ROTHAMSTED RESEARCH

Yields of the Field Experiments 1951

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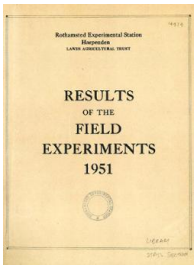

Short-term Experiments

Rothamsted Research

Rothamsted Research (1952) *Short-term Experiments ;* Yields Of The Field Experiments 1951, pp 60 - 93 **- DOI: https://doi.org/10.23637/ERADOC-1-171**

51/Ca/1

WHEAT

Control of Eyespot Rotation Experiment - Little Knott 1951 the 3rd year.

Arrangement of previous treatment crops: 4 longitudinal and 4 cross strips.

Area of each plot: Variable. Area harvested: Plot 225 (WW) 0.008 acre, average of remainder 0.08 acre.

Treatments: Longitudinal strips, crops grown in 1950 -
Wheat; Oats; Barley; Ryegrass
Cross strips, crops grown in 1949 -
Wheat; Winter Beans; Potatoes; Fallow.

Basal manuring: $2\frac{1}{2}$ cwt sulphate of ammonia per acre.

Cultivations, etc: Ploughed: Sept 11. Seed drilled at 3 bushels per acre: Oct 18. Sprayed with D.N.O.C.: May 11. Sulphate of ammonia applied: May 26. Harvested: Aug 23. Variety: Squareheads Master 13/4.

Summary of Results

	Crop in 1950				
	Wheat	Oats	Barley	Rye-grass	Mean
Crop in 1949	Grain: cwt per acre				
Wheat	24.6	33.8	24.9	32.0	28.8
Beans	21.4	33.7	21.8	35.6	28.1
Potatoes	22.4	32.8	25.9	37.3	29.6
Fallow	23.6	35.5	29.8	39.4	32.1
Mean	23.0	34.0	25.6	36.1	29.7
	Straw: cwt per acre				
Wheat	34.7*	47.3	38.3	45.8	41.5
Beans	30.7	48.3	34.3	50.1	40.8
Potatoes	29.9	43.8	39.2	51.9	41.2
Fallow	33.5	46.2	40.7	54.9	43.8
Mean	32.2	46.4	38.1	50.7	41.8

*Estimated value

WHEAT

Wireworm Experiment 1

Residual and direct effects of insecticides - Little Hoos 1951

System of replication: 3 randomized blocks of 9 plots each.
Area of each plot: 0.0289 acre.
Treatments:
None from 1948 onwards (duplicate plots).
Applied 1948. D.D. injected, 400 lb per acre; Ethylene dibromide 41% solution, injected, 15 gallons per acre; D.D.T. dust combine drilled, ¾ cwt per acre; Gammexane broadcast, 2 cwt per acre; Gammexane combine drilled, ¾ cwt per acre.
Applied 1951. Chlordane, 100 lb (5%); Gammexane, 56 lb per acre, both combine drilled.

Basal manuring per acre: 2 cwt superphosphate; 1 cwt sulphate of potash; 2½ cwt sulphate of ammonia as top dressing.

Cultivations, etc: Ploughed: Sept 4. Basal phosphate and potash drilled: Oct 26. Seed combine drilled at 3 bushels per acre with insecticides: Oct 27. Sprayed with D.N.O.C.: May 15. Basal sulphate of ammonia drilled: May 25. Harvested: Aug 23. Variety: Nord Desprez. Previous crop: Wheat.

Standard error per plot:
Grain: 2.05 cwt per acre or 12.1% (17 d.f.)

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Summary of Results

	Untreated from 1948 onwards	Treatments applied in 1948					Treatments applied in 1951		Mean
		D.D. Injected	Ethylene Dibromide Injected	D.D.T. Dust Drilled	Gammexane Broadcast	Gammexane Drilled	Chlordane Drilled	Gammexane Drilled	
Grain: cwt per acre									
Mean (±1.18)	14.7(1)	15.6	15.5	20.3	17.2	16.5	18.2	20.1	17.0
Increase (±1.45)		0.9	0.8	5.6	2.5	1.8	3.5	5.4	
Straw: cwt per acre									
Mean	16.3	17.8	17.8	20.1	18.9	18.0	19.4	20.6	18.3
Increase		1.5	1.5	3.8	2.6	1.7	3.1	4.3	
Plant number: thousands per acre									
Mean	1056	-	-	-	-	-	1072	1248	1108
Increase		-	-	-	-	-	16	192	
Plant height: cms. June 11									
Mean	12.6	-	-	-	-	-	12.5	14.8	13.1
Increase		-	-	-	-	-	-0.1	2.2	

Standard error (1) ±0.84

Dashes indicate that no countswere taken.

51/Ca/2.2

51/Ca/3.1

WHEAT

Wireworm Experiment 2

Residual and direct effects of insecticides - Little Hoos 1951.

System of replication: 3 incomplete randomized blocks of 6 plots each.

Area of each plot: 0.0289 acre.

Treatments:
None from 1948 onwards (duplicate plots).
Applied 1948. Gammexane combine drilled with seed: $\frac{1}{4}$; $\frac{1}{2}$; 1 cwt per acre.
Applied 1951. Aldrin 2½%, 200 lb per acre; Gammexane, 56 lb per acre, both combine drilled with seed.

Basal manuring: 2 cwt superphosphate and 1 cwt sulphate of potash per acre; $2\frac{1}{2}$ cwt sulphate of ammonia per acre as top dressing.

Cultivations, etc: Ploughed: Sept 4. Basal phosphate and potash drilled: Oct 26. Seed combine drilled at 3 bushels per acre with insecticides: Oct 27. Sprayed with D.N.O.C: May 15. Basal sulphate of ammonia drilled: May 25. Harvested: Aug 23. Variety: Nord Desprez. Previous crop: Wheat.

Standard error per plot:
Grain: 0.787 cwt per acre or 3.6% (10 d.f.)

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Summary of Results

	Untreated from 1948 onwards	Treatments applied 1948 Gammexane drilled ¼ cwt per acre	½ cwt per acre	1 cwt per acre	Treatments applied 1951 Aldrin 2½% Gammexane Drilled 200 lb per acre	56 lb per acre	Mean
			Grain: cwt per acre				
	(±0.32)		(±0.58)			(±0.45)	
Mean	19.8	19.5	19.9	20.6	26.2	25.7	21.9
Increase		-0.3	0.1	0.8	6.4	5.9	
			(±0.66)			(±0.55)	
			Straw: cwt per acre				
Mean	20.6	19.7	19.9	20.2	24.4	24.5	21.7
Increase		-0.9	-0.7	-0.4	3.8	3.9	
			Plant number: thousands per acre				
Mean	1003	1950	862	870	1162	1178	1022
Increase		-53	-141	-133	159	175	
			Plant height: cms. June 11				
Mean	14.3	13.8	14.3	12.8	15.6	15.6	14.5
Increase		-0.5	0.0	-1.5	1.3	1.3	

51/Ca/3.2

WHEAT

Control of Powdery Mildew - Sawyers III 1951.

System of replication: 2^5 factorial in 4 blocks of 8 plots each, 3 high order interactions being confounded with block differences.

Area of each plot: 0.0252 acre. Area harvested: 0.0197 acre.

Treatments: All combinations of:-
Sulphate of ammonia: None; 0.6 cwt N per acre.
Superphosphate: None; 0.6 cwt P_2O_5 per acre.
Muriate of potash: None; 1.2 cwt K_2O per acre.
Lime sulphur spray, concentration 1 in 80 applied in three doses, each at the rate of 160 gallons per acre: None; in winter; in late spring; in winter and in late spring.

Basal manuring: None.

Cultivations, etc.:- Ploughed: Sept 21. Superphosphate and muriate of potash applied: Oct 26. Seed drilled at 3 bushels per acre: Oct 27. Sulphate of ammonia applied: May 25. Spraying dates: Winter:- Jan 24, Feb 28, Mar 14. Late Spring:- Apr 3, May 14, June 18. Harvested: Aug 27. Variety: Bersee. Previous crop: Wheat.

Standard error per plot:
Grain: 2.08 cwt per acre or 25.1% (9 d.f.)

Notes

(1) The crop was severely infested with eyespot, take-all and weeds.

(2) Counts of Powdery Mildew infection were made and are available.

https://doi.org/10.23637/ERADOC-1-171

Summary of Results

	Spraying				
	None	In winter	In late spring	In winter and in late spring	Mean
Grain: cwt per acre					
Sulphate of ammonia					
None (±1.04)	6.3	6.9	6.9	7.6	6.9
0.6 cwt N per acre	9.7	9.6	10.4	8.7	9.6
Response to N (±1.47)	3.4	2.7	3.5	1.1	2.7 (1)
Superphosphate					
None (±1.04)	6.9	6.9	8.6	8.1	7.6
0.6 cwt P_2O_5 per acre	9.1	9.6	8.8	8.1	8.9
Response to P (±1.47)	2.2	2.7	0.2	0.0	1.3 (1)
Muriate of potash					
None (±1.04)	8.5	7.9	9.7	8.6	8.7
1.2 cwt K_2O per acre	7.5	8.6	7.7	7.7	7.9
Response to K (±1.47)	-1.0	0.7	-2.0	-0.9	-0.8 (1)
Mean (±0.73)	8.0	8.2	8.7	8.1	8.3
Straw: cwt per acre					
Sulphate of ammonia					
None	11.6	11.2	11.8	11.7	11.6
0.6 cwt N per acre	20.7	20.4	22.5	20.0	20.9
Response to N	9.1	9.2	10.7	8.3	9.3
Superphosphate					
None	15.1	14.9	16.9	17.0	16.0
0.6 cwt K_2O per acre	17.2	16.6	17.4	14.8	16.5
Response to P	2.1	1.7	0.5	-2.2	0.5
Muriate of Potash					
None	15.8	15.1	17.8	15.5	16.0
1.2 cwt K_2O per acre	16.6	16.4	16.5	16.2	16.4
Response to K	0.8	1.3	-1.3	0.7	0.4
Mean	16.2	15.8	17.1	15.9	16.2

(1) ±0.73

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Responses to Treatments

Response to	Sulphate of ammonia abs.	Sulphate of ammonia pres.	Superphosphate abs.	Superphosphate pres.	Muriate of potash abs.	Muriate of potash pres.
	Grain: cwt per acre					
			(±1.04)			
Sulphate of ammonia	-	-	2.8	2.6	2.3	3.1
Superphosphate	1.4	1.2	-	-	0.8	1.8
Muriate of potash	-1.2	-0.4	-1.3	-0.3	-	-
	Straw: cwt per acre					
Sulphate of ammonia	-	-	10.0	8.6	8.5	10.1
Superphosphate	1.2	-0.2	-	-	-0.2	1.2
Muriate of potash	-0.4	1.2	-0.3	1.1	-	-

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51/Ca/5

WHEAT

Late application of nitrogen - West Barnfield II, 1951.

System of replication: 3 randomized blocks of 3 plots each.

Area of each plot: 0.0136 acre.

Treatments:
Nitrochalk: None; 1½; 3 cwt per acre applied as a late top dressing.

Basal manuring: ¾ cwt superphosphate per acre, drilled with seed,
2½ cwt sulphate of ammonia per acre as a spring dressing.

Cultivations, etc.: Ploughed: Oct 5. Seed drilled at 3 bushels per acre, with superphosphate: Oct 24. Sulphate of ammonia drilled: Mar 25. Nitrochalk applied: July 5. Harvested: Aug 27. Variety: Nord Desprez. Previous crop: Spring Beans.

Standard errors per plot:
Grain: 1.58 cwt per acre or 4.3% (14 d.f.)
Straw: 2.00 cwt per acre or 4.7% (14 d.f.)

Summary of Results

	Nitrochalk: cwt per acre as top dressing			Mean
	None	1½	3	
Yield: cwt per acre				
Grain (±0.56)	36.7	35.9	36.4	36.3
Straw (±0.71)	42.8	44.0	42.0	42.9
Crude protein: cwt per acre				
Grain	3.53	3.51	3.62	
Increase		-0.02	0.09	
Straw	1.28	1.44	1.36	
Increase		0.16	0.08	
Percentage uptake of added Nitrogen				
Grain		-1	3	
Straw		12	3	

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BARLEY

Late application of nitrogen - Stackyard 1951.

System of replication: 8 randomized blocks of 3 plots each.

Area of each plot: 0.0186 acre.

Treatments:
Nitrochalk: None; 1½; 3 cwt per acre applied as a late top dressing.

Basal manuring: 1 cwt Superphosphate per acre drilled with seed;
2 cwt Sulphate of ammonia per acre as a top dressing.

Cultivations, etc: Ploughed: Mar 31. Seed drilled at 3¼ bushels per acre with Superphosphate: May 2. Sulphate of ammonia applied: June 1. Sprayed with DNOC against weeds, Nitrochalk applied: July 11. Harvested: Sept 13. Variety: Plumage Archer. Previous crop: Kale.

Standard errors per plot:
Grain*: 2.31 cwt per acre or 7.1% (14 d.f.)
Straw*: 1.97 cwt per acre or 7.7% (14 d.f.)

Summary of Results

Nitrochalk: cwt per acre, as top dressing.

	None	1½	3	Mean
		Yield: cwt per acre		
Grain* (±0.82)	31.7	32.4	33.3	32.5
Straw* (±0.76)	24.5	24.8	27.4	25.6
		Crude protein: cwt per acre		
Grain	3.70	4.15	4.50	
Increase		0.45	0.80	
Straw	1.19	1.33	1.61	
Increase		0.14	0.42	
		Percentage uptake of added nitrogen		
Grain		30	27	
Straw		10	14	

* Corrected to 85% dry matter owing to variable conditions during harvesting.

SPRING OATS

Late application of nitrogen - Great Harpenden II 1951.

System of replication: 8 randomized blocks of 3 plots each.

Area of each plot: 0.0186 acre.

Treatments:
Nitrochalk: None; 1½; 3 cwt per acre applied as a late top dressing.

Basal manuring: 1½ cwt Superphosphate per acre drilled with the seed; 1⅔ cwt Sulphate of ammonia per acre as a top dressing.

Cultivations, etc.: Ploughed: Dec 23. Seed drilled at 4 bushels per acre with Superphosphate: Apr 19. Sulphate of ammonia applied: June 4. Nitrochalk applied: July 5. Harvested: Aug 23.
Variety: Sun II. Previous crop: Spring Oats.

Standard errors per plot:
Grain: 0.814 cwt per acre or 4.4% (14 d.f.)
Straw*: 1.06 cwt per acre or 7.7% (14 d.f.)

Summary of Results

	Nitrochalk: cwt per acre, as top dressing			
	None	1½	3	Mean
Yield: cwt per acre				
Grain (±0.29)	17.7	18.4	18.7	18.3
Straw* (±0.38)	12.8	13.9	14.8	13.8
Crude protein: cwt per acre				
Grain	1.98	2.18	2.29	
Increase		0.20	0.31	
Straw	0.55	0.74	0.94	
Increase		0.19	0.39	
Percentage uptake of added nitrogen				
Grain		14	11	
Straw		13	14	

*Corrected to 85% dry matter owing to variable conditions during harvesting.

51/Cd/1.1

SPRING BEANS

Fertilizer placement - West Barnfield I, 1951.

System of replication: 4 randomized blocks of 8 plots each, a high order interaction being confounded with block differences.

Area of each plot: 0.0152 acre. Area harvested: 0.0126 acre.

Treatments: None (quadruplicate plots) and all combinations of:
Granular compound fertilizer (13¾% P_2O_5, 13¾% K_2O): 2.65; 5.30 cwt per acre.
Methods of placement: Drilled 3" below surface and 2" to side of seed (duplicate plots); broadcast on the flat and ploughed in (E); broadcast on the seed bed and harrowed in (L); half broadcast on the flat and ploughed in, half drilled; half broadcast on the seed bed and harrowed in, half drilled.

Basal manuring: None

Cultivations, etc.: 'E' fertilizers applied: Mar 8. Ploughed all plots: Mar 8. 'L' fertilizers applied, beans drilled at 4 bushels per acre with placed fertilizers as above: Apr 16. Sprayed with 1% nicotine against blackfly: June 11 and again July 19. Harvested: Sept 8. Previous crop: Wheat.

Standard errors per plot:
Yield, dry matter: 1.32 cwt per acre or 10.1% (18 d.f.)
Plant number: 9.59 thousands per acre or 8.2% (18 d.f.)

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Summary of Results

Compound fertilizer cwt per acre	Method of Placement D	E	L	½E½D	½L½D	Mean
Yield, dry matter: cwt per acre						
	(±0.66)		(±0.99)			
None						12.2 (±0.47)
2.65	13.7	13.4	12.8	14.9	13.0	13.6 (±0.38)
5.30	14.3	15.3	11.5	12.0	11.2	13.1
Mean (±0.66)	14.0 (1)	14.4	12.2	13.5	12.1	13.1

Standard error (1): 0.47.
Mean D.M. 79.0%

Plant number: thousands per acre						
	(±4.8)		(±7.2)			
None						118 (±3.4)
2.65	120	116	115	98	128	116 (±2.8)
5.30	116	104	125	124	124	118
Mean (±4.8)	118 (2)	110	120	111	126	117

Standard error (2): 3.4

D - Drilled.
E - Broadcast on flat and ploughed in.
L - Broadcast on seed bed and harrowed in.
½E½D - Half broadcast on flat and ploughed in, half drilled.
½L½D - Half broadcast on seed bed and harrowed in, half drilled.

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51/Cd/2.1

WINTER BEANS

Fertilizer placement - West Barnfield I, 1951.

System of replication: 4 randomized blocks of 8 plots each, a high order interaction being confounded with block differences.

Area of each plot: 0.0152 acre. Area harvested: 0.0120 acre.

Treatments: None (quadruplicate plots) and all combinations of:
Granular compound fertilizer (13¾% P_2O_5, 13¾% K_2O): 2.65; 5.30 cwt per acre.
Methods of placement: Drilled 3" below surface and 2" to side of seed (duplicate plots); broadcast on the flat and ploughed in (E); broadcast on the seed bed and harrowed in (L); half broadcast on the flat and ploughed in, half drilled; half broadcast on the seed bed and harrowed in, half drilled.

Basal manuring: None.

Cultivations, etc.: 'E' fertilizers applied, ploughed all plots: Sept 19. 'L' fertilizers applied: Sept 29. Beans drilled at 3½ bushels per acre with placed fertilizers as above: Oct 6. Harvested: Aug 15. Previous crop: Wheat.

Standard errors per plot:
Yield, dry matter: 1.47 cwt per acre or 5.9% (18 d.f.)
Plant number: 7.69 thousands per acre or 8.9% (18 d.f.)

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Summary of Results

Compound fertilizer cwt per acre	Method of Placement D	E	L	½E½D	½L½D	Mean
Yield, dry matter: cwt per acre						
	(±0.45)			(±0.68)		
None						12.3 (±0.32)
2.65	16.0	14.1	13.5	16.9	16.3	15.5 (±0.26)
5.30	18.9	16.3	14.0	16.6	16.9	16.9
Mean (±0.45)	17.5 (1)	15.2	13.8	16.7	16.6	15.2

Standard error (1): 0.32.
Mean D.M. 79.5%

Plant number: thousands per acre						
	(±3.8)			(±5.8)		
None						80 (±2.7)
2.65	97	86	75	87	97	90 (±2.2)
5.30	89	84	87	97	83	88
Mean (±3.8)	93 (2)	85	81	92	90	87

Standard error (2): 2.7

D - Drilled

E - Broadcast on flat and ploughed in.

L - Broadcast on seed bed and harrowed in.

½E½D - Half broadcast on flat and ploughed in, half drilled.

½L½D - Half broadcast on seed bed and harrowed in, half drilled.

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51/Cd/3

WINTER BEANS

Fertilizer placement (Contact) - West Barnfield I 1951.

System of replication: 2 randomized blocks of 6 plots each.

Area of each plot: 0.0152 acre. Area harvested: 0.0121 acre.

Treatments: None, and all combinations of: -
Compound granular fertilizer (13¾% P_2O_5, 13¾% K_2O): 2.65; 5.30 cwt per acre.
Method of placement: Broadcast immediately before drilling (5.30 cwt only; In contact with seed; Drilled 2" to side of seed.

Basal manuring: None.

Cultivations etc: Ploughed: Sept 19. Seed drilled at 3½ bushels per acre with fertilizer applied as above: Oct 6. Harvested: Aug 15. Previous crop: Wheat.

Standard error per plot:
Yield, dry matter: 3.29 cwt per acre or 18.2% (5 d.f.)

Summary of Results

Compound granular fertilizer cwt per acre.	Method of placement: Broadcast	In contact with seed	Drilled 2" to side of seed	Mean
	Yield, dry matter: cwt per acre			
None		(±2.32)		15.3 (±2.32)
2.65		16.4	16.7	16.5 (±1.64)
5.30	21.3	15.9	23.0	20.0 (±1.34)
Mean	21.3 (±2.32)	16.2	19.8 (±1.64)	18.1
	Plant number: thousands per acre			
None				130
2.65		122	130	126
5.30	123	115	120	119
Mean	123	118	125	123

Mean dry matter %: 79.6.

51/Ce/1.1

POTATOES

Application of dung - Little Hoos 1951

System of replication: 4 randomized blocks of 12 plots each, plots being split into 2 for the application of N, P, and K; the three 2-factor interactions being confounded with whole plot differences, and certain high order interactions being confounded with block differences.

Area of each sub plot: 0.0175 acre. Area harvested: 0.0140 acre.

Treatments: All combinations of:-

Whole plots — Dung: None; 5; 10; 15 tons per acre.
Method of application: W-Ploughed in, in winter; S-Ploughed in, in spring; R-Placed in the ridges in spring.

Sub plots — Sulphate of ammonia: None; 0.6 cwt N per acre.
Superphosphate: None; 0.6 cwt P_2O_5 per acre.
Muriate of potash: None; 1.0 cwt K_2O per acre.

Basal manuring: None

Cultivations, etc.: Dung applied to 'W' plots; Sept 21. Ploughed all plots: Sept 22. Dung applied to 'S' plots, ploughed all plots: Mar 30. Ridged: May 8. Dung applied to 'R' plots, fertilizers applied in the ridges, potatoes planted: May 11. Earthed up: July 11. Sprayed with copper fungicide 5 lb per acre: Aug.15 and again Sept 11. Sprayed with 15% sulphuric acid to kill off haulm: Oct 2. Lifted: Oct 10. Variety: Majestic. Previous crop: Wheat.

Standard errors per plot: total clean tubers.
Whole plot: 0.670 tons per acre or 12.0% (32 d.f.)
Sub plot: 0.911 tons per acre or 16.3% (30 d.f.)

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Summary of Results

Total Clean Tubers: tons per acre

	Dung: tons per acre 0	5	10	15	Mean
Mean (±0.193)	3.78	5.51	6.20	6.81	5.58
Method of application			(±0.335)		(±0.193)
Ploughed in, in winter		5.19	6.07	6.76	6.01
Ploughed in, in spring		5.03	6.19	6.41	5.88
Placed in ridges in spring		6.30	6.35	7.27	6.64
Sulphate of ammonia			(±0.268)*		
None	3.55	4.65	5.54	6.12	4.96
0.6 cwt per acre N	4.01	6.37	6.86	7.51	6.19
Response to N (±0.372)	0.46	1.72	1.32	1.39	1.23 (1)
Superphosphate			(±0.268)*		
None	3.19	5.12	5.81	6.46	5.14
0.6 cwt per acre P_2O_5	4.37	5.90	6.60	7.17	6.01
Response to P (±0.372)	1.18	0.78	0.79	0.71	0.87 (1)
Muriate of Potash			(±0.268)*		
None	2.72	4.93	5.82	6.61	5.02
1.0 cwt per acre K_2O	4.84	6.08	6.59	7.02	6.13
Response to K (±0.372)	2.12	1.15	0.77	0.41	1.11 (1)

Standard error (1) 0.186

*Standard error for use in comparisons other than vertical.

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Total Clean Tubers: tons per acre

	Method of application of dung		
	Ploughed in, in winter	Ploughed in, in spring	Placed in ridges in spring
Sulphate of ammonia		(±0.268)*	
None	5.13	5.45	5.73
0.6 cwt per acre N	6.89	6.31	7.55
Response to N (±0.372)	1.76	0.86	1.82
Superphosphate		(±0.268)*	
None	5.54	5.40	6.45
0.6 cwt per acre P_2O_5	6.48	6.36	6.83
Response to P (±0.372)	0.94	0.96	0.38
Muriate of potash		(±0.268)*	
None	5.30	5.53	6.53
1.0 cwt per acre K_2O	6.71	6.23	6.75
Response to K (±0.372)	1.41	0.70	0.22

*Standard error for use in comparisons other than vertical

Responses to treatments (±0.268)**

Response to:	Sulphate of ammonia		Superphosphate		Muriate of potash	
	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.
Sulphate of ammonia	-	-	0.71	1.75	0.53	1.93
Superphosphate	0.34	1.38	-	-	0.86	0.86
Muriate of potash	0.41	1.81	1.11	1.11	-	-

**Standard error of horizontal difference between two responses 0.387

Percentage Ware
($1\frac{1}{2}$" riddle)

Dung: tons per acre

	0	5	10	15	Mean
Mean	80.3	86.6	88.2	89.6	86.2
Method of application					
Ploughed in, in winter		87.0	87.6	89.6	88.1
Ploughed in, in spring		85.3	88.8	90.5	88.2
Placed in ridges in spring		87.4	88.1	88.8	88.1
Sulphate of ammonia					
None	81.8	85.6	87.1	89.6	86.0
0.6 cwt per acre N	78.9	87.6	89.3	89.6	86.4
Response to N	-2.9	2.0	2.2	0.0	0.4
Superphosphate					
None	79.6	86.6	88.3	90.3	86.2
0.6 cwt per acre P_2O_5	81.1	86.6	88.1	88.9	86.2
Response to P	1.5	0.0	-0.2	-1.4	0.0
Muriate of potash					
None	73.2	84.7	87.4	90.3	83.9
1.0 cwt per acre K_2O	87.5	88.5	89.0	88.9	88.5
Response to K	14.3	3.8	1.6	-1.4	4.6

Percentage Ware
($1\frac{1}{2}$" riddle)

Method of application of dung

	Ploughed in, in winter	Ploughed in, in spring	Placed in ridges in spring
Sulphate of ammonia			
None	86.5	87.6	88.2
0.6 cwt per acre N	89.7	88.8	88.0
Response to N	3.2	1.2	-0.2
Superphosphate			
None	87.9	88.6	88.7
0.6 cwt per acre P_2O_5	88.3	87.8	87.6
Response to P	0.4	-0.8	-1.1
Muriate of potash			
None	86.0	87.5	88.9
1.0 cwt per acre K_2O	90.1	88.9	87.3
Response to K	4.1	1.4	-1.6

Responses to treatments:

Response to:	Sulphate of ammonia		Superphosphate		Muriate of potash	
	Abs.	Pres.	Abs.	Pres.	Abs.	Pres.
Sulphate of ammonia	-	-	1.2	-0.4	-0.6	1.4
Superphosphate	0.8	-0.8	-	-	-0.2	0.2
Muriate of potash	3.5	5.5	4.3	4.7	-	-

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51/Ce/2.1

POTATOES

Methods of Planting and fertilizer application - Great Harpenden, 1951.

System of replication: 3 randomized blocks of 9 plots each.

Area of each plot: 0.028 acre. Area harvested: 0.021 acre.

Treatments: All combinations of:-
Compound fertilizer (7% N, 7% P_2O_5, 10.5% K_2O); None; $7\frac{1}{2}$; 15 cwt per acre.
Methods of planting: A - Draw ridges, broadcast fertilizer over ridges, plant by hand, split back ridges (standard method); D - Broadcast fertilizer on the flat, draw ridges, plant deep in ridges with dropper; S - As D but plant shallow.

Basal manuring: None

Cultivations, etc.: Ploughed: Sept 25 and again Jan 3. Ridged, fertilizer applied, potatoes planted: May 17. Earthed up ridges: July 23. Sprayed with copper fungicide, 5 lb per acre: Aug 16 and again Sept 11. Sprayed with 20% sulphuric acid to kill off haulm: Oct 10. Lifted: Oct 17. Variety: Majestic. Previous crop: Linseed.

Standard errors per plot:
Total clean tubers: 0.768 tons per acre or 12.2% (16 d.f.)
Plant number: 0.562 thousands per acre or 5.0% (16 d.f.)

https://doi.org/10.23637/ERADOC-1-171

Summary of Results

Compound Fertilizer cwt per acre	Method of planting A	D	S	Mean
Total Clean Tubers: tons per acre				
		(±0.443)		(±0.256)
0	3.44	4.73	6.03	4.73
7½	4.67	7.73	7.54	6.65
15	6.59	7.21	8.72	7.51
Mean (±0.256)	4.90	6.56	7.43	6.30
Plant Number: thousands per acre				
		(±0.32)		(±0.19)
0	10.1	11.3	12.2	11.2
7½	9.6	12.2	12.1	11.3
15	10.2	11.7	11.8	11.2
Mean (±0.19)	9.9	11.7	12.0	11.2

A - Draw ridges, broadcast fertilizer over ridges, plant by hand, split back ridges (standard method).

D - Broadcast fertilizer on the flat, draw ridges, plant deep in ridges with dropper.

S - As D but plant shallow.

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51/Ce/3

POTATOES

Fertilizer placement - Great Harpenden I 1951.

System of replication: 3 randomized blocks of 12 plots each.

Area of each plot: 0.014 acre. Area harvested: 0.0056 acre.

Treatments: None (duplicate plots) and all combinations of:-
Compound granular fertilizer (7% N, 7% P_2O_5, 10½% K_2O): 7½; 15 cwt per acre
Methods of placement: In front of seed shoe; in sidebands 4" to side of seed and at same depth as seed; broadcast on flat before planting by machine; in contact with seed; half broadcast on flat before planting, half in contact with seed.

Basal manuring: None

Cultivations, etc.: Ploughed: Sept 25 and again Jan 23. Ridged, potatoes planted, fertilizers applied: May 11. Earthed up ridges: July 12. Sprayed with copper fungicide 5 lb per acre: Aug 16 and again Sept 11. Sprayed with 20% sulphuric acid: Oct 10. Lifted: Oct 20. Variety: Majestic. Previous crop: Linseed.

Standard error per plot:
Total tubers: 1.45 tons per acre or 13.8% (23 d.f.)

Summary of Results

Total tubers: tons per acre

Compound Fertilizer cwt per acre	Method of placement: In front of seed shoe	Sidebands 4" to side and at same depth as seed	Broadcast on flat before planting	In contact with seed	½ broadcast on flat before planting, ½ in contact with seed	Mean
			(±0.838)			
None						7.04 (1)
7½	9.30	11.51	9.06	9.89	10.92	10.13 (2)
15	13.07	11.59	13.34	11.77	11.96	12.35 (2)
Mean (±0.593)	11.19	11.55	11.20	10.83	11.44	10.54

Standard errors: (1) 0.593
(2) 0.375

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POTATOES

Nitrophosphates - Highfield 4 1951.

System of replication: 5 randomized blocks of 6 plots each.

Area of each plot: 0.014 acre.

Treatments: None; Sulphate of ammonia; Granular superphosphate; Sulphate of ammonia and Superphosphate; British nitrophosphate (12.8% N, 15.25% P_2O_5); Dutch nitrophosphate (20% N, 20.3% P_2O_5). The dressings supply 0.39 cwt N and 0.39 cwt P_2O_5 per acre, the British nitrophosphate receiving extra N as Sulphate of ammonia to reach this standard.

Basal manuring: 2 cwt Muriate of potash per acre.

All fertilizers were directed into the bottom of the furrows.

Cultivations, etc: Ploughed: Mar 1. Ground chalk, 24 cwt per acre, applied: Apr 18. Ridged, fertilizers applied: May 7. Potatoes planted: May 8. Earthed up ridges: July 12. Sprayed with copper fungicide 5 lb per acre: Aug 15 and again Sept 11. Sprayed with 20% Sulphuric acid: Sept 29. Lifted: Oct 15. Variety: Majestic. Previous crop: Permanent grass.

Standard error per plot:
Total clean tubers: 1.03 tons per acre or 14.7% (20 d.f.)

Summary of Results

	No fert-ilizer	Sulphate of Ammonia	Super-phosphate	Sulphate of Ammonia and Super-phosphate	British Nitro-phosphate	Dutch Nitro-phosphate	Mean
			Total clean tubers: tons per acre				
Mean (±0.462)	6.67	7.16	7.20	7.47	7.04	6.46	7.00
Increase (±0.653)		0.49	0.53	0.80	0.37	-0.21	
			Percentage Ware ($1\frac{1}{2}$" riddle)				
Mean	79.2	73.3	80.3	79.1	78.9	81.6	78.8
Increase		-5.9	1.1	-0.1	-0.3	2.4	

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KALE

Fertilizer placement - Highfield 4 1951.

System of replication: 3 randomized blocks of 6 plots each.

Area of each plot: 0.0152 acre. Area harvested: 0.0076 acre.

Treatments: None (duplicate plots) and all combinations of:-
Compound granular fertilizer (13¾% P_2O_5, 13¾% K_2O): 2.65; 5.30 cwt per acre.
Method of placement: Broadcast; Drilled 2" to side of seed.

Basal manuring: 5 cwt nitrochalk per acre.

Cultivations, etc.: Ploughed: Mar 1. Ground chalk, 24 cwt per acre applied: Apr 18. Nitrochalk drilled, fertilizer broadcast: May 7. Seed drilled at 8 lb. per acre with fertilizer: May 7. Sprayed with DDT emulsion 4 pints per acre against fleabeetle: May 25. Dusted with DDT ½ cwt per acre against cabbage white caterpillar: July 17. Cut: Nov 22. Variety: Thousand Head. Previous crop: Permanent Grass.

Standard error per plot:
Total yield: 1.84 tons per acre or 10.1% (11 d.f.)

Summary of Results

Method of placement	Compound fertilizer: cwt per acre None	2.65	5.30	Mean
Total yield: tons per acre				
		(±1.06)		(±0.75)
Broadcast		19.19	17.56	18.38
Drilled 2" to side of seed		18.46	19.58	19.02
Mean (±0.75)	17.25	18.83	18.57	18.22
Plant number: thousands per acre (1 Block only)				
Broadcast		95.3	117.7	106.5
Drilled 2" to side of seed		74.7	90.8	82.8
Mean	60.1	85.0	104.3	83.1

LUCERNE

Fertilizer placement - Long Hoos IV 1951

System of replication: 3 randomized blocks of 12 plots each.

Area of each plot: 0.00798 acre. Area harvested: 0.00644 acre.

Treatments - applied 1950 and 1951: No fertilizer (duplicate plots); no fertilizer but plots drilled over both in 1950 and 1951 (duplicate plots); and all combinations of:-
Compound granular fertilizer (10% P_2O_5, 20% K_2O): 2.5; 5.0 cwt per acre.
Method of placement: Broadcast during preparation of seed bed 1950; drilled in bands 3" below surface and 2" to side of seed 1950; half broadcast during preparation of seed bed 1950, half broadcast on surface 1951; half drilled beside seed 1950, half drilled beside rows of plants 1951.

Basal manuring: None.

Cultivations, etc.: Fertilizers applied: Mar 30. 1st cut: June 20. 2nd cut: July 31. 3rd cut: Sept 26. Variety: Du Puits.

Standard errors per plot:
Dry matter, 1st cut: 2.95 cwt per acre or 5.6% (24 d.f.)
2nd cut: 2.37 cwt per acre or 11.2% (24 d.f.)
3rd cut: 2.41 cwt per acre or 9.4% (24 d.f.)

See. 1950 edition p.p. 50/Cg/1.1-1.2

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Summary of Results

Dry matter: cwt per acre

Compound fertilizer cwt per acre	Method of placement: Broadcast In seedbed '50	Drilled 3" below surface, 2" to side of seed	Broadcast ½ on seedbed '50, ½ on surface '51	Drilled ½ beside seed '50, ½ beside rows '51	Mean
1st cut					(±0.85)
None (±1.20)	51.6†	50.0†			50.8
2.5 (±1.70)	53.3	55.1	53.3	50.6	53.1
5.0	52.6	56.1	48.9	54.1	52.9
Mean (±1.20)	53.0*	55.6*	51.1	52.3	52.3
2nd cut					(±0.68)
None (±0.97)	19.9†	22.6†			21.2
2.5 (±1.37)	21.1	22.0	19.8	21.8	21.2
5.0	21.3	20.5	19.5	22.5	20.9
Mean (±0.97)	21.2*	21.2*	19.6	22.2	21.1
3rd cut					(±0.70)
None (±0.98)	24.7†	25.9†			25.3
2.5 (±1.39)	26.3	25.4	24.0	25.1	25.2
5.0	26.3	26.6	26.9	24.9	26.2
Mean (±0.98)	26.3*	26.0*	25.5	25.0	25.6

† See treatment description

* Excluding 'None'.

Mean Dry Matter %. 1st cut: 22.0
2nd cut: 25.2
3rd cut: 19.8

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51/Cg/2

LUCERNE - COCKSFOOT LEY

Fertilizer placement - Fosters Corner 1951.

System of replication: 3 randomized blocks of 6 plots each.

Area of each plot: 0.0152 acre.

Treatments: No fertilizer; no fertilizer but plots drilled over to assess damage to sward; and all combinations of:-
Compound granular fertilizer (15% P_2O_5, 13¾% K_2O): 3.3; 6.6 cwt per acre.
Method of placement: Broadcast; Drilled.

Basal manuring: None

Cultivations, etc.: Fertilizer applied: Mar 29. Cut: June 18 and weighed green.

Standard error per plot:
Ley, dry matter: 2.89 cwt per acre or 6.8% (10 d.f.)

Summary of Results

Ley, dry matter: cwt per acre

Method of placement	Compound fertilizer: cwt per acre None	3.3	6.6	Mean
		(±1.67)		(±1.18)
Broadcast	42.3†	45.3	43.1	44.2*
Drilled	39.9†	43.0	43.2	43.1*
Mean (±1.18)	41.1	44.1	43.2	42.8
Difference (±2.36)	-2.4	-2.3	0.1	-1.1* (±1.67)

† See treatment descriptions.

* Excluding 'None'

Mean Dry Matter %: 28.0

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PERMANENT GRASS

Fertilizer placement - Highfield 9 1951.

System of replication: 3 randomized blocks of 6 plots each.

Area of each plot: 0.0152 acre.

Treatments: No fertilizer; no fertilizer but plots drilled over to assess damage to sward; and all combinations of:-
Compound granular fertilizer (15% P_2O_5, 13¾% K_2O): 3.3; 6.6 cwt per acre.
Method of placement: Broadcast; Drilled.

Basal dressing: 3 cwt Nitrochalk per acre.

Cultivations, etc.: Fertilizer applied: Mar 28. Cut: June 19 and weighed green.

Standard error per plot:
Grass, dry matter: 2.49 cwt per acre or 7.9% (10 d.f.)

Summary of Results

Grass, dry matter: cwt per acre

Method of placement	Compound fertilizer: cwt per acre None	3.3	6.6	Mean
		(±1.43)		(±1.01)
Broadcast	28.4†	34.6	35.5	35.0*
Drilled	27.4†	31.2	31.2	31.2*
Mean (±1.01)	27.9	32.9	33.3	31.4
Difference (±2.03)	-1.0	-3.4	-4.3	-3.8* (±1.43)

† See Treatment descriptions

* Excluding 'None'

Mean Dry Matter %: 22.7

51/Ch/2

PERMANENT GRASS

Nitrophosphates - Highfield 9 1951.

System of replication: 6 × 6 Latin square.

Area of each plot: 0.0102 acre

Treatments: None; Sulphate of ammonia; Superphosphate; Sulphate of ammonia and superphosphate; British nitrophosphate (12.8% N, 15.25% P_2O_5); Dutch nitrophosphate (20% N, 20.3% P_2O_5). The dressings supply 0.39 cwt N and 0.39 cwt P_2O_5 per acre, the British nitrophosphate receiving extra N to reach this standard.

Basal manuring: 1⅓ cwt muriate of potash per acre.

Cultivations, etc.: Fertilizer applied: Mar 28. Cut: July 3.

Standard errors per plot:
Hay, dry matter: 1.52 cwt per acre or 5.4% (20 d.f.)
P_2O_5 uptake: 0.00803 cwt per acre or 6.7% (20 d.f.)

Summary of Results

	No fertilizer	Sulphate of Ammonia	Superphosphate	Sulphate of Ammonia and Superphosphate	British Nitrophosphate	Dutch Nitrophosphate	Mean
	Hay, dry matter: cwt per acre						
Mean (±0.62)	24.9	29.9	23.5	30.5	29.6	29.8	28.1
Increase (±0.88)		5.0	-1.4	5.6	4.7	4.9	
	P_2O_5 uptake: cwt per acre						
Mean (±0.0033)	0.101	0.115	0.109	0.137	0.125	0.134	0.120
Increase (±0.0046)		0.014	0.008	0.036	0.024	0.033	

Mean Dry Matter %: 72.6

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SUGAR BEET

Control of Virus Yellows - Long Hoos I, II and III 1951.

System of replication: 5 randomized blocks of 2 plots; each plot being split into three for singling dates.

Area of each sub-plot: 0.0278 acre.

Treatments:
Whole plots: Sowing date. 1 - As early as possible. 2 - As soon as previous sowing above ground.
Sub plots: Singling date. A - Early (cotyledons and first leaf less than 1"); B - Normal (cotyledon and 4 leaves); C - Late (8-12 leaves).

Basal manuring: 3 cwt nitrate of soda, 4 cwt superphosphate and 2 cwt muriate of potash per acre.

Cultivations, etc.: Ploughed: Oct 21. Basal fertilizers applied: Apr 19. Seed drilled at 18 lb per acre: '1' plots - May 2; '2' plots - May 21. Singled: Plots 1A - June 8, 1B and 2A - June 14, 1C and 2B - June 22, 2C - June 29. Lifted: Nov 15. Variety: Klein E. Previous crop: Wheat.

Standard errors per plot:
Total sugar: whole plot, 1.70 cwt per acre or 5.8% (4 d.f.)
sub plot, 4.35 cwt per acre or 14.9% (16 d.f.)
Percentage Virus Yellows (transformed values) whole plot, 2.53 or 10.8% (4 d.f.)
sub plot, 4.25 or 18.1% (16 d.f.)

Note. The analysis of the incidence of Virus Yellows has been carried out on percentages transformed to degrees, and all tests of significance should be applied to the transformed values.

Summary of Results

Sowing Date	Singling Date: Early	Normal	Late	Mean
	Total Sugar: cwt per acre (a and b)			
2nd May	35.9	34.0	22.7	30.8
21st May	32.1	26.4	24.0	27.5
Mean (±1.38)	34.0	30.2	23.4	29.2
Diff. (±2.49)	-3.8	-7.6	+1.3	-3.3 (±1.07)

(a) = ±1.94 for use in horizontal comparisons only.
(b) = ±1.76 for use in all other comparisons.

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Sowing Date	Singling Date: Early	Normal	Late	Mean
	Roots (washed): tons per acre			
2nd May	10.95	10.05	6.91	9.30
21st May	9.58	8.08	7.29	8.32
Mean	10.27	9.07	7.10	8.81
Diff.	-1.37	-1.97	+0.38	-0.98
	Sugar Percentage			
2nd May	16.5	16.9	16.5	16.6
21st May	16.8	16.4	16.5	16.5
Mean	16.6	16.6	16.5	16.6
Diff.	+0.3	-0.5	0.0	-0.1
	Plant No: thousands per acre			
2nd May	25.9	23.9	17.4	22.4
21st May	21.9	22.0	20.5	21.5
Mean	23.9	23.0	19.0	21.9
Diff.	-4.0	-1.9	+3.1	-0.9
	Noxious Nitrogen : Mg %			
2nd May	15.0	16.0	19.0	16.7
21st May	17.0	21.0	20.0	19.3
Mean	16.0	18.5	19.5	18.0
Diff.	+2.0	+5.0	+1.0	+2.6

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Singling Date

Sowing Date	Early	Normal	Late	Mean
	Percentage Virus Yellows (means calculated from transformed values)			
2nd May	12.5	17.6	15.6	15.1
21st May	17.0	21.9	11.3	16.5
Mean	14.8	19.6	13.4	15.9
Diff.	+4.5	+4.3	-4.3	+1.4
	Percentage Virus Yellows (transformed values) (a and b)			
2nd May	20.7	24.8	23.3	22.9
21st May	24.4	27.9	19.6	24.0
Mean (±1.34)	22.6	26.3	21.5	23.5
Diff. (±2.72)	+3.7	+3.1	-3.7	+1.1 (±1.60)

(a) = ±1.90 for use in horizontal comparisons only.
(b) = ±1.92 for use in all other comparisons.

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