ROTHAMSTED RESEARCH

Yields of the Field Experiments 1957

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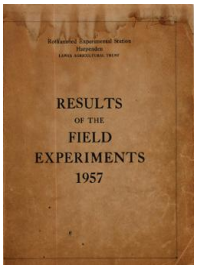

Short-term Experiments

Rothamsted Research

Rothamsted Research (1958) *Short-term Experiments ;* Yields Of The Field Experiments 1957, pp 69 - 118 **- DOI: https://doi.org/10.23637/ERADOC-1-177**

57/Ca/1

WINTER WHEAT

Control of wheat bulb fly by insecticides - Pennell's Piece 1957.

Design: 4 randomized blocks of 7 plots each.

Area of each plot: 0.0064 acres.

Treatments: Insecticides (per acre):-

None	(0)
4% Dieldrin dust, 1 cwt broadcast in late December	(1)
4% Dieldrin dust, 1 cwt broadcast in early February	(2)
4% Dieldrin dust, 1 cwt combine drilled with seed	(3)
1½% Dieldrin dust, 1 cwt combine drilled with seed	(4)
1½% Aldrin dust, 1 cwt combine drilled with seed	(5)
1.2% Dieldrin granules, 1.5 cwt combine drilled with seed	(6)

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

Note: all seed dressed with organo-mercurial fungicide.

Cultivations, etc.: Ploughed: Oct 10, 1956. Seed drilled at 2 bushels per acre: Nov 5. Dieldrin dust broadcast: Treatment '1' plots - Dec 18, treatment '2' plots - Feb 16. 'Nitro-Chalk' applied: Apr 27. Combine harvested: Aug 24. Variety: Cappelle. Previous crop: Bare fallow.

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

Standard error per plot.
Grain (at 85% dry matter): 3.34 cwt per acre or 6.4% (17 d.f.)

Note. The yields have been adjusted for a linear fertility trend along the blocks.

Summary of Results

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

	Insecticides 0	1	2	3	4	5	6	Mean
Mean (±1.67)	50.7	53.7	50.7	52.1	53.0	51.9	51.0	51.9
Increase (±2.36)		3.0	0.0	1.4	2.3	1.2	0.3	

Mean dry matter % as harvested: 82.9

https://doi.org/10.23637/ERADOC-1-177

WINTER WHEAT

Varieties and levels of nitrogen - Great Knott I 1957.

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: Banco (1); Cappelle (2); Heine 7 (3); Hybrid 46 (4); Leda (5); Minister (6); Squareheads' Master 13/4 (7); Yeoman (8).
Sub plots. Nitrogen: 0.4; 0.8 cwt N per acre applied as sulphate of ammonia.

Basal dressing: 1¼ cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Nov 15, 1956. Seed combine drilled at 2¾ bushels per acre: Nov 27. Sulphate of ammonia applied: May 1, 1957. Sprayed with DNOC at 8 lb in 80 gallons per acre: May 20. Combine harvested: Aug 25. Previous crop: Spring beans.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 2.28 cwt per acre or 6.3% (14 d.f.)
Sub plot: 1.93 cwt per acre or 5.4% (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
				(±1.53)*					
0.4	30.5	40.3	34.3	38.2	42.3	36.7	29.4	22.7	34.3
0.8	33.7	42.4	40.5	42.4	44.1	38.5	33.8	26.6	37.7
Mean (±1.32)	32.1	41.3	37.4	40.3	43.2	37.6	31.6	24.7	36.0
Difference (±1.58)	3.2	2.1	6.2	4.2	1.8	1.8	4.4	3.9	3.4 (±0.56)

*for use in comparisons other than vertical.

Mean dry matter % as harvested: 83.8

https://doi.org/10.23637/ERADOC-1-177

SPRING WHEAT

Take-All (Ophiobolus graminis) and weed control - Highfield 1957.

Design: 4 randomized blocks of 3 plots each, plots being split into 3 for treatment crops in 1956.

Area of each sub plot: 0.0069 acres.

Treatments:
Whole plots. To 1957 wheat: None; hand hoed; sprayed with 4-chloro-2 methyl phenoxy propionic acid (MCPP) at 6 pints per acre.
Sub plots. Treatment crops 1956: Wheat (Cappelle); oats (S.172); ½ wheat ½ oats; all at 4 bushels per acre.

Basal dressing: 2½ cwt compound fertilizer (12% N, 9% P_2O_5, 9% K_2O) per acre, combine drilled with seed.

Cultivations, etc.: Ploughed: Oct 19, 1956 and again Jan 19, 1957. Seed combine drilled at 3½ bushels per acre: Mar 19. Sprayed 'S' plots with MCPP at 6 pints in 40 gallons per acre: May 23. Combine harvested: Aug 27. Variety: Koga II.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.28 cwt per acre or 4.0% (6 d.f.)
Sub plot: 0.75 cwt per acre or 2.3% (18 d.f.)

Summary of Results

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

Treatments to 1957 wheat	Crop in 1956			Mean
	Wheat	Oats	½ wheat ½ oats	
	(1) and (2)			(±0.63)
None	31.1	34.3	31.3	32.2
Hand hoed	30.9	33.7	31.0	31.9
Sprayed	31.8	35.6	32.8	33.4
Mean (±0.21)	31.3	34.5	31.7	32.4

(1) ±0.37 for use in horizontal comparisons only.
(2) ±0.71 for use in all other comparisons.

Mean dry matter % as harvested: 81.6

Note. Counts of plant and ear numbers, and estimates of incidence of Take-All and weeds were made.

https://doi.org/10.23637/ERADOC-1-177

57/Ca/4

SPRING WHEAT

Levels and times of application of nitrogen - Little Hoos 1957.

Design: 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: 0.0140 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 seedbed (S); all as early top dressing (E); all as late top dressing (L); ½S & ½E; ½S & ½L; ½E & ½L; ⅓S, ⅓E, ⅓L.

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

Cultivations, etc.: Ploughed: Oct 22, 1956 and Jan 23, 1957. Seedbed 'Nitro-Chalk' applied, seed combine drilled at 3½ bushels per acre: Mar 21. Early 'Nitro-Chalk' top dressing applied: Apr 17. Late 'Nitro-Chalk' top dressing applied: May 15. Sprayed with MCPA, 2 pints in 40 gallons per acre: May 30. Combine harvested: Aug 31. Variety: Koga II. Previous crop: Wheat and barley.

Standard error per plot.
Grain (at 85% dry matter): 1.83 cwt per acre or 7.5% (27 d.f.)

Note: A similar experiment at Woburn was abandoned due to herbicide damage.

Summary of Results

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

N: cwt per acre	Time of application S	E	L	½S½E	½S½L	½E½L	⅓S⅓E⅓L	Mean
			(±1.38)				(±0.92)	(±0.46)
None								15.6(1)
0.3	24.5	21.2	22.5	22.0	23.2	24.4	22.9	23.0
0.6	24.2	28.6	26.4	25.2	26.6	24.9	24.5	25.6
0.9	28.5	26.5	26.3	25.8	28.7	26.7	26.7	27.0
Mean (±0.77)	25.7	25.4	25.1	24.3	26.2	25.3	24.7(2)	24.4

(1) ±0.92 (2) ±0.53

Mean dry matter % as harvested: 83.2

https://doi.org/10.23637/ERADOC-1-177

57/Ca/5

SPRING WHEAT

Varieties and levels of nitrogen - Great Knott III 1957.

Design: 3 randomized blocks of 7 plots each, plots being split into 2 for the application of nitrogen.

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

Treatments: All combinations of:-
Whole plots. Varieties: Atle (1); Atson (2); Koga II (3); Miana (4); Peko (5); Progress (6); Svenno (7).
Sub plots. Nitrogen: 0.4; 0.8 cwt N per acre applied as sulphate of ammonia.

Basal dressing: None.

Cultivations, etc.: Ploughed: Nov 30, 1956. Nitrogen applied, seed drilled at 3¼ bushels per acre: Apr 1, 1957. Sprayed with MCPA at 3 pints in 40 gallons per acre: May 8. Combine harvested: Aug 30. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.21 cwt per acre or 4.7% (12 d.f.)
Sub plot: 1.00 cwt per acre or 3.9% (14 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	Mean
				(±0.81)*				
0.4	24.5	27.0	30.1	26.2	25.5	25.3	24.6	26.2
0.8	25.1	26.4	27.6	26.7	24.9	25.0	24.3	25.7
Mean (±0.70)	24.8	26.7	28.8	26.4	25.2	25.1	24.5	25.9
Difference (±0.82)	+0.6	-0.6	-2.5	+0.5	-0.6	-0.3	-0.3	-0.5 (±0.31)

*for use in comparisons other than vertical.

Mean dry matter % as harvested: 82.7

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SPRING WHEAT

Combine drilling of nitrogen - Little Hoos 1957.

Design: 4 randomized blocks of 7 plots each.

Area of each plot: 0.0244 acres. Area harvested: 0.0163 acres.

Treatments: None and all combinations of:-
Nitrogen: 0.22 (N_1); 0.54 (N_2); 0.68 (N_3) cwt N per acre.
Method of application: Broadcast as sulphate of ammonia; combine drilled as compound fertilizer:

N_1: 5% N, 12½% P_2O_5, 12½% K_2O.
N_2: 8% N, 8% P_2O_5, 8% K_2O.
N_3: 12% N, 9% P_2O_5, 9% K_2O.

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

Cultivations etc.: Ploughed: Oct 12, 1956 and again Jan 23, 1957. Seed combine drilled at 3¼ bushels per acre: Apr 2. Sulphate of ammonia broadcast: Apr 3. Sprayed with MCPA at 2 pints in 40 gallons per acre: May 30. Combine harvested: Aug 31. Variety: Koga II. Previous crop: Wheat and barley.

Standard error per plot.
Grain (at 85% dry matter): 1.83 cwt per acre or 8.9% (18 d.f.)

Summary of Results

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

	Broadcast			Combine drilled			
None	0.22	0.54	0.68	0.22	0.54	0.68	Mean
15.1	20.2	21.6	21.0 (±0.92)	20.9	22.6	23.3	20.7

Mean dry matter % as harvested: 83.0

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BARLEY

Residual effects of Dung, N, P and K applied to potatoes 1956 and direct effects of N and P - Great Field II 1957.

Design: Half replicate of 4×2^5 arranged in 4 blocks of 16 plots each. The identity being $d(20 - 10 + 5 - 0)$ npkNP $\equiv 1$ with certain high order interactions confounded with block differences.

Area of each plot: 0.0200 acres. Area harvested: 0.0134 acres.

Treatments. All combinations of:-

Applied to potatoes 1956.

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.

Applied to barley 1957.

N: None; 0.4 cwt N per acre as 'Nitro-Chalk'.
P: None; 0.4 cwt P_2O_5 per acre as superphosphate.

Basal dressing: 0.8 cwt K_2O per acre as muriate of potash.

Cultivations, etc.: Ploughed: Nov 22 - 26, 1956. Fertilizers applied: Mar 25, 1957. Seed drilled at 2 bushels per acre: Mar 26. Sprayed with MCPA at 2 pints in 40 gallons per acre: May 23 - 28. Combine harvested: Aug 21. Variety: Proctor. Previous crop: Potatoes.

Standard error per plot.
Grain (at 85% dry matter): 1.55 cwt per acre or 3.7% (27 d.f.)

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

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

	Dung to potatoes 1956: tons per acre None	5	10	20	Mean
Mean (±0.39)	40.0	41.5	41.6	42.4	41.4
Applied to potatoes 1956					
N: cwt per acre					
None (±0.55)	39.4	41.7	41.5	42.2	41.2
0.9	40.7	41.3	41.7	42.6	41.6
Diff. (±0.78)	+1.3	-0.4	+0.2	+0.4	+0.4 (±0.39)
P_2O_5: cwt per acre					
None (±0.55)	39.2	40.8	40.7	41.9	40.7
0.75	40.9	42.3	42.5	42.8	42.1
Diff. (±0.78)	+1.7	+1.5	+1.8	+0.9	+1.4 (±0.39)
K_2O: cwt per acre					
None (±0.55)	40.7	41.5	41.2	42.4	41.5
1.5	39.4	41.6	41.9	42.3	41.3
Diff. (±0.78)	-1.3	+0.1	+0.7	-0.1	-0.2 (±0.39)
Applied to barley 1957					
N: cwt per acre					
None (±0.55)	40.2	42.0	41.7	42.3	41.6
0.4	39.9	41.1	41.4	42.4	41.2
Diff. (±0.78)	-0.3	-0.9	-0.3	+0.1	-0.4 (±0.39)
P_2O_5: cwt per acre					
None (±0.55)	39.0	40.4	40.8	42.6	40.7
0.4	41.1	42.6	42.4	42.2	42.1
Diff. (±0.78)	+2.1	+2.2	+1.6	-0.4	+1.4 (±0.39)

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

Response to	Responses to treatments Applied to potatoes 1956 cwt per acre: N None	N 0.9	P_2O_5 None	P_2O_5 0.75	K_2O None	K_2O 1.5	Applied to barley 1957: N None	N 0.4	P_2O_5 None	P_2O_5 0.4
					(±0.55)					
Applied to potatoes 1956										
N	-	-	+0.2	+0.6	-0.3	+1.1	+0.5	+0.3	+1.0	-0.2
P_2O_5	+1.3	+1.7	-	-	+1.8	+1.2	+0.8	+2.2	+2.0	+1.0
K_2O	-0.8	+0.6	+0.2	-0.4	-	-	-0.4	+0.2	-0.1	-0.1
Applied to barley 1957										
N	-0.3	-0.5	-1.1	+0.3	-0.7	-0.1	-	-	-0.3	-0.5
P_2O_5	+2.0	+0.8	+1.9	+0.9	+1.4	+1.4	+1.5	+1.3	-	-

Mean dry matter % as harvested: 85.4

https://doi.org/10.23637/ERADOC-1-177

BARLEY

Residual effects of dung, N, P, K and salt to sugar beet 1956 and direct effect of N - Rothamsted (R) Great Field II and Woburn (W) Butt Close 1957.

Design: Half replicate of 4×2^5 arranged in 4 blocks of 16 plots each, the identity being $d(20 - 10 - 5 + 0)npksN = 1$, with certain high order interactions confounded with block differences.

Area of each plot (acres): R - 0.0158; W - 0.0167. Area harvested: R - 0.0134; W - 0.0141.

Treatments: All combinations of:-

Applied to sugar beet 1956

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.

Applied to barley 1957

N:	None;	0.4 cwt N as 'Nitro-Chalk' per acre.

Basal dressing (each field): 0.2 cwt P_2O_5, 0.4 cwt K_2O as compound fertilizer (10% P_2O_5, 20% K_2O) per acre.

Cultivations, etc.:

Great Field II (R). Ploughed: Jan 25. Seed combine drilled with basal fertilizers at 2 bushels per acre: Mar 26. Nitrogen fertilizer applied: Mar 28. Sprayed with MCPA at 2 pints in 40 gallons per acre: May 28. Combine harvested: Aug 20. Variety: Proctor. Previous crop: Sugar beet.

Butt Close (W). Ploughed: Jan 7. Nitrogen fertilizer applied: Mar 18. Seed combine drilled with basal fertilizer at $2\frac{1}{2}$ bushels per acre: Mar 19. Sprayed with MCPA at 2 pints in 20 gallons per acre: May 23. Combine harvested: Aug 20. Variety: Herta. Previous crop: Sugar beet.

Standard errors per plot, Grain (at 85% dry matter): cwt per acre.
Great Field (R): 1.79 cwt per acre or 4.8% (25 d.f.)*
Butt Close (W): 3.39 cwt per acre or 12.4% (27 d.f.)

*2 missing values.

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Summary of Results

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

	Dung to sugar beet 1956: tons per acre				
	None	5	10	20	Mean
Great Field II, Rothamsted					
Mean (±0.45)	35.7	37.0	37.6	38.9	37.3
Applied to sugar beet 1956					
N: cwt per acre					
None (±0.63)	34.5	35.6	37.4	38.6	36.5
0.9	36.9	38.3	37.9	39.2	38.0
Difference (±0.90)	+2.4	+2.7	+0.5	+0.6	+1.5 (±0.45)
P_2O_5: cwt per acre					
None (±0.63)	35.0	35.8	36.7	38.2	36.4
0.75	36.4	38.1	38.6	39.5	38.1
Difference (±0.90)	+1.4	+2.3	+1.9	+1.3	+1.7 (±0.45)
K_2O: cwt per acre					
None (±0.63)	36.1	37.2	37.6	38.9	37.4
1.5	35.3	36.7	37.7	38.9	37.1
Difference (±0.90)	-0.8	-0.5	+0.1	0.0	-0.3 (±0.45)
Salt: cwt per acre					
None (±0.63)	34.6	36.8	37.9	38.9	37.1
5.0	36.7	37.2	37.4	38.8	37.5
Difference (±0.90)	+2.1	+0.4	-0.5	-0.1	+0.4 (±0.45)
Applied to barley 1957					
N: cwt per acre					
None (±0.63)	32.9	34.3	36.0	37.6	35.2
0.4	38.4	39.6	39.3	40.1	39.4
Difference (±0.90)	+5.5	+5.3	+3.3	+2.5	+4.2 (±0.45)

Responses to treatments cwt per acre

	Applied to sugar beet 1956								Applied to barley 1957	
	N		P_2O_5		K_2O		Salt		N	
Response to	None	0.9	None	0.75	None	1.5	None	5.0	None	0.4
Applied to sugar beet 1956					(±0.63)					
N	-	-	+1.6	+1.4	+1.3	+1.7	+1.7	+1.3	+3.4	-0.4
P_2O_5	+1.8	+1.6	-	-	+2.1	+1.3	+2.6	+0.8	+1.8	+1.6
K_2O	-0.5	-0.1	+0.1	-0.7	-	-	-0.2	-0.4	-0.6	0.0
Salt	+0.7	+0.3	+1.4	-0.4	+0.6	+0.4	-	-	+0.4	+0.6
Applied to barley 1957										
N	+6.1	+2.3	+4.3	+4.1	+3.9	+4.5	+4.1	+4.3	-	-

Mean dry matter % as harvested: 83.5

https://doi.org/10.23637/ERADOC-1-177

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

	Dung to sugar beet 1956: tons per acre				
	None	5	10	20	Mean
Butt Close, Woburn					
Mean (±0.85)	25.9	26.5	27.5	29.9	27.4
Applied to sugar beet 1956					
N: cwt per acre					
None (±1.20)	25.7	26.2	29.7	30.4	28.0
0.9	26.1	26.9	25.3	29.3	26.9
Difference (±1.70)	+0.4	+0.7	-4.4	-1.1	-1.1 (±0.85)
P_2O_5: cwt per acre					
None (±1.20)	26.0	26.1	28.0	30.3	27.6
0.75	25.7	27.0	27.0	29.5	27.3
Difference (±1.70)	-0.3	+0.9	-1.0	-0.8	-0.3 (±0.85)
K_2O: cwt per acre					
None (±1.20)	26.7	26.4	28.7	30.3	28.0
1.5	25.0	26.7	26.3	29.4	26.8
Difference (±1.70)	-1.7	+0.3	-2.4	-0.9	-1.2 (±0.85)
Salt: cwt per acre					
None (±1.20)	26.4	25.2	28.5	29.5	27.4
5.0	25.4	27.8	26.5	30.2	27.5
Difference (±1.70)	-1.0	+2.6	-2.0	+0.7	+0.1 (±0.85)
Applied to barley 1957					
N: cwt per acre					
None (±1.20)	22.4	24.4	23.4	27.0	24.3
0.4	29.4	28.6	31.6	32.7	30.6
Difference (±1.70)	+7.0	+4.2	+8.2	+5.7	+6.3 (±0.85)

Responses to treatments cwt per acre

Response to	Applied to sugar beet 1956: 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	Applied to barley 1957: N None	N 0.4
Applied to sugar beet 1956					(±1.20)					
N	-	-	-0.3	-1.9	-0.8	-1.4	-1.2	-1.0	-1.0	-1.2
P_2O_5	+0.5	-1.1	-	-	-0.6	0.0	+0.8	-1.4	-0.5	-0.1
K_2O	-0.9	-1.5	-1.5	-0.9	-	-	-0.1	-2.3	-0.7	-1.7
Salt	0.0	+0.2	+1.2	-1.0	+1.2	-1.0	-	-	-0.3	+0.5
Applied to barley 1957										
N	+6.4	+6.2	+6.1	+6.5	+6.8	+5.8	+5.9	+6.7	-	-

Mean dry matter % as harvested: 82.5

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BARLEY

Varieties and levels of nitrogen - Great Field II 1957.

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

Area of each sub plot: 0.0106 acres. Area harvested: 0.0071 acres.

Treatments: All combinations of:-
Whole plots. Varieties: Domen (1); Herta (2); Ingrid (3); Plumage Archer (4); Proctor (5).
Sub plots. Nitrogen: 0.3; 0.6 cwt N per acre applied as sulphate of ammonia.

Basal dressing: None.

Cultivations, etc.: Ploughed: Nov 26, 1956. Seed drilled at 2 bushels per acre: Mar 26, 1957. Sulphate of ammonia applied: Mar 28. Sprayed with CMPP at 6 pints in 40 gallons per acre: May 23. Combine harvested: Aug 26. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.26 cwt per acre or 3.3% (8 d.f.)
Sub plot: 1.73 cwt per acre or 4.6% (10 d.f.)

Summary of Results

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

N: cwt per acre	Variety 1	2	3	4	5	Mean
			(±1.01)*			
0.3	37.7	40.1	37.9	34.6	39.9	38.1
0.6	36.4	40.1	37.7	32.8	41.1	37.6
Mean (±0.72)	37.0	40.1	37.8	33.7	40.5	37.8
Diff. (±1.41)	-1.3	0.0	-0.2	-1.8	+1.2	-0.5 (±0.63)

*For use in comparisons other than vertical.

Mean dry matter % as harvested: 84.2

https://doi.org/10.23637/ERADOC-1-177

BARLEY

Levels and times of application of nitrogen - Little Hoos 1957.

Design: 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: 0.23; 0.46; 0.69 cwt N per acre as 'Nitro-Chalk'.
Times of application: All in seedbed (S); all as early top dressing (E); all as late top dressing (L); ½S & ½E; ½S & ½L; ½E & ½L; ⅓S, ⅓E, ⅓L.

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

Cultivations, etc.: Ploughed: Oct 12, 1956 and Jan 23, 1957. Seedbed 'Nitro-Chalk' applied, seed combine drilled at 2½ bushels per acre: Mar 22. Early 'Nitro-Chalk' top dressing applied: Apr 17. Late 'Nitro-Chalk' top dressing applied: May 15. Sprayed with MCPA, at 2 pints in 40 gallons per acre: May 30. Combine harvested: Aug 22. Variety: Herta. Previous crop: Wheat and barley.

Standard error per plot.
Grain (at 85% dry matter): 1.71 cwt per acre or 6.2% (26 d.f.)*

*1 missing value.

Note: A similar experiment at Woburn was abandoned due to herbicide damage.

Summary of Results

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

N: cwt per acre	Time of application S	E	L	½S½E	½S½L	½E½L	⅓S⅓E⅓L	Mean
			(±1.28)				(±0.85)	(±0.43)
None								20.9×(1)
0.23	22.7	22.0	26.5	26.8	26.1	21.9	25.6	24.6
0.46	27.1	26.6	29.8	29.4	31.3	28.5	28.0	28.6
0.69	33.6	34.6	30.1	30.9	29.0	31.3	30.8	31.4
Mean (±0.71)	27.8	27.7	28.8	29.0	28.8	27.2	28.1(2)	27.7

(1) ±0.85 (2) ±0.49

Mean dry matter % as harvested: 85.3

×Includes 1 estimated value.

https://doi.org/10.23637/ERADOC-1-177

BARLEY

Combine drilling of nitrogen - Rothamsted (R) Little Hoos and Woburn (W) Lansome Field 1957.

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

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

Treatments: None and all combinations of:-
Nitrogen: 0.22 (N_1); 0.54 (N_2); 0.68 (N_3) cwt N per acre.
Method of application: Broadcast as sulphate of ammonia; combine drilled as compound fertilizer:

N_1:	5% N,	12½% P_2O_5,	12½% K_2O
N_2:	8% N,	8% P_2O_5,	8% K_2O
N_3:	12% N,	9% P_2O_5,	9% K_2O

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

Cultivations, etc.:
Little Hoos (R). Ploughed: Oct 12, 1956 and Jan 23, 1957. Seed combine drilled at 2¼ bushels per acre: Apr 1. Sulphate of ammonia broadcast: Apr 3. Sprayed with MCPA at 2 pints in 40 gallons per acre: May 30. Combine harvested: Aug 31. Variety: Herta. Previous crop: Wheat and barley.

Lansome Field (W). Ploughed: Jan 28 - Feb 17, 1957. Sulphate of ammonia broadcast, seed combine drilled at 2½ bushels per acre: Mar 23. Sprayed with MCPP at 6 pints in 40 gallons per acre: May 20. Combine harvested: Aug 20. Variety: Herta. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter):
Little Hoos (R): 2.06 cwt per acre or 7.2% (18 d.f.)
Lansome Field (W): 2.17 cwt per acre or 7.7% (18 d.f.)

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

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

N: cwt per acre

None	Broadcast 0.22	Broadcast 0.54	Broadcast 0.68	Combine drilled 0.22	Combine drilled 0.54	Combine drilled 0.68	Mean
Little Hoos, Rothamsted							
20.6	26.1	31.1	31.9 (±1.03)	27.4	30.0	32.0	28.4

Mean dry matter % as harvested: 83.9

Lansome Field, Woburn							
21.6	24.6	31.6	34.2 (±1.08)	24.8	30.7	30.5	28.3

Mean dry matter % as harvested: 82.2

https://doi.org/10.23637/ERADOC-1-177

BARLEY

Residual effects of dung, N, P and K applied to potatoes 1956 and direct effect of N - Butt Close Woburn 1957.

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

Area of each plot: 0.0210 acres. Area harvested: 0.0141 acres.

Treatments: All combinations of:-

To potatoes 1956

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.

To barley 1957

N: None; 0.4 cwt N per acre as 'Nitro-Chalk'.

Basal dressing: 0.2 cwt P_2O_5, 0.4 cwt K_2O as compound fertilizer (10% P_2O_5, 20% K_2O) per acre.

Cultivations, etc.: Ploughed: Dec 10, 1956. Nitrogen fertilizer applied: Mar 18, 1957. Seed combine drilled with basal fertilizer at $2\frac{1}{2}$ bushels per acre: Mar 19. Sprayed with MCPA at 2 pints in 20 gallons per acre: May 23. Combine harvested: Aug 19. Variety: Herta. Previous crop: Potatoes.

Standard error per plot.
Grain (at 85% dry matter): 4.12 cwt per acre or 18.9% (35 d.f.)

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

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

	Dung to potatoes 1956: tons per acre None	5	10	20	Mean
Mean (±1.03)	19.6	20.0	22.4	25.2	21.8
Applied to potatoes 1956					
N: cwt per acre					
None (±1.46)	19.4	18.6	21.0	25.2	21.0
0.9	19.8	21.4	23.8	25.3	22.6
Difference (±2.06)	+0.4	+2.8	+2.8	+0.1	+1.6 (±1.03)
P_2O_5: cwt per acre					
None (±1.46)	19.6	18.5	23.8	26.0	22.0
0.75	19.6	21.4	21.0	24.4	21.6
Difference (±2.06)	0.0	+2.9	-2.8	-1.6	-0.4 (±1.03)
K_2O: cwt per acre					
None (±1.46)	19.4	20.3	23.3	26.3	22.3
1.5	19.9	19.7	21.5	24.1	21.3
Difference (±2.06)	+0.5	-0.6	-1.8	-2.2	-1.0 (±1.03)
Applied to barley 1957					
N: cwt per acre					
None (±1.46)	16.4	16.7	19.7	23.9	19.2
0.4	22.9	23.3	25.1	26.6	24.4
Difference (±2.06)	+6.5	+6.6	+5.4	+2.7	+5.2 (±1.03)

Responses to treatments cwt per acre

Response to	Applied to potatoes 1956: N None	N 0.9	P_2O_5 None	P_2O_5 0.75	K_2O None	K_2O 1.5	Applied to barley 1957: N None	N 0.4
Applied to potatoes 1956								
				(±1.46)				
N	-	-	+1.2	+1.8	+1.2	+1.8	+1.9	+1.1
P_2O_5	-0.7	-0.1	-	-	+1.2	-2.0	-1.2	+0.4
K_2O	-1.3	-0.7	+0.6	-2.6	-	-	+0.4	-2.4
Applied to barley 1957								
N	+5.7	+4.9	+4.5	+6.1	+6.7	+3.9	-	-

Mean dry matter % as harvested: 82.1

https://doi.org/10.23637/ERADOC-1-177 *pp 19*

SPRING OATS

Varieties and levels of nitrogen - Fosters 1957.

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

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

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

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

Cultivations, etc.: Ploughed: Nov 6, 1956 and again Jan 19, 1957. 'Nitro-Chalk' applied: Mar 22. Seed combine drilled at $3\frac{1}{2}$ bushels per acre: Mar 23. Sprayed with DNOC at 8 lb in 80 gallons per acre: May 21. Combine harvested: Aug 8. Previous crop: Wheat.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 0.85 cwt per acre or 2.8% (14 d.f.)
Sub plot: 0.80 cwt per acre or 2.6% (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
				(±0.58)*					
0.36	30.5	29.9	29.0	30.1	30.2	30.9	30.9	28.3	30.0
0.72	32.6	32.1	31.0	32.3	32.0	30.6	31.0	29.6	31.4
Mean (±0.48)	31.6	31.0	30.0	31.2	31.1	30.7	30.9	29.0	30.6
Difference (±0.65)	+2.1	+2.2	+2.0	+2.2	+1.8	-0.3	+0.1	+1.3	+1.4 (±0.23)

*for use in comparisons other than vertical.

Mean dry matter % as harvested: 83.9

https://doi.org/10.23637/ERADOC-1-177

CEREALS AND BEANS ROTATIONS

The effect of crop sequences on the incidence of cereal foot and root rot diseases - Great Field I 1957 - the 1st year.

Design: Three series each of 3 randomized blocks of 6 plots, starting in each of the years 1957, 1958 and 1959. In 1957 there were 3 plots per block with winter wheat.

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

Treatments:

Crop sequences for each series:

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

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

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

Basal dressing: 23 cwt ground chalk per acre, 2 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Nitrogen for cereals: 3 cwt 'Nitro-Chalk' per acre to spring wheat and 2 cwt 'Nitro-Chalk' per acre to oats and barley all in seedbed. 6 cwt 'Nitro-Chalk' per acre to winter wheat as spring top dressing, half applied in March and half in May.

Cultivations, etc.: Ground chalk applied: Nov 6, 1956. Ploughed: Nov 12. Winter wheat combine drilled at 2½ bushels per acre: Nov 15. 1st application of 'Nitro-Chalk' to winter wheat, 'Nitro-Chalk' applied for oats and seed combine drilled at 4 bushels per acre: Mar 13, 1957. 'Nitro-Chalk' applied for barley and seed combine drilled at 2 bushels per acre: Mar 14. 'Nitro-Chalk' applied for spring wheat and seed combine drilled at 3 bushels per acre: Mar 15. 2nd application of 'Nitro-Chalk' to winter wheat: May 2. Sprayed with DNOC at 8 lb in 80 gallons per acre: May 10. Combine harvested: Aug 26. Varieties: Winter wheat - Heine7; spring wheat - Koga II; oats - Sun II; barley - Proctor. Previous crop: Spring beans.

Summary of Results

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

	WW	SW	B	O
Grain	45.5	39.7	40.7	27.3
Straw	26.1	25.3	20.1	22.5

Mean dry matter % as harvested: Grain, 83.5; Straw, 87.2

https://doi.org/10.23637/ERADOC-1-177

SPRING BEANS

The control of Aphids (Aphis fabae) by dates of sowing and spraying - Long Hoos V 1957.

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

Area of each sub plot: 0.0253 acres.

Treatments. All combinations of:-
Whole plots. Date of sowing: Mid-March (A); early April (B); late April (C); mid-May (D).
Sub plots. Spray: None; mid-June (E); early July (L); E and L.

Owing to the first sowing 'A' being drilled in error at 150 lb per acre instead of 200 lb per acre, the second sowing 'B' was made in March.

The insecticide spray was methyl demeton at 12 fluid oz. in 60 gallons per acre.

Basal dressing: 2 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre placement drilled with seed.

Cultivations, etc.: Ploughed: Oct 4, 1956 and Jan 18, 1957. 'A' plots - seed drilled at 150 lb per acre with placed fertilizer: Mar 12. 'B', 'C', 'D' plots - seed drilled at 200 lb per acre with placed fertilizer: Mar 20, Apr 30, May 15. Sprayed 'A', 'B', 'C' plots with miscible DDT at 3 pints in 20 gallons per acre: May 29. Appropriate plots sprayed with methyl demeton: 'E' plots - June 13, 'L' plots - July 5. Combine harvested: 'A' and 'B' plots - Aug 30, 'C' plots - Sept 17, 'D' plots - Oct 9. Variety: Garton. Previous crop: Wheat.

Note: The crop failed completely on the unsprayed plots of 'A' and 'B' sowings and was very poor on the 'L' plots of the same sowings. The analysis was therefore carried out on the 'E' and 'EL' plots only of each sowing.

Standard errors per plot. Grain (at 85% dry matter):
Whole plot: 1.63 cwt per acre or 11.2% (6 d.f.)
Sub plot: 1.24 cwt per acre or 8.5% (12 d.f.)

Note: Counts of aphids at intervals after spraying, and assessment of early incidence of virus disease were made.

https://doi.org/10.23637/ERADOC-1-177 *pp 22*

Summary of Results

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

Date of Spraying	Date of Sowing Mar 12	Mar 20	Apr 30	May 15	Mean
		(±0.92)*			
June 13	10.2	16.7	15.3	13.8	14.0
June 13 & July 5	11.8	18.0	16.9	13.5	15.0
Mean (±0.81)	11.0	17.3	16.1	13.7	14.5
Diff. (±0.88)	+1.6	+1.3	+1.6	-0.3	+1.0 (±0.44)
Mean dry matter % as harvested:	79.6	80.9	50.3	62.8	68.4

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

Date of Spraying	Date of Sowing Mar 12	Mar 20	Apr 30	May 15
None	0.0	0.0	9.4	12.3
July 5	1.6	1.2	13.9	13.4

*For use in comparisons other than vertical.

https://doi.org/10.23637/ERADOC-1-177

SPRING BEANS

The control of Aphids (Aphis Fabae) by insecticides applied as high and low volume sprays - Deacons Field 1957.

Design: 3 randomized blocks of 6 plots each, plots being split into 2 for high and low volume spraying.

Area of each sub plot: 0.0537 acres. Area harvested: 0.0179 acres.

Treatments. All combinations of:-

Insecticides:

None - medium only.	(0)
Lindane at 6 oz active ingredient per acre.	(1)
Fluoroacetamide at 3 oz active ingredient per acre.	(2)
Methyl demeton at 6 oz active ingredient per acre.	(3)
Methyl demeton at 3 oz active ingredient per acre.	(4)
Malathion at 12 oz active ingredient per acre.	(5)

Volume:

High - 60 gallons per acre; low - 10 gallons per acre.

Note: The spray medium used with all the insecticides was benzoyl-β-oxydiphenyl-poly glyco ether at 6 oz per acre.

Basal dressing: 300 lb compound fertilizer (10% P_2O_5, 20% K_2O) per acre placement drilled with seed.

Cultivations, etc.: Ploughed: Dec 5 - 13, 1956. Seed placement drilled at 190 lb per acre: Mar 18 - 21, 1957. Sprayed appropriate plots with insecticides: June 13. Combine harvested: Sept 3. Variety: Garton's Tick. Previous crop: Wheat.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 4.55 cwt per acre or 25.0% (10 d.f.)
Sub plot: 1.91 cwt per acre or 10.5% (12 d.f.)

Note: Counts of aphids, at intervals after spraying, and assessments of early incidence of virus disease were made.

Summary of Results

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

Volume	Insecticides 0	1	2	3	4	5	Mean
			(±2.73)*				
High	5.3	4.9	26.7	25.3	27.4	19.3	18.2
Low	3.3	8.0	26.8	27.3	28.1	16.0	18.2
Mean (±2.62)	4.3	6.4	26.7	26.3	27.8	17.6	18.2
Difference (±1.56)	-2.0	+3.1	+0.1	+2.0	+0.7	-3.3	0.0 (±0.64)

*For use in comparisons other than vertical.
Mean dry matter % as harvested: 76.6

https://doi.org/10.23637/ERADOC-1-177 *pp 24*

BEANS

Time of sowing, spraying, P and K - Rothamsted (R) Great Harpenden II and Woburn (W) Warren Field N 1957.

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 (each field): 0.0337 acres. Area harvested: 0.0105 acres.

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

Basal dressing: None.

Cultivations, etc.:
Rothamsted. Ploughed: Oct 20, 1956. Fertilizers applied for autumn beans, seed drilled at 295 lb per acre: Nov 13. Fertilizers applied for spring beans, seed drilled at 150 lb per acre: Mar 5, 1957. Spring beans sprayed with miscible DDT, 3 pints in 20 gallons per acre: May 29. Appropriate plots sprayed with methyl demeton (Metasystox): Autumn sown - June 7, spring sown - June 13. Combine harvested: Aug 29. Variety: Autumn - S.Q.Giant, spring - Albyn Tick. Previous crop: Oats.
Woburn. Ploughed: Nov 12, 1956. Fertilizers applied for autumn beans: Nov 13. Seed drilled at 295 lb per acre: Nov 20. Ploughed "spring sown" plots: Jan 24, 1957. Fertilizers applied for spring beans, seed drilled at 150 lb per acre: Mar 14. Appropriate plots sprayed with methyl demeton (Metasystox): June 12. Combine harvested: Autumn sown - Aug 8, spring sown - Aug 21. Variety: Autumn - S.Q.Giant, spring - Albyn Tick. Previous crop: Potatoes.

Standard errors per plot, (Grain at 85% dry matter): cwt per acre.
Great Harpenden II (R)
Whole plot: 1.13 cwt per acre or 4.9% (4 d.f.)
Sub plot: 2.01 cwt per acre or 8.6% (12 d.f.)
Warren Field N (W)
Whole plot: 1.49 cwt per acre or 10.5% (4 d.f.)
Sub plot: 3.22 cwt per acre or 22.7% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

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

	Sown Autumn	Sown Spring	Diff.	P_2O_5: cwt per acre None	0.5	1.0	K_2O: cwt per acre None	1.0	2.0	Mean
Spray				Great Harpenden II, Rothamsted						
				(±0.82)*			(±0.82)*			
None	32.4	7.6	-24.8	19.4	20.9	19.8	18.5	20.6	20.9	20.0
'Metasystox'	34.3	18.7	-15.6	26.5	26.5	26.5	25.0	27.9	26.7	26.5
Diff.	+1.9	+11.1	+ 9.2 (±1.14)	+7.1	+5.6	+6.7 (±1.16)**	+6.5	+7.3	+5.8 (±1.16)**	+6.5
Sown				(1) & (2)			(1) & (2)			
Autumn				33.1	33.5	33.4	31.4	34.3	34.4	33.3
Spring				12.7	14.0	12.9	12.1	14.2	13.2	13.2
Mean (±0.58)				22.9	23.7	23.1	21.7	24.3	23.8	23.3
Diff. (±1.15)**				-20.4	-19.5	-20.5	-19.3	-20.1	-21.2	-20.15 (±0.65)

Mean dry matter % as harvested: Autumn sown, 82.4; spring sown, 75.4
(1) ±0.81 for use in diagonal comparisons only.
(2) ±0.82 for use in horizontal and interaction comparisons only.

Warren Field N, Woburn

Spray				(±1.31)*			(±1.31)*			
None	16.9	8.0	- 8.9	13.4	11.2	12.7	11.7	14.5	11.1	12.4
'Metasystox'	23.3	8.7	-14.6	16.7	15.5	15.8	13.6	16.3	18.1	16.0
Diff.	+6.4	+0.7	- 5.7 (±1.72)	+3.3	+4.3	+3.1 (±1.86)**	+1.9	+1.8	+7.0 (±1.86)**	+3.6
Sown				(1) & (2)			(1) & (2)			
Autumn				21.2	18.5	20.5	17.2	22.2	20.7	20.1
Spring				8.9	8.2	7.9	8.1	8.5	8.4	8.3
Mean (±0.93)				15.0	13.4	14.2	12.6	15.4	14.6	14.2
Diff. (±1.74)**				-12.3	-10.3	-12.6	-9.1	-13.7	-12.3	-11.8 (±0.86)

Mean dry matter % as harvested: Autumn sown, 79.5; spring sown, 71.5
(1) ±1.23 for use in diagonal comparisons only.
(2) ±1.31 for use in horizontal and interaction comparisons only.

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

https://doi.org/10.23637/ERADOC-1-177 *pp 26*

57/Cf/1.1

POTATOES

Control of virus spread by insecticide spray - Highfield V and VI 1957.

Design: 5 × 5 Latin square.

Area of each plot: 0.0608 acres. Area harvested: 0.0091 acres.

Treatments: Number of sprayings with DDT emulsion, 2 lb active ingredient in 25 gallons per acre.
None; 1, at 4th spraying; 2, at 3rd and 4th sprayings; 3, at 2nd, 3rd and 4th sprayings; 4.

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. The yields shown were taken from the undamaged rows and an estimate of the loss of yield due to tractor damage was made from a total area of 0.2280 acres.

Basal dressing per acre: 4 cwt sulphate of ammonia, 3 cwt muriate of potash.

Cultivations, etc.: Ploughed twice: Nov 16 - 20, 1956 and Jan 25 - 29, 1957. Sulphate of ammonia applied on flat: Apr 16. Potatoes machine planted: Apr 16 - 23. Muriate of potash applied: May 3. Earthed up: May 28. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: Aug 3 and again Aug 22. Sprayed with sulphuric acid, 20% BOV, 100 gallons per acre: Sept 23. Lifted: Oct 7 - 10. Variety: Majestic. Previous crop: Wheat.

Dates of DDT sprayings: June 3, June 19 - 21, July 4, July 30.

Standard error per plot:
Total tubers: 1.25 tons per acre or 8.8% (12 d.f.)

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

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

	Number of sprayings with DDT					Mean
	None	1	2	3	4	
Total tubers: tons per acre						
Mean (±0.559)	13.96	14.88	14.37	13.90	14.05	14.23
Increase (±0.791)		+0.92	+0.41	-0.06	+0.09	
Percentage ware (1½" riddle)						
Mean	77.9	82.3	80.0	78.9	78.4	79.5
Increase		+4.4	+2.1	+1.0	+0.5	

Estimated loss of yield due to 5 passages of the tractor: 11.7%

Estimated loss of yield in whole crop due to 5 passages of the tractor along 4 rows out of 6: 7.8%

https://doi.org/10.23637/ERADOC-1-177

POTATOES

The control of blight (Phytophthora infestans) by copper fungicide spray - Highfield IV 1957.

Design: 8 randomized blocks of 2 plots each.

Area of each plot: 0.1273 acres. Area harvested: Whole plots - 0.0141 acres; sub plots - 0.0071 acres.

Treatments.
Whole plots: No spray; copper fungicide sprayed twice.
Sub plots: On sprayed plots only, 2 rows damaged by 2 passages of the tractor during copper spray operations were compared with 2 undamaged rows.

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

Cultivations, etc.: Ploughed twice: Nov 22, 1956 and Feb 22 - Mar 1, 1957. Basal fertilizer applied on flat: Apr 24. Potatoes machine planted: Apr 25 - 26. Earthed up: July 9. Fungicide treatment, 5 lb in 40 gallons per acre, applied twice: July 31 and Aug 21. Sprayed with sulphuric acid, 20% BOV, 100 gallons per acre: Oct 3. Lifted: Oct 14 - 15. Variety: Majestic. Previous crop: Wheat.

Standard errors per plot. Total tubers:
Whole plots: 1.72 tons per acre or 11.8% (7 d.f.)
Sub plots (sprayed plots only): 1.14 tons per acre or 7.6% (7 d.f.)

Note: Estimates were made of the rate of bulking, destruction of foliage by blight, amount of blight on the tubers. 2 rows of King Edward were planted on each plot for an assessment of blight infected tubers.

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

Spray: None	Spray: Copper fungicide	Mean	Difference
Total tubers: tons per acre			
14.26	14.98	14.62	+0.72 (±0.862)
Percentage ware (1½" riddle)			
88.0	80.3	84.1	-7.7

Copper fungicide plots only

Undamaged	Damaged	Difference
Total tubers: tons per acre		
15.41	14.56	-0.85 (±0.570)
Percentage ware (1½" riddle)		
77.9	82.6	+4.7

https://doi.org/10.23637/ERADOC-1-177

57/Cf/3.1

POTATOES

Dung, N, P and K - Rothamsted (R) West Barnfield II and Woburn (W) Great Hill 1957.

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

Area of each plot: 0.0212 acres. Area harvested: 0.0141 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.:
West Barnfield II (R). Dung applied, ploughed: Jan 9. Fertilizers applied: Apr 19. Potatoes machine planted: Apr 24. Earthed up: July 5. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: Aug 1 and Aug 21. Sprayed with sulphuric acid, 20% BOV, 100 gallons per acre: Sept 19. Lifted: Oct 2 - 3. Variety: Majestic. Previous crop: Barley.
Great Hill (W). Dung applied, ploughed: Feb 4. Fertilizers applied: Apr 15. Potatoes machine planted: Apr 16. Earthed up: July 3. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 3, Aug 23, Sept 3. Sprayed with sodium arsenite at 1 gallon in 40 gallons per acre: Sept 17. Lifted: Oct 3 - 4. Variety: Majestic. Previous crop: Barley.

Standard errors per plot. Total tubers.
West Barnfield II (R): 0.785 tons per acre or 6.9% (30 d.f.)
Great Hill (W): 1.126 tons per acre or 8.1% (30 d.f.)

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Summary of Results

Total tubers: tons per acre

	Dung: tons per acre None	5	10	20	Mean
West Barnfield II, Rothamsted					
Mean (±0.196)	9.31	11.01	12.08	13.20	11.40
N: cwt per acre					
None (±0.278)	9.09	10.76	12.10	12.92	11.22
0.9	9.54	11.26	12.05	13.49	11.58
Difference (±0.392)	+0.45	+0.50	-0.05	+0.57	+0.36 (±0.196)
P_2O_5: cwt per acre					
None (±0.278)	9.22	10.31	11.66	13.07	11.06
0.75	9.41	11.71	12.49	13.34	11.74
Difference (±0.392)	+0.19	+1.40	+0.83	+0.27	+0.68 (±0.196)
K_2O: cwt per acre					
None (±0.278)	8.08	10.30	11.72	12.91	10.75
1.5	10.55	11.72	12.43	13.50	12.05
Difference (±0.392)	+2.47	+1.42	+0.71	+0.59	+1.30 (±0.196)
Great Hill, Woburn					
Mean (±0.282)	13.42	13.47	14.23	14.58	13.92
N: cwt per acre					
None (±0.398)	12.62	12.88	13.71	14.14	13.34
0.9	14.22	14.06	14.74	15.01	14.51
Difference (±0.563)	+1.60	+1.18	+1.03	+0.87	+1.17 (±0.282)
P_2O_5: cwt per acre					
None (±0.398)	13.52	13.52	14.13	14.00	13.79
0.75	13.32	13.42	14.32	15.16	14.06
Difference (±0.563)	-0.20	-0.10	+0.19	+1.16	+0.27 (±0.282)
K_2O: cwt per acre					
None (±0.398)	12.92	13.14	14.08	14.34	13.62
1.5	13.93	13.80	14.38	14.81	14.23
Difference (±0.563)	+1.01	+0.66	+0.30	+0.47	+0.61 (±0.282)

https://doi.org/10.23637/ERADOC-1-177

Percentage Ware

	Dung: tons per acre None	5	10	20	Mean
	West Barnfield II, Rothamsted(1)				
Mean	87.9	90.1	86.6	86.2	87.7
N: cwt per acre					
None	89.0	91.7	88.2	87.6	89.1
0.9	86.8	88.6	85.0	84.8	86.3
Difference	-2.2	-3.1	-3.2	-2.8	-2.8
P_2O_5: cwt per acre					
None	89.9	90.6	86.5	85.0	88.0
0.75	85.8	89.7	86.7	87.4	87.4
Difference	-4.1	-0.9	+0.2	+2.4	-0.6
K_2O: cwt per acre					
None	86.8	89.9	87.8	87.9	88.1
1.5	88.9	90.4	85.4	84.4	87.3
Difference	+2.1	+0.5	-2.4	-3.5	-0.8
	Great Hill, Woburn(2)				
Mean	88.8	88.6	88.6	88.6	88.6
N: cwt per acre					
None	89.8	89.6	88.6	90.9	89.7
0.9	87.8	87.5	88.6	86.4	87.6
Difference	-2.0	-2.1	0.0	-4.5	-2.1
P_2O_5: cwt per acre					
None	89.0	90.1	89.0	87.0	88.8
0.75	88.7	87.0	88.2	90.2	88.5
Difference	-0.3	-3.1	-0.8	+3.2	-0.3
K_2O: cwt per acre					
None	88.5	88.2	88.3	88.3	88.3
1.5	89.2	88.9	88.8	89.0	89.0
Difference	+0.7	+0.7	+0.5	+0.7	+0.7

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

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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
	West Barnfield II, Rothamsted (±0.278)					
N	-	-	+0.40	+0.32	+0.30	+0.42
P_2O_5	+0.71	+0.63	-	-	+0.03	+1.31
K_2O	+1.24	+1.36	+0.66	+1.94	-	-
	Great Hill, Woburn (±0.398)					
N	-	-	+1.61	+0.73	+0.96	+1.38
P_2O_5	+0.70	-0.18	-	-	+0.32	+0.20
K_2O	+0.40	+0.82	+0.67	+0.55	-	-

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
	West Barnfield II, Rothamsted(1)					
N	-	-	-1.7	-3.9	-0.7	-4.9
P_2O_5	+0.5	-1.7	-	-	-0.3	-0.9
K_2O	+1.3	-2.9	-0.5	-1.1	-	-
	Great Hill, Woburn(2)					
N	-	-	-2.5	-1.9	-1.7	-2.7
P_2O_5	-0.5	+0.1	-	-	-0.7	+0.3
K_2O	+1.2	+0.2	+0.2	+1.2	-	-

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

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POTATOES

Control of skin spot (*Oospora pustulans*) by fungicides - Rothamsted (R) Highfield IV and Woburn (W) Great Hill 1957.

Design: 3 randomized blocks of 12 plots each.

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

Treatments:
- None (3 plots per block).
- Dung (3 plots per block): 15 tons per acre applied in the furrows.
- PCNB, 20% Pentachloronitrobenzene dust applied: To seed at 1½ oz. per cwt (S); to furrows before planting at 300 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 150 lb per acre (F); (S) and (F).

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

Cultivations, etc.:

Highfield IV (R). Ploughed twice: Nov 22, 1956 and Feb 22 - Mar 1, 1957. Ridged, basal fertilizer, dung and fungicides applied, potatoes hand planted: May 1. Earthed up: July 8. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 31 and Aug 21. Sprayed with sulphuric acid, 20% BOV, 100 gallons per acre: Sept 28. Lifted: Oct 4. Variety: Majestic. Previous crop: Wheat.

Great Hill (W). Ploughed: Feb 6, 1957. Ridged: Apr 24. Dung, basal fertilizers and fungicides applied, potatoes hand planted: Apr 25. Earthed up: July 6. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 3, Aug 23, Sept 3. Sprayed with sodium arsenite at 1 gallon in 40 gallons per acre: Sept 20. Lifted: Oct 2. Variety: Majestic. Previous crop: Barley.

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.

In 1956 the Pentachloronitrobenzene dust, PCNB, was recorded in error as Parachloronitrobenzene

Standard errors per plot. Total tubers.
Highfield IV (R): 1.21 tons per acre or 8.6% (26 d.f.)
Great Hill (W): 1.52 tons per acre or 11.5% (26 d.f.)

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

	Treatment							
	0	D	PS	PF	PSF	NS	NF	NSF	Mean
Total tubers: tons per acre									
Highfield IV, Rothamsted									
	(±0.40)		(±0.70)						
Mean	14.08	14.54	13.81	13.79	14.48	12.65	14.67	13.64	14.08
Increase (±0.81)	-	+0.46(1)	-0.27	-0.29	+0.40	-1.43	+0.59	-0.44	
(1) ±0.57									
Great Hill, Woburn									
	(±0.51)		(±0.88)						
Mean	12.96	13.08	14.25	14.12	13.17	12.86	12.42	13.85	13.23
Increase (±1.02)	-	+0.12(1)	+1.29	+1.16	+0.21	-0.10	-0.54	+0.89	
(1) ±0.72									
Percentage Ware									
Highfield IV, Rothamsted(1)									
Mean	70.4	76.3	72.8	74.3	67.8	70.2	66.0	67.7	71.6
Increase	-	+5.9	+2.4	+3.9	-2.6	-0.2	-4.4	-2.7	
Great Hill, Woburn(2)									
Mean	87.0	86.4	87.1	91.7	87.4	83.0	86.4	85.7	86.8
Increase	-	-0.6	+0.1	+4.7	+0.4	-4.0	-0.6	-1.3	

Fungicide

D Dung at 15 tons per acre.
P PCNB (Pentachloronitrobenzene) 20% dust.
N Nomersan, 10% Thiram dust.

Method of application

S Seed treated.
F Applied to furrows before planting.

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

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SUGAR BEET

Dung, N, P, K and Salt - Rothamsted (R) West Barnfield II and Woburn (W) Great Hill 1957.

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

Area of each plot: 0.0167 acres. Area harvested: 0.0111 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 dressings: None.

Cultivations, etc.:

West Barnfield II (R). Dung applied, ploughed: Jan 8. Salt applied: Feb 18. Fertilizers applied: Apr 16. Seed drilled at 18 lb per acre: Apr 17. Sprayed with DDT emulsion, 3 pints in 20 gallons per acre: May 29. Singled: July 1 - 9. Sprayed with methyldemeton, 12 oz in 80 gallons per acre: July 6. Lifted: Nov 13 - 27. Variety: Klein E. Previous crop: Barley.

Great Hill (W). Salt applied: Feb 5. Dung applied, ploughed: Feb 6. Fertilizers applied: Apr 12. Seed drilled at 12 lb per acre: Apr 13. Sprayed with miscible DDT at 3 pints in 20 gallons per acre: May 22. Singled: June 3 - 6. Sprayed with methyldemeton at 12 oz in 80 gallons per acre: July 8. Lifted: Nov 25 - 28. Variety: Klein E. Previous crop: Barley.

Standard errors per plot.

Total sugar.	West Barnfield (R)	4.32 cwt per acre or 11.8%	(32 d.f.)
	Great Hill (W)	3.31 cwt per acre or 5.3%	(32 d.f.)
Tops.	West Barnfield (R)	1.674 tons per acre or 11.1%	(32 d.f.)
	Great Hill (W)	0.697 tons per acre or 6.1%	(32 d.f.)

https://doi.org/10.23637/ERADOC-1-177

Summary of Results

Roots (washed): tons per acre

	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)					
Mean	8.63	10.05	11.08	12.55	10.58
N: cwt per acre					
None	8.29	9.92	10.89	12.62	10.43
0.9	8.96	10.18	11.28	12.48	10.72
Difference	+0.67	+0.26	+0.39	-0.14	+0.29
P_2O_5: cwt per acre					
None	7.49	9.35	10.46	12.34	9.91
0.75	9.77	10.76	11.70	12.75	11.24
Difference	+2.28	+1.41	+1.24	+0.41	+1.33
K_2O: cwt per acre					
None	8.06	9.95	11.10	12.57	10.42
1.5	9.20	10.15	11.06	12.52	10.73
Difference	+1.14	+0.20	-0.04	-0.05	+0.31
Salt: cwt per acre					
None	7.36	9.52	10.53	12.07	9.87
5.0	9.89	10.58	11.64	13.02	11.28
Difference	+2.53	+1.06	+1.11	+0.95	+1.41
Great Hill (Woburn)					
Mean	15.99	16.94	17.77	18.67	17.34
N: cwt per acre					
None	14.93	16.80	17.07	18.39	16.80
0.9	17.05	17.08	18.47	18.95	17.89
Difference	+2.12	+0.28	+1.40	+0.56	+1.09
P_2O_5: cwt per acre					
None	16.16	17.02	17.92	18.86	17.49
0.75	15.82	16.86	17.62	18.48	17.19
Difference	-0.34	-0.16	-0.30	-0.38	-0.30
K_2O: cwt per acre					
None	15.99	17.03	18.11	18.33	17.36
1.5	15.99	16.85	17.43	19.01	17.32
Difference	0.00	-0.18	-0.68	+0.68	-0.04
Salt: cwt per acre					
None	15.76	16.94	17.42	18.83	17.24
5.0	16.22	16.93	18.13	18.51	17.45
Difference	+0.46	-0.01	+0.71	-0.32	+0.21

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Sugar percentage

	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)					
Mean	17.3	17.3	17.3	17.2	17.3
N: cwt per acre					
None	17.7	17.6	17.6	17.5	17.6
0.9	16.9	16.9	16.9	16.8	16.9
Difference	-0.8	-0.7	-0.7	-0.7	-0.7
P_2O_5: cwt per acre					
None	17.1	17.2	17.1	17.0	17.1
0.75	17.6	17.4	17.4	17.3	17.4
Difference	+0.5	+0.2	+0.3	+0.3	+0.3
K_2O: cwt per acre					
None	17.3	17.4	17.3	17.0	17.2
1.5	17.3	17.2	17.3	17.3	17.3
Difference	0.0	-0.2	0.0	+0.3	+0.1
Salt: cwt per acre					
None	17.1	17.1	17.4	17.3	17.2
5.0	17.5	17.5	17.2	17.0	17.3
Difference	+0.4	+0.4	-0.2	-0.3	+0.1
Great Hill (Woburn)					
Mean	18.2	18.0	17.7	17.7	17.9
N: cwt per acre					
None	18.5	18.2	17.8	18.0	18.1
0.9	17.9	17.7	17.7	17.3	17.7
Difference	-0.6	-0.5	-0.1	-0.7	-0.4
P_2O_5: cwt per acre					
None	18.1	18.0	17.7	17.6	17.9
0.75	18.2	17.9	17.8	17.7	17.9
Difference	+0.1	-0.1	+0.1	+0.1	0.0
K_2O: cwt per acre					
None	18.3	18.0	17.8	17.5	17.9
1.5	18.1	18.0	17.7	17.8	17.9
Difference	-0.2	0.0	-0.1	+0.3	0.0
Salt: cwt per acre					
None	18.0	18.0	17.7	17.9	17.9
5.0	18.4	17.9	17.8	17.5	17.9
Difference	+0.4	-0.1	+0.1	-0.4	0.0

https://doi.org/10.23637/ERADOC-1-177

Total sugar: cwt per acre

	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)					
Mean (±1.08)	30.0	34.8	38.3	43.0	36.5
N: cwt per acre					
None (±1.53)	29.5	35.0	38.3	44.2	36.8
0.9	30.4	34.6	38.2	41.9	36.3
Difference (±2.16)	+0.9	-0.4	-0.1	-2.3	-0.5 (±1.08)
P_2O_5: cwt per acre					
None (±1.53)	25.6	32.2	35.8	42.0	33.9
0.75	34.4	37.3	40.7	44.1	39.1
Difference (±2.16)	+8.8	+5.1	+4.9	+2.1	+5.2 (±1.08)
K_2O: cwt per acre					
None (±1.53)	28.0	34.5	38.3	42.8	35.9
1.5	32.0	35.0	38.2	43.3	37.1
Difference (±2.16)	+4.0	+0.5	-0.1	+0.5	+1.2 (±1.08)
Salt: cwt per acre					
None (±1.53)	25.3	32.5	36.5	41.7	34.0
5.0	34.7	37.0	40.0	44.3	39.0
Difference (±2.16)	+9.4	+4.5	+3.5	+2.6	+5.0 (±1.08)
Great Hill (Woburn)					
Mean (±0.83)	58.1	60.8	63.0	66.0	62.0
N: cwt per acre					
None (±1.17)	55.1	61.2	60.7	66.3	60.8
0.9	61.2	60.4	65.4	65.7	63.2
Difference (±1.66)	+6.1	-0.8	+4.7	-0.6	+2.4 (±0.83)
P_2O_5: cwt per acre					
None (±1.17)	58.6	61.2	63.3	66.5	62.4
0.75	57.7	60.3	62.8	65.5	61.6
Difference (±1.66)	-0.9	-0.9	-0.5	-1.0	-0.8 (±0.83)
K_2O: cwt per acre					
None (±1.17)	58.3	61.1	64.4	64.3	62.0
1.5	57.9	60.5	61.7	67.7	61.9
Difference (±1.66)	-0.4	-0.6	-2.7	+3.4	-0.1 (±0.83)
Salt: cwt per acre					
None (±1.17)	56.6	60.9	61.7	67.3	61.6
5.0	59.7	60.6	64.4	64.6	62.3
Difference (±1.66)	+3.1	-0.3	+2.7	-2.7	+0.7 (±0.83)

https://doi.org/10.23637/ERADOC-1-177

Tops: tons per acre

	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)					
Mean (±0.418)	12.50	14.75	15.77	17.39	15.10
N: cwt per acre					
None (±0.592)	10.29	13.98	14.19	15.71	13.54
0.9	14.71	15.52	17.35	19.08	16.66
Difference (±0.837)	+4.42	+1.54	+3.16	+3.37	+3.12 (±0.418)
P_2O_5: cwt per acre					
None (±0.592)	11.34	12.56	14.54	17.41	13.96
0.75	13.66	16.94	17.00	17.37	16.24
Difference (±0.837)	+2.32	+4.38	+2.46	-0.04	+2.28 (±0.418)
K_2O: cwt per acre					
None (±0.592)	11.72	15.43	15.69	17.57	15.10
1.5	13.28	14.07	15.85	17.21	15.10
Difference (±0.837)	+1.56	-1.36	+0.16	-0.36	0.00 (±0.418)
Salt: cwt per acre					
None (±0.592)	11.37	14.22	15.12	16.67	14.34
5.0	13.63	15.28	16.42	18.12	15.86
Difference (±0.837)	+2.26	+1.06	+1.30	+1.45	+1.52 (±0.418)
Great Hill (Woburn)					
Mean (±0.174)	9.60	10.83	11.70	13.53	11.41
N: cwt per acre					
None (±0.246)	7.38	8.45	9.56	11.68	9.27
0.9	11.83	13.21	13.83	15.37	13.56
Difference (±0.348)	+4.45	+4.76	+4.27	+3.69	+4.29 (±0.174)
P_2O_5: cwt per acre					
None (±0.246)	10.08	10.53	11.78	13.54	11.48
0.75	9.13	11.13	11.61	13.51	11.34
Difference (±0.348)	-0.95	+0.60	-0.17	-0.03	-0.14 (±0.174)
K_2O: cwt per acre					
None (±0.246)	9.44	10.76	11.49	13.17	11.21
1.5	9.77	10.90	11.91	13.88	11.61
Difference (±0.348)	+0.33	+0.14	+0.42	+0.71	+0.40 (±0.174)
Salt: cwt per acre					
None (±0.246)	9.39	10.95	11.45	13.45	11.31
5.0	9.82	10.71	11.95	13.60	11.52
Difference (±0.348)	+0.43	-0.24	+0.50	+0.15	+0.21 (±0.174)

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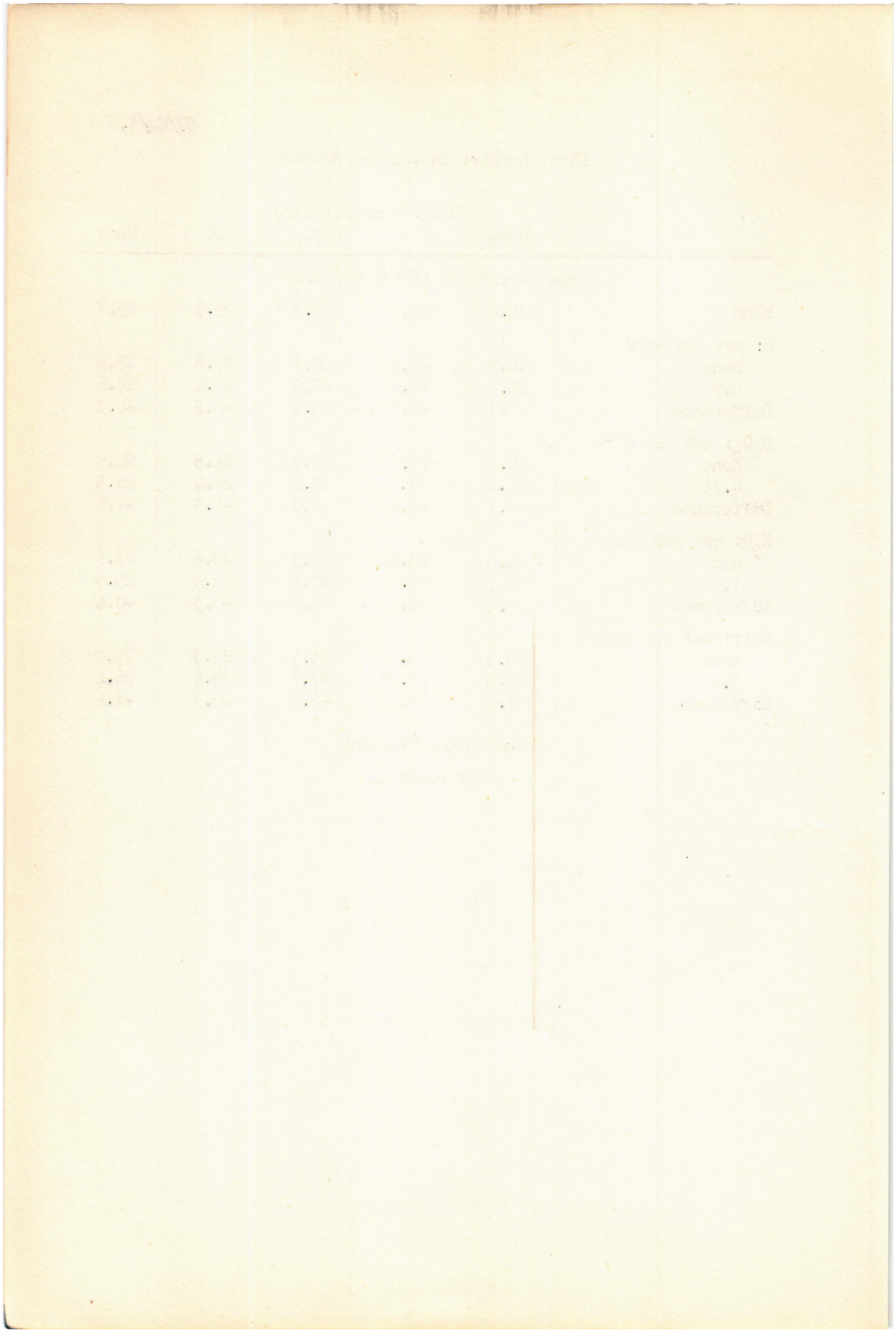

Roots (washed): tons per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)						
None	None	6.62	9.45	10.40	11.89	9.59
1.5	None	8.11	9.59	10.66	12.25	10.15
None	5.0	9.50	10.44	11.81	13.26	11.25
1.5	5.0	10.29	10.72	11.47	12.79	11.32
Great Hill (Woburn)						
None	None	15.81	16.96	18.21	18.57	17.39
1.5	None	15.71	16.93	16.63	19.09	17.09
None	5.0	16.16	17.10	18.01	18.09	17.34
1.5	5.0	16.27	16.76	18.24	18.93	17.55

Sugar percentage

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)						
None	None	17.2	17.2	17.4	17.1	17.2
1.5	None	17.1	17.0	17.3	17.5	17.2
None	5.0	17.4	17.6	17.1	17.0	17.3
1.5	5.0	17.6	17.4	17.3	17.1	17.3
Great Hill (Woburn)						
None	None	18.0	18.0	17.7	17.7	17.8
1.5	None	17.9	18.0	17.7	18.1	17.9
None	5.0	18.5	18.0	17.9	17.4	17.9
1.5	5.0	18.3	17.9	17.7	17.5	17.9

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Total sugar: cwt per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)						
			(±2.16)			(±1.08)
None	None	22.8	32.5	36.2	40.6	33.0
1.5	None	27.8	32.6	36.9	42.9	35.0
None	5.0	33.2	36.6	40.4	45.0	38.8
1.5	5.0	36.2	37.5	39.6	43.7	39.2
Great Hill (Woburn)						
			(±1.66)			(±0.83)
None	None	57.0	60.8	64.4	65.7	62.0
1.5	None	56.2	61.0	58.9	68.9	61.3
None	5.0	59.7	61.4	64.4	62.9	62.1
1.5	5.0	59.7	59.9	64.4	66.4	62.6

Tops: tons per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)						
			(±0.837)			(±0.418)
None	None	9.91	13.82	15.30	16.05	13.77
1.5	None	12.82	14.62	14.94	17.28	14.91
None	5.0	13.53	17.04	16.07	19.09	16.43
1.5	5.0	13.73	13.52	16.77	17.15	15.29
Great Hill (Woburn)						
			(±0.348)			(±0.174)
None	None	9.12	10.50	10.79	13.15	10.89
1.5	None	9.65	11.39	12.11	13.75	11.73
None	5.0	9.76	11.02	12.19	13.19	11.54
1.5	5.0	9.89	10.41	11.71	14.01	11.50

Plant number: thousands per acre

K_2O: cwt per acre	Salt: cwt per acre	Dung: tons per acre None	5	10	20	Mean
West Barnfield II (Rothamsted)						
None	None	24.1	24.7	25.2	25.0	24.7
1.5	None	23.7	25.6	25.8	25.7	25.2
None	5.0	25.6	27.2	25.9	26.2	26.2
1.5	5.0	26.0	26.3	29.3	25.0	26.6

Great Hill (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								
West Barnfield II (Rothamsted)								
N	-	-	+0.10	+0.50	+0.45	+0.15	-0.14	+0.74
P_2O_5	+1.13	+1.53	-	-	+1.06	+1.60	+0.97	+1.69
K_2O	+0.46	+0.16	+0.04	+0.58	-	-	+0.56	+0.06
Salt	+0.97	+1.85	+1.05	+1.77	+1.66	+1.16	-	-
Great Hill (Woburn)								
N	-	-	+1.15	+1.03	+1.03	+1.15	+0.91	+1.27
P_2O_5	-0.23	-0.35	-	-	-0.60	+0.02	+0.15	-0.73
K_2O	-0.10	+0.02	-0.35	+0.27	-	-	-0.29	+0.21
Salt	+0.03	+0.39	+0.65	-0.23	-0.04	+0.46	-	-
Sugar percentage								
West Barnfield II (Rothamsted)								
N	-	-	-0.9	-0.7	-0.9	-0.7	-1.0	-0.6
P_2O_5	+0.2	+0.4	-	-	+0.4	+0.2	+0.3	+0.3
K_2O	-0.1	+0.1	+0.1	-0.1	-	-	0.0	0.0
Salt	-0.1	+0.3	+0.1	+0.1	+0.1	+0.1	-	-
Great Hill (Woburn)								
N	-	-	-0.3	-0.7	-0.6	-0.4	-0.5	-0.5
P_2O_5	+0.3	-0.1	-	-	-0.1	+0.3	+0.1	+0.1
K_2O	-0.1	+0.1	-0.2	+0.2	-	-	+0.1	-0.1
Salt	0.0	0.0	0.0	0.0	+0.1	-0.1	-	-
Total sugar: cwt per acre								
West Barnfield II (Rothamsted)					(±1.53)			
N	-	-	-1.2	+0.2	0.0	-1.0	-2.3	+1.3
P_2O_5	+4.5	+5.9	-	-	+4.5	+5.9	+3.9	+6.5
K_2O	+1.7	+0.7	+0.5	+1.9	-	-	+2.0	+0.4
Salt	+3.2	+6.8	+3.7	+6.3	+5.8	+4.2	-	-
Great Hill (Woburn)					(±1.17)			
N	-	-	+3.2	+1.4	+1.8	+2.8	+1.7	+2.9
P_2O_5	+0.1	-1.7	-	-	-2.5	+0.9	+1.0	-2.6
K_2O	-0.6	+0.4	-1.8	+1.6	-	-	-0.7	+0.5
Salt	+0.1	+1.3	+2.5	-1.1	+0.1	+1.3	-	-

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Response to	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
			Responses to treatments cwt per acre					
Tops: tons per acre								
West Barnfield II (Rothamsted)								
			(±0.592)					
N	-	-	+2.83	+3.41	+3.55	+2.69	+3.16	+3.08
P_2O_5	+1.99	+2.57	-	-	+2.05	+2.51	+2.11	+2.45
K_2O	+0.43	-0.43	-0.23	+0.23	-	-	+1.14	-1.14
Salt	+1.56	+1.48	+1.35	+1.69	+2.66	+0.38	-	-
Great Hill (Woburn)								
				(±0.246)				
N	-	-	+4.23	+4.35	+3.47	+5.11	+4.32	+4.26
P_2O_5	-0.20	-0.08	-	-	-0.52	+0.24	+0.16	-0.44
K_2O	-0.42	+1.22	+0.02	+0.78	-	-	+0.84	-0.04
Salt	+0.24	+0.18	+0.51	-0.09	+0.65	-0.23	-	-
Plant number: thousands per acre								
West Barnfield II (Rothamsted)								
N	-	-	+0.1	+0.3	+0.1	+0.3	0.0	+0.4
P_2O_5	+1.5	+1.7	-	-	+1.3	+1.9	+1.7	+1.5
K_2O	+0.4	+0.6	+0.2	+0.8	-	-	+0.5	+0.5
Salt	+1.3	+1.7	+1.6	+1.4	+1.5	+1.5	-	-
Great Hill (Woburn)								
Not recorded								

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LUCERNE

Single and repeated applications of potash - Great Harpenden II 1957, the third 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 applied in the seedbed. Subsequent annual applications are given as top dressings.

Basal dressing: None.

Cultivations, etc.: Annual potash dressings applied: Dec 3, 1956.
Cut and weighed green: three times - May 6, 1957, July 8, Oct 15.

Standard errors per plot. Dry matter:

1st cut:	1.87 cwt per acre or 7.6%	(36 d.f.)
2nd cut:	2.40 cwt per acre or 6.0%	(36 d.f.)
3rd cut:	1.33 cwt per acre or 8.0%	(36 d.f.)
Total of 3 cuts:	3.44 cwt per acre or 4.2%	(36 d.f.)

Note. For first and second year's results, see "Results of the Field Experiments" 1955, Section Ce/1; 1956, Section Cg/1.

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Summary of Results

Dry matter: cwt per acre

	K_2O: cwt per acre						
		Applied 1955			Applied annually 1955,1956 & 1957		
	None	1.0	2.0	3.0	0.33	0.66	1.0	Mean
1st cut								
	(±0.54)				(±0.76)			
Mean	22.9	23.3	25.2	26.1	24.6	25.6	27.0	24.7
Increase (±0.93)		+0.4	+2.3	+3.2	+1.7	+2.7	+4.1	
2nd cut								
	(±0.69)				(±0.98)			
Mean	38.3	39.0	41.6	42.3	39.8	41.7	41.4	40.3
Increase (±1.20)		+0.7	+3.3	+4.0	+1.5	+3.4	+3.1	
3rd cut								
	(±0.39)				(±0.54)			
Mean	16.3	16.8	16.7	17.0	17.1	17.1	16.2	16.7
Increase (±0.67)		+0.5	+0.4	+0.7	+0.8	+0.8	-0.1	
Total of 3 cuts								
	(±0.99)				(±1.40)			
Mean	77.5	79.1	83.5	85.4	81.5	84.4	84.6	81.7
Increase (±1.72)		+1.6	+6.0	+7.9	+4.0	+6.9	+7.1	

Mean dry matter % as cut:

1st	25.4
2nd	32.1
3rd	33.3
Total of 3 cuts	30.3

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GRASS

Rates and times of application of nitrogenous fertilizers - Long Hoos I, II, III, 1957, the second year.

Design: 4 randomized blocks of 16 plots each.

Area of each plot: 0.0076 acres. Area harvested: 0.0045 acres.

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

Materials and methods of application

Applied in one single dressing:

Formalized casein	12.2% N in 1956
" "	12.2% N in 1957
Casein	12.6% N in 1956 and 1957

Applied in 4 dressings of one quarter the single rate each:

Ammonium sulphate	21.0% N in 1957
" "	21.0% N in 1956 and 1957
Urea	43.5% N in 1956 and 1957
Calcium nitrate	15.5% N in 1956 and 1957

Rates of application

0.75; 1.5 cwt N per acre.

Basal dressing: 5 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre; 30 cwt ground chalk per acre.

Cultivations, etc.: Basal fertilizer applied: Dec 19, 1956. Single and first quarter dressings of nitrogen applied: Feb 21, 1957. Ground chalk applied: Apr 18. 2nd, 3rd and 4th quarter dressings of nitrogen applied: Apr 15, June 12, July 31. Cut: 4 times - Apr 15, June 12, July 31, Oct 11. Variety: New Zealand H1 Ryegrass.

Standard errors per plot. Dry matter:

1st cut:	1.60 cwt per acre	or 9.6% (46 d.f.)
2nd cut:	1.64 cwt per acre	or 9.3% (46 d.f.)
3rd cut:	0.48 cwt per acre	or 8.3% (46 d.f.)
4th cut:	0.33 cwt per acre	or 13.8% (46 d.f.)
Total of 4 cuts:	2.44 cwt per acre	or 5.7% (46 d.f.)

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Summary of Results

Dry Matter: cwt per acre

Level of N in fertilizer: cwt per acre	Fertilizer: Single dressing 1956 F	1957 F	1956& 1957 C	Divided dressing 1957 A	1956 and 1957 A	U	N	Mean
1st Cut								
			(±0.80)					
None								6.0 (±0.57)
0.75	9.8	6.8	24.7	15.9	15.9	16.3	15.7	15.0 (±0.30)
1.50	13.9	9.2	31.2	21.2	24.0	26.1	25.4	21.6
Mean (±0.57)	11.9	8.0	28.0	18.5	19.9	21.2	20.6	16.7
Diff. (±1.13)	4.1	2.4	6.5	5.3	8.1	9.8	9.7	6.6 (±0.43)
2nd Cut								
			(±0.82)					
None								10.4 (±0.58)
0.75	10.1	9.9	12.9	19.7	18.8	20.0	20.1	15.9 (±0.31)
1.50	10.3	11.4	24.0	29.1	23.9	25.0	26.2	21.4
Mean (±0.58)	10.2	10.6	18.5	24.4	21.3	22.5	23.1	17.6
Diff. (±1.16)	0.2	1.5	11.1	9.4	5.1	5.0	6.1	5.5 (±0.44)
3rd Cut								
			(±0.24)					
None								2.9 (±0.17)
0.75	3.4	4.8	3.7	5.5	5.0	7.6	6.9	5.3 (±0.09)
1.50	3.9	6.8	4.4	8.2	7.6	10.0	10.6	7.4
Mean (±0.17)	3.6	5.8	4.0	6.8	6.3	8.8	8.8	5.8
Diff. (±0.34)	0.5	2.0	0.7	2.7	2.6	2.4	3.7	2.1 (±0.13)

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Dry Matter: cwt per acre

Level of N in fertilizer: cwt per acre	Fertilizer: Single dressing 1956 F	1957 F	1956 & 1957 C	Divided dressing 1957 A	1956 and 1957 A	U	N	Mean
4th Cut								
			(±0.16)					
None								0.9 (±0.12)
0.75	0.9	3.1	1.0	1.9	2.1	2.2	2.3	1.9 (±0.06)
1.50	1.1	6.3	1.3	3.6	3.8	4.2	3.4	3.4
Mean (±0.12)	1.0	4.7	1.1	2.8	2.9	3.2	2.9	2.4
Diff. (±0.23)	0.2	3.2	0.3	1.7	1.7	2.0	1.1	1.5 (±0.09)
Total of 4 cuts								
			(±1.22)					
None								20.2 (±0.86)
0.75	24.3	24.6	42.3	43.0	41.8	46.1	44.9	38.1 (±0.46)
1.50	29.2	33.6	61.0	62.1	59.2	65.3	65.7	53.7
Mean (±0.86)	26.7	29.1	51.6	52.5	50.5	55.7	55.3	42.7
Diff. (±1.73)	4.9	9.0	18.7	19.1	17.4	19.2	20.8	15.6 (±0.65)

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:	23.4
2nd cut:	29.8
3rd cut:	28.8
4th cut:	24.2
Total of 4 cuts:	26.6

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