3.06
K_2O: cwt per acre					
None	12.44	13.60	15.73	15.78	14.39
1.5	12.71	14.98	15.44	16.18	14.83
Difference	+0.27	+1.38	-0.29	+0.40	+0.44
Salt: cwt per acre					
None	12.28	13.46	14.87	15.50	14.03
5.0	12.87	15.13	16.30	16.47	15.19
Difference	+0.59	+1.67	+1.43	+0.97	+1.16
Butt Close (Woburn)					
Mean	12.65	14.60	14.89	15.82	14.49
N: cwt per acre					
None	10.19	13.13	13.36	14.80	12.87
0.9	15.11	16.07	16.41	16.84	16.11
Difference	+4.92	+2.94	+3.05	+2.04	+3.24
P_2O_5: cwt per acre					
None	12.47	13.88	14.87	16.13	14.33
0.75	12.84	15.33	14.91	15.51	14.65
Difference	+0.37	+1.45	+0.04	-0.62	+0.32
K_2O: cwt per acre					
None	12.42	13.31	14.99	15.52	14.06
1.5	12.88	15.90	14.78	16.12	14.92
Difference	+0.46	+2.59	-0.21	+0.60	+0.86
Salt: cwt per acre					
None	11.84	12.97	14.38	15.23	13.60
5.0	13.46	16.24	15.40	16.41	15.38
Difference	+1.62	+3.27	+1.02	+1.18	+1.78

https://doi.org/10.23637/ERADOC-1-176

Sugar percentage

	Dung: tons per acre None	5	10	20	Mean
	Great Field II (Rothamsted)				
Mean	15.9	16.1	15.8	15.9	16.0
N: cwt per acre					
None	16.2	16.5	16.2	16.2	16.3
0.9	15.6	15.7	15.4	15.7	15.6
Difference	-0.6	-0.8	-0.8	-0.5	-0.7
P_2O_5: cwt per acre					
None	15.8	16.2	15.9	16.0	16.0
0.75	16.0	16.0	15.7	15.9	15.9
Difference	+0.2	-0.2	-0.2	-0.1	-0.1
K_2O: cwt per acre					
None	15.9	16.2	15.9	15.8	15.9
1.5	16.0	16.1	15.8	16.0	16.0
Difference	+0.1	-0.1	-0.1	+0.2	+0.1
Salt: cwt per acre					
None	16.0	16.0	15.7	16.0	15.9
5.0	15.8	16.3	15.9	15.8	16.0
Difference	-0.2	+0.3	+0.2	-0.2	+0.1
	Butt Close (Woburn)				
Mean	18.1	18.2	18.0	17.9	18.1
N: cwt per acre					
None	18.0	18.2	18.2	18.2	18.2
0.9	18.1	18.2	17.9	17.6	17.9
Difference	+0.1	0.0	-0.3	-0.6	-0.3
P_2O_5: cwt per acre					
None	18.2	18.3	18.0	18.0	18.1
0.75	17.9	18.1	18.0	17.9	18.0
Difference	-0.3	-0.2	0.0	-0.1	-0.1
K_2O: cwt per acre					
None	18.0	18.1	17.9	18.2	18.0
1.5	18.2	18.3	18.1	17.6	18.1
Difference	+0.2	+0.2	+0.2	-0.6	+0.1
Salt: cwt per acre					
None	18.3	18.2	18.0	18.0	18.1
5.0	17.9	18.2	18.0	17.8	18.0
Difference	-0.4	0.0	0.0	-0.2	-0 1

https://doi.org/10.23637/ERADOC-1-176

Total sugar: cwt per acre

	Dung: tons per acre None	5	10	20	Mean
Great Field II (Rothamsted)					
Mean	40.2	46.1	49.3 (± 1.59)	50.9	46.6
N: cwt per acre					
None	41.4	46.1	49.6	51.8	47.2
0.9	39.0	46.1	48.9	50.1	46.0
Difference (±2.25)	-2.4	0.0	-0.7	-1.7	-1.2 (± 1.12)
P_2O_5: cwt per acre					
None	33.7	40.4	47.0	46.4	41.9
0.75	46.7	51.8	51.6	55.5	51.4
Difference (±2.25)	+13.0	+11.4	+4.6	+9.1	+9.5 (± 1.12)
K_2O: cwt per acre					
None	39.6	44.0	49.9	50.0	45.9
1.5	40.8	48.1	48.7	51.8	47.4
Difference (±2.25)	+1.2	+4.1	-1.2	+1.8	+1.5 (± 1.12)
Salt: cwt per acre					
None	39.5	43.0	46.6	49.7	44.7
5.0	40.9	49.2	51.9	52.2	48.5
Difference (±2.25)	+1.4	+6.2	+5.3	+2.5	+3.8 (± 1.12)
Butt Close (Woburn)					
Mean	45.7	53.2	53.6 (± 2.22)	56.6	52.3
N: cwt per acre					
None	36.7	47.9	48.6	54.0	46.8
0.9	54.8	58.5	58.7	59.2	57.8
Difference (±3.14)	+18.1	+10.6	+10.1	+5.2	+11.0 (± 1.57)
P_2O_5: cwt per acre					
None	45.4	50.8	53.5	57.8	51.9
0.75	46.1	55.6	53.7	55.4	52.7
Difference (±3.14)	+0.7	+4.8	+0.2	-2.4	+0.8 (± 1.57)
K_2O: cwt per acre					
None	44.8	48.1	53.6	56.4	50.7
1.5	46.7	58.3	53.6	56.7	53.8
Difference (±3.14)	+1.9	+10.2	0.0	+0.3	+3.1 (± 1.57)
Salt: cwt per acre					
None	43.2	47.1	51.9	54.8	49.3
5.0	48.3	59.3	55.3	58.4	55.3
Difference (±3.14)	+5.1	+12.2	+3.4	+3.6	+6.0 (± 1.57)

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Tops: tons per acre

	Dung: tons per acre None	5	10	20	Mean
Great Field II (Rothamsted)					
Mean	21.52	23.71	24.84 (± 0.869)	28.52	24.65
N: cwt per acre					
None	20.34	21.05	22.99	26.57	22.74
0.9	22.69	26.37	26.69	30.48	26.56
Difference (±1.229)	+2.35	+5.32	+3.70	+3.91	+3.82 (± 0.614)
P_2O_5: cwt per acre					
None	19.07	21.93	23.80	27.32	23.03
0.75	23.96	25.49	25.88	29.73	26.27
Difference (±1.229)	+4.89	+3.56	+2.08	+2.41	+3.24 (± 0.614)
K_2O: cwt per acre					
None	21.02	22.84	24.32	28.57	24.19
1.5	22.02	24.57	25.36	28.47	25.11
Difference (±1.229)	+1.00	+1.73	+1.04	-0.10	+0.92 (± 0.614)
Salt: cwt per acre					
None	20.96	21.17	23.11	27.33	23.14
5.0	22.08	26.25	26.57	29.72	26.15
Difference (±1.229)	+1.12	+5.08	+3.46	+2.39	+3.01 (± 0.614)
Butt Close (Woburn)					
Mean	9.43	9.89	10.50 (± 0.398)	11.44	10.32
N: cwt per acre					
None	7.27	8.30	8.81	9.74	8.53
0.9	11.60	11.49	12.18	13.13	12.10
Difference (±0.562)	+4.33	+3.19	+3.37	+3.39	+3.57 (± 0.281)
P_2O_5: cwt per acre					
None	9.05	9.72	10.68	11.56	10.25
0.75	9.82	10.07	10.31	11.32	10.38
Difference (±0.562)	+0.77	+0.35	-0.37	-0.24	+0.13 (± 0.281)
K_2O: cwt per acre					
None	9.70	9.56	10.58	11.21	10.26
1.5	9.16	10.23	10.42	11.66	10.37
Difference (±0.562)	-0.54	+0.67	-0.16	+0.45	+0.11 (± 0.281)
Salt: cwt per acre					
None	8.92	9.35	10.28	10.95	9.87
5.0	9.95	10.44	10.71	11.92	10.76
Difference (±0.562)	+1.03	+1.09	+0.43	+0.97	+0.89 (± 0.281)

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Plant number: thousands per acre

	Dung: tons per acre None	5	10	20	Mean
Great Field II (Rothamsted)					
Mean	27.0	27.4	26.5	25.6	26.6
N: cwt per acre					
None	27.6	27.4	27.0	25.8	27.0
0.9	26.4	27.4	26.1	25.4	26.3
Difference	-1.2	0.0	-0.9	-0.4	-0.7
P_2O_5: cwt per acre					
None	27.5	28.0	26.5	25.8	26.9
0.75	26.5	26.9	26.6	25.4	26.3
Difference	-1.0	-1.1	+0.1	-0.4	-0.6
K_2O: cwt per acre					
None	26.3	27.5	26.5	25.6	26.5
1.5	27.7	27.3	26.6	25.6	26.8
Difference	+1.4	-0.2	+0.1	0.0	+0.3
Salt: cwt per acre					
None	27.1	27.0	27.0	25.8	26.7
5.0	26.9	27.8	26.1	25.3	26.5
Difference	-0.2	+0.8	-0.9	-0.5	-0.2

Butt Close (Woburn)

Not recorded.

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Roots (washed): tons per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20
Great Field II (Rothamsted)					
None	None	11.51	12.52	14.75	15.76
1.5	None	13.06	14.40	14.98	15.24
None	5.0	13.38	14.69	16.71	15.81
1.5	5.0	12.36	15.57	15.90	17.13
Butt Close (Woburn)					
None	None	11.84	12.21	14.16	15.10
1.5	None	11.85	13.73	14.60	15.36
None	5.0	13.00	14.40	15.83	15.95
1.5	5.0	13.92	18.07	14.97	16.87

Sugar percentage

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20
Great Field II (Rothamsted)					
None	None	15.9	16.0	15.7	16.1
1.5	None	16.2	15.9	15.7	16.0
None	5.0	15.9	16.3	16.0	15.6
1.5	5.0	15.8	16.2	15.8	16.0
Butt Close (Woburn)					
None	None	18.2	18.0	18.0	18.2
1.5	None	18.4	18.4	18.1	17.8
None	5.0	17.8	18.2	17.8	18.2
1.5	5.0	18.0	18.2	18.2	17.5

https://doi.org/10.23637/ERADOC-1-176

Total sugar: cwt per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20
Great Field II (Rothamsted)					
		(± 2.25)			
None	None	36.8	40.2	46.3	50.6
1.5	None	42.3	45.8	47.0	48.8
None	5.0	42.4	47.9	53.5	49.5
1.5	5.0	39.4	50.5	50.4	54.9
Butt Close (Woburn)					
		(± 3.14)			
None	None	43.1	43.7	50.8	55.1
1.5	None	43.3	50.6	53.0	54.5
None	5.0	46.5	52.5	56.4	57.8
1.5	5.0	50.1	66.0	54.3	58.9

Tops: tons per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20
Great Field II (Rothamsted)					
		(± 1.229)			
None	None	19.33	20.51	21.45	27.87
1.5	None	22.59	21.83	24.77	26.78
None	5.0	22.70	25.17	27.20	29.28
1.5	5.0	21.45	27.32	25.94	30.17
Butt Close (Woburn)					
		(± 0.562)			
None	None	9.24	9.38	10.42	11.64
1.5	None	8.59	9.33	10.14	10.26
None	5.0	10.17	9.75	10.73	10.78
1.5	5.0	9.73	11.13	10.69	13.06

Plant number: thousands per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20
Great Field II (Rothamsted)					
None	None	26.5	27.4	27.6	26.1
1.5	None	27.7	26.6	26.5	25.5
None	5.0	26.2	27.6	25.4	25.0
1.5	5.0	27.7	28.1	26.8	25.7

Butt Close (Woburn)
not recorded.

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Response to	Responses to treatments cwt per acre: N None	N 0.9	P_2O_5 None	P_2O_5 0.75	K_2O None	K_2O 1.5	Salt None	Salt 5.0
Roots (washed): tons per acre								
Great Field II (Rothamsted)								
N	-	-	+0.05	+0.47	-0.29	+0.31	+0.41	+0.11
P_2O_5	+2.86	+3.28	-	-	+2.69	+3.45	+3.04	+3.10
K_2O	-0.11	+0.99	+0.06	+0.82	-	-	+0.79	+0.09
Salt	+1.32	+1.02	+1.14	+1.20	+1.52	+0.82	-	-
Butt Close (Woburn)								
N	-	-	+3.75	+2.73	+3.71	+2.77	+3.57	+2.91
P_2O_5	+0.82	-0.20	-	-	+0.26	+0.36	+0.41	+0.21
K_2O	+1.33	+0.39	+0.81	+0.91	-	-	+0.55	+1.17
Salt	+2.10	+1.44	+1.87	+1.67	+1.46	+2.08	-	-
Sugar percentage								
Great Field II (Rothamsted)								
N	-	-	-0.7	-0.7	-0.9	-0.5	-0.8	-0.6
P_2O_5	-0.1	-0.1	-	-	-0.1	-0.1	-0.1	-0.1
K_2O	-0.2	+0.2	0.0	0.0	-	-	0.0	0.0
Salt	-0.1	+0.1	0.0	0.0	0.0	0.0	-	-
Butt Close (Woburn)								
N	-	-	-0.2	-0.2	-0.2	-0.2	-0.4	0.0
P_2O_5	-0.1	-0.1	-	-	-0.2	0.0	-0.2	0.0
K_2O	0.0	0.0	-0.1	+0.1	-	-	+0.1	-0.1
Salt	-0.4	0.0	-0.3	-0.1	-0.1	-0.3	-	-
Total sugar: cwt per acre								
Great Field II (Rothamsted)								
				(± 1.59)				
N	-	-	-1.5	-0.9	-3.6	+1.2	-1.0	-1.4
P_2O_5	+9.2	+9.8	-	-	+8.2	+10.8	+9.4	+9.6
K_2O	-0.9	+3.9	+0.2	+2.8	-	-	+2.5	+0.5
Salt	+4.0	+3.6	+3.7	+3.9	+4.8	+2.8	-	-
Butt Close (Woburn)								
				(± 2.22)				
N	-	-	+13.1	+8.9	+12.7	+9.3	+11.8	+10.2
P_2O_5	+2.9	-1.3	-	-	+0.2	+1.4	+0.9	+0.7
K_2O	+4.8	+1.4	+2.5	+3.7	-	-	+2.2	+4.0
Salt	+6.9	+5.3	+6.2	+6.0	+5.2	+7.0	-	-

https://doi.org/10.23637/ERADOC-1-176 *pp 41*

Response to	Responses to treatments cwt per acre: N None	N 0.9	P_2O_5 None	P_2O_5 0.75	K_2O None	K_2O 1.5	Salt None	Salt 5.0
Tops: tons per acre								
Great Field II (Rothamsted)								
				(± 0.869)				
N	-	-	+2.94	+4.70	+3.87	+3.77	+3.84	+3.80
P_2O_5	+2.36	+4.12	-	-	+2.95	+3.53	+1.91	+4.57
K_2O	+0.97	+0.87	+0.63	+1.21	-	-	+1.70	+0.14
Salt	+3.03	+2.99	+1.68	+4.34	+3.79	+2.23	-	-
Butt Close (Woburn)								
				(± 0.398)				
N	-	-	+3.73	+3.41	+3.85	+3.29	+4.26	+2.88
P_2O_5	+0.29	-0.03	-	-	+0.51	-0.25	+0.87	-0.61
K_2O	+0.38	-0.18	+0.48	-0.28	-	-	-0.59	+0.79
Salt	+1.57	+0.19	+1.62	+0.14	+0.19	+1.57	-	-
Plant number: thousands per acre								
Great Field II (Rothamsted)								
N	-	-	-0.7	-0.5	-0.8	-0.4	-0.5	-0.7
P_2O_5	-0.7	-0.5	-	-	-0.2	-1.0	-0.4	-0.8
K_2O	+0.1	+0.5	+0.7	-0.1	-	-	-0.4	+1.0
Salt	-0.1	-0.3	0.0	-0.4	-0.9	+0.5	-	-
Butt Close (Woburn)								
Not recorded								

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LUCERNE

Single and repeated applications of potash - Great Harpenden II 1956, the second year.

Design: 6 randomized blocks of 8 plots each.

Area of each plot: 0.0147 acres.

Treatments: (For the 3 years 1955 - 57)
None (2 plots per block).
Single dressings in 1955: 1; 2; 3 cwt K_2O per acre as muriate of potash.
Annual dressings: 0.33; 0.66; 1.0 cwt K_2O per acre as muriate of potash.

Note: In spring 1955 all the potash dressings were given in the seed bed. Subsequent annual applications are applied as top dressings.

Basal dressing 1956: 3 tons ground chalk per acre.

Cultivations, etc.: Annual potash dressings applied: Nov 8, 1955. Ground chalk applied: Mar 12, 1956. Cut and weighed green: three times - June 11, July 24, Oct 24.

Standard errors per plot. Dry matter:

1st cut:	2.15 cwt per acre or 7.4%	(36 d.f.)
2nd cut:	2.50 cwt per acre or 9.4%	(36 d.f.)
3rd cut:	0.972 cwt per acre or 5.8%	(36 d.f.)
Total of 3 cuts:	3.89 cwt per acre or 5.4%	(36 d.f.)

Note: For the first year's results, see "Results of the Field Experiments" 1955, Section Ce/1.

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Summary of Results

Dry matter: cwt per acre

	K_2O: cwt per acre						
		Applied 1955			Applied annually 1955 and 1956		
	None	1.0	2.0	3.0	0.33	0.66	1.0	Mean
1st cut								
	(± 0.62)				(± 0.88)			
Mean	27.2	29.7	30.8	31.9	27.6	29.8	29.8	29.3
Increase (±1.08)		2.5	3.6	4.7	0.4	2.6	2.6	
2nd cut								
	(± 0.72)				(± 1.02)			
Mean	25.5	26.0	28.1	27.6	25.9	26.7	27.1	26.5
Increase (±1.25)		0.5	2.6	2.1	0.4	1.2	1.6	
3rd cut								
	(± 0.28)				(± 0.40)			
Mean	16.0	16.8	17.6	17.3	16.4	17.1	17.3	16.8
Increase (±0.49)		0.8	1.6	1.3	0.4	1.1	1.3	
Total of 3 cuts								
	(± 1.12)				(± 1.59)			
Mean	68.7	72.5	76.5	76.8	69.8	73.6	74.2	72.6
Increase (±1.95)		3.8	7.8	8.1	1.1	4.9	5.5	

1st cut, Mean dry matter % as cut: 24.2
2nd cut, Mean dry matter % as cut: 23.0
3rd cut, Mean dry matter % as cut: 24.5
Total of 3 cuts, Mean dry matter % as cut: 23.9

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56/Ch/1

KALE

Placement of nitrogen, phosphate and potash - W.Barnfield I 1956.

Design: 4 randomized blocks of 10 plots each.

Area of each plot: 0.00909 acres. Area harvested: 0.00727 acres.

Treatments: None (2 plots per block) and all combinations of
Fertilizer: P; K; PK; NPK.
Method of application: Broadcast in seed bed; drilled in band 2" to side of seed and 2" below soil surface

where N = 0.4 cwt N per acre as sulphate of ammonia
P = 0.6 cwt P_2O_5 per acre as superphosphate
K = 1.0 cwt K_2O per acre as muriate of potash

In addition top dressings were applied:-

To "NPK" plots: 0.8 cwt N per acre as sulphate of ammonia
To all other plots: 1.2 cwt N per acre as sulphate of ammonia.

Basal dressing: None.

Cultivations, etc.: Ploughed: Nov 1, 1955. Broadcast fertilizers applied, seed drilled at 6 lb per acre with sideband fertilizer: Apr 17, 1956. Sprayed with miscible DDT, 3 pints in 40 gallons: May 11. Top dressing applied: June 22. Cut (by blocks): Dec 3, 10, 14 and 20. Variety: Marrowstem. Previous crop: Wheat.

Standard error per plot:
Yield: 2.00 tons per acre or 7.9% (28 d.f.)

Summary of Results

Yield: tons per acre

N top dressing: cwt per acre		1.2			0.8	
Treatment at sowing	None	P	K	PK	NPK	Mean
Method of application			(± 0.999)			
Broadcast		24.28	22.90	28.04	28.04	25.81
Drilled		26.67	19.84	30.55	31.03	27.02
Mean (±0.707)	20.49	25.47	21.37	29.30	29.53	25.23
Difference (±1.413)		+2.39	-3.06	+2.51	+2.99	+1.21 (± 0.707)

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GRASS

Rates and times of application of nitrogenous fertilizers - Long Hoos 1, 2, 3, 1956.

Design: 4 randomized blocks of 16 plots each.

Area of each plot: 0.0075 acres. Area harvested: 0.0045 acres.

Treatments: None (4 plots per block) together with all combinations of:-

Materials and methods of application

Applied in one single dressing

Formalized casein	12.2% N
Casein	12.6% N
Ammonium sulphate	21.0% N

applied in 3 dressings of one third the single rate each

Ammonium sulphate	21.0% N
Urea	43.5% N
Calcium nitrate	15.5% N

Rates of application

0.75; 1.5 cwt N per acre.

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

Cultivations, etc.: Ploughed: Sept 19, 1955. Basal fertilizer applied, single dressings and first partial dressings of nitrogen applied, seed drilled at 50 lb per acre: Apr 10, 1956. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 22. Second and third partial dressings applied: July 11, Aug 10. Cut: three times - July 10, Aug 9, Oct 23. Variety: New Zealand H1 Ryegrass. Previous crop: Wheat.

Note: The ryegrass seed was sown in drills 7" apart and cross drilled.

Standard errors per plot. Grass dry matter:

1st cut	1.51 cwt	per acre or 15.2%	(48 d.f.)
2nd cut	1.22 cwt	per acre or 10.6%	(46 d.f.)*
3rd cut	1.40 cwt	per acre or 9.3%	(48 d.f.)
Total of 3 cuts	2.47 cwt	per acre or 6.8%	(48 d.f.)

*2 missing values.

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Summary of Results

Dry Matter: cwt per acre

Level of N in fertilizer: cwt per acre	Fertilizer: Single dressing F	C	A	Repeated dressing A	U	N	Mean
1st Cut (±0.75)							
None							2.8 (±0.38)
0.75	3.4	17.2	16.7	8.4	8.2	9.0	10.5 (±0.31)
1.50	4.1	19.9	20.2	10.8	13.1	16.6	14.1
Mean (±0.53)	3.7	18.6	18.5	9.6	10.7	12.8	9.9
Diff. (±1.07)	0.7	2.7	3.5	2.4	4.9	7.6	3.6 (±0.44)
2nd Cut (±0.61)							
None							3.4 (±0.30)
0.75	9.6	8.5	10.2*	14.3*	12.8	12.8	11.4 (±0.25)
1.50	15.2	15.5	16.5	19.6	16.9	18.5	17.0
Mean (±0.43)	12.4	12.0	13.3	16.9	14.9	15.7	11.5
Diff. (±0.86)	5.6	7.0	6.3	5.3	4.1	5.7	5.6 (±0.35)
3rd Cut (±0.70)							
None							4.9 (±0.35)
0.75	16.6	8.4	8.9	18.2	20.6	17.6	15.1 (±0.29)
1.50	25.8	13.4	15.5	26.7	26.0	23.0	21.7
Mean (±0.49)	21.2	10.9	12.2	22.5	23.3	20.3	15.0
Diff. (±0.99)	9.2	5.0	6.6	8.5	5.4	5.4	6.6 (±0.40)
Total of 3 cuts (±1.24)							
None							11.2 (±0.62)
0.75	29.7	34.2	35.8	41.0	41.6	39.5	37.0 (±0.50)
1.50	45.1	48.8	52.2	57.1	56.0	58.1	52.9
Mean (±0.87)	37.4	41.5	44.0	49.0	48.8	48.8	36.5
Diff. (±1.75)	15.4	14.6	16.4	16.1	14.4	18.6	15.9 (±0.71)

*Includes 1 estimated value.

Treatments

F = Formalized casein 12.2% N
C = Casein 12.6% N
A = Ammonium sulphate 21.0% N
U = Urea 43.5% N
N = Calcium nitrate 15.5% N

Mean dry matter % as cut:

1st cut: 20.1
2nd cut: 21.2
3rd cut: 19.9
Total of 3 cuts: 20.4

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