ROTHAMSTED RESEARCH

Yields of the Field Experiments 1958

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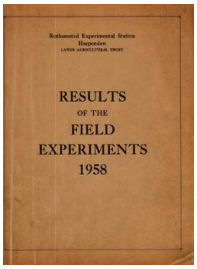

Short-term Experiments

Rothamsted Research

Rothamsted Research (1959) *Short-term Experiments ;* Yields Of The Field Experiments 1958, pp 76 - 117 **- DOI: https://doi.org/10.23637/ERADOC-1-181**

WINTER WHEAT

Seed rates, sowing dates and levels of nitrogen - Great Field I 1958.

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

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

Treatments. All combinations of:-
Seed rates: 2; 3; 4 bushels per acre.
Sowing dates: Sept 17; Oct 7; Nov 8, 1957.
Nitrogen: 0.6; 1.2 cwt N per acre applied as 'Nitro-Chalk' in two equal parts in early February and late April.

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

Cultivations, etc.: Ploughed: Aug 21, 1957. Compound fertilizer applied by hand: First sowing - Sept 17; second sowing - Oct 7; third sowing - Nov 8. First dressing of N applied: Feb 15, 1958. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 17. Second dressing of N applied: Apr 24. Combine harvested: Sept 10. Variety: Cappelle. Previous crop: Potatoes.

Standard errors per plot. Grain (at 85% dry matter):
Whole plot: 2.36 cwt per acre or 7.7% (16 d.f.)
Sub plot: 2.25 cwt per acre or 7.3% (18 d.f.)

Note. Estimates of % area lodged and counts of plant shoot and ear number were made. All plots were completely lodged at harvest.

https://doi.org/10.23637/ERADOC-1-181

58/Ca/1.2

Summary of Results

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

Seed rate: bushels per acre	Date of sowing: Sept 17th	Oct 7th	Nov 8th	N: cwt per acre: 0.4	0.8	Diff.	Mean
	(±0.96)			(±0.95)*		(±1.06)	(±0.56)
2	33.2	31.1	34.3	35.0	30.7	-4.3	32.8
3	29.3	27.2	33.7	30.8	29.3	-1.5	30.1
4	31.2	29.2	26.9	29.8	28.4	-1.4	29.1

Date of sowing	(±0.95)*		(±1.06)	(±0.56)
Sept 17th	31.3	31.1	-0.2	31.2
Oct 7th	30.1	28.1	-2.0	29.1
Nov 8th	34.1	29.2	-4.9	31.6
Mean	31.8	29.5	-2.3 (±0.61)	30.7

*For use in vertical and diagonal comparisons.

Mean dry matter % as harvested: 74.1

https://doi.org/10.23637/ERADOC-1-181

WINTER WHEAT

Uptake of nitrogen - Great Harpenden II 1958.

Design: 3 randomized blocks of 8 plots each.

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

Treatments: None (two plots per block) and all combinations of:-
Forms of nitrogen: Calcium nitrate; sulphate of ammonia, each at 100 lb N per acre.
Times of application of N: In autumn; in spring; half in autumn and half in spring.

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

Cultivations, etc.: Ploughed: Sept 16, 1957. Compound fertilizer applied, seed drilled at $2\frac{1}{2}$ bushels per acre, autumn nitrogen applied: Oct 5. Spring nitrogen applied: Mar 20, 1958. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 30. Combine harvested: Sept 3. Variety: Cappelle. Previous crop: Fallow.

Standard error per plot.
Grain (at 85% dry matter): 2.33 cwt per acre or 5.3% (15 d.f.)

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

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

Form of N	Time of application: Autumn	Spring	Autumn & Spring	Mean
Grain (at 85% dry matter): cwt per acre				
		(±1.35)		(±0.78)
None				43.9(1)
Calcium nitrate	44.8	42.7	42.4	43.3
Sulphate of ammonia	44.3	46.2	42.3	44.3
Mean (±0.95)	44.5	44.4	42.3	43.8
Difference (±1.90)	-0.5	+3.5	-0.1	+1.0 (±1.10)
Straw (at 85% dry matter): cwt per acre				
None				40.9
Calcium nitrate	44.0	38.4	43.2	41.9
Sulphate of ammonia	43.7	41.2	45.6	43.5
Mean	43.8	39.8	44.4	42.2
Difference	-0.3	+2.8	+2.4	+1.6

(1) ±0.95

Mean dry matter % as harvested: Grain: 79.4
Straw: 76.1

58/Ca/3

WINTER WHEAT

Varieties and levels of nitrogen - Long Hoos V 1958.

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

Area of each sub plot: 0.0116 acres. Area harvested: 0.0077 acres.

Treatments: All combinations of:-
Whole plots. Varieties: Banco (1); Cappelle (2); Heine 7 (3); Hybrid 46 (4); Leda (5); Marne (6); Minister (7); Pia (8).
Sub plots. Nitrogen: 0.5; 1.0 cwt N per acre applied as 'Nitro-Chalk'.

Basal dressing: 4 cwt compound fertilizer (5% N, 12½% P_2O_5, 12½% K_2O) per acre combine drilled with the seed.

Cultivations, etc.: Ploughed: Oct 15, 1957. Seed combine drilled at 2¾ bushels per acre: Oct 23. 'Nitro-Chalk' applied: Apr 16, 1958. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 30. Combine harvested: Sept 5. Previous crop: Spring beans.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.38 cwt per acre or 3.3% (14 d.f.)
Sub plot: 1.98 cwt per acre or 4.7% (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
				(±1.13)*					
0.7	38.8	47.3	44.2	47.0	43.1	40.0	46.0	40.6	43.4
1.2	33.3	48.2	41.7	43.5	34.6	43.0	43.3	36.4	40.5
Mean (±0.79)	36.0	47.8	42.9	45.3	38.8	41.5	44.6	38.5	41.9
Difference (±1.62)	-5.5	+0.9	-2.5	-3.5	-8.5	+3.0	-2.7	-4.2	-2.9 (±0.57)

*for use in comparisons other than vertical.

Mean dry matter % as harvested: 75.4

https://doi.org/10.23637/ERADOC-1-181

58/Ca/4

WINTER WHEAT

Levels and times of application of N - Great Knott I.

Design: 2 randomized blocks of 16 plots each.

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

Treatments: None (2 plots per block), and all combinations of:-
Nitrogen: 0.6; 1.2 cwt N per acre as sulphate of ammonia.
Times of application: All in seedbed (A); all as early top dressing (E); all as late top dressing (L); $\frac{1}{2}$A and $\frac{1}{2}$E; $\frac{1}{2}$A and $\frac{1}{2}$L; $\frac{1}{2}$E and $\frac{1}{2}$L; $\frac{1}{3}$A, $\frac{1}{3}$E and $\frac{1}{3}$L.

Basal dressing: 4 cwt per acre compound fertilizer (10% P_2O_5, 20% K_2O) combine drilled with seed.

Cultivations, etc.: Ploughed: Sept 13, 1957. Seedbed sulphate of ammonia applied: Oct 9. Seed combine drilled at $2\frac{1}{2}$ bushels per acre: Oct 11. Early top dressing of sulphate of ammonia applied: Mar 14, 1958. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 30. Late top dressing of sulphate of ammonia applied: May 17. Combine harvested: Sept 2.
Variety: Cappelle. Previous crop: Winter wheat.

Standard error per plot.
Grain (at 85% dry matter): 2.33 cwt per acre or 5.6% (16 d.f.)

Summary of Results

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

N: cwt per acre	Time of application A	E	L	$\frac{1}{2}$A$\frac{1}{2}$E	$\frac{1}{2}$A$\frac{1}{2}$L	$\frac{1}{2}$E$\frac{1}{2}$L	$\frac{1}{3}$A$\frac{1}{3}$E$\frac{1}{3}$L	Mean
			(±1.65)					(±0.62)
None								33.8(1)
0.6	40.6	43.7	39.4	42.5	39.1	39.8	40.0	40.7
1.2	46.0	46.7	41.6	44.4	44.4	47.2	45.6	45.1
Mean (±1.16)	43.3	45.2	40.5	43.4	41.8	43.5	42.8	41.8
Diff. (±2.33)	5.4	3.0	2.2	1.9	5.3	7.4	5.6	4.4 (±0.88)

(1) ±1.16

A applied in seedbed
E applied in March
L applied in May.

Mean dry matter % as harvested: 80.0

https://doi.org/10.23637/ERADOC-1-181

SPRING WHEAT

Combine drilling of nitrogen - Rothamsted (R) Great Knott III and Woburn (W) Lansome Field 1958.

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); 0.72*(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.

*Note. For N_1 and N_3 on Great Knott III (R) the compound fertilizer was actually applied at the rates of 0.19 and 0.59 cwt N per acre respectively. The broadcast dressings were corrected to these amounts.

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.:
Great Knott III (R): Ploughed: Oct 28, 1957. Seed combine drilled at 3 bushels per acre: Apr 3, 1958. Sulphate of ammonia broadcast: Apr 4. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 20. Combine harvested: Sept 12. Variety: Koga II. Previous crop: Spring wheat.
Lansome Field (W): Ploughed: Nov 27, 1957. Seed combine drilled at 3 bushels per acre: Apr 11, 1958. Sprayed with MCPA at 5 pints in 40 gallons per acre: May 22. Combine harvested: Oct 9. Variety: Peko. Previous crop: Fallow.

Standard errors per plot, Grain (at 85% dry matter):
Great Knott III (R): 0.94 cwt per acre or 5.1% (18 d.f.)
Lansome Field (W): 1.44 cwt per acre or 7.9% (18 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

N: cwt per acre							
	Broadcast			Combine drilled			
None	0.22+	0.54	0.72*	0.22+	0.54	0.72*	Mean
Great Knott III, Rothamsted							
9.9	13.1	20.1	20.2 (±0.46)	18.4	24.9	23.3	18.5

Mean dry matter % as harvested: 78.6

Lansome Field, Woburn							
12.6	17.7	21.7	22.0 (±0.71)	17.4	16.7	19.1	18.2

Mean dry matter % as harvested: 74.2

+0.19 on Great Knott III, Rothamsted.
*0.59 " " " " "

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SPRING WHEAT

Levels and times of application of nitrogen - Rothamsted (R) Great Knott III and Woburn (W) Stackyard, Series C 1958.

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 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.

Basal dressing:
Great Knott III (R): 2 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.
Stackyard (W): 1 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.:
Great Knott III (R). Ploughed: Oct 28, 1957. Seedbed 'Nitro-Chalk' applied, seed combine drilled at 3 bushels per acre: Apr 2, 1958. Early 'Nitro-Chalk' top dressing applied: Apr 25. Late 'Nitro-Chalk' top dressing applied: May 16. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 20. Combine harvested: Sept 12. Variety: Koga II. Previous crop: Spring wheat.
Stackyard (W). Ploughed: Feb 13, 1957 to Mar 5, 1958. Seedbed 'Nitro-Chalk' applied: Mar 21. Seed combine drilled at 3 bushels per acre: Mar 22. Early 'Nitro-Chalk' top dressing applied: Apr 23. Late 'Nitro-Chalk' top dressing applied: May 16. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 27. Combine harvested: Oct 9. Variety: Peko. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter).
Great Knott III (R): 2.58 cwt per acre or 14.0% (27 d.f.)
Stackyard (W): 1.97 cwt per acre or 7.4% (27 d.f.)

Note. Estimates of incidence of Eyespot (*Cercosporella herpotrichoides*) and Take-all (*Ophiobolus graminis*), and counts of plant number were made.

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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
Great Knott III, Rothamsted			(±1.94)				(±1.29)	(±0.64)
None								8.5(1)
0.3	19.4	16.1	16.4	14.5	13.8	21.4	13.9	16.2
0.6	24.6	21.9	13.4	16.4	24.1	17.6	21.6	20.2
0.9	20.3	22.2	18.5	22.2	23.8	14.7	24.5	21.4
Mean (±1.08)	21.4	20.1	16.1	17.7	20.6	17.9	20.0(2)	18.4

(1) ±1.29 (2) ±0.74

Mean dry matter % as harvested: 80.0

N: cwt per acre	Time of application: S	E	L	½S½E	½S½L	½E½L	⅓S⅓E⅓L	Mean
Stackyard Field, Woburn			(±1.48)				(±0.99)	(±0.49)
None								16.0(1)
0.3	27.4	24.1	21.7	24.9	23.7	22.9	25.7	24.5
0.6	31.1	26.9	26.2	31.4	25.7	25.2	29.3	28.1
0.9	31.4	29.4	26.3	32.4	29.9	31.1	31.1	30.3
Mean (±0.83)	30.0	26.8	24.7	29.6	26.4	26.4	28.7(2)	26.8

(1) ±0.99 (2) ±0.57

Mean dry matter % as harvested: 72.5

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58/Ca/7.1

SPRING WHEAT

Varieties and levels of nitrogen - Rothamsted (R) Great Knott III and Woburn (W) Stackyard 1958.

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

Area of each sub plot (acres):		Area harvested (acres):
Great Knott III (R):	0.0154	0.0103
Stackyard (W):	0.0193	0.0129

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, applied as sulphate of ammonia.

Great Knott III (R): None; 0.4 cwt N per acre

Stackyard (W): 0.4; 0.8 cwt N per acre.

Basal dressing:

Great Knott III (R): 3.3 cwt compound fertilizer (12% N, 9% P_2O_5, 9% K_2O) per acre combine drilled with seed.

Stackyard (W): 1 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.:

Great Knott III (R). Ploughed: Oct 28,1957. Seed combine drilled at 3¼ bushels per acre: Apr 4, 1958. Nitrogen applied: Apr 8. Sprayed with MCPA at 4 pints in 40 gallons per acre: Apr 20. Combine harvested: Sept 12. Previous crop: Spring wheat.

Stackyard (W). Ploughed: Feb 13, 1958. Nitrogen applied: Mar 24. Seed combine drilled at 3½ bushels per acre: Apr 2. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 27. Combine harvested: Oct 9. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter):

Great Knott III (R):

Whole plot: 1.53 cwt per acre or 6.2% (12 d.f.)

Sub plot: 1.98 cwt per acre or 8.0% (14 d.f.)

Stackyard (W):

Whole plot: 1.61 cwt per acre or 6.2% (12 d.f.)

Sub plot: 1.85 cwt per acre or 7.1% (14 d.f.)

https://doi.org/10.23637/ERADOC-1-181

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	Mean
Great Knott III (R)								
				(±1.20)*				
0.4	24.6	24.1	23.4	15.4	23.2	23.6	23.3	22.5
0.8	24.6	26.0	26.8	25.1	26.8	25.9	31.0	26.6
Mean (±0.88)	24.6	25.0	25.1	20.2	25.0	24.8	27.1	24.5
Difference (±1.62)	0.0	1.9	3.4	9.7	3.6	2.3	7.7	4.1 (±0.61)

Mean dry matter % as harvested: 80.6

N: cwt per acre	Stackyard (W)							
				(±1.20)*				
0.4	23.4	22.9	26.2	21.3	26.2	25.1	23.7	24.1
0.8	28.1	26.3	28.9	24.9	29.3	30.5	25.9	27.7
Mean (±0.93)	25.8	24.6	27.5	23.1	27.7	27.8	24.8	25.8
Difference (±1.51)	4.7	3.4	2.7	3.6	3.1	5.4	2.2	3.6 (±0.57)

Mean dry matter % as harvested: 73.6

*for use in comparisons other than vertical.

58/Cb/1.1

BARLEY

Residual effects of dung, N, P and K applied to potatoes 1957 and direct effects of N and P - West Barnfield II 1958.

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

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

Treatments. All combinations of:-

Applied to potatoes 1957.

- 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 1958.

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

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

Cultivations, etc.: Ploughed: Nov 7, 1957. 'Nitro-Chalk' and basal fertilizers applied, seed drilled at 2 bushels per acre: Mar 25, 1958. Sprayed with MCPB at 5 pints in 40 gallons per acre: May 28. Combine harvested: Sept 2. Variety: Proctor. Previous crop: Potatoes.

Standard error per plot.
Grain (at 85% dry matter): 1.51 cwt per acre or 4.4% (27 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

	Dung to potatoes 1957: tons per acre				
	None	5	10	20	Mean
Mean (±0.38)	33.6	33.9	34.1	35.0	34.2
Applied to potatoes 1957					
N: cwt per acre					
None (±0.53)	34.1	34.3	34.1	34.8	34.3
0.9	33.2	33.6	34.1	35.2	34.0
Difference (±0.76)	-0.9	-0.7	0.0	+0.4	-0.3 (±0.38)
P_2O_5: cwt per acre					
None (±0.53)	32.1	32.7	33.7	34.1	33.1
0.75	35.2	35.2	34.5	35.9	35.2
Difference (±0.76)	+3.1	+2.5	+0.8	+1.8	+2.1 (±0.38)
K_2O: cwt per acre					
None (±0.53)	33.6	34.3	33.4	35.7	34.2
1.5	33.7	33.6	34.8	34.3	34.1
Difference (±0.76)	+0.1	-0.7	+1.4	-1.4	-0.1 (±0.38)
Applied to barley 1958					
N: cwt per acre					
None (±0.53)	33.2	32.9	33.6	34.6	33.6
0.4	34.1	35.0	34.6	35.4	34.8
Difference (±0.76)	+0.9	+2.1	+1.0	+0.8	+1.2 (±0.38)
P_2O_5: cwt per acre					
None (±0.53)	31.0	32.7	33.1	34.0	32.7
0.4	36.2	35.2	35.0	35.9	35.6
Difference (±0.76)	+5.2	+2.5	+1.9	+1.9	+2.9 (±0.38)

Responses to treatments
cwt per acre

	Applied to potatoes 1957						Applied to barley 1958			
	N		P_2O_5		K_2O		N		P_2O_5	
Response to	None	0.9	None	0.75	None	1.5	None	0.4	None	0.4
Applied to potatoes 1957					(±0.53)					
N	-	-	+0.3	-0.9	-1.0	+0.4	+0.8	-1.4	-0.6	0.0
P_2O_5	+2.6	+1.4	-	-	+1.5	+2.5	+2.4	+1.6	+2.9	+1.1
K_2O	-0.9	+0.5	-0.7	+0.3	-	-	-0.2	-0.2	0.0	-0.4
Applied to barley 1958										
N	+2.3	+0.1	+1.6	+0.8	+1.2	+1.2	-	-	+1.0	+1.4
P_2O_5	+2.6	+3.2	+3.8	+2.0	+3.1	+2.7	+2.7	+3.1	-	-

Mean dry matter % as harvested: 80.9

https://doi.org/10.23637/ERADOC-1-181

BARLEY

Residual effects of dung, N, P, K and salt to sugar beet 1957 and direct effect of N - Rothamsted (R) West Barnfield II and Woburn (W) Great Hill 1958.

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 (each field): 0.0167 acres. Area harvested: 0.0141 acres.

Treatments: All combinations of:-

Applied to sugar beet 1957

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 agricultural salt per acre.

Applied to barley 1958

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

Basal dressing (each field): $2\frac{1}{2}$ cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.:

West Barnfield II (R). Ploughed: Jan 1. Seed combine drilled with basal fertilizers at 2 bushels per acre, nitrogen fertilizer applied: Mar 25. Sprayed with MCPB at 5 pints in 40 gallons per acre: May 28. Combine harvested: Aug 27. Variety: Proctor. Previous crop: Sugar beet.

Great Hill (W). Ploughed: Jan 27. Nitrogen fertilizer applied, seed combine drilled at 3 bushels per acre with basal fertilizer: Apr 9. Sprayed with MCPA at 5 pints in 40 gallons per acre: May 20. Combine harvested: Aug 26. Variety: Herta. Previous crop: Sugar beet.

Standard errors per plot, Grain (at 85% dry matter):

West Barnfield II (R): 1.48 cwt per acre or 3.9% (27 d.f.)
Great Hill (W): 1.48 cwt per acre or 5.8% (27 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

	Dung to sugar beet 1957: tons per acre				
	None	5	10	20	Mean
West Barnfield II (R)					
Mean (±0.37)	36.4	37.6	37.8	38.8	37.7
Applied to sugar beet 1957					
N: cwt per acre					
None (±0.52)	35.4	37.5	37.9	38.5	37.3
0.9	37.4	37.8	37.7	39.1	38.0
Difference (±0.74)	+2.0	+0.3	-0.2	+0.6	+0.7 (±0.37)
P_2O_5: cwt per acre					
None (±0.52)	36.0	37.4	37.1	38.1	37.1
0.75	36.8	37.9	38.5	39.5	38.2
Difference (±0.74)	+0.8	+0.5	+1.4	+1.4	+1.1 (±0.37)
K_2O: cwt per acre					
None (±0.52)	37.2	37.6	37.9	38.7	37.9
1.5	35.7	37.6	37.7	38.9	37.5
Difference (±0.74)	-1.5	0.0	-0.2	+0.2	-0.4 (±0.37)
Salt: cwt per acre					
None (±0.52)	36.6	37.7	38.1	38.8	37.8
5.0	36.3	37.5	37.5	38.9	37.5
Difference (±0.74)	-0.3	-0.2	-0.6	+0.1	-0.3 (±0.37)
Applied to barley 1958					
N: cwt per acre					
None (±0.52)	33.7	35.7	36.3	37.3	35.7
0.4	39.1	39.5	39.4	40.4	39.6
Difference (±0.74)	+5.4	+3.8	+3.1	+3.1	+3.9 (±0.37)

Responses to treatments cwt per acre

Response to	Applied to sugar beet 1957								Applied to barley 1958	
	N		P_2O_5		K_2O		Salt		N	
	None	0.9	None	0.75	None	1.5	None	5.0	None	0.4
Applied to sugar beet 1957						(±0.52)				
N	-	-	+1.3	+0.1	+1.1	+0.3	+1.1	+0.3	+2.1	-0.7
P_2O_5	+1.7	+0.5	-	-	+1.4	+0.8	+0.6	+1.6	+1.3	+0.9
K_2O	0.0	-0.8	-0.1	-0.7	-	-	-0.2	-0.6	-0.3	-0.5
Salt	+0.1	-0.7	-0.8	+0.2	-0.1	-0.5	-	-	-0.5	-0.1
Applied to barley 1958										
N	+5.2	+2.4	+4.0	+3.6	+3.9	+3.7	+3.6	+4.0	-	-

Mean dry matter % as harvested: 80.7

https://doi.org/10.23637/ERADOC-1-181

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

	Dung to sugar beet 1957: tons per acre None	5	10	20	Mean
	Great Hill (W)				
Mean (±0.37)	25.0	25.6	26.0	25.5	25.5
Applied to sugar beet 1957					
N: cwt per acre					
None (±0.52)	24.4	25.2	25.9	25.5	25.3
0.9	25.6	25.9	26.2	25.5	25.8
Difference (±0.74)	+1.2	+0.7	+0.3	0.0	+0.5 (±0.37)
P_2O_5: cwt per acre					
None (±0.52)	25.2	25.1	26.1	25.2	25.4
0.75	24.8	26.1	26.0	25.8	25.7
Difference (±0.74)	-0.4	+1.0	-0.1	+0.6	+0.3 (±0.37)
K_2O: cwt per acre					
None (±0.52)	24.7	25.9	26.1	25.8	25.6
1.5	25.2	25.2	26.0	25.3	25.4
Difference (±0.74)	+0.5	-0.7	-0.1	-0.5	-0.2 (±0.37)
Salt: cwt per acre					
None (±0.52)	24.6	26.0	25.7	25.3	25.4
5.0	25.4	25.1	26.4	25.7	25.6
Difference (±0.74)	+0.8	-0.9	+0.7	+0.4	+0.2 (±0.37)
Applied to barley 1958					
N: cwt per acre					
None (±0.52)	19.4	19.8	20.4	19.8	19.8
0.4	30.5	31.4	31.7	31.2	31.2
Difference (±0.74)	+11.1	+11.6	+11.3	+11.4	+11.4 (±0.37)

Responses to treatments cwt per acre

Response to	Applied to sugar beet 1957 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 1958 N None	N 0.4
Applied to sugar beet 1957					(±0.52)					
N	-	-	+0.1	+0.9	-0.3	+1.3	+0.6	+0.4	+0.9	+0.1
P_2O_5	-0.1	+0.7	-	-	+0.6	0.0	+0.9	-0.3	+0.2	+0.4
K_2O	-1.0	+0.6	+0.1	-0.5	-	-	-0.2	-0.2	+0.4	-0.8
Salt	+0.3	+0.1	+0.8	-0.4	+0.2	+0.2	-	-	-0.2	+0.6
Applied to barley 1958										
N	+11.8	+11.0	+11.3	+11.5	+12.0	+10.8	+11.0	+11.8	-	-

Mean dry matter % as harvested: 80.0

https://doi.org/10.23637/ERADOC-1-181

58/Cb/3.1

BARLEY

Combine drilling of nitrogen - Rothamsted (R) Great Knott III and Woburn (W) Lansome Field 1958.

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); 0.72* (N_3) cwt N per acre.
Method of application: Broadcast as sulphate of ammonia; combine drilled as compound fertilizer:

*N_1: 5% N, 12% 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

*Note: For N_1 and N_3 on Great Knott III (R), the compound fertilizer was actually applied at the rates of 0.19 and 0.57 cwt N per acre. The broadcast dressings were corrected to these amounts.

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.:
Great Knott III (R). Ploughed: Oct 28, 1957. Seed combine drilled at 2¾ bushels per acre: Apr 3, 1958. Sulphate of ammonia broadcast: Apr 4. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 20. Combine harvested: Aug 25. Variety: Herta. Previous crop: Spring wheat.
Lansome Field (W). Ploughed: Nov 27, 1957. Seed combine drilled at 2¾ bushels per acre: Apr 3, 1958. Sulphate of ammonia broadcast: Apr 8. Sprayed with MCPA at 5 pints in 40 gallons per acre: May 22. Combine harvested: Aug 27. Variety: Herta. Previous crop: Fallow.

Standard errors per plot, Grain (at 85% dry matter):
Great Knott III (R): 2.25 cwt per acre or 7.3% (18 d.f.)
Lansome Field (W): 1.79 cwt per acre or 5.8% (18 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

N: cwt per acre							
	Broadcast			Combine drilled			
None	0.22+	0.54	0.72*	0.22+	0.54	0.72*	Mean
Great Knott III, Rothamsted							
19.0	25.0	36.1	36.4 (±1.13)	25.8	37.3	37.2	31.0
Mean dry matter % as harvested: 74.2							
Lansome Field, Woburn							
20.0	27.7	33.9	33.4 (±0.89)	28.0	36.5	35.0	30.6
Mean dry matter % as harvested: 84.3							

+0.19 on Great Knott III, Rothamsted.

*0.57 " " " " " "

BARLEY

Levels and times of application of nitrogen - Rothamsted (R) Great Knott III and Woburn (W) Stackyard, Series C 1958.

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: 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 =
Great Knott III (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:
Great Knott III (R): 2 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.
Stackyard (W): 1 cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.:
Great Knott III (R): Ploughed: Oct 28, 1957. Seedbed 'Nitro-Chalk' applied: Apr 2, 1958. Seed combine drilled at $2\frac{3}{4}$ bushels per acre: Apr 3. Early 'Nitro-Chalk' top dressing applied: Apr 25. Late 'Nitro-Chalk' top dressing applied: May 16. Sprayed with MCPA, 4 pints in 40 gallons per acre: May 20. Combine harvested: Aug 26. Variety: Herta. Previous crop: Spring wheat.
Stackyard (W). Ploughed: Feb 13 to Mar 5, 1958. Seedbed 'Nitro-Chalk' applied, seed combine drilled at $2\frac{1}{2}$ bushels per acre: Mar 22. Early 'Nitro-Chalk' top dressing applied: Apr 23. Late 'Nitro-Chalk' top dressing applied: May 16. Sprayed with MCPA, 4 pints in 40 gallons per acre: May 27. Combine harvested: Sept 1. Variety: Herta. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter).
Great Knott III (R): 1.85 cwt per acre or 5.4% (27 d.f.)
Stackyard (W): 1.49 cwt per acre or 4.4% (27 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

N: cwt per acre	Time of application							Mean
	S	E	L	½S ½E	½S ½L	½E ½L	⅓S ⅓E ⅓L	
Great Knott III, Rothamsted								
			(±1.39)				(±0.92)	(±0.46)
None								22.7 (1)
0.23	30.2	32.0	30.1	31.7	31.9	30.2	30.5	30.9
0.46	35.8	36.0	35.7	35.7	36.0	39.5	37.7	36.7
0.69	36.6	37.8	37.8	37.2	38.4	38.9	39.3	38.1
Mean (±0.77)	34.2	35.3	34.5	34.8	35.4	36.2	35.8 (2)	34.3

(1) ±0.92 (2) ±0.53

Mean dry matter % as harvested: 75.5

N: cwt per acre	Time of application							Mean
	S	E	L	½S ½E	½S ½L	½E ½L	⅓S ⅓E ⅓L	
Stackyard, Woburn								
			(±1.12)				(±0.75)	(±0.37)
None								21.6 (1)
0.3	32.1	32.3	32.4	31.6	33.6	33.4	32.5	32.5
0.6	34.6	38.2	35.2	35.4	37.5	38.5	38.5	37.0
0.9	34.0	36.1	36.1	35.9	37.4	34.8	38.3	36.4
Mean (±0.62)	33.6	35.5	34.6	34.3	36.2	35.6	36.4 (2)	34.3

(1) ±0.75 (2) ±0.43

Mean dry matter % as harvested: 83.4

https://doi.org/10.23637/ERADOC-1-181

BARLEY

Varieties and levels of nitrogen - Rothamsted (R) Great Knott III and Woburn (W) Lansome Field.

Design: 3 randomized blocks of 6 plots each, plots being split into 2 for the application of nitrogen.

Area of each sub plot (acres):	Area harvested (acres):
Great Knott III (R): 0.0103.	0.0069
Lansome Field (W): 0.0167.	0.0111.

Treatments: All combinations of:-
Whole plots. Varieties: Domen (1); Herta (2); Ingrid (3); Plumage Archer (4); Proctor (5); Rika (6).
Sub plots. Nitrogen, applied as sulphate of ammonia.
Great Knott III (R): None; 0.3 cwt N per acre
Lansome Field (W): 0.4; 0.8 cwt N per acre.

Basal dressing:
Great Knott III (R): $2\frac{1}{2}$ cwt compound fertilizer (12% N, 9% P_2O_5, 9% K_2O) per acre combine drilled with seed.
Lansome Field (W): $2\frac{1}{2}$ cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre combine drilled with seed.

Cultivations, etc.:
Great Knott III (R): Ploughed: Oct 28 - Nov 6, 1957. Seed combine drilled at $2\frac{1}{2}$ bushels (Proctor - 2 bushels) per acre: Apr 3 - 4, 1958. Sulphate of ammonia applied: Apr 8. Sprayed with MCPA at 4 pints in 40 gallons per acre: Apr 22. Combine harvested: Aug 26. Previous crop: Spring wheat.

Lansome Field (W): Ploughed: Nov 27 - 29, 1957. Sulphate of ammonia applied: Apr 3, 1958. Seed combine drilled at $2\frac{3}{4}$ bushels per acre: Apr 11. Sprayed with MCPA at 5 pints in 40 gallons per acre: May 22. Combine harvested: Aug 27. Previous crop: Fallow.

Standard errors per plot, Grain (at 85% dry matter):
Great Knott III (R):
Whole plot: 1.14 cwt per acre or 3.7% (10 d.f.)
Sub plot: 0.81 cwt per acre or 2.6% (12 d.f.)
Lansome Field (W):
Whole plot: 1.38 cwt per acre or 4.2% (10 d.f.)
Sub plot: 1.88 cwt per acre or 5.8% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

N: cwt per acre (including basal)	Variety 1	2	3	4	5	6	Mean
	Great Knott III (R) (±0.73)*						
0.3	26.5	30.5	26.8	24.9	30.6	29.7	28.1
0.6	30.0	36.4	33.2	30.6	36.7	34.2	33.5
Mean (±0.65)	28.2	33.5	30.0	27.8	33.6	31.9	30.8
Difference (±0.66)	3.5	5.9	6.4	5.7	6.1	4.5	5.4 (±0.27)

Mean dry matter % as harvested: 74.4

N: cwt per acre	Lansome Field (W) (±1.10)*						
0.4	32.1	33.0	33.4	29.9	34.1	35.0	32.9
0.8	31.3	30.9	33.5	26.3	37.1	32.8	32.0
Mean (±0.79)	31.7	31.9	33.4	28.1	35.6	33.9	32.4
Difference (±1.54)	-0.8	-2.1	+0.1	-3.6	+3.0	-2.2	-0.9 (±0.63)

Mean dry matter % as harvested: 83.1

*for use in comparisons other than vertical.

BARLEY

Residual effects of nitrogenous fertilizers and direct effect of potash - Long Hoos I, II and III 1958.

Design: 4 randomized blocks of 16 plots each, plots being split into 2 for the application of potash.

Area of each sub plot: 0.0038 acres. Area harvested: 0.0032 acres.

Treatments: All combinations of:-

Applied to ryegrass. (whole plots):
None (2 plots per block) together with all combinations of:-

Materials and methods of application

Applied in 1 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:

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

Applied to barley (1958) (sub plots):
K: None; 1.0 cwt K_2O per acre as muriate of potash.

Basal dressing: 3 cwt compound fertilizer (9% N, 18% P_2O_5) per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Nov 28, 1957. Seed combine drilled at $2\frac{1}{2}$ bushels per acre, muriate of potash applied: Mar 22, 1958. Sprayed with MCPA at 5 pints in 40 gallons per acre: May 27. Harvested: Aug 11. Variety: Proctor. Previous crop: Ryegrass.

Standard errors per plot. Grain (at 85% dry matter):
Whole plot: 2.10 cwt per acre or 7.8% (46 d.f.)
Sub plot: 1.76 cwt per acre or 6.6% (49 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

Level of N in fertilizer: cwt per acre	Fertilizer: None	Single dressing 1956 F	Single dressing 1957 F	Single dressing 1956 & 1957 C	Divided dressing 1957 A	Divided dressing 1956 A	Divided dressing and U	Divided dressing 1957 N	Mean
Mean (±0.74)	25.5	25.4	31.9	26.2	25.7	24.7	27.9	26.9	26.8
				(±1.05)					
0.75	-	24.2	30.9	26.3	25.1	23.8	27.0	23.5	25.8
1.50	-	26.7	33.0	26.2	26.4	25.6	28.9	30.3	28.2
Diff. (±1.48)		+2.5	+2.1	-0.1	+1.3	+1.8	+1.9	+6.8	+2.4 (±0.56)
K_2O: cwt per acre				(±0.86)*					
None	25.9	25.0	31.5	25.3	25.6	23.7	28.0	26.0	26.4
1.0	25.1	25.8	32.4	27.1	25.9	25.7	27.9	27.8	27.2
Diff. (±0.88)	-0.8	+0.8	+0.9	+1.8	+0.3	+2.0	-0.1	+1.8	+0.8 (±0.31)

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

Level of N in fertilizer: cwt per acre	None	1956 F	1957 F	1957 C	1957 A	1956 A	and U	1957 N	Mean
Mean	21.6	23.4	29.7	23.5	22.8	22.4	25.4	24.0	24.1
0.75	-	22.2	27.0	25.1	23.2	21.6	23.6	20.8	23.4
1.50	-	24.5	32.4	22.0	22.5	23.3	27.2	27.1	25.6
Diff.		+2.3	+5.4	-3.1	-0.7	+1.7	+3.6	+6.3	+2.2
K_2O: cwt per acre									
None	22.2	22.9	29.2	22.0	21.8	21.8	25.3	22.8	23.5
1.0	21.0	23.8	30.2	25.0	23.9	23.1	25.5	25.2	24.7
Diff.	-1.2	+0.9	+1.0	+3.0	+2.1	+1.3	+0.2	+2.4	+1.2

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 harvested:
Grain, 77.3
Straw, 67.0

*For use in horizontal and diagonal comparisons only.

https://doi.org/10.23637/ERADOC-1-181

58/Cb/7.1

BARLEY

Residual effects of dung, N, P and K applied to potatoes 1957 and direct effect of N - Great Hill Woburn 1958.

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

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

Treatments. All combinations of:-

To potatoes 1957.

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 1958.

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

Basal dressing: $2\frac{1}{2}$ cwt compound fertilizer (16% P_2O_5, 16% K_2O) per acre.

Cultivations, etc.: Ploughed: Dec 10, 1957. 'Nitro-Chalk' and basal fertilizer applied, seed drilled at 3 bushels per acre: Apr 9, 1958. Sprayed with MCPA at 5 pints in 40 gallons per acre: May 20. Combine harvested: Aug 27. Variety: Herta. Previous crop: Potatoes.

Standard error per plot.
Grain (at 85% dry matter): 3.25 cwt per acre or 14.7% (34 d.f.)*

*1 missing value.

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

	Dung to potatoes 1957: tons per acre None	5	10	20	Mean
Mean (±0.81)	22.0	21.1	22.7	22.8	22.1
Applied to potatoes 1957					
N: cwt per acre					
None (±1.15)	21.1	20.1	21.8	20.7	20.9
0.9 (±1.15)	22.9	22.1	23.6	25.0	23.4
Difference (±1.62)	+1.8	+2.0	+1.8	+4.3	+2.5 (±0.81)
P_2O_5: cwt per acre					
None (±1.15)	22.9	20.3	21.3	22.9	21.9
0.75 (±1.15)	21.0	21.9	24.0	22.7	22.4
Difference (±1.62)	-1.9	+1.6	+2.7	-0.2	+0.5 (±0.81)
K_2O: cwt per acre					
None (±1.15)	22.9	21.2	23.3	23.6	22.7
1.5 (±1.15)	21.1	21.0	22.1	22.1	21.5
Difference (±1.62)	-1.8	-0.2	-1.2	-1.5	-1.2 (±0.81)
Applied to barley 1958					
N: cwt per acre					
None (±1.15)	16.5	15.1	18.3	16.6	16.6
0.4 (±1.15)	27.5	27.1	27.0	29.0	27.7
Difference (±1.62)	+11.0	+12.0	+8.7	+12.4	+11.1 (±0.81)

Responses to treatments cwt per acre

Response to	Applied to potatoes 1957: N None	N 0.9	P_2O_5 None	P_2O_5 0.75	K_2O None	K_2O 1.5	Applied to barley 1958: N None	N 0.4
Applied to potatoes 1957 (±1.15)								
N	-	-	+2.2	+2.8	+2.3	+2.7	+3.3	+1.7
P_2O_5	+0.2	+0.8	-	-	+0.4	+0.6	+1.2	-0.2
K_2O	-1.4	-1.0	-1.3	-1.1	-	-	-1.5	-0.9
Applied to barley 1958								
N	+11.8	+10.2	+11.7	+10.3	+10.7	+11.3	-	-

Mean dry matter % as harvested: 80.7

https://doi.org/10.23637/ERADOC-1-181

58/Cc/1

SPRING OATS

Varieties and levels of nitrogen - Long Hoos VII 1958.

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

Area of each sub plot: 0.0154 acres. Area harvested: 0.0103 acres.

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

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

Cultivations, etc.: Ploughed: Dec 30 - 31, 1957. Seed combine drilled at 3½ bushels per acre, sulphate of ammonia applied: Mar 27, 1958. Sprayed with MCPA, 5 pints in 40 gallons per acre: May 27. Combine harvested: Aug 31. Previous crop: Potatoes.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.68 cwt per acre or 5.4% (14 d.f.)
Sub plot: 3.54 cwt per acre or 11.4% (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
				(±1.74)*					
0.36	35.5	28.5	30.0	32.2	36.1	30.8	32.3	33.8	32.4
0.72	30.4	26.5	26.4	29.6	34.6	25.1	30.4	32.3	29.4
Mean (±0.96)	32.9	27.5	28.2	30.9	35.3	27.9	31.3	33.1	30.8
Difference (±2.89)	-5.1	-2.0	-3.6	-2.6	-1.5	-5.7	-1.9	-1.5	-3.0 (±1.02)

*for use in comparisons other than vertical.

Mean dry matter % as harvested: 84.8

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CEREALS AND BEANS ROTATIONS

The effect of crop sequences on the incidence of cereal foot and root rot diseases - Great Field I 1958 - the 2nd year.

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

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

Treatments:

Crop sequences for each series:

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

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

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

Basal dressing: All blocks received 23 cwt per acre ground chalk in Nov 1956; 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.: Ploughed: Sept 13, 1957. Winter wheat combine drilled at $2\frac{1}{2}$ bushels per acre: Oct 10. 1st application of 'Nitro-Chalk' to winter wheat: Mar 10, 1958. 'Nitro-Chalk' applied for barley, oats and spring wheat and seed combine drilled at 2, 4 and 3 bushels per acre respectively: Mar 20. 2nd application of 'Nitro-Chalk' to winter wheat: May 12. Sprayed with CMPP at 6 pints in 40 gallons per acre: May 15. Combine harvested: Oats and barley: Sept 1; winter and spring wheat: Sept 3. Varieties: Winter wheat - Heine 7; spring wheat - Koga II; oats - Sun II; barley - Proctor. Previous crop: Series starting in 1958: spring wheat.

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

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

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

Series starting in 1957

Crop in 1957 1958	WW WW	SW WW	B WW	O WW	WW O
Mean dry matter	18.7	19.5	20.2	19.8*	25.1
% as harvested		78.5			85.0

Series starting in 1958

Crop in 1958	WW	SW	B	O
Mean dry matter	12.3	13.3	29.4	26.7
% as harvested	75.2	70.2	81.5	85.1

*All three plots were badly damaged by birds.

https://doi.org/10.23637/ERADOC-1-181

SPRING BEANS

Effect of seed rates and spraying on aphids (Aphis fabae)- Great Knott III 1958.

Design: 4 randomized blocks of 6 plots each, plots being split into 2 for the application of spray.

Area of each sub plot: 0.0354 acres. Area harvested: 0.0126 acres.

Treatments. All combinations of:-
Seed rate, lb per acre: 50; 100; 200; 300; 400; 800.
Spray: None; demeton-methyl (new formulation) at 6 fluid oz of 50% active ingredient in 60 gallons per acre.

Basal dressing: 400 lb compound fertilizer (10% P_2O_5, 20% K_2O) per acre placement drilled with seed.

Cultivations, etc.: Ploughed: Oct 28, 1957. Seed placement drilled with basal fertilizer: Mar 18, 1958. Appropriate plots sprayed with demeton-methyl: June 18. Combine harvested: Oct 7. Variety: Spring Tick. Previous crop: Spring wheat.

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 2.75 cwt per acre or 10.8% (15 d.f.)
Sub plot: 1.69 cwt per acre or 6.6% (18 d.f.)

Note. Counts of aphids at intervals after spraying, plant numbers, and assessments of early incidence of virus diseases were made.

Summary of Results

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

Spray	Seed rate: lb per acre 50	100	200	300	400	800	Mean
			(±1.50)*				
None	16.6	24.2	27.9	27.9	26.2	20.5	23.9
Demeton-methyl	24.1	31.2	32.3	29.8	25.1	21.3	27.3
Mean (±1.38)	20.3	27.7	30.1	28.9	25.6	20.9	25.5
Diff.(±1.20)	+7.5	+7.0	+4.4	+1.9	-1.1	+0.8	+3.4 (±0.49)

*for use in horizontal and diagonal comparisons.

Mean dry matter % as harvested: 70.8

https://doi.org/10.23637/ERADOC-1-181

BEANS

Time of sowing, spraying, P and K - Little Knott I 1958.

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

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

Treatments. All combinations of:-
Time of sowing: Autumn; spring.
Spray: None; demeton-methyl (new formulation) at 6 fluid oz of 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.: Ploughed: Sept 12, 1957. Fertilizers applied for autumn beans, seed drilled at 275 lb per acre: Oct 8. Fertilizers applied for spring beans: Feb 22, 1958. Seed drilled at 200 lb per acre: Mar 7. Appropriate plots sprayed with demeton-methyl: June 18. Combine harvested: Sept 25. Variety: Winter beans - S.Q.Giant, spring beans - Albyn Tick. Previous crop: Spring wheat.

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

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 1.24 cwt per acre or 9.5% (4 d.f.)
Sub plot: 1.51 cwt per acre or 11.5% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

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

	Sown			P_2O_5: cwt per acre			K_2O: cwt per acre			
	Autumn	Spring	Diff.	None	0.5	1.0	None	1.0	2.0	Mean
					(±0.62)*			(±0.62)*		
Spray										
None	12.8	14.4	+1.6	14.8	14.1	11.9	14.3	14.0	12.6	13.6
Demeton-methyl	10.6	14.5	+3.9	13.6	11.6	12.5	13.5	12.8	11.3	12.6
Diff.	-2.2	+0.1	+2.3 (±1.43)	-1.2	-2.5 (±0.87)**	+0.6	-0.8	-1.2 (±0.87)**	-1.3	-1.0
					(1) & (2)			(1) & (2)		
Sown										
Autumn				12.9	11.0	11.2	12.3	11.5	11.3	11.7
Spring				15.4	14.7	13.2	15.5	15.3	12.6	14.5
Mean (±0.44)				14.2	12.8	12.2	13.9	13.4	12.0	13.1
Diff. (±1.01)				+2.5	+3.7	+2.0	+3.2	+3.8	+1.3	+2.8 (±0.72)

Mean dry matter % as harvested: Autumn sown, 70.7; spring sown, 72.6.

(1) ±0.71 for use in diagonal comparison only.
(2) ±0.62 for use in horizontal and interaction comparisons only.

*For use in horizontal comparisons only.

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

POTATOES

Control of skin spot (Oospora pustulans) by seed tuber treatment - Geescroft 1958.

Design: 6 randomized blocks of 6 plots each.

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

Treatments applied to seed tubers:

Wedderspoon seed untreated	(1)
Wedderspoon seed washed 5 days after lifting	(2)
Wedderspoon seed washed as above and dipped in organo-mercury fungicide 5 days after lifting	(3)
Wedderspoon seed washed and dipped as above and inoculated at planting	(4)
Irish seed untreated	(5)
Irish seed inoculated at planting	(6)

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

Cultivations, etc.: Ploughed: Sept 23 - Oct 21, 1957. Dung applied at 12½ tons per acre: Dec 2 - 10. Second ploughing: Dec 3 and Feb 6, 1958. Basal dressing applied: Apr 12. Potatoes hand planted: Apr 21. Earthed up: July 8. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 10. Sprayed with copper fungicide, 3 lb and 1 pint spreader in 40 gallons per acre: Aug 6 and again Aug 16. Sprayed with sulphuric acid at 20% BOV in 100 gallons per acre: Sept 10. Lifted: Oct 22. Variety: Majestic. Previous crop: Barley.

Standard error per plot.
Total tubers: 0.951 tons per acre or 7.3% (25 d.f.)

Summary of Results

Treatments 1	2	3	4	5	6	Mean
Total tubers: tons per acre (±0.388)						
13.66	12.81	11.92	12.33	14.00	13.43	13.03
Percentage ware (1½" riddle)						
90.0	89.0	84.6	88.5	88.2	89.4	88.3

Note. Records of incidence of skin spot (Oospora pustulans) were made.

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POTATOES

The control of blight (Phytophthora infestans) by copper fungicide spray - Great Knott II 1958.

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

Cultivations, etc.: Ploughed: Oct 2 - 19, 1957. Sprayed with TCA at 20 lb in 80 gallons per acre: Jan 14, 1958. Basal fertilizer applied: Apr 21. Potatoes machine planted: Apr 23. Earthed up: July 4. Fungicide treatment, 5 lb in 40 gallons per acre, applied twice: July 16 and Aug 11. Sprayed with sulphuric acid, 20% BOV, 100 gallons per acre: Sept 17. Lifted: Oct 24. Variety: Majestic. Previous crop: Spring wheat.

Standard errors per plot. Total tubers:
Whole plots: 0.693 tons per acre or 6.0% (7 d.f.)
Sub plots (sprayed plots only): 0.611 tons per acre or 5.1% (7 d.f.)

Note. Estimates were made of the rate of bulking, destruction of foliage by blight and 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-1-181

Summary of Results

Spray: None	Spray: Copper fungicide	Mean	Difference
Total tubers: tons per acre			
11.04	12.08	11.56	+1.04 (±0.347)
Percentage ware ($1\frac{1}{2}$" riddle)			
91.2	91.8	91.5	+0.6

Sprayed plots only

Undamaged	Damaged	Difference
Total tubers: tons per acre		
12.23	11.93	-0.30 (±0.305)
Percentage ware ($1\frac{1}{2}$" riddle)		
92.2	91.5	-0.7

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POTATOES

Control of virus spread by application of insecticides to the soil at planting - Highfield Drive 1958.

Design: 4 × 4 Latin square.

Area of each plot: 0.0089 acres. Area harvested: 0.0081 acres.

Treatments (applied by hand in the ridges before planting):
Fertilizer alone, 10 cwt compound per acre (10% N, 10% P_2O_5, 18% K_2O). (C)
Fertilizer and 'Thimet' applied together. (F)
Fertilizer and 'Thimet' applied separately. (T)
Fertilizer and 'Rogor' applied separately. (R)

Infector plants: One leaf roll and one virus Y King Edward infector planted in each plot.

Percentages and rate of application of % active ingredient of insecticide: 'Thimet' (Carbon powder) 44%, 'Rogor' (Charcoal powder) 50%, each at 10.8 lb per acre.

Cultivations, etc.: Dung applied at 10 tons per acre: Nov 26, 1957. Ploughed: Nov 28. Compound fertilizer applied: Apr 16, 1958. Potatoes hand planted: Apr 21. Earthed up: June 19. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: July 12. Twice sprayed with copper fungicide at 3 lb and 1 pint of spreader to 40 gallons per acre: Aug 6 and 16. Sprayed with sulphuric acid, 20% BOV, 100 gallons per acre: Sept 18. Lifted: Sept 26. Variety: Majestic. Previous crop: Winter wheat.

Standard error per plot.
Total tubers: 0.845 tons per acre or 5.6% (6 d.f.)

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

Summary of Results

	Treatment C	F	T	R	Mean
	Total tubers: tons per acre				
Mean (±0.423)	15.07	14.95	15.48	14.43	14.98
Increase (±0.598)		-0.12	+0.41	-0.64	
	Percentage ware ($1\frac{1}{2}$" riddle)				
Mean	92.0	93.6	94.6	92.5	93.2
Increase		+1.6	+2.6	+0.5	

https://doi.org/10.23637/ERADOC-1-181

GRASS

Slow acting nitrogenous fertilizers - Harwoods Piece 1958.

Design: 4 randomized blocks of 16 plots each.

Area of each plot: 0.0087 acres. Area harvested: 0.0050 acres.

Treatments: None (6 plots per block) together with all combinations of:-

Materials and methods of application

'Nitro-Chalk' (15.5% N): all in seed bed.
Ureaformaldehyde (37.2% N): all in seed bed (2 plots per block).
'Nitro-Chalk' (15.5% N): $\frac{1}{3}$ in seed bed; $\frac{1}{3}$ after 1st and 2nd cuts (2 plots per block).

Rates of application

1.0; 2.0 cwt N per acre.

Basal dressing: 5 cwt compound fertilizer (10% P_2O_5, 10% K_2O) per acre applied in seed bed.

Cultivations, etc.: Ploughed: Oct 28 - Nov 22, 1957. Basal fertilizer and seed bed nitrogen applied: Apr 23, 1958. Seeds sown: Apr 24. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 27. 2nd and 3rd dressings of 'Nitro-Chalk' applied: July 15 and Aug 14. Cut three times: July 8, Aug 13, Oct 23. Variety: S22 Italian Ryegrass. Previous crop: Spring wheat.

Standard errors per plot. Dry matter:

1st cut:	1.69 cwt per acre	or 7.9%	(54 d.f.)
2nd cut:	1.26 cwt per acre	or 10.4%	(54 d.f.)
3rd cut:	1.28 cwt per acre	or 10.1%	(54 d.f.)
Total of 3 cuts:	2.96 cwt per acre	or 6.4%	(54 d.f.)

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Summary of Results

Dry matter: cwt per acre

	Fertilizer						
		Single dressing				Divided dressing	
	None	N1	N2	U1	U2	N1	N2	Mean
1st cut								
	(±0.35)	(±0.85)			(±0.60)			
Mean	13.2	29.9	32.1	22.4	27.6	22.1	27.4	21.3
Increase		16.7	18.9	9.2	14.4	8.9	14.2	
		(±0.91)			(±0.69)			
2nd cut								
	(±0.26)	(±0.63)			(±0.44)			
Mean	7.7	12.4	15.7	9.0	12.2	17.2	21.4	12.1
Increase		4.7	8.0	1.3	4.5	9.5	13.7	
		(±0.68)			(±0.51)			
3rd cut								
	(±0.26)	(±0.64)			(±0.45)			
Mean	7.9	11.4	16.4	10.7	12.9	18.7	21.1	12.6
Increase		3.5	8.5	2.8	5.0	10.8	13.2	
		(±0.69)			(±0.52)			
Total of 3 cuts								
	(±0.60)	(±1.48)			(±1.05)			
Mean	28.9	53.8	64.2	42.1	52.7	58.1	69.9	46.0
Increase		24.9	35.3	13.2	23.8	29.2	41.0	
		(±1.60)			(±1.21)			

Fertilizers:

N 'Nitro-Chalk' 15.5% N

U Ureaformaldehyde 37.2% N

Levels of N in fertilizer: cwt per acre

1 1.0

2 2.0

Mean dry matter % as cut:

1st cut: 15.9

2nd cut: 15.9

3rd cut: 16.6

Total of 3 cuts: 16.1

https://doi.org/10.23637/ERADOC-1-181

GRASS

Levels of N and K - Harwoods Piece 1958.

Design: 4 randomized blocks of 12 plots each.

Area of each plot: 0.0087 acres. Area harvested: 1st cut - 0.0050 acres, 2nd and 3rd cuts - 0.0035 acres.

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

Basal dressing: None.

Cultivations, etc.: Ploughed: Oct 28 - Nov 22, 1957. Fertilizers applied in seedbed: Apr 23, 1958. Seeds sown: Apr 24. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 27. 2nd and 3rd dressings of N and K applied: July 16 and Sept 9. Cut 3 times: July 9, Sept 9 and Oct 27. Variety: S22 Italian Ryegrass. Previous crop: Spring wheat.

Standard error per plot. Dry matter:
1st cut: 2.03 cwt per acre or 7.7% (33 d.f.)
2nd cut: 1.91 cwt per acre or 6.7% (33 d.f.)
3rd cut: 0.83 cwt per acre or 5.9% (33 d.f.)
Total of 3 cuts: 3.06 cwt per acre or 4.5% (33 d.f.)

Summary of Results

Dry matter: cwt per acre

cwt per acre												
N	0.0	0.3	0.3	0.3	0.6	0.6	0.6	0.9	0.9	0.9	0.9	0.9	
P_2O_5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	1.2	
K_2O	0.0	0.0	0.3	0.6	0.0	0.3	0.6	0.0	0.3	0.6	0.6	0.6	Mean
1st cut (±1.01)	15.2	21.6	22.3	19.8	27.3	27.6	27.5	31.6	30.3	30.4	30.5	31.0	26.3
2nd cut (±0.95)	15.6	25.1	25.2	26.2	29.8	30.2	30.1	32.0	33.8	32.1	30.8	32.1	28.6
3rd cut (±0.41)	4.0	12.3	12.7	11.9	14.6	15.5	15.0	17.1	15.5	16.0	15.6	17.4	13.9
Total of 3 cuts (±1.53)	34.8	59.0	60.2	57.9	71.6	73.3	72.6	80.6	79.5	78.4	76.8	80.5	68.8

Mean dry matter % as cut:
1st cut: 15.1 3rd cut: 12.6
2nd cut: 12.4 Total of 3 cuts: 13.4

https://doi.org/10.23637/ERADOC-1-181

58/Cg/3.1

GRASS

Species and levels of nitrogen - Harwood's Piece 1958.

Design: 4 randomized blocks of 12 plots each.

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

Treatments. All combinations of:-

Species sown in spring 1958:

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

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

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

Cultivations, etc.: Ploughed: Oct 28 - Nov 22, 1957. Basal fertilizer and seedbed nitrogen applied: Apr 23, 1958. Seed sown: Apr 24. Sprayed with MCPA at 4 pints in 40 gallons per acre: May 27. Topped: July 9. Cut twice: Aug 25, Oct 24. 2nd and 3rd dressings of 'Nitro-Chalk' applied: July 16 and Aug 25. Previous crop: Spring wheat.

Standard errors per plot. Dry matter:

1st cut:	2.08 cwt per acre	or 11.5% (33 d.f.)
2nd cut:	1.81 cwt per acre	or 12.3% (33 d.f.)
Total of 2 cuts:	3.14 cwt per acre	or 9.6% (33 d.f.)

https://doi.org/10.23637/ERADOC-1-181

Summary of Results

Dry matter: cwt per acre

N: cwt per acre *	Species C	M	R	T	Mean
1st cut					
		(±1.04)			(±0.51)
None	9.1	7.8	10.0	8.0	8.7
0.3	22.2	19.5	21.2	18.2	20.3
0.6	30.0	21.6	27.6	21.3	25.1
Mean (±0.60)	20.4	16.3	19.6	15.8	18.0
2nd cut					
		(±0.90)			(±0.45)
None	6.0	6.2	8.0	4.1	6.1
0.3	20.1	18.1	18.7	10.9	17.0
0.6	26.0	21.5	22.8	14.0	21.0
Mean (±0.53)	17.4	15.2	16.5	9.7	14.6
Total of 2 cuts					
		(±1.56)			(±0.78)
None	15.1	14.0	18.0	12.0	14.8
0.3	42.4	37.6	39.9	29.2	37.2
0.6	56.0	43.0	50.3	35.3	46.2
Mean (±0.90)	37.8	31.5	36.1	25.5	32.7

Mean dry matter % as cut:
- 1st cut: 15.5
- 2nd cut: 16.7
- Total of 2 cuts: 16.1

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

*Applied for each cut.