ROTHAMSTED RESEARCH

Yields of the Field Experiments 1956

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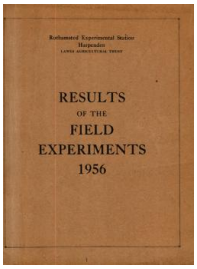

Long-term Experiments

Rothamsted Research

Rothamsted Research (1957) *Long-term Experiments ;* Yields Of The Field Experiments 1956, pp 15 - 69 **- DOI: https://doi.org/10.23637/ERADOC-1-176**

56/Ba/1.1

THREE COURSE ROTATION EXPERIMENT

5th year of revised scheme

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

Area of each plot (acres): Potatoes (sub plot), 0.0092; barley, 0.0200; sugar beet, 0.0205.

Cultivations, etc.:

Potatoes.

Straw applied, all plots ploughed: Dec 2, 1955. Fertilizers applied: Apr 7, 1956. Potatoes machine planted: Apr 12. Earthed up: June 23. Sprayed with copper fungicide, 3 lb in 80 gallons per acre: July 25. Sprayed with sulphuric acid, 20% BOV at 80 gallons per acre: Sept 13. Lifted: Oct 11. Variety: Majestic.

Barley.

Straw applied, all plots ploughed: Dec 2, 1955. Ground chalk applied at 20 cwt per acre: Dec 7. Fertilizers applied, seed drilled at 3 bushels per acre: Mar 15, 1956. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 15. Harvested: Aug 24. Variety: Plumage Archer.

Sugar beet.

Straw applied, all plots ploughed: Dec 2, 1955. Seed drilled at 18 lb per acre: Mar 29, 1956. Fertilizers applied: Mar 30. Singled: June 1 - 5. Lifted: Dec 6. Variety: Klein E.

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

Summary of Results

Potatoes

Treatments applied: 1953 and 1955		1956	0		0.4N		St + 0.2N		St + 0.6N		K_s		K_s + 0.4N	
			-	K	-	K	-	K	-	K	-	K	-	K
1950	1951	1952 1954 & 1956	Total tubers: tons per acre											
	Ar	0			9.94	9.85								
		0.4N	11.98	10.72										
Ar		0			8.63	9.51								
		0.4N	10.79	10.72										
	St1 St2	0			9.65	10.38			11.59	12.17			10.04	10.09
		0.4N	11.40	12.37			11.54	13.39			11.88	13.29		
St1 St2		0			9.21	10.62								
		0.4N	10.72	12.37										
		St+ 0.2N			9.65	11.11								
		St+ 0.6N	11.30	12.08										
		K_s			8.83	10.28								
		K_s+ 0.4N	12.90	13.43										
	Ad	0			9.75	8.83			10.09	9.12			12.12	11.06
Ad		0.4N	10.91	10.72										
		St+ 0.6N	10.14	11.01										
		K_s+ 0.4N	12.90	13.63										

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56/Ba/1.2

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56/Ba/1.3

Potatoes

Treatments applied: 1950	1951	1953 and 1955 / 1956	1952 1954 & 1956	0 -	0 K	0.4N -	0.4N K	St + 0.2N -	St + 0.2N K	St + 0.6N -	St + 0.6N K	K_s -	K_s K	K_s + 0.4N -	K_s + 0.4N K
				Percentage Ware ($1\frac{1}{2}$" riddle)											
	Ar	0				85.9	84.2								
		0.4N		86.4	88.1										
Ar		0				87.8	87.1								
		0.4N		87.6	87.6										
	St1 St2	0				85.8	87.1			88.0	88.6			87.2	89.2
		0.4N		85.3	82.1			88.9	88.8			88.8	87.4		
St1 St2		0				85.8	88.0								
		0.4N		86.7	87.0										
		St + 0.2N				87.1	85.3								
		St + 0.6N		85.9	89.1										
		K_s				85.5	82.0								
		K_s + 0.4N		86.9	85.4										
	Ad	0				82.9	88.4			85.9	87.8			88.8	88.3
Ad		0.4N		85.8	88.1										
		St+ 0.6N		86.5	83.6										
		K_s+ 0.4N		89.9	91.7										

Barley

Treatments applied: 1950	1951	1953 and 1955 / 1952 1954 & 1956	0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
Grain (at 85% dry matter): cwt per acre								
	Ar	0		28.1				
		0.4N	28.9					
Ar		0		26.3				
		0.4N	29.5					
	St1 St2	0		28.8		29.6		28.5
		0.4N	30.9		30.9		29.8	
St1 St2		0		27.5				
		0.4N	30.5					
		St+ 0.2N		30.2				
		St+ 0.6N	30.5					
		K_s		28.3				
		K_s+ 0.4N	30.4					
	Ad	0		26.3		30.2		27.7
Ad		0.4N	29.5					
		St+ 0.6N	29.3					
		K_s+ 0.4N	27.5					
Straw (at 85% dry matter): cwt per acre								
	Ar	0		30.5				
		0.4N	28.5					
Ar		0		27.5				
		0.4N	30.1					
	St1 St2	0		29.3		31.6		33.6
		0.4N	30.5		31.9		31.7	
St1 St2		0		26.6				
		0.4N	34.5					
		St+ 0.2N		29.9				
		St+ 0.6N	36.2					
		K_s		28.9				
		K_s+ 0.4N	31.9					
	Ad	0		25.4		32.5		27.0
Ad		0.4N	27.0					
		St+ 0.6N	32.5					
		K_s+ 0.4N	26.4					

Mean dry matter % as harvested Grain: 79.0
Straw: 76.7

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

Sugar Beet

Treatments applied: 1950	1951	1952 1954 & 1956	0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
			Roots (washed): tons per acre					
	Ar	0		8.88				
		0.4N	11.85					
Ar		0		9.10				
		0.4N	12.08					
	St1 St2	0		10.54		10.48		9.38
		0.4N	11.57		14.21		11.55	
St1 St2		0		9.21				
		0.4N	11.81					
		St+ 0.2N		9.58				
		St+ 0.6N	12.13					
		K_s		9.60				
		K_s+ 0.4N	11.87					
	Ad	0		9.80		8.84		9.91
Ad		0.4N	12.31					
		St+ 0.6N	13.05					
		K_s+ 0.4N	11.00					
			Sugar Percentage					
	Ar	0		18.1				
		0.4N	18.4					
Ar		0		18.0				
		0.4N	18.1					
	St1 St2	0		18.2		17.8		18.7
		0.4N	18.6		17.8		18.1	
St1 St2		0		18.1				
		0.4N	18.2					
		St+ 0.2N		18.5				
		St+ 0.6N	18.3					
		K_s		18.0				
		K_s+ 0.4N	18.6					
	Ad	0		18.1		18.4		18.1
Ad		0.4N	18.2					
		St+ 0.6N	18.1					
		K_s+ 0.4N	17.8					

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Sugar Beet

Treatments applied: 1950	1951	1953 and 1955 / 1952 1954 & 1956	0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
Total sugar: cwt per acre								
	Ar	0		32.2				
		0.4N	43.6					
Ar		0		32.7				
		0.4N	43.8					
	St1 St2	0		38.4		37.2		35.1
		0.4N	43.0		50.6		41.9	
St1 St2		0		33.3				
		0.4N	42.9					
		St+ 0.2N		35.5				
		St+ 0.6N	44.4					
		K_s		34.6				
		K_s+ 0.4N	44.3					
	Ad	0		35.5		32.5		35.9
Ad		0.4N	44.8					
		St+ 0.6N	47.1					
		K_s+ 0.4N	39.1					
Tops: tons per acre								
	Ar	0		7.08				
		0.4N	9.47					
Ar		0		6.48				
		0.4N	9.22					
	St1 St2	0		7.75		7.97		5.81
		0.4N	8.34		9.71		10.96	
St1 St2		0		7.20				
		0.4N	9.76					
		St+ 0.2N		7.79				
		St+ 0.6N	10.00					
		K_s		7.44				
		K_s+ 0.4N	9.41					
	Ad	0		7.31		6.09		7.73
Ad		0.4N	9.95					
		St+ 0.6N	11.70					
		K_s+ 0.4N	10.19					

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Sugar Beet

Treatments applied: 1950	1951	1953 and 1955: 1952, 1954 & 1956	0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
		Plant number: thousands per acre						
	Ar	0		31.0				
		0.4N	29.6					
Ar		0		30.1				
		0.4N	30.4					
	St1 St2	0		31.1		30.0		30.9
		0.4N	31.3		30.3		29.8	
St1 St2		0		31.1				
		0.4N	30.3					
		St+ 0.2N		30.1				
		St+ 0.6N	30.3					
		K_s		31.4				
		K_s+ 0.4N	30.7					
	Ad	0		30.4		30.8		30.6
Ad		0.4N	30.4					
		St+ 0.6N	31.2					
		K_s+ 0.4N	30.2					

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FOUR COURSE ROTATION EXPERIMENT

2nd year of revised scheme

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

Area of each sub plot (acres): Potatoes, 0.0120; barley, 0.0129; beans (whole plot), 0.0244; wheat, 0.0129.

Area harvested (acres): Potatoes, 0.0093; barley, 0.0057; beans, 0.0097; wheat, 0.0056.

Note: The winter sown beans were badly thinned by frost and the crop was resown in spring.

Cultivations, etc.:

Potatoes. Ploughed: Sept 9, 1955 and Nov 17. Fertilizers applied broadcast on flat: Apr 7, 1956. Machine planted: Apr 11. Earthed up: June 26. Sprayed with copper fungicide, 3 lb in 80 gallons per acre: July 25. Sprayed with sulphuric acid 20% BOV: Sept 13. Lifted: Oct 10. Variety: Majestic.

Barley. Ploughed: Oct 11, 1955. Fertilizers applied, seed drilled at 3 bushels per acre: Mar 15, 1956. Sprayed with MCPA at 3 pints in 40 gallons per acre: May 15. Combine harvested: Sept 8. Variety: Plumage Archer.

Beans. Ploughed: Sept 23, 1955. Fertilizers applied: Oct 14. Seed drilled at 300 lb per acre: Oct 17. Whole block ploughed: Apr 11, 1956. Seed drilled at 200 lb per acre: Apr 12. Combine harvested: Oct 10. Variety: Spring Tick.

Wheat. Ploughed: Sept 24 - 26, 1955. Seed drilled at 2¾ bushels per acre: Oct 18. Potash and phosphate fertilizers applied: Oct 26. Nitrogen treatments applied: Apr 24, 1956. Sprayed with MCPA at 3 pints in 40 gallons per acre: May 22. Combine harvested: Sept 8. Variety: Yeoman.

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Summary of Results

Previous Manure	Treatment Year applied	P_2O_5: cwt per acre	Potatoes: Total tubers: tons per acre — N: cwt per acre 0.2	0.6	Mean	Diff.	Potatoes: Percentage Ware ($1\frac{1}{2}$" riddle) — N: cwt per acre 0.2	0.6	Mean	Diff.	Barley: Grain (at 85% dry matter): cwt per acre — N: cwt per acre None	0.4	Mean	Diff.
Dung	1954	0.24	9.69	12.97	11.33	+3.28	84.4	79.7	82.1	- 4.7	19.5	27.5	23.5	+ 8.0
	1953		8.19	9.68	8.94	+1.49	83.6	87.0	85.3	+ 3.4	15.9	26.8	21.4	+10.9
	1952		9.18	13.20	11.19	+4.02	87.8	78.4	83.1	- 9.4	22.8	28.3	25.6	+ 5.5
	1951		8.22	11.01	9.62	+2.79	85.1	84.5	84.8	- 0.6	20.1	26.3	23.2	+ 6.2
	1950		9.25	11.79	10.52	+2.54	87.8	82.2	85.0	- 5.6	16.7	26.6	21.6	+ 9.9
Adco (straw compost)	1954	0.12	9.11	10.11	9.61	+1.00	90.3	86.4	88.4	- 3.9	22.0	29.1	25.6	+ 7.1
	1953		8.42	9.99	9.21	+1.57	87.2	82.7	85.0	- 4.5	26.9	18.9	22.9	- 8.0
	1952		8.19	10.10	9.15	+1.91	83.7	87.0	85.4	+ 3.3	19.8	25.5	22.6	+ 5.7
	1951		7.68	9.37	8.53	+1.69	87.1	81.5	84.3	- 5.6	16.5	24.6	20.6	+ 8.1
	1950		8.48	10.91	9.70	+2.43	90.9	81.1	86.0	- 9.8	17.3	29.6	23.4	+12.3
Straw	1954	0.24	10.69	14.25	12.47	+3.56	85.2	84.4	84.8	- 0.8	20.3	29.7	25.0	+ 9.4
	1953		8.40	11.39	9.90	+2.99	82.9	83.3	83.1	+ 0.4	20.1	30.8	25.4	+10.7
	1952		9.09	9.90	9.50	+0.81	86.5	85.0	85.8	- 1.5	19.5	33.2	26.4	+13.7
	1951		8.59	11.09	9.84	+2.50	83.2	71.9	77.6	-11.3	11.8	30.7	21.2	+18.9
	1950		9.88	11.86	10.87	+1.98	83.6	86.2	84.9	+ 2.6	17.6	27.9	22.8	+10.3
Super-phosphate	1954	0.24	7.76	11.25	9.51	+3.49	86.1	82.9	84.5	-33.2	18.4	26.9	22.6	+ 8.5
	1953		9.32	11.01	10.17	+1.69	83.0	87.6	85.3	+ 4.6	20.9	26.3	23.6	+ 5.4
	1952		7.96	10.60	9.28	+2.64	84.3	87.8	86.1	+ 3.5	18.1	27.1	22.6	+ 9.0
	1951		8.63	10.79	9.71	+2.16	84.3	86.6	85.5	+ 2.3	12.7	26.0	19.4	+13.3
	1950		6.65	9.44	8.05	+2.79	86.6	85.4	86.0	- 1.2	16.5	28.3	22.4	+11.8
Rock phosphate	1954	None	6.39	8.31	7.35	+1.92	83.1	87.1	85.1	+ 4.0	20.3	24.4	22.4	+ 4.1
	1953		7.58	9.32	8.45	+1.74	92.7	82.4	87.6	-10.3	14.8	26.0	20.4	+11.2
	1952		5.94	7.78	6.86	+1.84	85.5	85.6	85.6	+ 0.1	9.1	21.7	15.4	+12.6
	1951		6.32	8.53	7.43	+2.21	87.0	91.0	89.0	+ 4.0	15.9	26.9	21.4	+11.0
	1950		6.00	5.84	5.92	-0.16	85.1	72.6	78.9	-12.5	14.3	25.0	19.6	+10.7
Mean dry matter % as harvested													73.2	

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56/Ba/2.2

Previous Treatment			Wheat Grain (at 85% dry matter): cwt per acre				Beans Grain (at 85% dry matter): cwt per acre
Manure	Year applied	P_2O_5: cwt per acre	N: cwt per acre None	0.4	Mean	Diff.	
Dung	1954	0.24	15.3	20.3	17.8	+ 5.0	23.4
	1953		9.4	15.7	12.6	+ 6.3	23.4
	1952		6.5	13.0	9.8	+ 6.5	22.5
	1951		9.4	15.4	12.4	+ 6.0	22.9
	1950		6.2	13.5	9.8	+ 7.3	25.6
Adco (straw compost)	1954	0.12	8.1	12.2	10.2	+ 4.1	25.4
	1953		13.5	17.8	15.6	+ 4.3	26.3
	1952		13.7	18.3	16.0	+ 4.6	24.8
	1951		8.6	13.7	11.2	+ 5.1	25.7
	1950		14.5	12.6	13.6	- 1.9	24.8
Straw	1954	0.24	12.9	20.7	16.8	+ 7.8	21.8
	1953		11.4	15.6	13.5	+ 4.2	25.0
	1952		16.5	21.6	19.0	+ 5.1	24.4
	1951		9.4	17.3	13.4	+ 7.9	24.6
	1950		9.1	18.1	13.6	+ 9.0	23.9
Super-phosphate	1954	0.24	3.2	7.6	5.4	+ 4.4	22.4
	1953		2.5	12.9	7.7	+10.4	24.8
	1952		7.0	18.1	12.6	+11.1	22.2
	1951		3.5	10.3	6.9	+ 6.8	24.0
	1950		6.2	7.9	7.0	+ 1.7	23.7
Rock phosphate	1954	None	3.2	14.5	8.8	+11.3	20.3
	1953		5.6	18.6	12.1	+13.0	15.2
	1952		7.3	11.0	9.2	+ 3.7	18.7
	1951		3.2	7.9	5.6	+ 4.7	21.0
	1950		8.7	9.4	9.0	+ 0.7	15.2
Mean dry matter % as harvested:					74.1		54.4

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

56/Ba/3.1

SIX COURSE ROTATION EXPERIMENT

The 27th year

Seasonal effects of fertilizers - Rothamsted Long Hoos IV and Woburn Stackyard 1956.

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

Area of each plot: Rothamsted, 0.0250 acres. Woburn, 0.0266 acres.

Cultivations, etc.:

Rothamsted

Sugar beet.
Ploughed: Sept 6, 1955 and Nov 24. Fertilizers applied, seed drilled at 18 lb per acre: Mar 29, 1956. Singled: May 24 - 30. Lifted: Dec 5. Variety: Klein E.

Barley.
Sugar beet tops spread: Nov 22, 1955. Ploughed: Nov 24. Ground chalk applied at 20 cwt per acre: Dec 2. Seed drilled at 3 bushels per acre: Mar 14, 1956. Fertilizers applied: Mar 15. Clover seed undersown: Apr 23. Harvested: Sept 12. Variety: Plumage Archer.

Clover.
Seed undersown in barley at 40 lb per acre: Apr 26, 1955. Autumn fertilizers applied: Oct 27. Sulphate of ammonia applied: Apr 9, 1956. Cut: July 13. Variety: Late flowering Montgomery Red.

Wheat.
Ploughed: July 28, 1955 and Oct 12. Autumn fertilizers applied: Oct 17. Seed drilled at 2¾ bushels per acre: Oct 18. Sulphate of ammonia applied: Apr 24, 1956. Harvested: Aug 22. Variety: Yeoman.

Potatoes.
Ploughed: Sept 6, 1955 and Oct 17. Ridged: Mar 26, 1956. Fertilizers applied, potatoes planted: Mar 27. Earthed up: June 23. Sprayed with copper fungicide at 3 lb in 80 gallons per acre: July 25. Sprayed with sulphuric acid, 20% BOV, 80 gallons per acre: Sept 13. Lifted: Oct 8. Variety: Majestic.

Rye.
Ploughed: Oct 3, 1955. Ground chalk applied at 20 cwt per acre: Oct 4. Autumn fertilizers applied: Oct 15. Seed drilled at 3 bushels per acre: Oct 17. Sulphate of ammonia applied: Apr 24, 1956. Harvested: Aug 21. Variety: King II.

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Woburn

Sugar beet.
Ploughed: Sept 1, 1955 and Dec 12. Fertilizers applied: Apr 6, 1956. Seed drilled at 12 lb per acre: Apr 9. Re-drilled thin places: May 12. Dusted with 5% DDT: May 19. Sprayed with parathion, ½ pint in 40 gallons per acre: May 25. Singled: June 6 - 7. Lifted: Oct 23. Variety: Klein E.
Note: The DDT and parathion were applied to control leaf miner (Pegomyia beta).

Barley.
Beet tops spread, ploughed: Oct 31, 1955. Fertilizers applied: Mar 13. Seed drilled at 2½ bushels per acre: Mar 15. Sprayed with MCPA, 2 pints in 20 gallons per acre: May 7. Harvested: Aug 14. Variety: Herta.

Clover.
Autumn fertilizers applied: Oct 13, 1955. Undersown crop failed during winter. Whole block ploughed: Mar 9, 1956. Sulphate of ammonia applied: Mar 27. Seed drilled at 40 lb per acre: Mar 28. Cut: July 6. Variety: Crimson Clover.

Wheat.
Ploughed: July 19, 1955. Autumn fertilizers applied: Oct 12, 1955. Seed drilled at 3 bushels per acre: Oct 15. Sulphate of ammonia applied: Apr 26, 1956. Sprayed with DNOC, 6 lb in 80 gallons per acre: May 1. Harvested: Aug 23. Variety: Yeoman.

Potatoes.
Ploughed: Sept 1, 1955 and Dec 12. Ridged, fertilizers applied, potatoes planted: Apr 4, 1956. Earthed up: June 18. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 23. Sprayed with arsenious compound, 1 gallon in 40 gallons per acre: Sept 4. Lifted: Oct 4. Variety: Majestic.

Rye.
Ploughed: Oct 6, 1955. Ground chalk applied at 20 cwt per acre: Oct 13. Seed drilled at 2½ bushels per acre: Oct 15. Seed re-drilled at 2½ bushels per acre: Nov 16. Sulphate of ammonia applied: Apr 24, 1956. Harvested: Aug 23. Variety: King II.
Note: A poor plant was obtained from the first sowing because of a defective drill.

Note: In 1956 at Woburn the nitrogen levels were doubled on all crops except clover.

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Summary of Results

Mean yields per acre and responses in yield per cwt of N, P_2O_5 and K_2O

	Rothamsted	Woburn	Rothamsted	Woburn
	Sugar Beet, roots (washed): tons per acre		Barley, grain: cwt per acre *	
Mean	11.59	10.76	25.3	34.0
Response to: N	+5.27	+8.97	+16.9	+23.6
P	-2.55	+2.21	-0.3	-1.0
K	+0.07	+0.64	-3.7	-2.7
Mean dry matter % as harvested:			80.9	
	Sugar Beet, sugar percentage		Barley, straw: cwt per acre *	
Mean	18.4	18.1	26.9	29.2
Response to: N	-0.4	0.0	+26.3	+25.1
P	0.0	-0.1	+0.5	-1.2
K	+0.1	+0.2	-6.4	-2.3
Mean dry matter % as harvested:			81.4	
	Sugar Beet, total sugar: cwt per acre		Clover, hay, dry matter: cwt per acre	
Mean	42.6	38.9	21.3	19.1
Response to: N	+18.5	+32.1	+5.3	-5.5
P	-9.1	+7.7	-11.7	+12.4
K	+0.6	+2.6	-2.5	+12.9
Mean dry matter % as harvested:			79.7	
	Sugar Beet, tops: tons per acre		Wheat, grain: cwt per acre *	
Mean	9.22	6.41	27.7	19.1
Response to: N	+6.32	+8.08	+6.1	+11.3
P	-4.37	+2.65	+5.7	-1.0
K	-0.31	+0.46	+1.6	-0.2
Mean dry matter % as harvested:			78.1	
	Sugar Beet, plant number: thousands per acre		Wheat, straw: cwt per acre *	
Mean	28.1	**	37.6	23.2
Response to: N	-2.1		+14.5	+10.9
P	-3.7		+10.5	-2.5
K	+1.1		-0.6	-1.2
Mean dry matter % as harvested:			79.9	

*(at 85% dry matter) **not recorded.

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

Mean yields per acre and responses in yield per cwt of N, P_2O_5 and K_2O

	Rothamsted	Woburn	Rothamsted	Woburn
	Potatoes, total tubers: tons per acre		Rye, grain: cwt per acre	
			*	
Mean	9.03	10.87	28.8	30.7
Response to: N	+6.19	+5.33	+19.1	+15.5
P	+1.83	+2.61	+2.0	+1.9
K	+0.42	-0.04	-4.7	-5.7
Mean dry matter % as harvested:			76.6	
	Potatoes, percentage ware		Rye, straw: cwt per acre	
	(1)	(2)	*	
Mean	91.0	83.3	36.4	35.1
Response to: N	+7.3	+6.2	+23.1	+17.6
P	-17.1	-13.8	+2.3	+0.6
K	+0.2	-9.8	-6.9	-6.4
Mean dry matter % as harvested:			80.7	

*(at 85% dry matter)

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

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56/Bb/1.1

DEEP CULTIVATION ROTATION EXPERIMENT

The 13th year

Deep ploughing, fertilizers and dung - Long Hoos I and II 1956.

For treatments etc. see "Details of the Classical and Long Term Experiments" 1956.

Area of each plot: 0.0312 acres. Area harvested:
Barley, spring oats, 0.0265 acres; ley, 0.0275 acres;
wheat, 0.0188 acres.

Termination of Experiment. Series 1 and 2, due to carry sugar beet and potatoes in 1956, were terminated. They completed the two cycles of the 6 course rotation in 1955 and were sown with barley this year.

Cultivations, etc.:

Barley

Ploughed: Dec 22, 1955. Ground chalk at 20 cwt per acre applied: Jan 3, 1956. Basic slag and sulphate of ammonia applied: Mar 10. Seed drilled at 3 bushels per acre: Mar 14. Seeds for 1 year ley undersown: Apr 24. Harvested: Aug 29. Variety: Plumage Archer.

Ley

Seeds undersown: Apr 26, 1955. Cut: June 21, 1956. Seeds mixture 18 lb S24 perennial ryegrass, 8 lb Montgomery red clover, 2 lb American Alsike clover.

Wheat

"Deep" plots ploughed: Oct 5, 1955. "Shallow" plots ploughed: Oct 6. Seed drilled at $2\frac{3}{4}$ bushels per acre; Oct 25. Sulphate of ammonia applied: Apr 30, 1956. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 15. Combine harvested: Aug 29. Variety: Yeoman.

Oats

Ploughed: Nov 1, 1955. Ground chalk at 20 cwt per acre applied: Dec 2. Sulphate of ammonia applied: Mar 10, 1956. Seed drilled at 4 bushels per acre: Mar 13. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 15. Harvested: Aug 30. Variety: Star.

Standard errors per plot:

Barley, Grain (at 85% D.M.):	1.81 cwt per acre or 6.4% (4 d.f.)
Ley, Hay:	3.38 cwt per acre or 15.1% (4 d.f.)
Wheat, Grain (at 85% D.M.):	1.08 cwt per acre or 3.9% (4 d.f.)
Spring Oats, Grain (at 85% D.M.):	0.945 cwt per acre or 3.9% (4 d.f.)

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

Summary of Results

Responses to treatments to previous sugar beet

Response to	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Barley									
Grain (at 85% dry matter): Mean yield 28.2 cwt per acre									
	(±0.90)			(±1.28)					
Ploughing deep-shallow	0.0	-	-	+0.3	-0.3	+0.9	-0.9	+0.1	-0.1
Dung	+1.8	+2.1	+1.5	-	-	+1.1	+2.5	+2.4	+1.2
Phosphate	-0.2	+0.7	-1.1	-0.9	+0.5	-	-	-0.7	+0.3
Potash	+0.3	+0.4	+0.2	+0.9	-0.3	-0.2	+0.8	-	-
Straw (at 85% dry matter): Mean yield 34.9 cwt per acre									
Ploughing deep-shallow	+3.1	-	-	+3.2	+3.0	+2.3	+3.9	+1.8	+4.4
Dung	+6.6	+6.7	+6.5	-	-	+6.1	+7.1	+9.5	+3.7
Phosphate	+0.3	-0.5	+1.1	-0.2	+0.8	-	-	+1.3	-0.7
Potash	+1.3	0.0	+2.6	+4.2	-1.6	+2.3	+0.3	-	-
Ley									
Hay: Mean yield 22.3 cwt per acre									
	(±1.69)			(±2.39)					
Ploughing deep-shallow	+1.4	-	-	+1.4	+1.4	0.0	+2.8	-0.4	+3.2
Dung	+3.9	+3.9	+3.9	-	-	+3.3	+4.5	+3.4	+4.4
Phosphate	-0.8	-2.2	+0.6	-1.4	-0.2	-	-	-1.2	-0.4
Potash	+1.3	-0.5	+3.1	+0.8	+1.8	+0.9	+1.7	-	-
Wheat*									
Grain (at 85% dry matter): Mean yield 27.7 cwt per acre									
	(±0.54)			(±0.76)					
Ploughing deep-shallow	+3.6	-	-	+5.2	+2.0	+3.5	+3.7	+3.0	+4.2
Dung	+2.5	+4.1	+0.9	-	-	+1.4	+3.6	+4.2	+0.8
Phosphate	+0.7	+0.6	+0.8	-0.4	+1.8	-	-	+0.4	+1.0
Potash	+1.3	+0.7	+1.9	+3.0	-0.4	+1.0	+1.6	-	-

*Cultivation treatments direct to wheat, manures to previous sugar beet.

Mean dry matter % as harvested:
- Barley, grain: 76.8
- straw: 73.7
- Wheat, grain: 73.3

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

Responses to treatments to previous potatoes

Response to	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Spring Oats									
Grain (at 85% dry matter): Mean yield 24.2 cwt per acre									
	(±0.47)				(±0.67)				
Ploughing deep-shallow	-1.8	-	-	-1.9	-1.7	-0.8	-2.8	-2.1	-1.5
Dung	+1.3	+1.2	+1.4	-	-	+2.3	+0.3	+2.0	+0.6
Phosphate	+2.0	+3.0	+1.0	+3.0	+1.0	-	-	+1.6	+2.4
Potash	+2.7	+2.4	+3.0	+3.4	+2.0	+2.3	+3.1	-	-
Straw: Mean yield 41.3 cwt per acre									
Ploughing deep-shallow	+1.3	-	-	+2.8	-0.2	+3.5	-0.9	+1.2	+1.4
Dung	+2.8	+4.3	+1.3	-	-	+1.5	+4.1	+3.2	+2.4
Phosphate	+1.2	+3.4	-1.0	-0.1	+2.5	-	-	+0.5	+1.9
Potash	+2.9	+2.8	+3.0	+3.3	+2.5	+2.2	+3.6	-	-

Mean dry matter % as harvested:
Spring oats, grain: 79.2

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LEY AND ARABLE ROTATIONS

Highfield and Fosters Field 1956 - the 8th year.

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

Rates of application of supplementary (corrective) potash (K_2O: cwt per acre)

Crop	Year of cycle	Rate	
Cut grass	"1st treatment"	3.0	(3 years previous cutting)
	"2nd treatment"	1.5	(received supplement in 1955)
	"3rd treatment"	1.5	(received supplement in 1955)
Lucerne	"1st treatment"	3.0	(3 years previous lucerne)
	"2nd treatment"	1.0	(received supplement in 1955)
	"3rd treatment"	1.0	(received supplement in 1955)
Permanent and Reseeded	"1st treatment"	1.2	(1 previous hay crop taken)
Remainder		None	

Cultivations, etc.:

HIGHFIELD

1st year Treatment Crops

Cut grass. Ploughed twice: Sept 8, 1955 and Nov 29. 1st dressing of supplementary K applied: Mar 9, 1956. Basal PK and 'Nitro-Chalk' applied: Apr 17. Seed sown at 33 lb per acre: Apr 19. 2nd dressing of supplementary K applied: July 11. Cut 4 times: July 10, Aug 9, Sept 6, Nov 12. 'Nitro-Chalk' applied after each cut except the last.

Grazed ley. Ploughed twice: Sept 8, 1955 and Nov 29. Basal PK applied: Apr 17, 1956. 'Nitro-Chalk' applied: Apr 18. Seed sown at 44 lb per acre: Apr 19. 'Nitro-Chalk' applied: Aug 23. Grazed: 7 - 8 circuits, July 5 - Nov 1.

Lucerne. Ploughed twice: Sept 8, 1955 and Nov 29. 1st dressing of supplementary K applied: Mar 9, 1956. Basal PK applied: Apr 17. Seed drilled at 28 lb per acre: Apr 19. 2nd dressing of supplementary K applied: Aug 3. Cut twice: Aug 3, Nov 9. Variety: Du Puits.

Hay. Seeds undersown in barley at 28 lb per acre: Apr 25, 1955. Basal PK applied: Dec 5. 'Nitro-Chalk' applied: Mar 20, 1956. Cut: June 27.

2nd year Treatment Crops

Cut grass. Basal PK applied: Dec 6, 1955. Supplementary K applied: Mar 9, 1956. 'Nitro-Chalk' applied: Mar 15 and after each cut except the last. Cut 6 times: May 16, June 20, July 10, Aug 9, Sept 6, Nov 12.

Grazed ley. Basal PK applied: Dec 6, 1955. 'Nitro-Chalk' applied: May 7, 1956 and Aug 23. Grazed: 9 circuits, Apr 24 - Oct 28.

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

Lucerne. Basal PK applied: Dec 6, 1955. Supplementary K applied: Mar 9, 1956. Cut 3 times: June 21, Aug 2, Nov 9.
Potatoes. Ploughed twice: June 11, 1955 and Oct 14. Ridged: Mar 26, 1956. Basal PK applied: Mar 27. Sulphate of ammonia and dung applied, potatoes planted: Mar 29. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. Basal PK applied: Dec 6, 1955. Supplementary K applied: Mar 9, 1956. 'Nitro-Chalk' applied: Mar 15 and after each cut except the last. Cut 6 times: May 16, June 20, July 10, Aug 9, Sept 6, Oct 18.
Grazed ley. Basal PK applied: Dec 6, 1955. 'Nitro-Chalk' applied: May 7, 1956 and Aug 23. Grazed: 8 circuits, Apr 28 - Oct 5.
Lucerne. Basal PK applied: Dec 6, 1955. Sprayed with TCA (Sodium trichloracetate), 20 lb in 90 gallons per acre: Mar 8, 1956. Supplementary K applied: Mar 9. Cut 3 times: June 21, Aug 3, Oct 18.
Oats. Ploughed: Oct 14, 1955. 'Nitro-Chalk' applied, seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK: Mar 13, 1956. Combine harvested: Sept 15. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Sept 8, 1955. Ploughed leys: Oct 25 - 27. Seed drilled at $2\frac{3}{4}$ bushels per acre with basal PK: Nov 1. 'Nitro-Chalk' applied: Apr 25, 1956. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 22. Combine harvested: Sept 17. Variety: Yeoman.

2nd Test Crop, Potatoes

Ploughed twice: Sept 8, 1955 and Nov 29. Ridged: Mar 26, 1956. Basal PK applied: Mar 27. Dung, sulphate of ammonia and additional P and K applied, potatoes planted: Mar 29. Earthed up: June 22. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 25. Sprayed with sulphuric acid, 20% BOV at 80 gallons per acre: Sept 13. Lifted: Oct 12. Variety: Majestic.

3rd Test Crop, Barley

Ploughed: Oct 14, 1955. Ground chalk applied to blocks 9 and 12: Dec 5. 'Nitro-Chalk' applied: Mar 13, 1956. Seed drilled at 2 bushels per acre with basal PK: Mar 14. Combine harvested: Sept 15 - 17. Variety: Proctor.

Permanent grasses. Basal PK applied to all plots: Dec 6, 1955.
6th year reseeded, 6th experimental year of permanent grass, Blocks 9-12.
Blocks 9 and 12. Ground chalk applied: Dec 5, 1955. 'Nitro-Chalk' applied to reseeded grass: May 30, 1956 and Sept 7. 'Nitro-Chalk' applied to permanent grass: June 4 and Aug 27. Grazed: 8 circuits, May 6 - Nov 3.
Blocks 10 and 11. 'Nitro-Chalk' to reseeded grass: May 28, 1956 and Sept 3. 'Nitro-Chalk' to permanent grass: May 30 and Aug 27. Grazed: 8 circuits, May 6 - Oct 30.

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7th year reseeded, 7th experimental year of permanent grass, Blocks 5-8.
Blocks 5 and 8. Supplementary K applied: Mar 9, 1956. 'Nitro-Chalk' applied: Mar 20. Cut for hay, 'Nitro-Chalk' applied: June 27. Grazed aftermath: 4 circuits, July 21 - Oct 22.
Blocks 6 and 7. 'Nitro-Chalk' applied: May 24 - 26, 1956 and Aug 23. Grazed: 8 circuits, May 2 - Oct 30.

8th year reseeded, 8th experimental year of permanent grass, Blocks 1-4. 'Nitro-Chalk' applied: Mar 18, 1956 and Aug 27 - Sept 3. Grazed: 8-9 circuits, Apr 24 - Nov 7.

FOSTERS

1st year Treatment Crops

Cut grass. Ploughed twice: Sept 7, 1955 and Nov 28. 1st dressing of supplementary K applied: Mar 8, 1956. Basal PK applied: Mar 17. 'Nitro-Chalk' applied: Mar 18. Seed sown at 33 lb per acre: Mar 19. 2nd dressing of supplementary K applied: July 12. Cut 4 times: July 11, Aug 8, Sept 8, Nov 12. 'Nitro-Chalk' applied after each cut except the last.

Grazed ley. Ploughed twice: Sept 8, 1955 and Nov 29. Basal PK applied: Apr 17, 1956. 'Nitro-Chalk' applied: Apr 18. Seed sown at 44 lb per acre: Apr 19. 'Nitro-Chalk' applied: Aug 24. Grazed: 5 circuits, July 6 - Oct 19.

Lucerne. Ploughed twice: Sept 7, 1955 and Nov 28. 1st dressing of supplementary K applied: Mar 8, 1956. Basal PK applied: Apr 17. Seed drilled at 28 lb per acre: Apr 19. 2nd dressing of supplementary K applied: Aug 2. Cut twice: Aug 1 and Nov 9. Variety: Du Puits.

Hay. Seeds undersown in barley at 28 lb per acre: Apr 25, 1955. Basal PK applied: Dec 5. 'Nitro-Chalk' applied: Mar 20, 1956. Cut: June 25.

2nd year Treatment Crops

Cut grass. Basal PK applied: Dec 5, 1955. Supplementary K applied: Mar 8, 1956. 'Nitro-Chalk' applied: Mar 14 and after each cut except the last. Cut 6 times: May 16, June 20, July 11, Aug 8, Sept 8, Nov 12.

Grazed ley. Basal PK applied: Dec 5, 1955. 'Nitro-Chalk' applied: May 7, 1956 and Aug 25. Grazed: 7-8 circuits, Apr 25 - Oct 23.

Lucerne. Basal PK applied: Dec 6, 1955. Supplementary K applied: Mar 8, 1956. Cut 3 times: June 22, July 31, Nov 9.

Potatoes. Ploughed twice: June 11, 1955 and Oct 14. Ridged: Mar 26, 1956. Basal PK applied: Mar 27. Sulphate of ammonia and dung applied, potatoes planted: Mar 28. For later cultivations see Potato Test Crop.

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3rd year Treatment Crops

Cut grass. Basal PK applied: Dec 5, 1955. Supplementary K applied: Mar 8, 1956. 'Nitro-Chalk' applied: Mar 14 and after each cut except the last. Cut 6 times: May 16, June 20, July 11, Aug 8, Sept 8, Oct 19.

Grazed ley. Basal PK applied: Dec 5, 1955. 'Nitro-Chalk' applied: May 7, 1956 and Aug 24. Grazed: 7 circuits, Apr 29 - Oct 15.

Lucerne. Basal PK applied: Dec 5, 1955. Supplementary K applied: Mar 8, 1956. Cut 3 times: June 22, July 31, Oct 19.

Oats. Ploughed: Oct 13, 1955. 'Nitro-Chalk' applied, seed drilled at 3½ bushels per acre with basal PK: Mar 13, 1956. Combine harvested: Sept 14. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Sept 7, 1955. Ploughed leys: Oct 27. Seed drilled at 2¾ bushels per acre with basal PK: Nov 1. 'Nitro-Chalk' applied: Apr 25, 1956. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 17. Combined harvested: Sept 4. Variety: Yeoman.

2nd Test Crop, Potatoes

Ploughed twice: Sept 7, 1955 and Nov 28. Ridged: Mar 26, 1956. Basal PK applied: Mar 27. Dung, sulphate of ammonia and additional P and K applied, potatoes planted: Mar 27 - 28. Earthed up: June 22. Sprayed with copper sulphate, 5 lb in 40 gallons per acre: July 24. Sprayed with sulphuric acid, 20% BOV at 80 gallons per acre: Sept 13. Lifted: Oct 9. Variety: Majestic.

3rd Test Crop, Barley

Ploughed: Oct 13, 1955. 'Nitro-Chalk' applied: Mar 13, 1956. Seed drilled at 2 bushels per acre with basal PK: Mar 14. Combine harvested: Sept 14. Variety: Proctor.

Note: One block received a basal dressing of sulphate of ammonia in error.

Permanent grasses. Basal PK applied to all plots: Dec 5, 1955.

6th year reseeded grass, Blocks 6, 10, 11, 12.
'Nitro-Chalk' applied: May 14, 1956 and Aug 25. Grazed: 7 circuits, May 3 - Oct 27.

7th year reseeded grass, Blocks 5, 7, 8, 9.
Blocks 5 and 7. Supplementary K applied: Mar 8, 1956. 'Nitro-Chalk' applied: Mar 20. Cut for hay, 'Nitro-Chalk' applied: June 25. Grazed aftermath: 4 circuits, July 28 - Oct 7.
Blocks 8 and 9. 'Nitro-Chalk' applied: May 14, 1956 and Aug 24. Grazed: 7 circuits, May 3 - Oct 19.

8th year reseeded grass, Blocks 1, 2, 3, 4.
'Nitro-Chalk' applied: May 14, 1956 and Aug 29 - Sept 3. Grazed: 8-9 circuits, Apr 25 - Oct 31.

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Standard errors per ¼ plot. Test Crops.

Wheat, grain (at 85% dry matter).	Highfield:	1.78	cwt per acre or 5.5% (13 d.f.)
	Fosters:	1.36	cwt per acre or 3.8% (13 d.f.)
Potatoes, total tubers.	Highfield ¼ plot:	1.507	tons per acre or 9.4% (14 d.f.)
	⅛ plot:	1.134	tons per acre or 7.1% (20 d.f.)
	Fosters ¼ plot:	0.531	tons per acre or 3.7% (14 d.f.)
	⅛ plot:	1.011	tons per acre or 7.1% (20 d.f.)
Barley, grain (at 85% dry matter).	Highfield:	2.73	cwt per acre or 8.0% (15 d.f.)
	Fosters:	1.64	cwt per acre or 4.2% (15 d.f.)

Summary of Results

Wheat 1st test crop

N: cwt per acre	Treatment crops 1953-1955: Lucerne	Ley	Cut Grass	Arable with hay	Mean
Grain (at 85% dry matter): cwt per acre					
Highfield					
Mean	34.2	36.2	20.4	39.7	32.6
To test crop					
0.3	34.8	36.9	21.4	38.2	32.8
0.6	33.7	35.4	19.5	41.1	32.4
Difference (±1.26)	-1.1	-1.5	-1.9	+2.9	-0.4 (± 0.63)
To treatment crops					
Single rate		36.3	22.2	39.2	32.6
Double rate		36.1	18.7	40.1	31.6
Difference (±1.26)		-0.2	-3.5	+0.9	-1.0 (± 0.73)
Fosters					
Mean	41.7	36.1	33.8	30.5	35.5
To test crop					
0.3	40.4	34.6	32.0	27.1	33.5
0.6	43.0	37.6	35.7	34.0	37.6
Difference (±0.96)	+2.6	+3.0	+3.7	+6.9	+4.1 (± 0.48)
To treatment crops					
Single rate		35.2	33.4	28.8	32.5
Double rate		37.0	34.3	32.3	34.5
Difference (±0.96)		+1.8	+0.9	+3.5	+2.0 (± 0.56)

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Wheat 1st test crop

N: cwt per acre	Excluding Lucerne: N to previous treatment crop: Single rate	Excluding Lucerne: N to previous treatment crop: Double rate	Excluding Lucerne: Mean	Arable with hay only: Dung to potatoes 1954: tons per acre: None	Arable with hay only: Dung to potatoes 1954: tons per acre: 12	Arable with hay only: Mean
Grain (at 85% dry matter): cwt per acre						
Highfield						
To test crop	(± 0.73)		(± 0.51)	(± 1.26)		(± 0.89)
0.3	32.0	32.4	32.2	37.0	39.3	38.2
0.6	33.2	30.9	32.0	39.3	42.9	41.1
Mean	32.6	31.6	32.1	38.2	41.1	39.7
	(± 0.51)			(± 0.89)		
To previous treatment crops				(± 1.26)		(± 0.89)
Single rate				37.9	40.4	39.2
Double rate				38.5	41.8	40.1
Mean				38.2	41.1	39.7
				(± 0.89)		
Mean dry matter % as harvested: 81.6						
Fosters						
To test crop	(± 0.56)		(± 0.39)	(± 0.96)		(± 0.68)
0.3	30.2	32.3	31.2	26.7	27.6	27.1
0.6	34.8	36.8	35.8	32.6	35.3	34.0
Mean	32.5	34.5	33.5	29.6	31.5	30.5
	(± 0.39)			(± 0.68)		
To previous treatment crops				(± 0.96)		(± 0.68)
Single rate				28.2	29.3	28.8
Double rate				31.0	33.6	32.3
Mean				29.6	31.5	30.5
				(± 0.68)		
Mean dry matter % as harvested: 71.4						

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Wheat 1st test crop

N: cwt per acre	Treatment crops 1953-1955 Lucerne	Ley	Cut Grass	Arable with hay	Mean
Straw (at 85% dry matter): cwt per acre					
Highfield					
Mean	24.2	37.1	15.3	26.7	25.8
To test crop					
0.3	24.8	37.3	15.0	28.9	26.5
0.6	23.6	37.0	15.6	24.5	25.2
Difference	-1.2	-0.3	+0.6	-4.4	-1.3
To treatment crops					
Single rate		36.3	17.2	25.8	26.4
Double rate		38.0	13.4	27.6	26.3
Difference		+1.7	-3.8	+1.8	-0.1
Fosters					
Mean	26.2	27.5	22.0	21.2	24.2
To test crop					
0.3	27.1	26.7	20.4	18.9	23.3
0.6	25.3	28.3	23.6	23.4	25.2
Difference	-1.8	+1.6	+3.2	+4.5	+1.9
To treatment crops					
Single rate		27.0	22.9	18.6	22.8
Double rate		27.9	21.2	23.7	24.3
Difference		+0.9	-1.7	+5.1	+1.5

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Wheat 1st test crop

N: cwt per acre	Excluding Lucerne: N to previous treatment crop Single rate	Excluding Lucerne: N to previous treatment crop Double rate	Excluding Lucerne: Mean	Arable with hay only: Dung to potatoes 1954: tons per acre None	Arable with hay only: Dung to potatoes 1954: tons per acre 12	Arable with hay only: Mean
Straw (at 85% dry matter): cwt per acre						
Highfield						
To test crop						
0.3	26.4	27.8	27.1	26.7	31.2	28.9
0.6	26.5	24.9	25.7	24.8	24.2	24.5
Mean	26.4	26.3	26.4	25.8	27.7	26.7
To previous treatment crops						
Single rate				26.1	25.6	25.8
Double rate				25.4	29.8	27.6
Mean				25.8	27.7	26.7

Mean dry matter % as harvested: 84.6

Fosters						
To test crop						
0.3	21.0	23.0	22.0	17.1	20.8	18.9
0.6	24.6	25.6	25.1	24.8	21.9	23.4
Mean	22.8	24.3	23.6	21.0	21.4	21.2
To previous treatment crops						
Single rate				18.8	18.5	18.6
Double rate				23.2	24.2	23.7
Mean				21.0	21.4	21.2

Mean dry matter % as harvested: 83.4

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

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

	Treatment crops 1952-1954				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	15.64	17.86	14.81	15.54	15.96
N: cwt per acre					
0.5	16.13	17.89	14.74	15.18	15.98
1.0	15.15	17.82	14.87	15.90	15.94
Difference (±1.066)	-0.98	-0.07	+0.13	+0.72	-0.04 (± 0.533)
Dung: tons per acre					
None	13.10	16.62	13.38	13.92	14.25
12	18.19	19.10	16.23	17.16	17.67
Difference (±1.066)	+5.09	+2.48	+2.85	+3.24	+3.42 (± 0.533)
P_2O_5: cwt per acre*					
0.9	15.75	17.99	14.47	15.12	15.83
1.8	15.54	17.72	15.14	15.96	16.09
Difference (±0.567)	-0.21	-0.27	+0.67	+0.84	+0.26 (± 0.284)
K_2O: cwt per acre*					
0.9	14.53	17.47	13.65	14.40	15.01
1.8	16.75	18.25	15.96	16.67	16.91
Difference (±0.567)	+2.22	+0.78	+2.31	+2.27	+1.90 (± 0.284)
Fosters					
Mean	14.23	14.76	13.37	14.70	14.27
N: cwt per acre					
0.5	14.22	14.40	13.62	14.18	14.10
1.0	14.24	15.12	13.12	15.22	14.43
Difference (±0.375)	+0.02	+0.72	-0.50	+1.04	+0.33 (± 0.188)
Dung: tons per acre					
None	12.95	14.28	12.01	13.37	13.15
12	15.51	15.24	14.73	16.03	15.38
Difference (±0.375)	+2.56	+0.96	+2.72	+2.66	+2.23 (± 0.188)
P_2O_5: cwt per acre*					
0.9	14.44	14.79	12.94	14.53	14.17
1.8	14.02	14.73	13.80	14.87	14.36
Difference (±0.505)	-0.42	-0.06	+0.86	+0.34	+0.19 (± 0.253)
K_2O: cwt per acre*					
0.9	13.65	14.41	13.13	14.68	13.97
1.8	14.81	15.11	13.61	14.72	14.56
Difference (±0.505)	+1.16	+0.70	+0.48	+0.04	+0.59 (± 0.253)

*Including basal dressing

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

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Highfield						
N: cwt per acre	(±0.533)		(1) and (2)		(1) and (2)	
0.5	13.88	18.09	16.07	15.90	15.02	16.95
1.0	14.63	17.25	15.60	16.27	15.01	16.87
Dung: tons per acre			(1) and (2)		(1) and (2)	
None			14.09	14.42	12.51	15.99
12			17.58	17.76	17.51	17.82

Lucerne rotation only	K_2O: cwt per acre*		Mean
	0.9	1.8	
P_2O_5: cwt per acre*	(3) and (4)		
0.9	14.87	16.63	15.75
1.8	14.19	16.88	15.54
Mean	14.53	16.75	15.64

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Fosters						
N: cwt per acre	(± 0.188)		(1) and (2)		(1) and (2)	
0.5	13.04	15.17	14.08	14.13	13.82	14.38
1.0	13.27	15.58	14.27	14.58	14.11	14.74
Dung: tons per acre			(1) and (2)		(1) and (2)	
None			13.18	13.13	12.59	13.71
12			15.17	15.58	15.34	15.41

Lucerne rotation only	K_2O: cwt per acre*		Mean
	0.9	1.8	
P_2O_5: cwt per acre*	(3) and (4)		
0.9	13.80	15.09	14.44
1.8	13.49	14.54	14.02
Mean	13.65	14.81	14.23

*Including basal dressing.

Highfield	Fosters
(1) ±0.284	(1) ±0.253 for use in horizontal and interaction comparisons.
(2) ±0.427	(2) ±0.223 for use in all others.
(3) ±1.066	(3) ±0.375 for use only in testing the PK interaction.
(4) ±0.854	(4) ±0.445 for use in all other comparisons.

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Potatoes 2nd test crop. Percentage ware (1½" riddle)

	Treatment crops 1952-1954				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	77.3	74.3	69.6	67.5	72.2
N: cwt per acre					
0.5	80.6	75.3	69.5	70.8	74.0
1.0	74.0	73.3	69.7	64.2	70.3
Difference	-6.6	-2.0	+0.2	-6.6	-3.7
Dung: tons per acre					
None	74.7	75.1	71.7	67.6	72.3
12	79.9	73.5	67.5	67.4	72.1
Difference	+5.2	-1.6	-4.2	-0.2	-0.2
P_2O_5: cwt per acre*					
0.9	79.9	73.7	69.2	65.6	72.1
1.8	74.6	75.0	70.0	69.4	72.2
Difference	-5.3	+1.3	+0.8	+3.8	+0.1
K_2O: cwt per acre*					
0.9	78.0	70.6	70.0	66.0	71.2
1.8	76.6	78.0	69.2	69.0	73.2
Difference	-1.4	+7.4	-0.8	+3.0	+2.0
Fosters					
Mean	91.2	89.3	89.7	91.0	90.3
N: cwt per acre					
0.5	91.4	89.7	90.2	91.8	90.8
1.0	90.9	88.9	89.1	90.3	89.8
Difference	-0.5	-0.8	-1.1	-1.5	-1.0
Dung: tons per acre					
None	90.3	91.3	89.6	90.8	90.5
12	92.0	87.3	89.8	91.4	90.1
Difference	+1.7	-4.0	+0.2	+0.6	-0.4
P_2O_5: cwt per acre*					
0.9	92.2	88.4	89.4	91.2	90.3
1.8	90.1	90.2	89.9	90.9	90.2
Difference	-2.1	+1.8	+0.5	-0.3	-0.1
K_2O: cwt per acre*					
0.9	90.4	89.3	90.3	90.1	90.0
1.8	91.9	89.3	89.0	92.0	90.6
Difference	+1.5	0.0	-1.3	+1.9	+0.6

*Including basal dressing.

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Potatoes 2nd test crop. Percentage ware ($1\frac{1}{2}$" riddle)

Highfield

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
N: cwt per acre						
0.5	74.7	73.4	75.0	73.1	73.9	74.2
1.0	69.8	70.8	69.2	71.4	68.4	72.2
Dung: tons per acre						
None			73.0	71.5	71.8	72.7
12			71.2	72.9	70.5	73.6

Lucerne rotation only	K_2O: cwt per acre* 0.9	1.8	Mean
P_2O_5: cwt per acre* 0.9	81.0	78.9	79.9
1.8	75.0	74.2	74.6
Mean	78.0	76.6	77.3

Fosters

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
N: cwt per acre						
0.5	90.9	90.7	90.4	91.2	90.6	91.0
1.0	90.0	89.5	90.2	89.3	89.5	90.1
Dung: tons per acre						
None			90.9	90.0	90.6	90.3
12			89.7	90.5	89.4	90.8

Lucerne rotation only	K_2O: cwt per acre* 0.9	1.8	Mean
P_2O_5: cwt per acre* 0.9	90.5	94.0	92.2
1.8	90.4	89.8	90.1
Mean	90.4	91.9	91.2

*Including basal dressing.

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

	Treatment crops 1951-1953				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	31.5	33.2	35.9	36.8	34.3
N: cwt per acre					
None	32.8	33.9	35.4	39.7	35.4
0.2	30.2	32.5	36.4	34.0	33.3
Difference (±1.93)	-2.6	-1.4	+1.0	-5.7	-2.1 (± 0.97)
Dung to potatoes 1955: tons per acre					
None	30.6	32.6	37.2	35.9	34.1
12	32.3	33.8	34.6	37.7	34.6
Difference (±1.93)	+1.7	+1.2	-2.6	+1.8	+0.5 (± 0.97)
Fosters					
Mean	36.7	38.8	40.3	39.8	38.9
N: cwt per acre					
0.2	36.6	39.3	41.6	39.9	39.3
0.4	36.9	38.4	39.1	39.7	38.5
Difference (±1.16)	+0.3	-0.9	-2.5	-0.2	-0.8 (± 0.58)
Dung to potatoes 1955: tons per acre					
None	38.2	38.9	40.3	40.5	39.5
12	35.3	38.7	40.4	39.1	38.4
Difference (±1.16)	-2.9	-0.2	+0.1	-1.4	-1.1 (± 0.58)

	Highfield		Fosters	
	N: cwt per acre		N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1955: tons per acre	(±0.97)		(±0.58)	
None	36.4	31.8	39.6	39.4
12	34.5	34.7	39.1	37.6

Mean dry matter % as harvested:
Highfield: 79.3
Fosters: 80.3

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

Barley 3rd test crop. Straw: cwt per acre

	Treatment crops 1951-53				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield*					
Mean	38.4	37.5	33.5	35.4	36.2
N: cwt per acre					
None	38.1	33.9	33.9	33.1	34.8
0.2	38.7	41.1	33.1	37.8	37.7
Difference	+0.6	+7.2	-0.8	+4.7	+2.9
Dung to potatoes 1955: tons per acre					
None	35.8	36.8	31.2	34.2	34.5
12	41.1	38.2	35.8	36.7	37.9
Difference	+5.3	+1.4	+4.6	+2.5	+3.4
Fosters					
Mean	27.7	30.0	28.2	29.6	28.9
N: cwt per acre					
0.2	26.5	28.5	28.0	29.5	28.1
0.4	29.0	31.5	28.5	29.6	29.6
Difference	+2.5	+3.0	+0.5	+0.1	+1.5
Dung to potatoes 1955: tons per acre					
None	27.7	29.1	28.1	30.1	28.8
12	27.8	30.9	28.4	29.0	29.0
Difference	+0.1	+1.8	+0.3	-1.1	+0.2

	Highfield		Fosters	
	N: cwt per acre		N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1955: tons per acre				
None	33.5	35.5	28.2	29.3
12	36.0	39.8	28.1	30.0

Mean dry matter % as harvested:
Highfield: 73.7
Fosters: 84.0

*At 85% dry matter.

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Treatment crops Arable and Hay rotation

(values based on Mean of 2 sub plots only)

	Highfield N: cwt per acre applied in 1956			Fosters N: cwt per acre applied in 1956		
	Single rate	Double rate	Mean	Single rate	Double rate	Mean
Hay (dry matter): cwt per acre						
No dung	50.7	59.2	55.0	41.4	48.3	44.9
Dung in 1954	61.0	55.4	58.2	39.6	57.0	48.3
Mean	55.8	57.3	56.6	40.5	52.7	46.6
Potatoes, total tubers: tons per acre						
No dung	11.78	13.14	12.46	12.77	12.17	12.47
Dung in 1956	17.46	18.91	18.19	14.35	15.14	14.74
Mean	14.62	16.03	15.32	13.56	13.66	13.61
Potatoes, percentage ware ($1\frac{1}{2}$" riddle)						
No dung	64.2	73.0	68.6	92.2	89.3	90.8
Dung in 1956	71.1	74.2	72.6	88.6	90.4	89.5
Mean	67.7	73.6	70.6	90.4	89.9	90.2
	Oats					
	None	0.2		0.2	0.4	
Grain (at 85% dry matter): cwt per acre						
No dung	30.6	30.0	30.3	33.6	38.7	36.2
Dung in 1955	32.4	30.2	31.3	37.1	34.4	35.8
Mean	31.5	30.1	30.8	35.3	36.6	36.0
Straw: cwt per acre						
No dung	32.7	28.7	30.7	25.0	24.2	24.6
Dung in 1955	25.8	31.2	28.5	25.5	33.3	29.4
Mean	29.2	29.9	29.6	25.3	28.7	27.0

Highfield, Oats, Mean dry matter % as harvested Grain: 78.3 Straw: 85.7
Fosters, Oats, Mean dry matter % as harvested Grain: 81.5 Straw: 84.7

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

Cut grass. Dry Matter: cwt per acre

1st year	Corrective dressing of K_2O: cwt per acre	Highfield N: to previous 3 test crops		Highfield Dung to potatoes 1954: tons per acre		Highfield Mean	Fosters N: to previous 3 test crops		Fosters Dung to potatoes 1954: tons per acre		Fosters Mean
		Single rate	Double rate	None	12		Single rate	Double rate	None	12	
N(1) to cut grass (4 cuts)											
Single rate		55.7	56.7	55.7	56.7	56.2	36.4	40.7	37.7	39.4	38.5
Double rate		63.4	61.9	60.8	64.5	62.7	46.2	49.3	48.6	46.8	47.7
N to test crops											
Single rate				59.0	60.1	59.5			41.4	41.2	41.3
Double rate				57.5	61.1	59.3			44.9	45.0	45.0
Mean				58.2	60.6	59.4			43.1	43.1	43.1

		Highfield N to cut grass (1) Single rate	Highfield N to cut grass (1) Double rate	Highfield Mean	Fosters N to cut grass (1) Single rate	Fosters N to cut grass (1) Double rate	Fosters Mean
2nd year (6 cuts)	1.5	60.6	86.9	73.8	54.2	73.3	63.7
3rd year (6 cuts)	1.5	65.1	86.2	75.7	63.2	77.9	70.6

(1) 0.15 v. 0.3 cwt N as 'Nitro-Chalk' for every cut.

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56/Bc/1.16

Lucerne. Dry matter: cwt per acre

1st year (2 cuts)	Corrective dressing of K_2O: cwt per acre	Highfield N to 3 previous test crops Single rate	Highfield N to 3 previous test crops Double rate	Highfield Mean	Fosters N to 3 previous test crops Single rate	Fosters N to 3 previous test crops Double rate	Fosters Mean
Dung to potatoes 1954							
None		43.0	48.0	45.5	32.9	35.7	34.3
12 tons		45.1	48.6	46.8	32.2	33.0	32.6
Mean		44.1	48.3	46.2	32.6	34.4	33.5
2nd year (3 cuts)	1.0			88.0			90.1
3rd year (3 cuts)	1.0			96.6			105.4

Grazed Ley. Dry matter: cwt per acre (estimated from sample cuts)

	Highfield N: cwt per acre (yearly) 0.15	Highfield N: cwt per acre (yearly) 0.30	Highfield Mean	Fosters N: cwt per acre (yearly) 0.15	Fosters N: cwt per acre (yearly) 0.30	Fosters Mean
1st year	20.7	19.8	20.3	15.4	18.2	16.8
2nd year	25.0	29.5	27.2	25.0	23.0	24.0
3rd year	29.8	30.6	30.2	21.1	24.3	22.7

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

Reseeded Grass. Dry matter: cwt per acre

	Corrective dressing of K_2O: cwt per acre	Cut for hay N Single rate	Cut for hay N Double rate	Cut for hay Mean	Grazed Estimated from sampling cuts N Single rate	Grazed Estimated from sampling cuts N Double rate	Grazed Estimated from sampling cuts Mean
Highfield							
6th exptl. year Blocks 9-12	None				32.5	33.6	33.0
7th exptl. year Blocks 6 and 7	None				25.0	33.3	29.1
Blocks 5 and 8	1.2	59.8	63.2	61.5	19.9*	25.9*	22.9*
8th exptl. year Blocks 1-4	None				23.5	28.8	26.2
Fosters							
6th exptl. year Blocks 6, 10-12	None				17.2	18.5	17.8
7th exptl. year Blocks 8 and 9	None				13.0	17.0	15.0
Blocks 5 and 7	1.2	33.1	37.7	35.4	16.2*	21.6*	18.9*
8th exptl. year Blocks 1-4	None				24.5	21.4	22.9

Permanent Grass. Dry matter: cwt per acre

Highfield							
6th exptl. year Blocks 9-12	None				31.4	31.9	31.6
7th exptl. year Blocks 6 and 7	None				21.7	25.0	23.4
Blocks 5 and 8	1.2	39.6	43.9	41.7	25.1*	26.6*	25.8*
8th exptl. year Blocks 1-4	None				24.7	29.1	26.9

*Aftermath grazing.

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

GREEN MANURING EXPERIMENT

Woburn Stackyard - 1956, the 3rd year of the revised scheme.

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

Note: In 1955 the green manure crops undersown in the barley failed; these were resown after the barley was cut.

The straw treatment due to be applied after harvest was given only to the "fallow" (i.e. not undersown) plots, the application of straw to the green manure plots being postponed until later.

Area of each plot: 0.0395 acres. Area harvested: Potatoes, 0.0237; barley, 0.0395 acres.

Cultivations, etc.:

Green manures after barley: Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, resown: Sept 6, 1955. Varieties: Trefoil-English; Ryegrass-Western Wolths.

Early Potatoes: Straw applied to "fallow" plots only: Sept 27, 1955. "Fallow" plots ploughed: Sept 28. Straw applied to trefoil and ryegrass plots: Dec 8. "Fallow" plots ploughed: Jan 5, 1956. All plots ploughed: Mar 6. Basal fertilizers applied: Mar 19. 'Nitro-Chalk' applied: Mar 21. Potatoes mechanically planted: Mar 24. Earthed up: June 1. Lifted: July 25. Variety: Ulster Chieftain.

Green manures after early potatoes: Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, sown: July 29, 1955. Varieties: Trefoil-English; Ryegrass-Western Wolths.

Barley: "Fallow" and "early" green manure plots ploughed: Nov 17, 1955 and Jan 7, 1956. All plots ploughed including "late" green manure plots: Mar 7. Ground chalk at 20 cwt per acre applied: Mar 9. 'Nitro-Chalk' applied: Mar 16. Seed drilled at $2\frac{1}{2}$ bushels per acre: Mar 17. Trefoil and ryegrass undersown: Apr 23. Harvested: Aug 15. Variety: Herta.

Standard errors per plot:

Potatoes, Total tubers: 0.967 tons per acre or 12.3% (18 d.f.)

Barley, Grain: 2.64 cwt per acre or 8.8% (20 d.f.)

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

	Green manure	Ploughed in	Dry matter	Nitrogen
For Early Potatoes	Trefoil		5.9	0.187
	Ryegrass		6.9	0.153
For Barley	Trefoil	Early	17.4	0.572
	Ryegrass	Early	11.8	0.347
	Trefoil	Late	4.9	0.183
	Ryegrass	Late	7.2	0.218

Erratum to "Results of the Field Experiments" 1955 page 55/Bd/1.2.

Excluding plots fallow under old scheme:

S.E. of straw × N table should read (±0.130) not (±0.120).

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

Summary of Results

Early Potatoes, total tubers: tons per acre

	Straw: tons per acre		N: cwt per acre (including basal)		Dung to cabbages 1952: tons per acre		Mean
	None	1½	0.23	0.46	None	10	
Excluding plots fallow under old scheme							
Undersown green manures for potatoes	(±0.342)		(±0.342)		(±0.342)		(±0.242)
None	7.69	7.94	7.88	7.74	6.94	8.69	7.81
	(±0.484)		(±0.484)		(±0.484)		(±0.342)
Trefoil	8.71	7.65	8.24	8.11	7.24	9.12	8.18
Ryegrass	8.25	7.61	7.83	8.03	7.16	8.70	7.93
Straw: tons per acre			(±0.342)		(±0.342)		(±0.242)
None			8.33	7.84	7.02	9.15	8.08
1½			7.60	7.97	7.12	8.45	7.78
N: cwt per acre (including basal)							
0.23					7.08	8.84	7.96
0.46					7.05	8.76	7.91
Mean (±0.242)					7.07	8.80	7.93
Plots fallow under old scheme							
Straw: tons per acre			(±0.684)		(±0.684)		(±0.484)
None			7.14	7.88	6.60	8.42	7.51
1½			7.18	8.12	6.70	8.60	7.66
N: cwt per acre (including basal)							
0.23					6.14	8.19	7.16
0.46					7.16	8.84	8.00
Mean (±0.484)					6.65	8.52	7.58

Old scheme	Undersown green manures for potatoes: None	None	Trefoil	Ryegrass	Mean
	Fallow	Excluding Fallow			
	7.58 (±0.342)	7.81 (±0.242)	8.18 (±0.342)	7.93	7.86

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

Barley, grain: cwt per acre

	Green manures: Ploughed in Early	Ploughed in Late	In barley for potatoes: None	In barley for potatoes: Undersown	N: cwt per acre (including basal) 0.23	N: cwt per acre (including basal) 0.46	Dung to cabbages 1953: tons per acre None	Dung to cabbages 1953: tons per acre 10	Mean
Excluding plots fallow under old scheme									
Green manures after potatoes for barley	(±0.93)		(±0.93)		(±0.93)		(±0.93)		(± 0.66)
Trefoil	29.1	30.3	31.5	27.9	28.3	31.1	28.4	31.0	29.7
Ryegrass	32.1	33.0	33.3	31.8	31.4	33.7	31.8	33.4	32.6
Green manures ploughed in									
Early			32.2	29.0	29.4	31.8	30.4	30.8	30.6
Late			32.6	30.7	30.3	33.0	29.8	33.5	31.7
Green manures in barley for potatoes									
None					31.5	33.3	32.2	32.6	32.4
Undersown					28.2	31.5	28.0	31.7	29.9
N: cwt per acre (including basal)									
0.23							28.3	31.4	29.9
0.46							31.9	32.9	32.4
Mean (±0.66)							30.1	32.2	31.1

Plots fallow under old scheme

Old scheme	Green manures after potatoes for barley: None Fallow	Trefoil	Ryegrass	Mean
		Excluding fallow		
	25.6	29.7	32.6	30.0
	(± 0.93)	(± 0.66)		

N: cwt per acre (including basal)	(±1.87)		(± 1.32)
0.23	24.8	22.5	23.6
0.46	28.2	26.8	27.4
Mean (±1.32)	26.5	24.6	25.6

Barley, straw: cwt per acre

	Green manures: Ploughed in Early	Green manures: Ploughed in Late	Green manures: In barley for potatoes None	Green manures: In barley for potatoes Undersown	N: cwt per acre (including basal) 0.23	N: cwt per acre (including basal) 0.46	Dung to cabbages 1953: tons per acre None	Dung to cabbages 1953: tons per acre 10	Mean
Excluding plots fallow under old scheme									
Green manures after potatoes for barley									
Trefoil	23.1	25.1	25.9	22.2	22.6	25.5	22.0	26.1	24.1
Ryegrass	25.3	26.7	27.0	25.0	25.5	26.5	25.4	26.7	26.0
Green manures ploughed in									
Early			26.2	22.2	23.0	25.4	23.5	24.9	24.2
Late			26.7	25.1	25.2	26.7	23.9	27.9	25.9
Green manures in barley for potatoes									
None					25.6	27.4	25.5	27.4	26.5
Undersown					22.6	24.7	21.9	25.4	23.6
N: cwt per acre (including basal)									
0.23							22.3	25.9	24.1
0.46							25.1	27.0	26.0
Mean							23.7	26.4	25.1

Plots fallow under old scheme

Old scheme	Green manures after potatoes for barley: None Fallow	Trefoil Excluding fallow	Ryegrass Excluding fallow	Mean
	21.2	24.1	26.0	24.3

N: cwt per acre (including basal)			
0.23	20.4	18.6	19.5
0.46	22.8	22.9	22.9
Mean	21.6	20.8	21.2

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56/Bd/1.5

LEY AND ARABLE ROTATIONS

Woburn Stackyard 1956 - the 19th year.

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

In 1956 carrots replaced sugar beet as the 3rd course of the arable rotation. Sugar beet replaced potatoes as the 1st test crop. The seeds hay split plot test of N after the first crop was discontinued.

Cultivations, etc.:

Treatment crops

Ley rotations

Ley 1st year. Ploughed twice: Sept 23, 1955 and Oct 28. Basal fertilizers applied, seed sown: Apr 16, 1956. 2nd dressing 'Nitro-Chalk' applied: Aug 29. Grazed 6 circuits: June 25 - 29, July 25 - Aug 2, Aug 19 - 29, Sept 14 - 22, Oct 9 - 17, Nov 2 - 10. Seeds mixture (sown at 40 lb per acre) 20 lb S24 Perennial Ryegrass, 11 lb S143 Cocksfoot, 6 lb Late Flowering Red Clover, 3 lb S100 White Clover.

Ley 2nd year. Basal potash applied: Apr 13, 1956. 'Nitro-Chalk' applied: May 20 and Sept 3. Grazed 8 circuits: May 4 - 12, May 20 - 28, June 17 - 25, July 7 - 15, Aug 8 - 17, Sept 6 - 14, Oct 1 - 9, Oct 25 - Nov 2.

Ley 3rd year. Basal potash applied: Apr 13, 1956. 'Nitro-Chalk' applied: May 16 and Sept 5. Grazed 9 circuits: Apr 26 - May 4, May 12 - 20, June 9 - 17, June 29 - July 7, July 17 - 25, Aug 2 - 11, Aug 29 - Sept 6, Sept 22 - Oct 1, Oct 17 - 25.

Lucerne 1st year. Ploughed twice: Sept 23, 1955 and Oct 28. Basal fertilizers applied, seed sown at 25 lb per acre: Apr 16, 1956. Dusted with 5% DDT: May 5. Sprayed with DDT emulsion, 3 pints per acre: May 7 and June 2. Cut twice: Aug 8 and Nov 16. Variety: Du Puits.

Lucerne 2nd year. Basal potash applied: Apr 13, 1956. Cut 3 times: June 21, Aug 8, Nov 16.

Lucerne 3rd year. Basal potash applied: Apr 13, 1956. Cut 3 times: June 21, Aug 8, Nov 16.

Arable rotations

Potatoes 1st course. Ploughed twice: Sept 23, 1955 and Oct 28. Basal fertilizers applied: Apr 11, 1956. Ridged, potatoes planted: Apr 13. Earthed up: June 22. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 23. Sprayed with arsenious compound, 1 gallon in 40 gallons per acre: Sept 4. Lifted: Oct 4 - 5. Variety: Majestic.

Rye 2nd course. Ploughed: Sept 3, 1955. Seed drilled at 3 bushels per acre: Oct 15. 'Nitro-Chalk' applied: Apr 16, 1956. Seeds hay mixture undersown on 4 plots: Apr 20. Harvested: Aug 22. Variety: King II.

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Seeds hay 3rd course. Seeds undersown in rye: May 9, 1955. Basal fertilizers applied: Apr 9, 1956. 1st cut: June 21. 'Nitro-Chalk' applied: June 22. 2nd cut: Nov 16. Seeds mixture per acre: 19 lb S24 Perennial Ryegrass, 9 lb Late Flowering Red Clover, 2 lb Alsike American.

Carrots 3rd course. Ploughed twice: Sept 6, 1955 and Dec 12. Basal fertilizer applied, seed drilled at 6 lb per acre: Apr 13, 1956. Singled: June 21 - 26. Lifted: Nov 8. Variety: James' Scarlet Intermediate.

Test crops

Sugar beet 1st test crop. Ploughed: Nov 9 - 11, 1955. Dung applied, ploughed: Mar 8, 1956. Basal and treatment fertilizers applied, rubbed seed drilled at 12 lb per acre: Apr 9. Sprayed with DDT emulsion, 3 pints in 40 gallons: May 7. Singled: June 1 - 5. Lifted: Oct 22 - 26. Variety: Klein E.

Barley 2nd test crop. Ploughed: Oct 29, 1955. Ground chalk applied: Dec 8. Potash applied to equalise treatment dressings to 1955 potatoes: Jan 16, 1956. 'Nitro-Chalk' applied: Mar 13. Seed drilled at 2½ bushels per acre: Mar 16. Additional 'Nitro-Chalk' applied: Apr 19. Harvested: Aug 21. Variety: Herta.

Note. The change of 1st test crop from potatoes to sugar beet, was decided on in spring, and the application of dung necessitated a second ploughing; this gave poor seed bed conditions after the leys and the yield of sugar beet after lucerne was possibly depressed as a result.

Standard errors per plot. Test Crops.

Sugar beet. Total sugar.	Whole plot:	3.36 cwt per acre or 6.2%	(3 d.f.)
	½ plot:	3.88 cwt per acre or 7.2%	(4 d.f.)
	⅛ plot:	3.41 cwt per acre or 6.3%	(24 d.f.)
Tops.	Whole plot:	0.758 tons per acre or 5.0%	(3 d.f.)
	½ plot:	0.856 tons per acre or 5.7%	(4 d.f.)
	⅛ plot:	1.786 tons per acre or 11.8%	(24 d.f.)
Barley. Grain	Whole plot:	2.24 cwt per acre or 6.3%	(4 d.f.)
	½ plot:	1.90 cwt per acre or 5.4%	(4 d.f.)

Errata to "Results of the Field Experiments" 1939-47, Vol.I.

Page Bf/1.4. Potatoes 1947. Date sown should read 'May 12" not "Apr 12".

Page Bf/1.16. Barley 1947. Order of crops previous to potatoes, for grain and straw tables should read "Lucerne, Arable with sugar beet, Arable with hay, Ley" and not as shown.

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Summary of Results

Treatment crops

Ley, sheep days of grazing per acre

1st year	2nd year	3rd year
1212	1746	2073

Lucerne, yield of hay (at 85% dry matter): cwt per acre

	1st crop	2nd crop	3rd crop	Total
1st year				
Dung in 1954: tons per acre				
None	10.5	4.8		15.3
15	11.5	6.9		18.4
Difference	+1.0	+2.1		+3.1
Previous rotation				
Lucerne	10.4	5.7		16.1
Arable with hay	11.6	6.0		17.6
Mean	11.0	5.8		16.8
2nd year				
Dung in 1953: tons per acre				
None	27.4	23.6	9.7	60.7
15	33.5	27.7	11.7	72.9
Difference	+6.1	+4.1	+2.0	+12.2
Previous rotation				
Lucerne	28.6	25.3	10.3	64.2
Arable with sugar beet	32.3	26.0	11.1	69.4
Mean	30.4	25.6	10.7	66.7
3rd year				
Dung in 1952: tons per acre				
None	30.4	24.5	9.7	64.6
15	37.3	28.0	11.9	77.2
Difference	+6.9	+3.5	+2.2	+12.6
Previous rotation				
Lucerne	31.5	24.3	10.2	66.0
Arable with hay	36.2	28.2	11.4	75.8
Mean	33.8	26.2	10.8	70.8

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

Treatment crops

	Potatoes		Rye	
	Total tubers: tons per acre	Percentage ware	Grain: cwt per acre	Straw: cwt per acre
Dung: tons per acre				
None	13.58	90.5	41.2	46.3
15*	14.43	88.9	42.6	49.9
Difference	+0.85	-1.6	+1.4	+3.6
Previous rotation				
Ley	15.40	89.6	44.4	50.5
Lucerne	14.07	90.4	42.0	48.5
Arable with hay	13.32	89.8	39.5	44.0
Arable with sugar beet	13.22	89.2	41.7	49.5
Mean	14.00	89.7	41.9	48.1

Hay

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

	1st crop	2nd crop	Total
Dung in 1952: tons per acre			
None	48.2	20.7	68.9
15	50.3	24.0	74.3
Difference	2.1	3.3	5.4
Previous rotation			
Lucerne	48.9	23.7	72.6
Arable with hay	49.6	21.0	70.6
Mean	49.2	22.4	71.6

Carrots

	Roots (washed): tons per acre	Tops: tons per acre
Dung in 1952: tons per acre		
None	15.43	4.52
15	17.85	4.94
Difference	2.42	0.42
Previous rotation		
Ley	19.40	5.67
Arable with sugar beet	13.88	3.79
Mean	16.64	4.73

*Dung applied: Potatoes - for test crop potatoes in 1954.
Rye - for test crop potatoes in 1953.

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

1st Test Crop

	Previous rotation				
	Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean
Sugar beet, roots (washed): tons per acre					
Mean	16.82	15.05	14.80	15.71	15.59
Dung: tons per acre					
None	15.55	13.41	12.15	13.29	13.60
15	18.10	16.70	17.44	18.13	17.59
Difference	+2.55	+3.29	+5.29	+4.84	+3.99
Response to additional 0.72 cwt N per acre					
No dung	+0.33	-0.85	-0.61	+0.81	-0.08
Dung 15 tons per acre	+0.53	+0.01	+0.51	+0.94	+0.49
Response to additional 0.9 cwt K_2O per acre					
No dung	+0.79	+1.79	+1.38	-0.71	+0.81
Dung 15 tons per acre	+0.45	+1.23	+0.39	-0.85	+0.31
Sugar beet, sugar percentage					
Mean	16.9	17.4	17.4	18.0	17.4
Dung: tons per acre					
None	17.1	17.4	17.6	18.0	17.6
15	16.6	17.3	17.2	18.0	17.3
Difference	-0.5	-0.1	-0.4	0.0	-0.3
Response to additional 0.72 cwt N per acre					
No dung	-0.4	-0.4	-1.0	-0.8	-0.6
Dung 15 tons per acre	-0.4	-0.4	-0.2	-0.5	-0.4
Response to additional 0.9 cwt K_2O per acre					
No dung	+0.4	0.0	+0.3	-0.2	+0.1
Dung 15 tons per acre	0.0	+0.2	+0.2	-0.4	0.0

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

1st Test Crop

	Previous rotation				
	Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean
Sugar beet, total sugar: cwt per acre					
Mean (±2.38)	56.7	52.3	51.4	56.5	54.2
Dung: tons per acre					
None (±3.07)*	53.2	46.7	42.9	47.9	47.7
15	60.2	57.9	59.9	65.2	60.8
Difference (±3.88)	+7.0	+11.2	+17.0	+17.3	+13.1 (± 1.94)
Response to additional 0.72 cwt N per acre		(±2.41)			(± 1.21)
No dung	-0.3	-3.9	-4.5	+0.8	-2.0
Dung 15 tons per acre	+0.7	-1.6	+0.8	+1.5	+0.3
Response to additional 0.9 cwt K_2O per acre		(±2.41)			(± 1.21)
No dung	+3.7	+6.3	+5.5	-3.2	+3.0
Dung 15 tons per acre	+1.3	+5.2	+2.0	-4.0	+1.1
Sugar beet, tops: tons per acre					
Mean (±0.536)	17.15	15.59	16.26	11.33	15.08
Dung: tons per acre					
None (±0.686)*	16.64	15.31	14.75	9.98	14.17
15	17.66	15.88	17.78	12.69	16.00
Difference (±0.856)	+1.02	+0.57	+3.03	+2.71	+1.83 (± 0.428)
Response to additional 0.72 cwt N per acre		(±1.263)			(± 0.631)
No dung	+3.57	+1.60	+2.85	+2.36	+2.59
Dung 15 tons per acre	+3.35	+1.08	+1.88	+1.79	+2.03
Response to additional 0.9 cwt K_2O per acre		(±1.263)			(± 0.631)
No dung	+2.14	+1.04	+0.95	+0.11	+1.06
Dung 15 tons per acre	+0.45	-0.74	-1.19	-1.67	-0.79

*For use in comparisons other than vertical.

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

1st Test Crop

Plots receiving no additional N or K

Dung: tons per acre	Previous Rotation: Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean
Sugar beet, roots (washed): tons per acre					
Mean	16.26	14.81	14.58	15.81	15.36
None	14.83	13.42	12.22	13.76	13.56
15	17.68	16.20	16.92	17.87	17.17
Difference	+2.85	+2.78	+4.70	+4.11	+3.61
Sugar beet, sugar percentage					
Mean	16.9	17.5	17.5	18.5	17.6
None	17.1	17.5	17.9	18.4	17.7
15	16.7	17.5	17.1	18.7	17.5
Difference	-0.4	0.0	-0.8	+0.3	-0.2
Sugar beet, total sugar: cwt per acre					
Mean (±2.83)	54.8	51.7	50.9	58.7	54.0
None (±4.01)*	50.5	46.8	43.8	50.6	47.9
15	59.2	56.6	58.0	66.8	60.2
Difference (±5.53)	+8.7	+9.8	+14.2	+16.2	+12.3
Sugar beet, tops: tons per acre					
Mean (±0.913)	14.75	14.42	15.33	10.62	13.78
None (±1.291)*	13.58	13.62	13.19	8.91	12.32
15	15.92	15.22	17.47	12.33	15.24
Difference (±1.768)	+2.34	+1.60	+4.28	+3.42	+2.92

*For use in comparisons other than vertical.

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

2nd Test Crop

Dung in 1955: tons per acre	Previous Rotation: Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean
Barley, grain: cwt per acre					
None (±1.85)*	36.3	35.1	33.7	31.3	34.1
15	35.6	41.7	36.1	32.5	36.5
Mean (±1.58)	35.9	38.4	34.9	31.9	35.3
Difference (±1.90)	-0.7	+6.6	+2.4	+1.2	+2.4 (± 0.95)
Barley, straw: cwt per acre					
None	30.1	29.2	28.3	26.0	28.4
15	32.3	33.0	29.1	27.5	30.5
Mean	31.2	31.1	28.7	26.8	29.4
Difference	+2.2	+3.8	+0.8	+1.5	+2.1

*For use in comparisons other than vertical.

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WOBURN MARKET GARDEN EXPERIMENT

Organic manures and nitrogen - Lansome 1956 the 15th year.

For treatments etc. see "Details of the Classical and Long Term Experiments" 1956.

In 1956 the spring cabbages failed because of bird damage and were replaced by early potatoes; in future early potatoes will take the place of spring cabbages in the rotation. The treatments are unaltered except that early potatoes receive N in one dose only.

Note: the results for the 1956-57 leeks will be included in the 1957 report.

Area of each plot: 0.0125 acre.

Cultivations, etc.:

Leeks 1955-56.
Organic manures applied, all plots ploughed: July 22, 1955. 'Nitro-Chalk' and basal fertilizers applied: Aug 15. Planted: Aug 17. Second dressing of 'Nitro-Chalk' applied: Oct 21. Harvested: Mar 8 - Apr 11, 1956. Variety: Musselburgh.

Early potatoes (replacement for spring cabbage).
Organic manures spread and ploughed in: Sept 20, 1955. Aldrin (for cutworm) at 1½ cwt per acre, basal fertilizers applied: Sept 22. Spring cabbages (Durham Early) planted: Sept 27. Crop remnants ploughed in: Mar 6, 1956. All 'Nitro-Chalk' applied: Mar 20. Planted: Mar 23. Ridged: May 19. Lifted: July 24. Variety: Arran Pilot.

Globe beet.
Organic manures applied: Apr 25, 1956. Ploughed: Apr 26. Ground chalk at 20 cwt per acre, basal fertilizers and 'Nitro-Chalk' applied: Apr 27. Seed drilled at 14 lb per acre: Apr 28. 5% DDT dust at 20 lb per acre applied: May 9. Sprayed with DDT, 3 pints in 20 gallons per acre: May 23. Singled: June 6 - 18. Second dressing of 'Nitro-Chalk' applied: June 18. Harvested: July 30 - Aug 28. Variety: Detroit.

Standard errors per plot:

Leeks 1955-56.	Saleable produce: 0.262 tons per acre or 10.6% (17 d.f.)
Early potatoes.	Total tubers: 0.609 tons per acre or 7.5% (17 d.f.)
Globe beet.	Saleable bulbs: 1.97 tons per acre or 31.3% (17 d.f.)

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

Summary of Results

Leeks 1955-56

Organic manures	Level of manuring: tons per acre	N: cwt per acre None	0.3	0.6	0.9	Mean
Saleable produce: tons per acre			(±0.185)			(±0.131)
None		1.75	1.80	2.03	1.35	1.77*
Dung	10	2.57	2.81			2.69
	20	3.35	3.71			3.53
Sludge compost	10	2.51	2.19			2.35
	20	2.35	2.88			2.61
Sludge	10	1.85	1.97			1.91
	20	1.80	2.23			2.02
Vegetable compost	10	2.51	2.59			2.55
	20	3.28	3.73			3.50
Mean (±0.065)		2.53+	2.76+			2.46
Percentage saleable, (by number)						
None		93.7	93.9	95.4	85.6	93.8*
Dung	10	96.2	95.0			95.6
	20	96.1	96.4			96.2
Sludge compost	10	97.5	95.2			96.3
	20	95.3	98.0			96.6
Sludge	10	93.1	95.8			94.4
	20	94.7	93.2			94.0
Vegetable compost	10	95.1	94.8			95.0
	20	97.7	97.1			97.4
Mean		95.7+	95.7+			95.0

Early Potatoes

Total tubers: tons per acre			(±0.431)			(±0.305)
None		5.23	6.04	7.89	8.03	5.64*
Dung	10	8.76	8.70			8.73
	20	8.86	10.06			9.46
Sludge compost	10	7.84	8.15			8.00
	20	8.69	7.96			8.32
Sludge	10	7.60	8.29			7.94
	20	7.32	7.41			7.36
Vegetable compost	10	7.78	8.98			8.38
	20	9.42	8.72			9.07
Mean (±0.152)		8.28+	8.53+			8.09

*Mean over None and 0.3 cwt N per acre only.
+Excluding 'No organics'.

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

Globe beet

Organic manures	Level of manuring: tons per acre	N: cwt per acre None	0.3	0.6	0.9	Mean
Saleable bulbs: tons per acre						
			(±1.392)			(±0.984)
None		1.75	2.20	3.32	0.92	1.98*
Dung	10	5.82	7.26			6.54
	20	10.27	11.11			10.69
Sludge compost	10	6.65	4.00			5.32
	20	8.28	9.18			8.73
Sludge	10	4.44	3.25			3.84
	20	5.42	6.47			5.95
Vegetable compost	10	5.98	8.12			7.05
	20	10.14	11.23			10.68
Mean (±0.492)		7.12+	7.58+			6.29
Total produce (whole plants): tons per acre						
None		4.60	4.24	6.26	3.06	4.42*
Dung	10	9.84	12.38			11.11
	20	17.28	19.47			18.38
Sludge compost	10	11.87	9.01			10.44
	20	15.60	17.60			16.60
Sludge	10	9.21	8.05			8.63
	20	12.22	13.26			12.74
Vegetable compost	10	9.61	14.21			11.91
	20	17.12	18.56			17.84
Mean		12.84+	14.07+			11.67
Plant number: thousands per acre						
None		77.7	69.1	76.4	93.6	73.4*
Dung	10	64.4	80.4			72.4
	20	92.4	100.6			96.5
Sludge compost	10	79.8	105.4			92.6
	20	82.5	83.4			83.0
Sludge	10	93.9	114.9			104.4
	20	97.6	110.6			104.1
Vegetable compost	10	66.2	94.8			80.5
	20	82.6	81.4			82.0
Mean		82.4+	96.4+			87.4

*Mean over None and 0.3 cwt N per acre only.
+Excluding 'No organics'.

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IRRIGATION EXPERIMENT

The 6th year

The effects of irrigation and nitrogen - Woburn Butt Close 1956.

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

Area of each sub-plot: Cut grass, 0.0264; remainder, 0.0278 acres.
Area harvested (acres): Potatoes, 0.0155; sugar beet, 0.0176; barley, 0.0168; cut grass, 0.0165.

Rainfall and Irrigation: inches

Week ending	Rain-fall	Potatoes A & C	Sugar beet B & C	Barley B & C	Cut grass A	Cut grass B	Cut grass C
May 7	.04						.52
14	.10			1.12		.50	.50
21	-			.50			.50
28	.10			.50	1.00	.50	.75
June 4	.51			.50		.50	.52
11	1.11		.87				
18	.93						
25	.07						
July 2	.18	.50				.50	.50
9	1.27		.50		1.00		
16	.73						.57
23	1.09						
30	.73						
Aug 6	1.56						
13	.71						
20	.98						
27	.46						
Sept 3	1.03						
10	1.05						
17	.06						
24	.21						
Oct 1	.24						
Total	13.16	0.50	1.37	2.62	2.00	2.00	3.86

Note: On sugar beet and barley 0 = A, B = C; on potatoes 0 = B, A = C.

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Cultivations, etc.:

Potatoes. Ploughed: Aug 18, 1955. Dung applied: Nov 21. Ploughed: Nov 23. Fertilizers applied: Mar 26, 1956. Potatoes planted by machine: Mar 28. Earthed up: June 20. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 23. Sprayed with arsenious compound, 1 gallon in 40 gallons per acre: Aug 31. Lifted: Oct 6. Variety: Majestic.

Sugar beet. Ploughed: Oct 7, 1955. Ground chalk applied at 20 cwt per acre: Dec 8. Salt applied: Mar 26, 1956. Fertilizers applied, seed drilled at 12 lb per acre (rubbed and graded): Apr 6. Sprayed with Parathion against leaf miner, 8 oz in 40 gallons per acre: May 25. Singled: May 31. Lifted: Nov 21. Variety: Klein E.

Barley. Ploughed: Nov 24, 1955. Fertilizers applied: Mar 12, 1956. Seed drilled at $2\frac{1}{2}$ bushels per acre: Mar 15. Harvested: Aug 14. Variety: Herta.

Cut grass. Basal fertilizer applied: Jan 12, 1956. 1st application of 'Nitro-Chalk': Mar 12. Cut 6 times (all plots): May 28, June 22, July 17, Aug 13, Sept 7 and Nov 19. 'Nitro-Chalk' applied after each cut except the last. Variety: Cocksfoot S37.

Standard errors per plot:

Potatoes.	Total tubers,	whole plot:	1.115 tons per acre or 7.4%	(8 d.f.)
		sub plot:	0.757 tons per acre or 5.0%	(10 d.f.)
Sugar beet.	Total sugar,	whole plot:	2.34 cwt per acre or 3.8%	(8 d.f.)
		sub plot:	2.70 cwt per acre or 4.4%	(10 d.f.)
	Tops,	whole plot:	1.017 tons per acre or 9.4%	(8 d.f.)
		sub plot:	0.969 tons per acre or 8.9%	(10 d.f.)
Barley.	Grain,	whole plot:	2.40 cwt per acre or 8.0%	(8.d.f.)
		sub plot:	2.18 cwt per acre or 7.3%	(10 d.f.)
Cut grass.	Dry matter,	whole plot:	5.66 cwt per acre or 7.5%	(6 d.f.)
		sub plot:	3.75 cwt per acre or 5.0%	(8 d.f.)

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Summary of Results

N: cwt per acre including basal	Irrigation 0 & B	Irrigation A & C	Mean	Irrigation 0 & B	Irrigation A & C	Mean
	Potatoes					
	total tubers: tons per acre (± 0.505)*			percentage ware ($1\frac{5}{8}$" riddle)		
0.5	14.20	14.76	14.48	88.4	87.6	88.0
1.0	15.64	16.06	15.85	89.6	92.4	91.0
Mean	14.92 (± 0.455)	15.41	15.16	89.0	90.0	89.5
Difference	1.44 (± 0.437)	1.30	1.37 (± 0.309)	1.2	4.8	3.0

N: cwt per acre including basal	Irrigation 0 & A	Irrigation B & C	Mean	Irrigation 0 & A	Irrigation B & C	Mean
	Sugar Beet					
	roots (washed): tons per acre			sugar percentage		
0.4	16.24	15.06	15.65	18.6	18.3	18.5
0.8	18.54	17.46	18.00	18.2	18.6	18.4
Mean	17.39	16.26	16.83	18.4	18.5	18.4
Difference	+2.30	+2.40	+2.35	-0.4	+0.3	-0.1
	total sugar: cwt per acre (±1.23)*			tops: tons per acre (± 0.501)*		
0.4	60.3	55.3	57.8	10.21	9.35	9.78
0.8	67.4	65.2	66.3	12.45	11.48	11.96
Mean	63.8 (±0.95)	60.2	62.0	11.33 (± 0.415)	10.41	10.87
Difference	7.1 (±1.56)	9.9	8.5 (±1.10)	2.24 (± 0.560)	2.13	2.18 (± 0.396)

*for use in comparisons other than vertical.

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N: cwt per acre including basal	Irrigation 0 & A	Irrigation B & C	Mean	Irrigation 0 & A	Irrigation B & C	Mean
	Barley					
	grain: cwt per acre			straw: cwt per acre		
	(±1.16)*					
0.2	24.6	29.1	26.8	20.2	30.6	25.4
0.4	31.2	34.7	32.9	26.4	41.2	33.8
Mean	27.9	31.9	29.9	23.3	35.9	29.6
	(±0.98)					
Difference	6.6	5.6	6.1	6.2	10.6	8.4
	(±1.26)		(±0.89)			

Level of N	Irrigation 0	A	B	C	Mean
	Cut grass, dry matter: cwt per acre (Total of 6 cuts)				
	(±3.61)*				
1	55.7	61.8	63.8	72.0	63.3
2	81.4	83.0	84.3	99.7	87.1
Mean (±3.26)	68.6	72.4	74.1	85.8	75.2
Difference (±3.06)	25.7	21.2	20.5	27.7	23.8 (±1.53)

*for use in comparisons other than vertical.

Cut grass. Levels of N

1 = 0.15 cwt N per acre in spring and after each cut except the last.
2 = 0.30 cwt N per acre in spring and after each cut except the last.

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