ROTHAMSTED RESEARCH

Yields of the Field Experiments 1950

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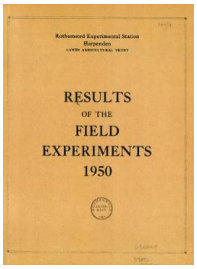

Long-term Experiments

Rothamsted Research

Rothamsted Research (1951) *Long-term Experiments ;* Yields Of The Field Experiments 1950, pp 13 - 54 **- DOI: https://doi.org/10.23637/ERADOC-1-185**

50/Ba/1.1

TWO COURSE ROTATION EXPERIMENT

Cumulative effects of agricultural salt - Long Hoos V 1950

For details of treatments and rotations etc see Appendix Z.

Note. Only Barley (Series 2) was grown in 1950 and the experiment is now terminated.

Area of each plot: 0.0189 acre.

Cultivations, etc:
Agricultural salt applied: Dec 29. Ploughed: Jan 12.
Springtined: Mar 8 and again Mar 11. Harrowed: Mar 13.
Sulphate of ammonia applied: Mar 14. Seed drilled: Mar 15.
Harrowed in and rolled: Mar 16. Sprayed against weeds with Cornox 2, 4-D: May 18. Harvested: Aug 5. Variety: Plumage Archer. Previous crop: Sugar beet.

Standard error per plot:
Barley, grain, 1.47 cwt per acre or 5.5% (22 d.f.)

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Series 2: Barley

Salt applied in 1949 cwt per acre	Potash applied in 1949 K_2O cwt per acre 0.0	1.0	2.0	Salt applied In Winter	In seed bed	Salt in 1950 None	Half Rate	Mean
Grain: cwt per acre								
		(±0.73)			(±0.56)			(±0.42)
0	27.2	28.6	26.4					27.4
2.5	27.2	26.5	25.3	26.6	26.0	26.3	26.3	26.3
5.0	27.3	26.8	27.2	27.5	26.7	26.2	28.0	27.1
7.5	25.7	26.3	26.8	26.2	26.3	25.4	27.2	26.3
Mean	26.9	27.1	26.4	26.8	26.3	26.0	27.2	26.8
		(±0.37)			(±0.34)			
Straw: cwt per acre								
0	33.8	35.8	32.7					34.1
2.5	34.1	32.0	33.0	32.4	33.7	32.9	33.2	33.0
5.0	32.2	34.0	32.9	33.7	32.4	31.9	34.2	33.0
7.5	31.2	31.1	32.4	32.2	31.0	30.8	32.3	31.6
Mean	32.8	33.2	32.8	32.8	32.4	31.9	33.2	32.9

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THREE COURSE ROTATION EXPERIMENT

The 18th year

Ploughing in straw - Long Hoos VI 1950.

For details of rotation and treatments etc see Appendix Z.

Area of each plot: 0.0200 acre.

Cultivations, etc:

Potatoes (Series 1)

Adco, straw and accompanying artificials applied and ploughed in: Dec 10-12. Cultivated: Mar 21. Harrowed: Mar 27. Ridged, artificials applied, potatoes planted and covered in: Mar 31. Rolled down ridges: Apr 3. Harrowed: May 5. Grubbed: May 23. Weeded: June 12-13 and 21. Earthed up: June 26. Sprayed with "Perenox": July 24. Sprayed with "Coppesan" : Aug 18. Sprayed with 15% B.O.V. to kill off haulm: Sept 25. Lifted: Oct 10. Variety: Majestic. Previous crop: Sugar beet.

Barley (Series 3)

Adco, straw and accompanying artificials applied and ploughed in: Dec 10-12. Springtined: Mar 8. and again Mar 10. Artificials applied: Mar 13. Seed drilled and harrowed in: Mar 14. Harvested: Aug 7. Variety: Plumage Archer. Previous crop: Potatoes.

Sugar beet (Series 2)

Adco, straw and accompanying artificials applied and ploughed in: Dec 10-12. Cultivated: Mar 21. Harrowed, artificials applied: Mar 27. Ring rolled: Mar 28. Seed drilled, harrowed in: Mar 29. Rolled: Mar 30. Hoed: May 19. Singled: June 2-6. Hoed: June 6, 8, 30 and July 14. Lifted: Nov 1. Variety: Klein E. Previous crop: Barley.

Standard errors per plot:

Potatoes,	Total clean tubers:	1.46 tons per acre or 10.7% (8 d.f.)
	Percentage ware:	2.37 (5 d.f.)
Barley,	Grain:	1.38 cwt per acre or 4.4% (8 d.f.)
	Straw:	2.78 cwt per acre or 6.9% (8 d.f.)
Sugar beet,	Roots (washed):	1.13 tons per acre or 7.5% (8 d.f.)
	Tops:	1.34 tons per acre or 14.3% (8 d.f.)
	Sugar percentage:	0.382 (8 d.f.)
	Total sugar:	4.29 cwt per acre or 7.5% (8 d.f.)
	Plant number:	1.23 thousands per acre or 5.3% (8 d.f.)

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Summary of Results

	Treatments applied 1948/49					Treatments applied 1949/50				
	Art.	Adco	St 1	St 2	Mean	Art.	Adco	St 1	St 2	Mean
Sugar Beet										
Roots (washed) tons per acre	14.16	13.80	13.75	15.07	14.19 (±0.327)	17.24	14.90	16.54	15.82	16.13 (±0.327)
			(±0.654)					(±0.654)		
Tops tons per acre	8.11	8.52	8.90	8.53	8.51 (±0.388)	10.68	9.56	10.67	10.23	10.29 (±0.388)
			(±0.775)					(±0.775)		
Sugar Percentage	18.79	18.75	19.00	18.86	18.85 (±0.110)	19.05	18.72	18.93	18.47	18.80 (±0.110)
			(±0.221)					(±0.221)		
Total sugar cwt per acre	53.2	51.6	52.2	56.9	53.5 (±1.24)	65.7	55.7	62.6	58.4	60.6 (±1.24)
			(±2.47)					(±2.47)		
Plant number thous. per acre	23.6	22.5	23.6	22.9	23.1 (±0.35)	22.7	23.3	22.9	22.7	22.9 (±0.35)
			(±0.71)					(±0.71)		
Barley										
Grain cwt per acre	29.5	30.4	33.8	30.4	31.0 (±0.40)	31.2	30.4	32.9	33.3	31.9 (±0.40)
			(±0.80)					(±0.80)		
Straw cwt per acre	39.6	38.1	40.8	35.7	38.6 (±0.80)	42.5	36.8	44.9	43.4	41.9 (±0.80)
			(±1.60)					(±1.60)		
Potatoes										
Clean tubers tons per acre	11.84	12.23	13.24	14.04	12.84 (±0.420)	14.21	13.24	14.57	15.14	14.29 (±0.420)
			(±0.841)					(±0.841)		
Percentage Ware	90.8	93.5	91.6	92.8	92.2 (±0.69)	93.8	93.9	91.1	92.4	92.8 (±0.69)
			(±1.37)					(±1.37)		

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50/Ba/2.3

Responses to Magnesium Sulphate

	Treatments applied 1948/49					Treatments applied 1949/50				
	Art.	Adco	St 1	St 2	Mean	Art.	Adco	St 1	St 2	Mean
Sugar Beet Roots (washed) tons per acre	1.24	2.42	1.52 (±1.369)	0.08	1.31	0.04	0.69	0.16 (±1.369)	0.12	0.26
Tops tons per acre	0.17	3.64	-1.42 (±1.645)	-0.67	0.43	-1.02	0.94	0.21 (±1.645)	0.34	0.12
Sugar Percentage	0.63	-0.88	-0.04 (±0.468)	0.92	0.16	0.46	-1.00	0.42 (±0.468)	-0.32	-0.11
Total sugar cwt per acre	6.5	6.5	5.7 (±5.25)	3.0	5.4	1.8	-0.3	2.1 (±5.25)	-0.6	0.7
Plant number thous. per acre	0.8	-1.0	1.7 (±1.51)	0.5	0.5	1.6	-1.1	1.5 (±1.51)	-1.4	0.2
Barley Grain cwt per acre	-1.7	-1.9	-4.3 (±1.69)	-0.2	-2.0	-0.6	1.7	1.8 (±1.69)	1.4	1.1
Straw cwt per acre	0.2	1.6	-4.7 (±3.41)	-1.8	-1.2	-2.4	-0.4	0.7 (±3.41)	4.4	0.6
Potatoes Clean tubers tons per acre	-1.94	1.08	2.76 (±1.784)	1.15	0.76	0.26	-0.84	-1.79 (±1.784)	1.17	-0.30
Percentage Ware	-3.9	-3.0	2.0 (±2.91)	0.0	-1.2	0.0	0.0	-5.4 (±2.91)	-1.7	-1.8

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FOUR COURSE ROTATION EXPERIMENT

Direct and residual effects of organics and phosphates - Hoosfield 1950.

For details of treatments and rotation etc. see Appendix Z.

Area of each plot: Potatoes; 0.0228 acre. Barley, Ryegrass and wheat; 0.0244 acre.

Manures applied 1949-50

	Organic fertilizers (cwt per acre)				Additional artificial fertilizers (cwt per acre)		
Treatment	Organic matter	N	P_2O_5	K_2O	N as Sulph. of amm.	P_2O_5 as Super	K_2O as mur. of potash
Dung	50 (as F.Y.M.)	1.560	0.650	2.602	0.240	0.550	0.398
Adco	50 (as Adco)	1.604	0.912	0.864	0.196	0.288	2.136
Straw	155 (as Straw)	0.962	0.300	1.565	0.838	0.900	1.435
Super			None		0.36	1.2	0.6
Rock phosphate			None		0.36	1.2*	0.6

* As mineral phosphate

Cultivations; etc.:

Potatoes,

Ploughed: Aug 26-29. First dressing of fertilizers applied to straw plots: Dec 6. Dung and Adco applied: Dec 12. Supplementary fertilizers to Adco and Dung applied, second dressing of fertilizers applied to straw plots: Dec 13. Straw applied and ploughed in: Dec 13-15. Cultivated: Mar 25. Cultivated, springtinedand harrowed: Mar 27. Ridged, spring fertilizers including third dressing to straw plots, and sulphate of ammonia to half plots, applied; potatoes planted and covered in; rolled ridges: Apr 3. Chain harrowed: May 5. Grubbed: May 24. Weeded: June 21. Ridged: June 27. Sprayed with "Perenox": July 24. Sprayed with "Copperan": Aug 18. Sprayed with B.O.V. 15% to kill off haulm. Lifted: Oct 12. Variety: Majestic. Previous crop: Wheat.

Barley,

Ploughed: Sept 23-24. First dressing of fertilizers applied to straw plots: Dec 6. Dung, Adco and supplementary fertilizers, and second dressing of fertilizers to straw plots applied: Dec 14. Straw applied, all plots ploughed: Dec 22-29. Ground chalk applied: Jan 18. Springtined: Mar 9 and again Mar 11. Spring fertilizers including third dressing to straw plots applied, harrowed, seed drilled and harrowed in, rolled: Mar 14. Harvested: Aug 10. Variety: Plumage Archer. Previous crop: Potatoes.

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Ryegrass,

Dung, Adco and supplementary fertilizers applied: Sept 13. First dressing of fertilizers applied to straw plots: Sept 14. Straw applied, ploughed all plots: Sept 13-16. Springtined: Oct 14. Harrowed: Oct 15. Autumn fertilizers applied: Oct 22. Second dressing of fertilizers applied to straw plots: Dec 6. Seeds not sown owing to wet state of land. Reploughed: Dec 6-8. Spring-tined twice: Mar 9. Harrowed, rolled, fertilizers including third dressing to straw plots applied, seeds sown: Mar 13. Harrowed in and rolled: Mar 14. Sprayed with D.N.O.C. to kill off weeds: May 4. Harvested: July 20. Variety: Western Wolths. Previous crop: Barley.

Wheat,

Ploughed: June 25-29. Dung, Adco and supplementary fertilizers, first dressing of fertilizers to straw plots applied: Sept 14. Ring rolled: Sept 15. Straw applied, all plots ploughed: Sept 16-19. Harrowed: Oct 15. Autumn fertilizers applied: Oct 22. Harrowed, seed drilled and harrowed in: Oct 29. Second dressing of fertilizers applied to straw plots: Dec 6. Rolled: Apr 8. Sulphate of ammonia applied: Apr 20. Third dressing of fertilizers applied to straw plots: Apr 21. Ring rolled: Apr 22. Sprayed to kill off weeds: May 4. Harvested: Aug 9. Variety: Squareheads Master 13/4. Previous crop: Ryegrass.

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Summary of Results

Manure[+]	Year of Cycle	Wheat[*] Grain cwt. per acre	Wheat[*] Straw cwt. per acre	Barley Grain cwt per acre	Barley Straw cwt per acre	Ryegrass Dry matter cwt per acre	Potatoes: Total clean tubers, tons per acre — Additional N Without	Additional N With	Mean	Resp. to Nitrogen	Percentage Ware — Additional N Without	Additional N With	Mean	Resp. to N
	I	25.8	47.1	18.7	26.2	18.6	10.55	11.71	11.13	1.16	94.3	94.5	94.4	0.2
Manure	II	23.2	40.0	21.0	25.1	14.3	6.42	10.42	8.42	4.00	89.2	89.0	89.1	-0.2
as	III	19.8	41.2	18.7	23.6	11.9	5.39	7.72	6.56	2.33	89.2	93.5	91.4	4.3
F.Y.M.	IV	22.1	39.9	18.3	24.3	13.5	6.42	7.43	6.92	1.01	91.5	90.4	91.0	-1.1
	V	24.9	32.1	15.9	20.5	9.7	6.48	8.30	7.39	1.82	91.1	89.3	90.2	-1.8
	I	26.4	45.2	18.0	27.2	14.4	7.68	10.88	9.28	3.20	90.2	91.0	90.6	0.8
Manure	II	26.1	46.7	11.7	17.6	15.9	9.01	10.22	9.62	1.21	93.6	84.5	89.0	-9.1
as	III	20.3	40.7	17.7	26.4	10.5	7.43	10.07	8.75	2.64	94.5	88.5	91.5	-6.0
Adco	IV	21.2	37.2	18.5	27.2	13.6	7.10	7.31	7.20	0.21	90.2	88.6	89.4	-1.6
(straw compost)	V	21.3	36.2	18.3	25.5	10.1	6.35	6.12	6.24	-0.23	87.9	90.0	89.0	2.1
	I	26.8	45.7	25.0	34.2	14.2	8.64	10.63	9.64	1.99	89.0	94.5	91.8	5.5
Manure	II	22.2	39.7	18.3	25.7	10.6	6.02	8.45	7.24	2.43	87.5	96.1	91.8	8.6
as	III	21.1	41.5	19.7	26.1	10.9	7.45	8.93	8.19	1.48	89.9	87.4	88.6	-2.5
Straw	IV	22.2	38.6	22.8	29.5	11.7	7.77	9.41	8.59	1.64	88.4	92.3	90.4	3.9
	V	18.7	31.7	15.7	20.9	10.3	6.48	9.70	8.09	3.22	90.6	92.8	91.7	2.2
	I	26.6	47.2	20.0	24.7	16.8	9.01	10.74	9.88	1.73	91.6	89.3	90.4	-2.3
Super-	II	24.8	42.0	17.4	25.3	15.5	6.64	7.12	6.88	0.48	94.0	89.8	91.9	-4.2
phosphate	III	26.7	45.6	19.0	20.6	15.4	8.74	8.06	8.40	-0.68	95.3	91.4	93.4	-3.9
	IV	24.5	41.7	24.3	32.4	17.2	6.94	6.52	6.73	-0.42	82.1	87.9	85.0	5.8
	V	22.9	37.4	15.2	23.2	19.1	7.05	10.51	8.78	3.46	91.2	74.9	83.0	-16.3
	I	25.7	46.3	11.3	22.0	16.9	3.51	3.20	3.36	-0.31	84.7	84.4	84.6	-0.3
Rock	II	23.6	41.3	7.0	20.5	14.4	4.91	6.44	5.68	1.53	81.6	87.2	84.4	5.6
phosphate	III	23.9	43.4	21.9	30.5	18.0	5.15	6.27	6.21	0.12	86.3	92.0	89.2	5.7
	IV	20.8	33.9	16.7	24.2	16.2	5.02	6.31	5.66	1.29	87.4	91.1	89.2	3.7
	V	25.0	40.4	16.1	24.8	16.6	5.90	5.90	5.90	0.00	89.1	89.3	89.2	0.2

+ Note. All manures are supplemented by fertilizers as shown in Table on page 50/Ba/3.1.

[*] Owing to varying conditions during harvesting wheat grain yields have been corrected to 83% Dry Matter, and wheat straw to 82%.

SIX COURSE ROTATION EXPERIMENT

The 21st year

Seasonal effects of fertilizers - Rothamsted Long Hoos IV and Woburn Stackyard, 1950.

For details of rotation and treatments etc. see Appendix Z.

Area of each plot: Rothamsted - 0.0250 acre. Woburn - 0.0268 acre.

Cultivations, etc.:

Rothamsted

Sugar beet.
Ploughed: Aug 29 and again Jan 10-12. Cultivated: Mar 21. Harrowed, fertilizers applied: Mar 27. Ring rolled: Mar 28. Seed drilled and harrowed in: Mar 29. Rolled: Mar 30. Hoed: May 17. Singled: May 31-June 1. Hoed: June 5 and 29, July 12 and 13. Lifted: Oct 31. Variety: Klein E. Previous crop: Rye.

Barley.
Ploughed: Dec 7-8. Ground chalk applied: Jan 16. Springtined: Mar 8 and again Mar 10. Fertilizers applied and harrowed in, seed drilled and harrowed in: Mar 14. Rolled: Mar 15. Clover seed undersown and harrowed in: Mar 21. Ring rolled: Mar 22. Harvested: Aug 4. Variety: Plumage Archer. Previous crop: Sugar beet.

Clover.
Seed undersown in barley and harrowed in: Apr 13. Autumn fertilizers applied: Dec 6. Rolled: Mar 15. Sulphate of ammonia applied: Apr 17. Cut: July 20. Variety: Late flowering Montgomery Red. Previous crop: Barley.

Wheat.
Ploughed: July 2-4. Springtined, autumn fertilizers applied: Oct 14. Harrowed, seed drilled and harrowed in: Oct 28. Harrowed: Mar 16. Rolled: Apr 8. Sulphate of ammonia applied: Apr 17. Ring rolled: Apr 20. Harvested: Aug 3. Variety: Yeoman. Previous crop: Clover.

Potatoes.
Ploughed: Aug 30 and again Jan 7-9. Cultivated: Mar 31. Harrowed: Mar 27 and again Mar 28. Ring rolled: Mar 29. Ridged: Mar 31. Fertilizers applied, potatoes planted and covered in: Apr 1. Rolled down ridges: Apr 3. Chain harrowed: May 5. Grubbed: May 23. Hoed weeds: June 21. Earthed up: June 26. Sprayed with Perenox: July 25. Sprayed with Copperam: Aug 18. Sprayed with 15% B.O.V. to kill off haulm: Sept 22. Lifted: Oct 11. Variety: Majestic. Previous crop: Wheat.

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Rye.
Ploughed: Sept 22. Springtined, autumn fertilizers applied: Oct 14. Ground chalk applied: Oct 27. Harrowed, seed drilled and harrowed in: Oct 28. Harrowed: Mar 16. Rolled: Apr 8. Sulphate of ammonia applied: Apr 14. Ring rolled: Apr 20. Harvested: Aug 3. Variety: King II. Previous crop: Potatoes.

Woburn

Sugar beet.
Ploughed: Aug 31. Springtined: Nov 2. Ploughed: Nov 15 and again Jan 23. Springtined: Mar 2. Harrowed and rolled: Mar 27. Fertilizers applied: Mar 29. Harrowed, rolled, seed drilled, harrowed and rolled in: Mar 30. Hoed: May 11. Singled: June 1-2. Hoed: June 8, 15, 29, 30, July 1 and 26. Weeded: Sept 11. Lifted: Sept 29. Variety: Klein E. Previous crop: Rye.

Barley.
Ploughed: Oct 5 and again Jan 24. Ground chalk applied: Feb 27. Springtined: Mar 7. Fertilizers applied: Mar 15. Seed drilled and harrowed in: Mar 16. Rolled: Mar 17. Clover undersown, harrowed and rolled: Mar 22. Harvested: Aug 4. Variety: Plumage Archer. Previous crop: Sugar beet.

Clover.
Seed undersown in barley: Mar 18. Rolled: Mar 28. Fertilizers applied: Apr 12. Cut: June 20. Variety: Late flowering Montgomery Red. Previous crop: Barley.

Wheat.
Ploughed: July 20. Harrowed: Aug 24. Ploughed: Aug 25 and again Oct 5. Springtined: Oct 31. Harrowed, seed drilled, autumn fertilizers applied, harrowed in: Nov 1. Tractor weeded: Mar 21. Sulphate of ammonia applied: Apr 12. Sprayed with D.N.O.C.: June 5. Harvested: Aug 8. Variety: Squarehead's Master 13/4. Previous crop: Clover.

Potatoes.
Ploughed: Aug 31, Nov 2-3 and Jan 23. Springtined: Mar 21. Harrowed: Mar 27. Rolled: Mar 30. Ridged, fertilizers applied: Apr 3. Potatoes planted and covered in: Apr 4. Rolled: Apr 12. Tractor weeded: May 11. Chain harrowed ridges: May 15. Reridged: May 16. Chain harrowed: May 24. Grubbed: June 7. Ridged: June 29. Hand weeded: July 14. Sprayed with Perenox: July 22 and again Aug 4. Sprayed with 15% B.O.V. to kill off haulm: Sept 18. Lifted: Oct 4. Variety: Majestic. Previous crop: Wheat.

P.T.O

https://doi.org/10.23637/ERADOC-1-185

Summary of Results

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

	Rothamsted Response	Woburn Response	Rothamsted Response	Woburn Response
	Sugar Beet, roots (washed): tons per acre		Clover, hay: dry matter cwt per acre	
Yield	15.34	10.72	44.2	38.4
N	6.39	10.23	-16.4	9.8
P	-2.25	1.41	4.8	1.5
K	-1.66	-1.36	-10.0	-13.8
	Sugar Beet, tops: tons per acre		Wheat, grain: cwt per acre	
Yield	11.05	4.80	27.8	11.5
N	6.93	4.34	8.5	12.0
P	-3.55	0.02	-3.6	-1.6
K	-1.63	-0.56	-1.7	-0.5
	Sugar Beet, Sugar percentage		Wheat, straw: cwt per acre	
Yield	18.52	19.25	45.4	20.9
N	-1.29	0.48	24.3	28.7
P	0.87	0.22	-3.9	2.7
K	0.25	-0.98	-6.8	-6.2
	Sugar Beet, total sugar: cwt per acre		Potatoes, total tubers: tons per acre	
Yield	56.8	41.3	12.59	8.21
N	19.9	40.8	5.63	8.78
P	-5.7	6.1	-0.32	-0.15
K	-5.5	-7.5	0.97	-1.61
	Sugar Beet, plant number: thousands per acre		Potatoes, percentage ware	
Yield	22.4		90.0	92.3
N	-3.0		0.1	2.1
P	-1.9		-12.5	-0.1
K	-0.1		4.2	-1.7

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	Rothamsted Response	Woburn Response	Rothamsted Response	Woburn Response
	Barley, grain: cwt per acre		Rye, grain: cwt per acre	
Yield	28.3	20.7	34.9	26.0
N	10.7	28.0	14.3	22.1
P	2.1	3.1	1.3	3.6
K	-0.4	-3.1	-0.7	1.6
	Barley, straw: cwt per acre		Rye, straw: cwt per acre	
Yield	37.3	25.9	44.5	33.1
N	4.2	14.7	23.4	26.9
P	-5.1	1.7	-4.2	3.1
K	1.9	2.4	-1.4	-0.3

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DEEP CULTIVATION ROTATION EXPERIMENT

The 7th Year

Deep ploughing, fertilizers and dung - Long Hoos I and II 1950.

For details of rotation and treatments etc see Appendix Z.

Area of each plot: 0.03125 acre. Area harvested: wheat, spring oats, barley, 0.02652 acre; ley 0.02750 acre; sugar beet (half plot), 0.01186 acre; potatoes (half plot), 0.01068 acre.

Cultivations, etc:

Sugar Beet (Series 2)

Artificials applied "early": Sept 7. Dung applied: Sept 12. Ploughed deep and shallow: Sept 13. Cultivated: Jan 16. Ploughed: Jan 17. Cultivated: Mar 21. Springtined: Mar 22. Harrowed: Mar 27. Artificials applied "late", ring rolled: Mar 28. Seed drilled and harrowed in: Mar 29. Rolled: Mar 30. Hoed: May 17. Singled: June 2-6. Hoed: June 6, 8 and 30, and July 13. Lifted: Nov 3. Variety: Klein E. Previous crop: Spring Oats.

Barley (Series 3)

Ploughed: Dec 9-13. Slag applied: Mar 6. Springtined: Mar 8 and again Mar 11. Sulphate of ammonia applied, harrowed, seed drilled, harrowed in and rolled: Mar 10. Seeds mixture undersown, harrowed in and rolled: Mar 22. Harvested: Aug 1. Variety: Plumage Archer. Previous crop: Sugar Beet.

Ley (Series 4)

Seeds mixture undersown in barley, harrowed in and rolled: Apr 14, 1949. Rolled: Mar 15, 1950. Cut: June 9. Seeds mixture per acre: 14 lb ryegrass (S24), 4 lb English red clover (Montgomery), 1 lb American Alsike Clover. Previous crop: Barley.

Wheat (Series 5)

Deep ploughed: July 6-7. Shallow ploughed: July 9. Cultivated: Oct 13. Disced, rolled and springtined: Oct 14. Springtined: Oct 15. Harrowed: Oct 28. Seed drilled and harrowed in: Oct 29. Harrowed: Mar 16. Ring rolled: Apr 20. Sulphate of ammonia applied: May 3. Harvested: Aug 4. Variety: Yeoman. Previous crop: Ley.

Potatoes (Series 1)

Artificials applied "early": Sept 7. Dung applied, deep and shallow ploughed: Sept 12. Cultivated: Jan 16. Ploughed: Jan 17-19. Cultivated: Mar 21. Springtined: Mar 22. Harrowed: Mar 27. Ring rolled twice and harrowed: Mar 28. Ridged: Apr 3. Artificials applied to ridges, planted and covered in: Apr 4. Rolled down ridges: Apr 6. Harrowed ridges: May 5. Grubbed: May 24. Hoed weeds: June 21. Earthed up: June 26. Sprayed with Perenox: July 24. Sprayed with Copperman: Aug 18. Sprayed with B.O.V. 15% to kill off haulm: Sept 21. Lifted: Oct 9. Variety: Majestic. Previous crop: Wheat.

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Spring Oats (Serics 6).
Ploughed: Oct 13 and again Jan 16-19. Springtined: Mar 8 and again Mar 10. Sulphate of ammonia and seed drilled, harrowed in: Mar 10. Ring rolled: Mar 11. Harvested: Aug 4. Variety: Star. Previous crop: Potatoes.

Standard errors per plot:

Sugar beet	Total sugar,	whole plot, 3.06 cwt per acre or 4.5% (4 d.f.) sub-plot, 2.81 cwt per acre or 4.1% (7 d.f.)
	Tops,	whole plot, 1.52 tons per acre or 7.2% (4d.f.) sub-plot, 0.670 tons per acre or 3.2% (6 d.f.)
Barley	Grain,	1.16 cwt per acre or 3.5% (4 d.f.)
Ley		7.60 cwt per acre or 15.2% (4 d.f.)
Wheat	Grain,	1.45 cwt per acre or 4.0% (4 d.f.)
Potatoes	Ware tubers,	whole plot, 0.604 tons per acre or 4.0% (4 d.f.) sub-plot, 1.07 tons per acre or 7.1% (7 d.f.)
Spring oats	Grain,	2.47 cwt per acre or 6.7% (4 d.f.)

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Summary of Results

Series 2: Sugar Beet

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pros.	Phosphate Abs.	Phosphate Pros.	Potash Abs.	Potash Pros.
Total Sugar: Mean yield 68.1 cwt per acre									
	(±1.53)					(±2.17)			
Ploughing deep-shallow	-4.0	-	-	-2.3	-5.7	-2.5	-5.5	-2.7	-5.3
Dung	6.6	8.3	4.9	-	-	9.5	3.7	5.8	7.4
Phosphate	0.6	2.1	-0.9	3.5	-2.3	-	-	0.4	0.8
Potash	1.0	2.3	-0.3	0.2	1.8	0.8	1.2	-	-
Roots (washed): Mean yield 19.91 tons per acre									
Ploughing deep-shallow	-0.76	-	-	-0.37	-1.15	-0.63	-0.89	-0.46	-1.06
Dung	2.17	2.56	1.78	-	-	2.96	1.38	1.91	2.43
Phosphate	-0.01	0.12	-0.14	0.78	-0.80	-	-	-0.01	-0.01
Potash	0.23	0.53	-0.07	-0.03	0.49	0.23	0.23	-	-
Sugar Percentage: Mean 17.10									
Ploughing deep-shallow	-0.36	-	-	-0.28	-0.44	-0.10	-0.62	-0.32	-0.40
Dung	-0.21	-0.13	-0.29	-	-	-0.16	-0.26	-0.18	-0.24
Phosphate	0.14	0.40	-0.12	0.19	0.09	-	-	0.09	0.19
Potash	0.06	0.10	0.02	0.09	0.03	0.01	0.11	-	-
Tops: Mean yield 21.04 tons per acre									
	(±0.761)					(±1.076)			
Ploughing deep-shallow	2.27	-	-	1.80	2.74	1.13	3.41	2.30	2.24
Dung	3.66	3.19	4.13	-	-	3.86	3.46	4.59	2.73
Phosphate	-0.92	-2.06	0.22	-0.72	-1.12	-	-	-1.04	-0.80
Potash	0.58	0.61	0.55	1.51	-0.35	0.46	0.70	-	-
Plant Number: Mean 25.3 thousands per acre									
Ploughing deep-shallow	1.2	-	-	0.8	1.6	1.8	0.6	1.6	0.8
Dung	-0.6	-1.0	-0.2	-	-	-0.7	-0.5	0.0	-1.2
Phosphate	0.4	1.0	-0.2	0.3	0.5	-	-	0.7	0.1
Potash	0.3	0.7	-0.1	0.9	-0.3	0.6	0.0	-	-
Noxious Nitrogen: Mean 30.3 mgs. %									
Ploughing deep-shallow	2.3	-	-	0.6	4.0	-1.6	6.2	1.4	3.2
Dung	4.8	3.1	6.5	-	-	4.6	5.0	3.1	6.5
Phosphate	0.1	-3.8	4.0	-0.1	0.3	-	-	-3.8	4.0
Potash	-0.7	-1.6	0.2	-2.4	1.0	-4.6	3.2	-	-

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Series 2: Sugar Beet

	None	Phosphate Ploughed in	Phosphate In seed bed	None	Potash Ploughed in	Potash In seed bed	Mean
Total sugar: cwt per acre							
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	69.1	73.3	68.9	68.9	70.8	71.7	70.1
Deep	66.5	66.8	64.5	66.2	65.0	67.0	66.1
No dung	63.1	69.0	64.1	64.7	64.7	65.1	64.8
Dung	72.5	71.2	69.3	70.4	71.1	73.6	71.4
Mean	67.8	70.1	66.7	67.6	67.9	69.3	68.1
Roots (washed): tons per acre							
Shallow	20.23	21.09	19.62	20.02	20.61	20.50	20.29
Deep	19.60	19.78	19.14	19.57	19.41	19.57	19.53
No dung	18.43	19.95	18.49	18.84	18.93	18.69	18.83
Dung	21.39	20.92	20.27	20.75	21.09	21.39	20.99
Mean	19.91	20.43	19.38	19.80	20.01	20.04	19.91
Sugar Percentage							
Shallow	17.08	17.40	17.56	17.23	17.18	17.48	17.28
Deep	16.98	16.88	16.84	16.91	16.75	17.11	16.92
No dung	17.11	17.28	17.32	17.16	17.07	17.42	17.20
Dung	16.95	17.01	17.08	16.98	16.85	17.17	17.00
Mean	17.03	17.14	17.20	17.07	16.96	17.30	17.10
Tops: tons per acre							
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	20.94	18.93	18.83	19.61	20.09	20.33	19.91
Deep	22.07	22.28	22.29	21.90	22.54	22.37	22.18
No dung	19.58	19.32	18.39	18.46	20.47	19.47	19.21
Dung	23.43	21.90	22.73	23.05	22.16	23.23	22.87
Mean	21.50	20.61	20.56	20.76	21.31	21.35	21.04

Standard errors (b) are for use in horizontal comparisons only, (a) and (c) for use in all other comparisons.

Standard errors:	(a)	(b)	(c)
Total Sugar	1.53	1.41	1.83
Tops	0.761	0.335	0.797

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Series 2: Sugar Beet

	None	Phosphate Ploughed In seed in	bed	None	Potash Ploughed In seed in	bed	Mean
Plant Number: thousands per acre							
Shallow	24.2	24.9	25.5	24.4	24.7	25.4	24.7
Deep	26.0	26.7	25.0	26.0	26.3	25.4	25.9
No dung	25.5	26.5	25.1	25.2	26.5	25.6	25.6
Dung	24.8	25.1	25.5	25.2	24.6	25.2	25.0
Mean	25.1	25.8	25.3	25.2	25.5	25.4	25.3
Noxious Nitrogen: mg. %							
Shallow	31.1	28.8	25.8	30.0	30.2	26.5	29.2
Deep	29.5	36.2	30.8	31.4	33.8	29.5	31.5
No dung	28.0	30.0	25.8	29.1	27.0	26.5	27.9
Dung	32.6	35.0	30.8	32.2	37.0	29.5	32.8
Mean	30.3	32.5	28.2	30.7	32.0	28.0	30.3

Series 3: Barley

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 33.1 cwt per acre									
	(±0.58)				(±0.82)				
Ploughing deep-shallow	-0.1	-	-	-1.5	1.3	0.1	-0.3	-0.2	0.0
Dung	1.3	-0.1	2.7	-	-	1.3	1.3	1.0	1.6
Phosphate	0.1	0.3	-0.1	0.1	0.1	-	-	1.2	-1.0
Potash	-0.1	-0.2	0.0	-0.4	0.2	1.0	-1.2	-	-
Straw: Mean yield 46.5 cwt per acre									
Ploughing deep-shallow	-0.5	-	-	-0.7	-0.3	-1.2	0.2	0.1	-1.1
Dung	3.2	3.0	3.4	-	-	3.1	3.3	3.8	2.6
Phosphate	-1.0	-1.7	-0.3	-1.1	-0.9	-	-	0.8	-2.8
Potash	0.4	1.0	-0.2	1.0	-0.2	2.2	-1.4	-	-

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Series 4: Ley

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Hay: Mean yield 50.1 cwt per acre	(±3.80)					(±5.37)			
Ploughing deep-shallow	-8.8	-	-	-10.4	-7.2	-13.3	-4.3	-10.7	-6.9
Dung	3.7	2.1	5.3	-	-	3.9	3.5	5.3	2.1
Phosphate	4.7	0.2	9.2	4.9	4.5	-	-	6.6	2.8
Potash	6.1	4.2	8.0	7.7	4.5	8.0	4.2	-	-

Series 5: Wheat

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 36.6 cwt per acre	(±0.72)					(±1.02)			
Ploughing deep-shallow	0.1	-	-	-0.4	0.6	-0.1	0.3	-1.2	1.4
Dung	0.6	0.1	1.1	-	-	1.6	-0.4	1.9	-0.7
Phosphate	1.0	0.8	1.2	2.0	0.0	-	-	1.0	1.0
Potash	0.2	-1.1	1.5	1.5	-1.1	0.2	0.2	-	-
Straw: Mean yield 56.1 cwt per acre									
Ploughing deep-shallow	3.8	-	-	2.5	5.1	5.5	2.1	3.0	4.6
Dung	1.3	0.0	2.6	-	-	2.8	-0.2	2.8	-0.2
Phosphate	1.4	3.1	-0.3	2.9	-0.1	-	-	1.1	1.7
Potash	-0.3	-1.1	0.5	1.2	-1.8	-0.6	0.0	-	-

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Series 1: Potatoes

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Ware Tubers: Mean yield 15.13 tons per acre									
	(±0.302)				(±0.427)				
Ploughing deep-shallow	0.19	-	-	0.21	0.17	0.62	-0.24	0.52	-0.14
Dung	2.37	2.39	2.35	--	-	2.49	2.25	4.41	0.33
Phosphate	0.38	0.81	-0.05	0.50	0.26	-	-	0.97	-0.21
Potash	2.04	2.37	1.71	4.08	0.00	2.63	1.45	-	-
Percentage ware: Mean 88.9									
Ploughing deep-shallow	-0.1	-	-	2.0	-2.2	-1.1	0.9	1.0	-1.2
Dung	0.7	2.8	-1.4	-	-	-0.1	1.5	3.3	-1.9
Phosphate	-0.5	-1.5	0.5	-1.3	0.3	-	-	-0.3	-0.7
Potash	0.9	2.0	-0.2	3.5	-1.7	1.1	0.7	-	-

	Phosphate None	Phosphate Ploughed in	Phosphate In ridges	Potash None	Potash Ploughed in	Potash In ridges	Mean
Ware Tubers: tons per acre							
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	14.63	15.29	15.60	13.85	16.39	16.05	15.04
Deep	15.25	14.99	15.41	14.37	15.43	16.72	15.23
No dung	13.70	14.11	14.28	11.91	16.08	15.89	13.95
Dung	16.18	16.16	16.73	16.32	15.74	16.89	16.32
Mean	14.94	15.14	15.51	14.11	15.91	16.39	15.13
Percentage ware							
Shallow	89.7	88.6	88.0	88.0	89.6	90.5	89.0
Deep	88.6	89.0	89.3	89.0	87.8	89.8	88.9
No dung	89.2	88.5	87.4	86.8	90.0	90.8	88.6
Dung	89.1	89.1	89.8	90.1	87.4	89.5	89.3
Mean	89.2	88.8	88.6	88.5	88.7	90.1	88.9

Standard error (b) is for use in horizontal comparisons only; standard errors (a) and (c) for use in all other comparisons.

Standard errors	(a)	(b)	(c)
	±0.302	±0.537	±0.485

Series 6: Oats

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 37.0 cwt per acre									
	(±1.24)					(±1.75)			
Ploughing deep-shallow	-2.3	-	-	-2.7	-1.9	-1.8	-2.8	-2.8	-1.8
Dung	0.5	0.1	0.9	-	-	0.8	0.2	0.1	0.9
Phosphate	-0.1	0.4	-0.6	0.2	-0.4	-	-	-0.4	0.2
Potash	0.5	0.0	1.0	0.1	0.9	0.2	0.8	-	-
Straw: Mean yield 53.2 cwt per acre									
Ploughing deep-shallow	-1.4	-	-	0.3	-3.1	-2.0	-0.8	-0.7	-2.1
Dung	5.2	6.9	3.5	-	-	5.2	5.2	7.8	2.6
Phosphate	1.4	0.8	2.0	1.4	1.4	-	-	0.9	1.9
Potash	1.0	1.7	0.3	3.6	-1.6	0.5	1.5	-	-

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50/Bo/1.1

LEY AND ARABLE ROTATIONS

Highfield and Fosters Field - 1950

For details of treatments and rotations etc. see Appendix Z.

Cultivations, etc.:

Highfield

Wheat (Blocks 6 & 7). Ploughed: Oct 18-27. 1st application of ground chalk: Oct 27. Rolled and disced: Oct 27-28. Disced and harrowed: Oct 29. 2nd and 3rd applications of ground chalk: Nov 18 and 19. Seed drilled, basal fertilizer applied and harrowed in: Oct 31. Dusted against wireworm: Feb 14. Harrowed and ring rolled: Apr 6. Nitrochalk applied: Apr 15. Weeded: June 16. Harvested: Aug 11. Variety: Yeoman.

Potatoes (Blocks 1-4). Ploughed: Sept 1 and Jan 10-11. Springtined: Mar 21. Cultivated and harrowed: Mar 28. Ring rolled: Mar 30. Ridged: Apr 4. Dung, sulphate of ammonia and basal fertilizers applied, potatoes planted and covered in: Apr 5. Ridges rolled: Apr 8. Ridges harrowed: May 5 and again May 10. Grubbed: June 1. Hoed: June 21-22. Earthed up: June 26. Sprayed with Perenox: July 27. Sprayed with Copperan : Aug 19. Sprayed with 15% B.O.V. to kill off haulm: Sept 27. Lifted: Oct 13. Variety: Majestic.

Hay, Cut Grass, Grazed Ley, Reseeded Grass and Lucerne, all 1st year (Blocks 5 and 8, Reseeded Grass 5-8). Ploughed: Oct 18-27. Ground chalk applied: Oct 27. Ring rolled and disced: Oct 27-28. Disced and harrowed: Oct 29. Ground chalk applied: Nov 18 and 19. Springtined: Mar 21. Basal fertilizer applied: Mar 22. Harrowed: Mar 23. Nitrochalk applied (none to Lucerne): Mar 28.

Hay. Harrowed, rolled, seeds sown, harrowed and rolled in: Mar 25. Cut: July 13.

Cut Grass. Harrowed, rolled, seeds sown, harrowed and rolled in: Mar 25. Cut 5 times: June 15, July 11, Aug 2, Aug 31, Oct 5. Nitrochalk applied after each cut except the last. Topped: Nov 15.

Grazed Ley. Harrowed: Mar 28 Rolled: Mar 30. Seeds sown, harrowed and rolled in: Apr 6. Nitrochalk applied: July 13. Grazed: 7 circuits June - Nov.

Reseeded Grass. Grazed: 7 circuits June - Nov.

Lucerne. Drilled: Mar 22. Cut: 3 times, June 20, Aug 1, Oct 5. Variety: Du Puits.

Permanent Grass. 1st year (Blocks 5-8). Three applications of ground chalk: Oct 27, Nov 18 and 19. Basal fertilizer applied: Jan 14. 1st application of nitrochalk: Mar 28. Rolled: Mar 29. 2nd application of nitrochalk: July 4-7. Grazed: 6 circuits June - Nov.

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Cut Grass. 2nd year (Blocks 2 and 3). Basal fertilizers applied: Jan 14. Nitrochalk applied: Mar 28. Rolled: Mar 29. Cut 8 times: Apr 22, May 10, May 30, June 20, July 11, Aug 2, Aug 31, Oct 5. Nitrochalk applied after each of the first 5 cuts.

Grazed Ley and Reseeded Grass. 2nd year (Blocks 2 and 3). Basal fertilizer applied: Jan 14. Nitrochalk applied: Mar 28. Rolled: Mar 29. Topped after grazing: May 27, June 21. Nitrochalk applied: July 10-12. Grazed: Ley - 8 circuits, Reseeded - 9 circuits June-Nov.

Lucerne. 2nd year (Blocks 2 and 3). Basal fertilizer applied: Jan 14. Hoed and weeded: Apr 20. Cut 3 times: June 20, Aug 1, Oct 5.

Permanent Grass. 2nd year (Blocks 1-4). Basal fertilizers applied: Jan 14. 1st application of nitrochalk: Mar 28. Rolled: Mar 29. 2nd application of nitrochalk: July 10-12. Grazed: 7 circuits June - Nov.

Fosters

Wheat (Blocks 8 and 9). Ploughed: Oct 17-27. Harrowed, seed and basal fertilizers drilled and harrowed in: Oct 31. Nitrochalk applied: Apr 14. Rolled: Apr 25. Sprayed with D.N.O.C.: May 10. Weeded: June 16-20. Harvested: Aug 11. Variety: Yeoman.

Potatoes (Blocks 1-4). Ploughed wheat stubble: Aug 29-30. Ploughed hay stubble: Sept 5-6. Springtined: Mar 18. Cultivated: Mar 27. Harrowed twice: Mar 28. Ring rolled: Mar 29. Ridged: Apr 3. Dung sulphate of ammonia applied and basal fertilizers drilled: Apr 4. Potatoes planted and covered in: Apr 5. Rolled ridges: Apr 6. Chain harrowed: May 5 and again May 10. Grubbed: May 25. Hoed: June 20-21. Earthed up: June 26. Sprayed with Perenox: July 25. Sprayed with Copper sanr Aug 4 and again Aug 18. Weeded: Sept 4-5. Sprayed with 20% B.O.V. to kill off haulm: Sept 25. Lifted: Oct 9-10. Variety: Majestic.

Hay, Cut Grass, Grazed Ley, Reseeded Grass and Lucerne, all 1st year (Blocks 5 and 7, Reseeded Grass 5, 7, 8 and 9). Ploughed: various days Oct 17-27. Springtined: Mar 18. Basal fertilizers applied, harrowed, rolled and harrowed: Mar 21-22. Nitrochalk applied (none to lucerne): Mar 29.

Hay. Rolled, seeds sown, harrowed and rolled in: Mar 24. Weeded: June 12-14. Cut: Aug 10.
Cut Grass. Rolled, harrowed, seeds sown, harrowed and rolled in: Mar 22. Weeded: June 12-14. Cut 4 times: July 10, Aug 3, Aug 30, Oct 6. Nitrochalk applied after each cut except the last.
Grazed Ley. Seeds sown: Apr 4. Harrowed and rolled in: Apr 5. Nitrochalk applied: July 10. Topped: July 12 and Nov 14. Grazed: 4 circuits June - Oct.
Reseeded Grass. Seeds sown: Apr 4. Harrowed and rolled in: Apr 5. Topped: July 12 and Nov 14. Nitrochalk applied: July 25. Grazed: 4 circuits June - Oct.

Lucerne. Harrowed, rolled, seeds sown: Mar 27. Rolled in: Mar 29. Hoed and weeded: Apr 21. Dusted with D.D.T. powder: Apr 27. Hoed: June 13. Weeded: June 12-14. Cut twice: July 31, Oct 6. Variety: Du Puits.

Cut Grass. 2nd year (Blocks 2 and 4). Owing to poor plant it was decided to resow. Ploughed: Jan 13. Springtined: Mar 18. Basal fertilizer applied, harrowed, rolled and harrowed: Mar 21. Rolled, seeds sown, harrowed and rolled in: Mar 22. Nitrochalk applied: Mar 29. Weeded: June 10-14. Cut: 4 times July 10, Aug 3, Aug 30, Oct 6. Nitrochalk applied after each cut except the last.

Grazed Ley and Reseeded Grass. 2nd year (Blocks 2 and 4). Basal fertilizer applied: Jan 13. Nitrochalk applied: Mar 29. Rolled: Mar 30. Topped: May 16, June 7, June 23, July 12, Nov 14. 2nd application of nitrochalk: to Grazed Ley - July 14, to Reseeded Grass - July 25. Grazed: 5 circuits May - Oct.

Lucerne. 2nd year (Blocks 2 and 4). Basal fertilizer applied: Jan 13. Hoed and harrowed: Apr 1. Hoed and weeded: Apr 21-22. Cut: 3 times - June 16, July 31, Oct 6.

Standard errors per sub plot

Per ¼ plot.	Wheat, grain.	Highfield:	1.72 cwt per acre or 5.8% (23 d.f.)
		Fosters:	2.90 cwt per acre or 18.1% (23 d.f.)
	Potatoes, total tubers	Highfield:	0.941 tons per acre or 6.7% (27 d.f.)
		Fosters:	0.896 tons per acre or 6.2% (27 d.f.)
	Hay, dry matter.	Highfield:	1.46 cwt per acre or 12.7% (5 d.f.)
		Fosters:	1.33 cwt per acre or 8.6% (5 d.f.)
	Cut Grass, dry matter.	Highfield:	3.47 cwt per acre or 5.1% (10 d.f.)
		Fosters:	3.52 cwt per acre or 7.7% (10 d.f.)
Per ½ plot.	Old Pasture, dry matter.	Highfield:	5.10 cwt per acre or 11.2% (7 d.f.)
	Ley and Reseeded grass, dry matter	Highfield:	3.40 cwt per acre or 7.8% (11 d.f.)
		Fosters:	4.17 cwt per acre or 11.6% (11 d.f.)

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Wheat. cwt per acre

	Highfield			Fosters		
	cwt N per acre			cwt N per acre		
	0.3	0.6	Mean	0.3	0.6	Mean
	(±0.43)			(±0.73)		
Grain	30.1	29.6	29.9	14.8	17.3	16.0
Straw	42.8	43.2	43.0	19.4	21.9	20.6

Potatoes

		Highfield			Fosters		
	Dung: tons per acre	cwt N per acre 0.5	1.0	Mean	cwt N per acre 0.5	1.0	Mean
				(±0.210)			(±0.200)
Total tubers tons per acre	None	14.19	13.56	13.88	14.15	14.09	14.12
		(±0.297)			(±0.283)		
	15	14.26	14.19	14.22	14.61	14.86	14.74
	Mean	14.23	13.87	14.05	14.38	14.48	14.43
		(±0.210)			(±0.200)		
Percentage Ware	None	81.4	83.6	82.5	87.5	85.2	86.4
	15	80.2	82.5	81.4	87.0	83.7	85.4
	Mean	80.8	83.1	81.9	87.3	84.4	85.9

Hay. Dry Matter: cwt per acre

Highfield			Fosters		
cwt N per acre			cwt N per acre		
0.3	0.6	Mean	0.3	0.6	Mean
11.1	11.9	11.5	14.3	16.7	15.5
(±0.73)			(±0.67)		

Cut Grass Dry Matter: cwt per acre

	Highfield				Fosters			
	No. of cuts	cwt N per acre 0.15	0.30	Mean	No. of cuts	cwt N per acre 0.15	0.30	Mean
				(±1.23)				(±1.24)
1st year	5	61.4	67.8	64.6	4	40.8	47.7	44.2
		(±1.74)				(±1.76)		
2nd year	8	66.3	78.6	72.4	4	42.8	51.9	47.3
Mean		63.8	73.2	68.5		41.8	49.8	45.8
		(±1.23)				(±1.24)		

https://doi.org/10.23637/ERADOC-1-185

		Highfield		Fosters	
Lucerne.	Dry Matter: cwt per acre	No. of cuts		No. of cuts	
1st year		2	51.3	2	46.2
2nd year		3	94.2	3	83.0

Grazed Plots. Estimates from Sample cuts of amount of Dry Matter cwt per acre, consumed by sheep.

	Highfield			Fosters		
	cwt N per acre			cwt N per acre		
	0.15	0.30	Mean	0.15	0.30	Mean
Permanent Grass			(±1.80)			
1st year blocks	40.2	43.5	41.8			
	(±2.55)					
2nd year blocks	49.0	49.7	49.4			
Mean	44.6	46.6	45.6			
	(±1.80)					
Ley & Reseeded Grass			(±0.98)			(±1.20)
1st year	34.8	36.4	35.6	32.8	37.8	35.3
	(±1.39)			(±1.70)		
2nd year	52.0	51.8	51.9	36.3	36.7	36.5
Mean	43.4	44.1	43.8	34.5	37.2	35.9
	(±0.98)			(±1.20)		

Note. The estimates of Dry Matter calculated from the sheep weights were considered unreliable and have been omitted.

Mean Grazing Days per acre. (Mean of 1st and 2nd year blocks)

	Highfield			Fosters		
	cwt N per acre			cwt N per acre		
	0.15	0.30	Mean	0.15	0.30	Mean
Permanent Grass	2626	2667	2646			
Ley and Reseeded Grass	2309	2389	2349	1368	1393	1380

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50/Bd/1.1

GREEN MANURING EXPERIMENT

Woburn Stackyard - 1950, 14th year

For details of treatments etc. see Appendix Z.

Cultivations, etc.:

Green manures (Upper half). Ryegrass and clover undersown in Barley: Mar 23. Ploughed Lupin, rape and fallow plots: Sept 7, Oct 5-6. Springtined: Nov 15. 3rd ploughing: Mar 1-2. Springtine and harrowed: Mar 24-25. Rolled rape and lupin plots: Mar 27. Fertilizers applied to green crops: Mar 28-29. Lupins drilled and rape sown, rolled and harrowed: Mar 29. Rape dusted with D.D.T: Apr 21. Lupin plots hoed: May 5 and 10. Fallow plots thistle barred and weeded, lupin plots weeded: May 11. Lupin plots hoed: June 9 and 16.

Cabbages (Upper half). Dung and straw applied to ryegrass, clover and fallow plots, ploughed, rolled, harrowed: May 23-24. Harrowed twice: June 21. Harrowed, rolled and applied manures to half plots for early planting: June 22. Cabbages planted and watered in: June 23-24. Dung and straw applied to rape and lupin plots, ploughed in, harrowed and rolled twice: June 29. Manures applied: June 30. Cabbages planted on rape and lupin plots and on "late" half plots, and watered in: July 4-6. Cabbages hoed: July 19, 24-25, Aug. 4, 8-15 and 18, Sept 12. Weeded: Sept 25-26. Harvested: Feb-Mar. Variety: January King. Previous crop: Barley.

Barley (Lower half). Ploughed: Mar 2-4. Chalk applied: Mar 10. Harrowed: Mar 11 and 16. Seed drilled and harrowed in: Mar 17. Rolled: Mar 18. Sulphate of ammonia applied; clover and ryegrass sown, all plots harrowed: Mar 22. Rolled: Mar 24. Harvested: Aug 10. Variety: Plumage Archer. Previous crop: Cabbages.

Standard Errors per plot:

Cabbages, total yield. Whole plot: 0.560 tons per acre or 8.4%(8 d.f.)
Sub-plot: 0.432 tons per acre or 6.5%(16 d.f.)

Barley, grain. 4.00 cwt per acre or 20.9%(9 d.f.)

Note

The Cabbages were severely infected with club root and the total weight has been corrected to allow for this.

https://doi.org/10.23637/ERADOC-1-185

Upper Half - Cabbage

	None	Lupins	Clover	Rape	Rye-grass	Mean
Total weight: tons per acre (±0.280)						(±0.125)
No Dung	5.15	5.92	7.53	6.00	5.29	5.98
Dung	6.74	7.45	8.90	6.22	7.44	7.35
No Straw	5.75	7.00	7.84	6.33	6.75	6.73
Straw	6.14	6.37	8.58	5.89	5.98	6.59
Sulph. amm.						
2 cwt per acre	5.66	6.71	8.13	6.06	5.98	6.51
4 cwt per acre	6.24	6.66	8.30	6.17	6.75	6.82
Sulph. amm. to barley*						
Low	5.61	6.67	7.86	6.05	6.28	6.49
High	6.28	6.70	8.57	6.17	6.45	6.83
Time of Planting			(a) and (b)			(±0.088)
Early	6.02		8.58		6.49	7.03
Late	5.87		7.85		6.24	6.65
Mean (±0.198)	5.95	6.68	8.22	6.11	6.37	6.66

(a) ±0.153 for use in vertical comparisons only.
(b) ±0.226 for use in all others.

Total number: thousands per acre

No Dung	17.8	17.7	17.8	17.2	17.6	17.6
Dung	18.0	17.8	17.1	18.2	17.8	17.8
No Straw	17.9	18.1	17.6	18.0	18.0	17.9
Straw	17.9	17.5	17.2	17.4	17.4	17.5
Sulph. amm.						
2 cwt per acre	17.8	17.9	17.2	18.2	17.9	17.8
4 cwt per acre	18.0	17.6	17.6	17.1	17.5	17.6
Sulph. amm. to barley*						
Low	17.7	17.6	17.6	17.4	18.0	17.7
High	18.1	18.0	17.2	17.8	17.4	17.7
Time of Planting						
Early	17.6		17.0		17.6	17.4
Late	18.1		17.8		17.8	17.9
Mean	17.9	17.8	17.4	17.6	17.7	17.7

*Sulphate of ammonia to barley and green manure crops, 1949.

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Differential Responses

	Mean	Dung Abs.	Dung Pres.	Straw Abs.	Straw Pres.	Sulph. Amm. cwt per acre 2	Sulph. Amm. cwt per acre 4	Sulph. Amm. Barley Low	Sulph. Amm. Barley High	Time of planting Early	Time of planting Late
Total weight: tons per acre											
	(±0.177)					(±0.250)					(±0.202)*
Dung	1.37	-	-	1.26	1.48	1.54	1.20	1.50	1.24	1.53	1.87
Straw	-0.14	-0.25	-0.03	-	-	0.08	-0.36	-0.64	0.36	0.02	0.22
Sulph. Amm.	0.32	0.49	0.15	0.54	0.10	-	-	0.49	0.15	0.29	0.73
Sulph. Amm. to Barley	0.34	0.47	0.21	-0.16	0.84	0.51	0.17	-	-	0.54	0.50
Late-Early Planting	(±0.097) -0.38	-0.55	-0.21	-0.48	-0.28	(±0.137) -0.60	-0.16	-0.36	-0.40	-	-
Total number: thousands per acre											
Dung	0.2	-	-	0.1	0.3	-0.1	0.5	0.4	0.0	-0.5	0.3
Straw	-0.4	-0.5	-0.3	-	-	-0.3	-0.5	-0.3	-0.5	-0.7	0.1
Sulph. Amm.	-0.2	-0.5	0.1	-0.1	-0.3	-	-	-0.6	0.2	0.0	0.2
Sulph. Amm. to Barley	0.1	0.3	-0.1	0.2	0.0	-0.3	0.5	-	-	-0.3	-0.1
Late-Early Planting	0.5	0.1	0.9	0.1	0.9	0.4	0.6	0.4	0.6	-	-

*S.E. of horizontal difference between two responses (±0.193)

50/Bd/1.3

Lower Half - Barley

Green Manure Crops	None	Lupins	Clover	Rape	Rye-grass	Mean
Grain: cwt per acre (±2.00)						(±0.89)
No Dung to cabbages 1949	22.7	19.2	13.3	18.4	14.6	17.6
Dung to cabbages	22.1	23.6	16.2	21.4	19.8	20.6
No straw to cabbages 1949	22.3	20.6	14.5	20.2	17.9	19.1
Straw to cabbages	22.5	22.2	15.0	19.6	16.6	19.2
Sulph. Amm. to cabbages 1949						
2 cwt per acre	21.8	20.8	12.9	19.6	17.0	18.4
4 cwt per acre	22.9	22.1	16.6	20.2	17.5	19.9
Sulph. Amm. to barley						
Nil	20.5	19.6	13.4	18.8	14.4	17.3
1½ cwt per acre	24.2	23.2	16.0	21.0	20.1	20.9
Mean (±1.41)	22.4	21.4	14.7	19.9	17.2	19.1
Straw: cwt per acre						
No Dung to cabbages 1949	23.3	19.8	19.0	21.2	20.5	20.8
Dung to cabbages	25.0	27.7	22.5	25.0	27.9	25.6
No straw to cabbages 1949	23.8	22.3	21.0	23.4	24.3	23.0
Straw to cabbages	24.6	25.2	20.6	22.8	24.1	23.4
Sulph. Amm. to cabbages 1949						
2 cwt per acre	23.1	24.2	19.6	23.1	24.4	22.9
4 cwt per acre	25.2	23.4	21.9	23.1	24.0	23.5
Sulph. Amm. to barley						
Nil	20.6	21.5	16.6	21.3	23.2	20.7
1½ cwt per acre	27.7	26.0	24.9	25.0	25.2	25.8
Mean	24.2	23.8	20.8	23.1	24.2	23.2

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Lower Half - Barley

	Mean	Dung to Cabbages Abs.	Dung to Cabbages Pres.	Straw to Cabbages Abs.	Straw to Cabbages Pres.	Sulph. amm. to cabbages cwt per acre 2	Sulph. amm. to cabbages cwt per acre 4	Sulph. amm. to barley cwt per acre 0	Sulph. amm. to barley cwt per acre 1½
Grain: cwt per acre									
	(±1.26)				(±1.81)				
Dung to Cabbages 1949	3.0	-	-	2.8	3.2	3.0	3.0	2.8	3.2
Straw to Cabbages 1949	0.1	-0.1	0.3	-	-	-1.2	1.4	0.8	-0.6
Sulph. amm. to Cabbages 1949	1.5	1.5	1.5	0.2	2.8	-	-	1.9	1.1
Sulph. amm. to barley	3.6	3.4	3.8	4.3	2.9	4.0	3.2	-	-
Straw: cwt per acre									
Dung to Cabbages 1949	4.8	-	-	3.7	5.9	5.7	3.9	4.1	5.5
Straw to Cabbages 1949	0.5	-0.6	1.6	-	-	-0.6	1.6	-0.1	1.1
Sulph. amm. to Cabbages 1949	0.7	1.6	-0.2	-0.4	1.8	-	-	1.9	-0.5
Sulph. amm. to barley	5.1	4.4	5.8	4.5	5.7	6.3	3.9	-	-

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LEY AND ARABLE ROTATIONS

Woburn, Stackyard - 1950.

For details of rotations, etc. see Appendix Z.

Cultivations, etc.:

Block I. Potatoes. Ploughed: Nov 1-2, Jan 24-25, and Mar 5. Springtined and rolled: Mar 30. Ridged: Apr 3. Dung applied: Apr 2-5. Potatoes planted and covered in, basal fertilizer applied: Apr 5. Rolled down ridges: Apr 12. Tractor weeded: May 11. Harrowed: May 15. Ridged: May 16. Harrowed: May 24. Grubbed: June 7. Ridged: June 29. Thistles pulled: July 14-17. Sprayed with Perenox: July 22 and again Aug 4. Sprayed with 15% B.O.V. to kill off haulm: Sept 18. This was ineffective so sprayed with 20% B.O.V.: Sept 23. Lifted: Oct 3-4. Variety: Majestic. Previous crops: Ley, lucerne, hay, sugar beet.

Block II. Barley. Ploughed: Sept 26. and Jan 20. Ground chalk (8.1 cwt CaO per acre) applied: Feb 27. Springtined: Mar 7. Basal fertilizers applied: Mar 15. Harrowed, seed drilled and harrowed in: Mar 16. Rolled: Mar 17. Rows patched: Apr 21. Sprayed with D.N.O.C.: June 5. Harvested: Aug 10. Variety: Plumage Archer. Previous crop: Potatoes.

Block III. Ley. Third year. Grazed by sheep: Apr 24-28, May 7-15, May 30 - June 7, June 15-19, July 11-18, July 28 - Aug 1, Aug 17-19, Aug 31 - Sept 3, Sept 14-15 and Oct 3-7.

Lucerne. Third year. Harrowed: Jan 19. Hoed: Feb 17. Weeded: Feb 18 and Mar 10. Harrowed: Mar 24-25. Harrowed three times: Apr 5. Hoed: Apr 21. First cut: June 20. Second cut: July 31. Third cut: Oct 4.

Hay. Seeds mixture undersown in rye: Mar 30. Rolled: Mar 27. First dressing of nitrochalk applied: Mar 28. First cut: June 20. Second dressing of nitrochalk applied: June 22. Second cut: Aug 30. Seeds mixture: Late flowering Montgomery Red Clover (12 lb. per acre); Perennial Ryegrass (24 lb. per acre) and American Alsike Clover (3 lb. per acre). Previous crop: Rye.

Sugar beet. Ploughed: Sept 6 and Jan 20. Springtined: Mar 7, 24 and 25. Rolled: Mar 27. Nitrate of soda applied: Mar 28. Seed drilled: Mar 29. Hoed: May 11. Singled: May 31. Hoed: June 7 and 15. Lifted: Oct 5. Variety: Klein E. Previous crop: Rye.

Block IV. Ley. First year. Ploughed: Sept 6 and Jan 19. Springtined: Mar 7 and 24. Harrowed: Mar 25. Rolled: Mar 27. Seed sown, harrowed and rolled in: Mar 28. Fertilizers applied: Apr 3. Topped: June 15. Grazed by sheep; June 12-15; June 23-26, July 22-26. Aug 8-12, Sept 5-8 and Oct 10-12. Seeds mixture: S23 Perennial Ryegrass (21 lb. per acre); S143 Cocksfoot (12 lb. per acre); Late flowering Montgomery Red Clover (6 lb. per acre); S100 White Clover (3 lb per acre). Previous crop: Barley.

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Lucerne. First year. Ploughed: Sept 16 and Jan 19. Springtined: Mar 7 and 24. Harrowed: Mar 25. Rolled: Mar 27. Seed drilled and rolled in: Mar 28. Fertilizers applied: Apr 3. Dusted with D.D.T.: May 10. Plots 55 and 56 (Arable with Hay rotation) spoilt by tornado: May 21. Plots 55 and 56. Thistle barred: May 30. Harrowed, rolled, seed redrilled and rolled in: May 31. Dusted with D.D.T.: June 7. Hoed and weeded: June 21-22. Hoed: Aug 16. First cut: Aug 30. Second cut: Oct 4.
Plots 59 and 60. (Lucerne Rotation). Hoed: June 2. First cut: June 30. Second cut: Oct 4.
Variety: Du Puit. Previous crop: Barley.

Potatoes. Ploughed: Sept 16 and Jan 19. Springtined: Mar 7 and 24. Harrowed: Mar 25. Rolled: Mar 30. Ridged, fertilizers applied: Apr 3. Potatoes planted: Apr 4. Covered in: Apr 5. Rolled down ridges: Apr 12. Tractor weeded: May 11. Harrowed: May 15. Ridged: May 17. Harrowed: May 31. Grubbed: June 7. Ridged: June 29. Sprayed with Perenox: June 22 and Aug 4. Sprayed with 15% B.O.V. to kill off haulm: Sept 18. Lifted: Oct 2. Variety: Majestic. Previous crop: Barley.

Block V. Ley. Second year. Rolled: Mar 30. 1 cwt Nitrochalk per acre applied: June 13. Grazed by sheep: Apr 28 - May 7, May 15-23, June 7 - 12, June 19-23, July 18-28, Aug 12-17, Sept 3-5, Sept 12-14 and Oct 7-10.

Lucerne. Second year. Harrowed: Jan 19. Hoed and weeded: Feb 15. Weeded: Mar 10. Hoed and harrowed: Mar 24. Hoed: Apr 21. First cut: June 20. Second cut: July 31. Third cut: Oct 4.

Rye. Ploughed: Sept 29. Springtined: Oct 31. Harrowed; seed sown: Nov 1. Harrowed in: Nov 2. Weeded: Mar 10. Rolled: Mar 18. 3 cwt Nitrochalk per acre applied, hay mixtures undersown on appropriate plots: Mar 28. Variety: King II. Previous crops: Ley, lucerne, potatoes.

Standard errors per plot:

Block I. Potatoes.

Total tubers:	whole plot,	1.12 tons per acre or 7.0% (4 d.f.)
	sub-plot,	0.358 tons per acre or 2.2%(4 d.f.)
Percentage ware:	whole plot,	1.24 (4 d.f.)
	sub-plot,	1.29 (4 d.f.)

Block II. Barley.

Grain:	whole plot,	3.62 cwt per acre or 21.9% (4 d.f.)
	sub-plot,	2.38 cwt per acre or 14.4% (3 d.f.)
Straw:	whole plot,	2.36 cwt per acre or 10.8% (4 d.f.)
	sub-plot,	1.60 cwt per acre or 7.3% (4 d.f.)

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Previous Rotation

	Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean
Block I					
Potatoes. Total tubers: tons per acre					
No Dung (±0.810)(1)	14.94	15.02	13.40	12.26	13.90
Dung in 1950	18.66	18.74	17.73	16.55	17.92
Mean (±0.790)	16.80	16.88	15.56	14.41	15.91
Increase (±0.358)	3.72	3.72	4.33	4.29	4.02(±0.179)
Potatoes: Percentage Ware					
No Dung (±1.09)(1)	93.7	93.4	92.1	93.8	93.2
Dung in 1950	95.1	95.0	94.2	93.4	94.4
Mean (±0.88)	94.4	94.2	93.2	93.6	93.8
Increase (±1.29)	1.4	1.6	2.1	-0.4	1.2(±0.64)
Block II					
Barley. Grain: cwt per acre					
No Dung (±2.82)(1)	23.0	16.4	14.3	16.1	17.4
Dung in 1949	19.7	16.9	12.4	13.6	15.7
Mean (±2.56)	21.3	16.6	13.4	14.9	16.5
Increase (±2.38)	-3.3	0.5	-1.9	-2.5	-1.7 (±1.19)
Barley. Straw: cwt per acre					
No Dung (±1.85)(1)	21.1	19.8	19.0	21.4	20.3
Dung in 1949	21.5	24.0	26.0	22.6	23.5
Mean (±1.67)	21.3	21.9	22.5	22.0	21.9
Increase (±1.60)	0.4	4.2	7.0	1.2	3.2 (±0.80)

Standard error (1) for comparisons other than vertical ones.

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Block III

Ley. 3rd Year

	Sheep days of grazing per acre	No. of sheep carried per acre for the year
Mean	2089	5.7

Lucerne. 3rd Year

Yield of Lucerne Hay (85% dry matter): tons per acre

	1st Crop	2nd Crop	3rd Crop	Total
No Dung	1.86	1.60	0.78	4.24
Dung in 1946	2.27	1.86	0.90	5.03
Mean	2.07	1.73	0.84	4.64
Increase	0.41	0.26	0.12	0.79
Previous Rotation:				
Lucerne	1.84	1.58	0.80	4.22
Arable with hay	2.30	1.87	0.86	5.03

Hay (85% dry matter): tons per acre

	1st Crop	2nd Crop	Total
No Dung	2.56	0.83	3.39
Dung in 1946	3.20	1.26	4.46
Mean	2.88	1.04	3.92
Increase	0.64	0.43	1.07
Previous Rotation:			
Lucerne	2.76	1.26	4.02
Arable with hay	2.98	0.84	3.82

Sugar Beet

	Clean Beet tons per acre	Tops tons per acre	Total Sugar cwt per acre	Sugar %
No Dung	13.41	8.02	50.6	18.87
Dung in 1946	14.90	8.80	57.9	19.44
Mean	14.16	8.41	54.3	19.16
Increase	1.49	0.78	7.3	0.57
Previous Rotation:				
Ley	14.48	9.03	55.6	19.18
Arable with sugar beet	13.84	7.79	53.0	19.12

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Block IV

Ley. 1st Year

	Sheep days of grazing per acre	No. of Sheep carried per acre for the year
Mean	1000	2.7

Potatoes

	Total tubers tons per acre	Percentage Ware
No Dung	11.79	91.3
Dung in 1948	14.82	92.8
Mean	13.30	92.0
Increase	3.03	1.5
Previous Rotation:		
Ley	15.20	93.4
Lucerne	13.27	92.6
Arable with hay	12.40	91.2
Arable with sugar beet	12.36	90.9

Lucerne. 1st Year

Yield of Lucerne Hay (85% dry matter): tons per acre

	1st Crop	2nd Crop	Total
No Dung	0.58	0.42	1.00
Dung in 1948	0.82	0.64	1.46
Mean	0.70	0.53	1.23
Increase	0.24	0.22	0.46
Previous Rotation:			
Lucerne	0.68	0.92	1.60
Arable with hay	0.71	0.13	0.84

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Block V

Ley. 2nd Year

	Sheep days of grazing per acre	No. of sheep carried per acre for the year
Mean	2217	6.1

Lucerne. 2nd Year

Yield of Lucerne Hay (85% dry matter): tons per acre

	1st Crop	2nd Crop	3rd Crop	Total
No Dung	1.61	1.56	0.74	3.91
Dung in 1947	1.92	1.63	0.82	4.37
Mean	1.77	1.60	0.78	4.15
Increase	0.31	0.07	0.08	0.46
Previous Rotation:				
Lucerne	1.70	1.62	0.77	4.09
Arable with sugar beet	1.84	1.58	0.78	4.20

Rye

	Grain: cwt per acre	Straw: cwt per acre
No Dung	34.7	43.1
Dung in 1947	34.5	45.4
Mean	34.6	44.2
Increase	-0.2	2.3
Previous Rotation:		
Ley	35.8	47.1
Lucerne	36.1	46.8
Arable with hay	33.7	41.6
Arable with sugar beet	32.8	41.5

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WOBURN MARKET GARDEN EXPERIMENT

Globe Beet and Green Peas. 1st crops of 9th year.

Organic manures and sulphate of ammonia - Lansome 1950.

System of replication: two series, one for each crop, each consisting of 4 randomized blocks of 10 plots, certain interactions being confounded with block differences.

Area of each plot: 0.0125 acre.

Treatments:
Organic manures: Dung, sewage sludge compost, sewage sludge (West Middlesex), and vegetable compost, each at 15 and 30 tons per acre.
Sulphate of ammonia: None, 0.2 cwt N per acre on organic manure plots. None, 0.2, 0.4, 0.6 cwt N per acre on plots not receiving organic manures.

Basal Manuring: Superphosphate: 0.4 cwt P_2O_5 per acre
Muriate of potash: 0.5 cwt K_2O per acre.

Cultivations, etc.:
Series A. Globe Beet.
Organics applied and ploughed in: Mar 22-24. Ground chalk applied to all plots receiving sulphate of ammonia (plots having 0.4 N at 11 cwt per acre, plots having 0.6 N at 17 cwt per acre, other plots at 6 cwt per acre): Mar 30. Springtine harrowed, rolled, harrowed and rolled, sulphate of ammonia applied (plots having 0.4 and 0.6 N receiving only half their total dressings), seed drilled and rolled in: Mar 31. Weeded and hoed: May 12, 17 and 24. Hoed: June 1-5 and 12. Singled: June 19-27. Second dressing of sulphate of ammonia applied to plots having 0.4 and 0.6 cwt N, and all plots hoed: June 28. Lifted: July 12-24. Variety: "Detroit" Previous crop: Leeks.

Series B. Green Peas.
Organics applied and ploughed in: Mar 8-9. Harrowed twice, rolled and harrowed: Mar 18. Springtine harrowed and rolled: Mar 20. Harrowed, rolled, sulphate of ammonia applied (plots having 0.4 and 0.6 cwt N receiving only half their total dressings), peas drilled and rolled in: Mar 21. Hoed: Apr 20-21. Weeded: Apr 28. Second dressing of sulphate of ammonia applied to plots having 0.4 and 0.6 cwt N: June 12. Harvested: June 28-July 10. Variety: Kelvedon Wonder. Previous crop: Winter Cabbage.

Standard errors per plot:
Globe Beet, total produce: 1.04 tons per acre or 13.9% (17 d.f.)
weight of bulbs: 0.664 tons per acre or 16.1% (17 d.f.)
plant number: 11.7 thousands per acre or 12.1% (17 d.f.)
Green Peas, marketable produce: 11.3 cwt per acre or 22.2% (17 d.f.)

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Summary of Results

Globe Beet

Organic Manures	Level of manuring (tons/acre)	Sulphate of ammonia cwt N per acre None	0.2	0.4	0.6	Mean
Total produce: Mean 7.49 tons per acre				(±0.739)		(±0.522)
None		3.30	5.20	7.06	6.96	4.25*
Dung	15	6.14	8.28			7.21
	30	10.62	9.58			10.10
Sludge compost	15	6.38	6.12			6.25
	30	7.74	7.28			7.51
Sludge	15	8.08	9.12			8.60
	30	10.12	10.34			10.23
Vegetable compost	15	5.23	6.54			5.88
	30	7.56	8.18			7.88
Weight of bulbs: Mean 4.12 tons per acre				(±0.469)		(±0.332)
None		1.85	2.78	3.64	3.62	2.32*
Dung	15	3.22	4.74			3.98
	30	5.86	5.48			5.66
Sludge compost	15	3.52	3.29			3.41
	30	4.34	4.10			4.22
Sludge	15	4.54	4.97			4.76
	30	5.85	5.76			5.81
Vegetable compost	15	2.84	3.41			3.12
	30	4.04	4.50			4.27
Plant number: Mean 97.1 thousands per acre				(±8.30)		(±5.87)
None		95.4	104.0	105.7	112.4	99.7*
Dung	15	103.6	102.2			102.9
	30	105.4	97.2			101.3
Sludge compost	15	104.4	96.4			100.4
	30	103.8	83.6			93.7
Sludge	15	94.0	79.8			86.9
	30	84.8	86.6			85.8
Vegetable compost	15	98.0	100.8			99.4
	30	101.6	82.4			92.0

* Mean over None and 0.2 cwt N per acre only.

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Green Peas

Organic Manures	Level of manuring (tons/acre)	Sulphate of ammonia cwt N per acre None	0.2	0.4	0.6	Mean
Marketable weight: Mean 50.8 cwt per acre						
			(±8.00)			(±5.66)
None		45.0	32.8	45.7	52.8	38.9*
Dung	15	68.5	64.2			66.4
	30	57.8	64.9			61.4
Sludge compost	15	51.4	43.9			47.6
	30	69.6	47.1			58.3
Sludge	15	27.5	49.2			38.4
	30	33.2	46.4			39.8
Vegetable compost	15	47.8	58.5			53.2
	30	56.4	53.5			55.0

* Mean over None and 0.2 cwt N per acre only.

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WOBURN MARKET GARDEN EXPERIMENT

Leeks and Winter Cabbages 2nd Crops of 9th year.

Organic manures and sulphate of ammonia - Lansome 1950-51.

System of replication: 2 series, one for each crop, each consisting of 4 randomized blocks of 10 plots, certain interactions being confounded with block differences.

Area of each plot: 0.0125 acre.

Treatments:

Organic manures applied to previous crops: Dung, sewage sludge compost, sewage sludge (West Middlesex), and vegetable compost, each of 15 and 30 tons per acre.

Sulphate of ammonia: None, 0.4 cwt N per acre on organic manure plots. None, 0.4, 0.8, 1.2 cwt N per acre on plots not receiving organic manures.

Basal manuring: None.

Cultivations, etc.:

Series B. Leeks.

Ploughed and harrowed: July 12. Sulphate of ammonia applied, plots having 0.8 and 1.2 cwt N receiving only half their dressings: July 13. Leeks planted and watered in: July 13-18. Cultivated: July 27. Hoed: July 31-Aug 2, Aug 9, 10, 12-16, 25-30, Sept 1-2, 4-8 and 11. Replanted where necessary: Aug 21 and Sept 1. Second dressing of sulphate of ammonia applied to plots having 0.8 and 1.2 cwt N: Nov 17. Lifted: Feb 13-Mar 28. Variety: Musselburgh. Previous crop: Peas.

Series A. Winter Cabbages.

Ploughed: July 27. Harrowed, rolled, sulphate of ammonia applied, plots having 0.8 and 1.2 cwt N receiving only half their dressings July 28. Cabbages planted and watered in: July 28-29. Replanted where necessary: Aug 8-9, 21 and Sept 21. Hoed: Aug 9-10 and Sept 2-4. Second dressing of sulphate of ammonia applied to plots having 0.8 and 1.2 cwt N: Nov 17. Lifted: Feb 23-Apr 10. Variety: January King. Previous crop: Globe Beet.

Standard errors per plot:

Leeks,	total weight	9.40 cwt per acre or 8.8% (17 d.f.)
	plant number:	0.560 thousands per acre or 1.3% (")
Winter Cabbages,	marketable weight:	0.662 tons per acre or 8.3% (")
	plant number:	1.01 thousands per acre or 6.7% (")

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Summary of Results

Leeks

Organic manures	Level of manuring tons per acre	Sulphate of Ammonia cwt N per acre None	0.4	0.8	1.2	Mean
Total weight: cwt per acre			(±6.64)			(±4.70)
None		64.2	89.8	94.4	104.8	77.0*
Dung	15	96.8	105.2			101.0
	30	104.8	119.4			112.1
Sludge compost	15	96.3	123.1			109.7
	30	117.9	117.9			117.9
Sludge	15	112.2	114.4			113.3
	30	129.4	129.9			129.6
Vegetable compost	15	93.2	115.2			104.2
	30	96.2	107.4			101.8
Plant number: thousands per acre			(±0.40)			(±0.28)
None		43.2	42.5	42.4	42.8	42.8*
Dung	15	42.6	43.4			43.0
	30	43.0	42.2			42.6
Sludge compost	15	42.3	42.8			42.6
	30	43.6	41.9			42.8
Sludge	15	43.0	42.8			42.9
	30	42.4	42.4			42.4
Vegetable compost	15	42.8	42.9			42.9
	30	42.6	43.0			42.8

* Mean over None and 0.4 cwt N per acre only.

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Winter Cabbages

Organic manures	Level of manuring tons per acre	Sulphate of Ammonia cwt N per acre None	0.4	0.8	1.2	Mean
Marketable weight: tons per acre						
			(±0.468)			(±0.331)
None		3.70	5.90	7.47	8.15	4.80*
Dung	15	6.30	7.80			7.05
	30	8.02	9.24			8.63
Sludge compost	15	6.26	7.06			6.66
	30	7.52	10.64			9.08
Sludge	15	8.16	10.30			9.23
	30	11.57	10.67			11.12
Vegetable compost	15	5.60	7.71			6.65
	30	7.82	9.70			8.76
Plant number: thousands per acre						
			(±0.71)			(±0.51)
None		11.6	13.4	15.1	15.6	12.5*
Dung	15	14.6	15.5			15.1
	30	15.6	16.2			16.0
Sludge compost	15	13.7	14.9			14.3
	30	15.3	16.0			15.7
Sludge	15	14.8	16.2			15.5
	30	16.2	15.8			16.0
Vegetable compost	15	12.8	15.2			14.0
	30	15.2	16.6			15.9

*Mean over None and 0.4 cwt N per acre only.

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