ROTHAMSTED RESEARCH

Yields of the Field Experiments 1951

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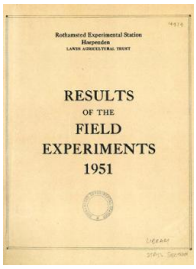

Long-term Experiments

Rothamsted Research

Rothamsted Research (1952) *Long-term Experiments ;* Yields Of The Field Experiments 1951, pp 13 - 59 **- DOI: https://doi.org/10.23637/ERADOC-1-171**

THREE COURSE ROTATION EXPERIMENT

The 19th year

Ploughing in straw - Long Hoos VI 1951.

For details of rotation and treatment see Appendix Z 1950.

Area of each plot: 0.0200 acre.

Cultivations, etc:

Potatoes (Series 2)

Adco and all autumn fertilizers applied: Jan 29. Straw applied, ploughed all plots: Mar 5. Spring fertilizers applied: May 3. Ridged: May 9. Potatoes planted by dropper into top of ridges: May 10. Earthed up ridges: July 6. Sprayed with copper fungicide, 5 lb per acre: Aug 14 and again Sept 8. Sprayed with 15% sulphuric acid: Sept 26. Lifted Oct 8th. Variety: Majestic.

Barley (Series 1)

Adco, straw and all autumn fertilizers applied: Jan 29. Ploughed: Mar 5. Spring fertilizers applied, seed drilled at 3 bushels per acre: Apr 17. Harvested: Aug 29. Variety: Plumage Archer.

Sugar beet (Series 3)

Adco applied: Jan 29. Autumn fertilizers and straw applied: Jan 30. Ploughed: Mar 5. Spring fertilizers applied: Apr 24. Seed drilled at 18 lb per acre: May 2. Singled: June 18. Lifted: Nov 7. Variety: Klein E.

Standard errors per plot:

Potatoes,	Total clean tubers:	0.500 tons per acre or 7.8% (8 d.f.)
Barley,	Grain:	3.62 cwt per acre or 14.9% (8 d.f.)
Sugar beet,	Total sugar:	4.46 cwt per acre or 13.1% (8 d.f.)
	Tops:	1.31 tons per acre or 14.8% (8 d.f.)

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Summary of Results

	Treatments applied 1949/50					Treatments applied 1950/51				
	Art.	Adco	St 1	St 2	Mean	Art.	Adco	St 1	St 2	Mean
Potatoes										
Total clean tubers: tons per acre	5.36	6.40	6.23	6.16	6.04 (±0.144)	7.50	6.05	6.22	7.34	6.78 (±0.144)
		(±0.289)					(±0.289)			
Percentage ware	75.8	81.5	79.4	81.9	79.6	82.7	82.7	83.7	83.6	83.2
Barley										
Grain: cwt per acre	21.1	20.8	21.4	24.6	22.0 (±1.04)	30.3	21.3	28.1	26.8	26.6 (±1.04)
		(±2.09)					(±2.09)			
Straw: cwt per acre	19.3	19.9	18.2	22.4	19.9	30.0	19.4	25.7	23.7	24.7
Sugar beet										
Roots (washed): tons per acre	9.84	8.18	10.00	10.30	9.58	12.53	8.43	10.32	8.52	9.95
Sugar Percentage	17.51	17.71	17.37	17.40	17.50	17.45	17.58	17.46	17.16	17.42
Total sugar: cwt per acre	34.5	29.0	34.8	35.9	33.5 (±1.29)	43.8	29.7	36.0	29.2	34.7 (±1.29)
		(±2.58)					(±2.58)			
Tops: tons per acre	8.35	7.19	8.88	9.37	8.45 (±0.378)	12.30	7.31	9.74	7.80	9.29 (±0.378)
		(±0.756)					(±0.756)			
Plant number: thous. per acre	27.7	27.8	26.4	27.9	27.4	27.1	26.8	26.5	25.7	26.5

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Responses to Magnesium Sulphate

	Treatments applied 1949/50					Treatments applied 1950/51				
	Art.	Adco	St 1	St 2	Mean	Art.	Adco	St 1	St 2	Mean
Potatoes										
Total clean tubers: tons per acre	0.50	1.23 (±0.612)	-0.47	-0.32	0.23 (±0.306)	1.34	0.11 (±0.612)	-0.98	-0.63	-0.04 (±0.306)
Percentage ware	2.4	4.6	-1.3	5.5	2.8	0.8	1.8	6.7	2.1	2.8
Barley										
Grain: cwt per acre	-1.2	-4.1 (±4.43)	-5.3	0.6	-2.5 (±2.21)	-3.7	-1.5 (±4.43)	1.2	-3.4	-1.8 (±2.21)
Straw: cwt per acre	-0.3	-3.1	-6.9	-0.5	-2.7	-2.8	-0.3	2.3	-4.4	-1.3
Sugar beet										
Roots (washed): tons per acre	-0.36	1.40	1.25	1.53	0.95	-1.24	1.03	-3.52	0.09	-0.91
Sugar percentage	0.34	-0.02	-0.30	0.44	0.11	-0.52	0.33	0.16	0.48	0.11
Total sugar: cwt per acre	-0.6	4.9 (±5.47)	3.7	6.3	3.6 (±2.73)	-5.6	4.1 (±5.47)	-12.0	1.1	-3.1 (±2.73)
Tops: tons per acre	-0.67	0.94 (±1.60)	1.95	1.09	0.83 (±0.80)	-2.50	-0.25 (±1.60)	-4.09	0.49	-1.59 (±0.80)
Plant number: thous. per acre	-0.5	-1.7	2.1	1.3	0.3	1.4	2.1	-0.7	-1.1	0.4

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51/Ba/2.1

FOUR COURSE ROTATION EXPERIMENT

The 22nd year

Direct and residual effects of organics and phosphates - Hoosfield 1951.

For details of treatments and rotation see Appendix Z 1950.

Area of each plot: Potatoes: 0.0242 acre. Barley: 0.030.
Ryegrass and wheat: 0.0244 acre.

Manures (cwt per acre) applied 1950-51

	Organic fertilizers				Additional fertilizers		
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.)	1.514	0.566	1.121	0.286	0.634	1.879
Adco	50 (as Adco)	1.207	0.522	0.826	0.593	0.678	2.174
Straw	126 (as Straw)	0.992	0.290	1.614	0.808	0.910	1.386
Super			None		0.36	1.2	0.6
Rock Phosphate			None		0.36	1.2*	0.6

*As rock phosphate

Cultivations, etc.:

Potatoes: Ploughed: Aug 30. Dung and Adco applied: Jan 26. Supplementary fertilizers to dung and Adco and first two dressings to straw plots applied: Jan 30. Straw applied, all plots ploughed: Mar 5. Spring fertilizers, including third dressing to straw plots applied, ridged: May 9. Potatoes planted with dropper machine: May 10. Earthed up ridges: July 19. Sprayed with copper fungicide 5 lb per acre: Aug 14 and again Sept 8. Sprayed with 15% sulphuric acid: Sept 26. Lifted: Oct 9. Variety: Majestic.

Barley. Dung, Adco and supplementary fertilizers, and first two dressings to straw plots applied: Jan 30. Straw applied, all plots ploughed: Feb 7. Ground chalk 19 cwt per acre applied: Apr 5. Spring fertilizers and third dressing to straw plots applied, seed drilled at 3 bushels per acre: Apr 17. Harvested: Sept 10. Variety: Plumage Archer.

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Ryegrass. Dung, Adco and supplementary fertilizers, and first dressing to straw plots applied: Sept 14. Straw applied, all plots ploughed: Sept 18. Autumn fertilizers and second dressing to straw plots applied: Oct 12. Sulphate of ammonia and third dressing to straw plots applied: Apr 17. Seed sown at 70 lb per acre: Apr 19. Harvested: July 20. Variety: Western Wolths.

Wheat. Ploughed: Aug 5. Dung, Adco and supplementary fertilizers, and first dressing to straw plots applied: Sept 18. Straw applied, ploughed all plots: Sept 19. Autumn fertilizers applied: Oct 9. Seed drilled at 3 bushels per acre: Oct 18. Second dressing to straw plots applied: Jan 31. Sulphate of ammonia and third dressing to straw plots applied: May 9. Harvested: Aug 24. Variety: Squareheads Master 13/4.

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Summary of Results

Manure+	Year of Cycle	Potatoes: Total clean tubers, tons per acre — Additional N: Without	With	Mean	Resp. to Nitrogen	Potatoes: Percentage Ware — Additional N: Without	With	Mean	Resp. to Nitrogen	Barley: Grain cwt per acre	Barley: Straw cwt per acre	Ryegrass: Dry matter cwt per acre	Wheat: Grain cwt per acre	Wheat: Straw cwt per acre
	I	4.63	5.76	5.20	1.13	73.9	85.7	79.8	11.8	25.0	21.4	8.3	15.0	28.3
Manure	II	5.03	7.85	6.44	2.82	78.1	88.0	83.0	9.9	16.6	11.3	6.1	13.7	21.1
as	III	5.13	6.56	5.84	1.43	78.4	83.5	81.0	5.1	15.0	9.8	5.2	13.3	18.6
F.Y.M.	IV	4.01	4.87	4.44	0.86	78.4	84.6	81.5	6.2	12.1	7.9	5.7	11.5	14.7
	V	4.67	5.72	5.20	1.05	77.8	83.5	80.6	5.7	15.3	11.6	5.8	12.9	17.3
Manure	I	6.20	7.82	7.01	1.62	84.8	89.7	87.2	4.9	23.7	19.9	9.8	22.0	38.9
as	II	4.08	5.30	4.69	1.22	82.5	86.2	84.4	3.7	17.6	13.1	5.7	15.0	21.1
Adco	III	4.85	6.20	5.52	1.35	82.3	86.2	84.2	3.9	13.7	10.2	5.2	12.6	19.4
(straw	IV	4.87	4.61	4.74	-0.26	78.3	76.6	77.4	-1.7	14.8	11.2	7.2	12.3	16.5
compost)	V	3.34	3.74	3.54	0.40	74.6	77.6	76.1	3.0	9.7	7.2	5.2	12.6	17.7
	I	5.89	5.24	5.56	-0.65	79.3	81.4	80.4	2.1	24.6	18.0	7.0	18.0	26.6
Manure	II	4.99	6.99	5.99	2.00	76.3	82.0	79.2	5.7	17.8	12.8	2.3	15.4	23.5
as	III	4.99	4.99	4.99	0.00	81.0	80.8	80.9	-0.2	15.4	10.8	6.1	15.2	23.3
Straw	IV	4.71	5.79	5.25	1.08	78.4	79.6	79.0	1.2	12.5	9.6	7.4	12.0	15.7
	V	4.59	5.59	5.09	1.00	79.8	84.2	82.0	4.4	15.7	11.0	4.7	12.6	16.9
	I	6.05	6.18	6.12	0.13	81.0	87.1	84.0	6.1	22.8	18.3	7.7	16.7	27.6
Super-	II	6.32	7.15	6.74	0.83	82.7	86.4	84.6	3.7	21.6	17.0	5.6	15.2	21.8
phosphate	III	5.52	5.54	5.53	0.02	82.6	87.0	84.8	4.4	23.5	18.4	5.8	16.0	23.0
	IV	5.76	7.30	6.53	1.54	80.3	89.9	85.1	9.6	18.7	14.6	4.2	16.5	25.5
	V	4.40	6.72	5.56	2.32	82.8	89.3	86.0	6.5	20.8	18.1	5.9	16.3	24.0
	I	4.68	4.87	4.78	0.19	86.0	85.7	85.8	-0.3	15.5	11.3	6.6	18.4	25.7
Rock	II	4.32	5.45	4.88	1.13	89.3	88.6	89.0	-0.7	21.1	15.8	4.7	16.4	23.5
phosphate	III	3.80	3.65	3.72	-0.15	80.2	82.1	81.2	1.9	19.5	16.7	5.5	15.2	22.5
	IV	4.01	3.46	3.74	-0.55	81.5	82.2	81.8	0.7	22.3	17.8	5.1	17.8	27.2
	V	4.33	2.87	3.60	-1.46	83.7	73.9	78.8	-9.8	20.6	17.2	8.0	15.3	22.3

+Note. All manures are supplemented by fertilizers as shown in table on page 51/Ba/2.1

51/Ba/3.1

SIX COURSE ROTATION EXPERIMENT

The 22nd year

Seasonal effects of fertilizers - Rothamsted Long Hoos IV and Woburn Stackyard, 1951.

For details of rotation and treatments etc. see Appendix Z 1950.

Area of each plot: Rothamsted - 0.0250 acre. Woburn-0.0266 acre.

Cultivations, etc.:

Rothamsted

Sugar beet.
Ploughed: Aug 16 and again Jan 27. Fertilizers applied: Apr 25. Seed drilled at 18 lb per acre: May 2. Singled: June 13. Lifted: Nov 1. Variety: Klein E.

Barley.
Ploughed: Jan 25. Ground chalk applied: Apr 5. Fertilizers applied: Apr 14. Seed drilled at 3 bushels per acre: Apr 16. Harvested: Aug 25. Variety: Plumage Archer.

Clover.
Seed undersown in barley at 40 lb per acre: Mar 21. Autumn fertilizers applied: Oct 4. Sulphate of ammonia applied: May 3. Cut: July 7. Variety: Late flowering Montgomery Red.

Wheat.
Ploughed: Aug 10. Autumn fertilizers applied: Oct 5. Seed drilled at 3 bushels per acre: Oct 18. Sulphate of ammonia applied: May 21. Harvested: Aug 14. Variety: Yeoman.

Potatoes.
Ploughed: Aug 16 and again Jan 27. Fertilizers applied on the flat: May 3. Ridged: May 9. Potatoes planted with dropper machine into top of ridges: May 10. Earthed up: June 23. Sprayed with copper fungicide 5 lb per acre: Aug 14 and again Sept 8. Sprayed with 15% sulphuric acid: Sept 26. Lifted: Oct 9. Variety: Majestic.

Rye.
Ploughed: Oct 19. Ground chalk applied: Oct 20. Autumn fertilizers applied and seed drilled at 3 bushels per acre: Oct 21. Sulphate of ammonia applied: May 21. Harvested: Aug 14. Variety: King II.

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Woburn

Sugar beet.
Ploughed: Aug 29 and again Oct 20. Fertilizers applied: Apr 20. Seed drilled at 18 lb per acre: May 2. Singled: June 8. Lifted: Oct 11. Variety: Klein E.

Barley.
Ploughed: Oct 6. Ground chalk applied: Apr 5. Fertilizers applied and seed drilled at 3 bushels per acre: Apr 16. Harvested: Sept 3. Variety: Plumage Archer.

Clover.
Seed undersown in barley at 40 lb per acre: Mar 22. Autumn fertilizers applied: Oct 20. Sulphate of ammonia applied: May 7. Cut: July 9. Variety: Late flowering Montgomery Red.

Wheat.
Ploughed: July 20. Autumn fertilizers applied: Oct 17. Seed drilled at 3 bushels per acre: Oct 19. Sulphate of ammonia applied: May 7. Harvested: Aug 20. Variety: Squareheads Master 13/4.

Potatoes.
Ploughed: Aug 19 and again Oct 5. Fertilizers applied:May 3. Ridged: May 7. Potatoes planted: May 8. Earthed up: July 11. Sprayed with copper fungicide 5 lb per acre: Aug 8 and again Sept 8. Sprayed with 15% sulphuric acid: Sept 26. Lifted: Oct 4. Variety: Majestic.

Rye.
Ploughed: Oct 5. Autumn fertilizers applied: Oct 17. Seed drilled at 3 bushels per acre: Oct 19. Ground chalk applied: Apr 5. Sulphate of ammonia applied: May 7. Harvested: Aug 20. Variety: King II.

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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	10.05	6.19	27.9	16.9
Response to: N	0.73	5.19	8.7	19.5
P	1.26	-0.65	-1.7	-12.3
K	-0.78	-0.79	0.9	-2.8
	Sugar Beet, sugar percentage		Barley, straw: cwt per acre	
Mean	17.20	16.51	31.0	18.3
Response to: N	-0.63	-1.69	-2.8	5.9
P	0.12	-0.63	-2.5	-10.8
K	-0.17	-1.22	2.9	1.7
	Sugar Beet, total sugar: cwt per acre		Clover, hay: dry matter cwt per acre	
Mean	34.6	20.4	39.2	48.5
Response to: N	1.3	14.9	8.6	-22.1
P	4.7	-3.2	-6.0	29.9
K	-3.0	-4.0	-3.8	-1.5
	Sugar Beet, tops: tons per acre		Wheat, grain: cwt per acre	
Mean	10.66	5.62	26.8	8.7
Response to: N	6.09	6.55	23.4	19.9
P	2.15	-0.65	-0.3	10.7
K	-0.36	-0.15	-0.7	-1.4
	Sugar Beet, plant number: thousands per acre		Wheat, straw: cwt per acre	
Mean	29.3		37.9	16.4
Response to: N	-0.2		36.9	28.5
P	-0.3		0.5	8.3
K	1.6		1.6	-1.5

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	Rothamsted	Woburn	Rothamsted	Woburn
	Potatoes, total tubers tons per acre		Rye, grain: cwt per acre	
Mean	7.42	8.34	25.6	18.1
Response to: N	2.14	4.61	17.0	21.1
P	1.39	2.29	0.0	-5.5
K	0.03	0.60	1.5	3.6
	Potatoes, percentage ware		Rye, straw: cwt per acre	
Mean	85.3	82.0	28.2	17.8
Response to: N	0.4	11.2	13.9	19.5
P	-3.9	2.8	4.1	-4.0
K	3.0	5.3	-0.1	5.1

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

51/Bb/1.1

DEEP CULTIVATION ROTATION EXPERIMENT

The 8th Year

Deep ploughing, fertilizers and dung - Long Hoos I and II 1951.

For details of rotation and treatments etc see Appendix Z 1950.

Area of each plot: 0.0312 acre. Area harvested: wheat, spring oats, barley, 0.0265 acre; ley 0.0275 acre; sugar beet (half plot), 0.0119 acre; potatoes (half plot), 0.0107 acre.

Cultivations, etc:

Sugar beet (Series 6)
Fertilizers for ploughing in applied: Sept 8. Dung applied and ploughed in 'deep': Sept 29. Dung applied and ploughed in 'shallow': Oct 3. Fertilizers for surface applications broadcast: Apr 26. Seed drilled at 18 lb per acre: May 2. Singled: June 20. Lifted: Nov 7. Variety: Klein E.

Barley (Series 2)
Ploughed: Feb 2 and again Mar 5. Basic slag applied: Apr 11. Seed drilled at 3 bushels per acre and basal sulphate of ammonia applied: Apr 16. Harvested: Sept 3. Variety: Plumage Archer.

Ley (Series 3)
Seeds undersown in barley: Mar 22 1950. Harvested: June 18 1951. Seeds mixture (per acre) 18 lb S.24 perennial ryegrass, 8 lb Montgomery red clover, 2 lb Canadian Alsike clover.

Wheat (Series 4)
Ploughed 'deep' plots: July 19. Ploughed 'shallow' plots: Aug 1. Ploughed all plots: Sept 18. Seed drilled at 3¼ bushels per acre: Nov 1. Basal sulphate of ammonia drilled: May 25. Harvested: Aug 16. Variety: Yeoman.

Potatoes (Series 5)
Fertilizers for ploughing in applied: Sept 8. Dung applied and ploughed in 'deep': Sept 28. Dung applied and ploughed in 'shallow': Oct 3. Ridged: May 15. Fertilizers applied in ridges, potatoes planted: May 18. Earthed up ridges: July 19. Sprayed with copper fungicide 5 lb per acre: Aug 15 and again Sept 8. Sprayed with 15% sulphuric acid: Sept 26. Lifted: Oct 12. Variety: Majestic.

Spring oats (Series 1)
Ploughed: Nov 6. Seed at 4 bushels per acre, and basal sulphate of ammonia drilled: Apr 16. Harvested: Aug 16. Variety: Star.

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

Standard errors per plot:

Sugar beet	Total sugar,	whole plot, 4.21 cwt per acre or 13.4%	(4d.f)
		sub-plot, 2.06 cwt per acre or 6.6%	(7d.f)
	Tops,	whole plot, 1.65 tons per acre or 10.8%	(4d.f)
		sub-plot, 1.05 tons per acre or 6.9%	(7d.f)
Barley	Grain,	2.34 cwt per acre or 8.0%	(4d.f)
Ley	Hay,	2.90 cwt per acre or 5.0%	(4d.f)
Wheat	Grain,	3.66 cwt per acre or 14.0%	(4d.f)
Potatoes	Total clean tubers,	whole plot, 0.861 tons per acre or 18.0%	(4d.f)
		sub-plot, 1.249 tons per acre or 26.0%	(7d.f)
Spring oats	Grain,	0.819 cwt per acre or 2.4%	(4d.f)

Erratum to 1950 Results 50/Bb/1.1

Ley. The seeds mixture should have been shown as 18 lb Ryegrass S.24, 4 lb English red clover (Montgomery), 2 lb American Alsike clover.

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

Summary of Results

Series 6: Sugar Beet

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Roots (washed): Mean yield 9.82 tons per acre									
Ploughing deep-shallow	1.55	-	-	2.13	0.97	1.91	1.19	1.35	1.75
Dung	2.05	2.63	1.47	-	-	2.93	1.17	2.53	1.57
Superphosphate	0.40	0.76	0.04	1.28	-0.48	-	-	0.95	-0.15
Potash	1.33	1.13	1.53	1.81	0.85	1.88	0.78	-	-
Sugar percentage: Mean 16.03									
Ploughing deep-shallow	-0.18	-	-	-0.35	-0.01	-0.28	-0.08	-0.10	-0.26
Dung	-0.01	-0.18	0.16	-	-	-0.07	0.05	-0.20	0.18
Superphosphate	0.11	0.01	0.21	0.05	0.17	-	-	0.10	0.12
Potash	0.18	0.26	0.10	-0.01	0.37	0.17	0.19	-	-
Total Sugar: Mean yield 31.4 cwt per acre									
	(±2.11)				(±2.98)				
Ploughing deep-shallow	4.6	-	-	6.2	3.0	5.5	3.7	4.1	5.1
Dung	6.6	8.2	5.0	-	-	9.3	3.9	7.7	5.5
Superphosphate	1.5	2.4	0.6	4.2	-1.2	-	-	3.2	-0.2
Potash	4.6	4.1	5.1	5.7	3.5	6.3	2.9	-	-
Tops: Mean yield 15.23 tons per acre									
	(±0.825)				(±1.167)				
Ploughing deep-shallow	0.66	-	-	1.61	-0.29	0.73	0.59	0.50	0.82
Dung	1.80	2.75	0.85	-	-	2.53	1.07	1.91	1.69
Superphosphate	0.26	0.33	0.19	0.99	-0.47	-	-	0.50	0.02
Potash	1.10	0.94	1.26	1.21	0.99	1.34	0.86	-	-
Plant Number: Mean 25.6 thousands per acre									
Ploughing deep-shallow	1.5	-	-	0.7	2.3	1.5	1.5	1.1	1.9
Dung	-0.4	-1.2	0.4	-	-	0.4	-1.2	-0.4	-0.4
Superphosphate	0.9	0.9	0.9	1.7	0.1	-	-	1.7	0.1
Potash	-0.2	-0.6	0.2	-0.2	-0.2	0.6	-1.0	-	-
Noxious Nitrogen: Mean 40.9 mgs. %									
Ploughing deep-shallow	0.6	-	-	4.4	-3.2	0.0	1.2	-1.9	3.1
Dung	2.5	6.3	-1.3	-	-	-1.3	6.3	1.9	3.1
Superphosphate	-0.6	-1.2	0.0	-4.4	3.2	-	-	5.6	-6.8
Potash	-3.8	-6.3	-1.3	-4.4	-3.2	2.4	-10.0	-	-

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Series 6: Sugar Beet

	Phosphate			Potash		
	None	Ploughed in	In seed bed	None	Ploughed in	In seed bed	Mean
Roots (washed): tons per acre							
Shallow	8.66	9.58	9.27	8.48	9.97	9.24	9.04
Deep	10.57	10.40	10.81	9.82	11.28	11.42	10.59
No dung	8.15	9.39	9.47	7.89	9.80	9.59	8.79
Dung	11.08	10.59	10.61	10.42	11.45	11.07	10.84
Mean	9.62	9.99	10.04	9.15	10.63	10.33	9.82
Sugar Percentage							
Shallow	16.12	16.12	16.15	15.99	16.20	16.30	16.12
Deep	15.84	15.93	16.16	15.89	15.97	16.02	15.94
No dung	16.01	15.84	16.29	16.04	15.82	16.26	16.04
Dung	15.94	16.21	16.02	15.84	16.36	16.07	16.03
Mean	15.98	16.02	16.16	15.94	16.09	16.16	16.03
Total Sugar: cwt per acre							
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	27.9	30.8	29.8	27.1	32.3	30.1	29.1
Deep	33.5	33.2	35.0	31.2	36.1	36.6	33.8
No dung	26.1	29.6	30.8	25.3	30.9	31.2	28.2
Dung	35.4	34.3	34.0	33.0	37.4	35.5	34.7
Mean	30.7	32.0	32.4	29.1	34.2	33.3	31.4
Tops: tons per acre							
	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	14.74	14.40	15.73	14.43	15.09	15.65	14.90
Deep	15.46	15.11	16.21	14.93	15.99	16.40	15.56
No dung	13.84	14.43	15.22	13.73	14.65	15.22	14.33
Dung	16.36	15.07	16.72	15.63	16.43	16.82	16.13
Mean	15.10	14.75	15.97	14.68	15.54	16.02	15.23

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

Standard errors:	(a)	(b)	(c)
Total sugar	2.11	1.03	2.23
Tops	0.825	0.526	0.905

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Series 6: Sugar Beet

	Phosphate			Potash			
	None	Ploughed in	In seed bed	None	Ploughed in	In seed bed	Mean
Plant number: thousands per acre							
Shallow	24.4	25.9	24.8	25.1	24.7	24.4	24.9
Deep	25.9	26.5	27.2	26.3	26.3	26.7	26.4
No dung	25.0	26.5	26.9	25.9	25.6	25.9	25.8
Dung	25.3	25.8	25.1	25.5	25.4	25.2	25.4
Mean	25.1	26.2	26.0	25.7	25.5	25.6	25.6
Noxious nitrogen: mgs %							
Shallow	41.2	42.5	37.5	43.8	38.8	36.2	40.6
Deep	41.2	45.0	37.5	41.9	46.2	35.0	41.2
No dung	41.9	42.5	32.5	41.9	40.0	35.0	39.7
Dung	40.6	45.0	42.5	43.8	45.0	36.2	42.2
Mean	41.2	43.8	37.5	42.8	42.5	35.6	40.9

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Series 1: Barley

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 29.2 cwt per acre									
	(±1.17)					(±1.65)			
Ploughing deep-shallow	-0.3	-	-	0.1	-0.7	1.4	-2.0	-0.8	0.2
Dung	4.4	4.8	4.0	-	-	5.6	3.2	5.5	3.3
Superphosphate	-1.3	0.4	-3.0	-0.1	-2.5	-	-	-0.5	-2.1
Potash	0.9	0.4	1.4	2.0	-0.2	1.7	0.1	-	-
Straw: Mean yield 30.5 cwt per acre									
Ploughing deep-shallow	-3.6	-	-	-1.9	-5.3	0.0	-7.2	-4.5	-2.7
Dung	8.5	10.2	6.8	-	-	8.2	8.8	10.5	6.5
Superphosphate	-0.8	2.8	-4.4	-1.1	-0.5	-	-	-1.1	-0.5
Potash	1.3	0.4	2.2	3.3	-0.7	1.0	1.6	-	-

Series 3: Ley

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Hay: Mean yield 57.5 cwt per acre									
	(±1.45)					(±2.05)			
Ploughing deep-shallow	-1.1	-	-	-0.1	-2.1	-0.9	-1.3	-2.2	0.0
Dung	-0.6	0.4	-1.6	-	-	-0.8	-0.4	-3.6	2.4
Superphosphate	0.7	0.9	0.5	0.5	0.9	-	-	2.1	-0.7
Potash	-0.3	-1.4	0.8	-3.3	2.7	1.1	-1.7	-	-

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Series 4: Wheat

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Grain: Mean yield 26.1 cwt per acre	(±1.83)					(±2.58)			
Ploughing deep-shallow	-0.5	-	-	0.4	-1.4	-0.6	-0.4	0.4	-1.4
Dung	-1.4	-0.5	-2.3	-	-	-3.6	0.8	-1.3	-1.5
Superphosphate	2.4	2.3	2.5	0.2	4.6	-	-	0.1	4.7
Potash	1.7	2.6	0.8	1.8	1.6	-0.6	4.0	-	-
Straw: Mean yield 33.3 cwt per acre									
Ploughing deep-shallow	3.1	-	-	0.4	5.8	3.3	2.9	1.4	4.8
Dung	3.2	0.5	5.9	-	-	0.0	6.4	0.6	5.8
Superphosphate	2.3	2.5	2.1	-0.9	5.5	-	-	-0.2	4.8
Potash	5.0	3.3	6.7	2.4	7.6	2.5	7.5	-	-

Series 5: Potatoes

Responses to treatments

	Mean	Ploughing Shallow	Ploughing Deep	Dung Abs.	Dung Pres.	Phosphate Abs.	Phosphate Pres.	Potash Abs.	Potash Pres.
Total tubers: Mean yield 4.79 tons per acre	(±0.431)					(±0.609)			
Ploughing deep-shallow	-1.46	-	-	-0.71	-2.21	-1.08	-1.84	-1.05	-1.87
Dung	2.58	3.33	1.83	-	-	2.37	2.79	3.51	1.65
Superphosphate	0.87	1.25	0.49	0.66	1.08	-	-	0.93	0.81
Potash	1.39	1.80	0.98	2.32	0.46	1.45	1.33	-	-
Percentage ware: Mean yield 82.3									
Ploughing deep-shallow	-2.6	-	-	-1.0	-4.2	-3.5	-1.7	-2.8	-2.4
Dung	6.7	8.3	5.1	-	-	6.5	6.9	9.9	3.5
Superphosphate	-1.8	-2.7	-0.9	-2.0	-1.6	-	-	0.2	-3.8
Potash	4.1	3.9	4.3	7.3	0.9	6.1	2.1	-	-

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Potatoes

	Phosphate: None	Phosphate: Ploughed in	Phosphate: In ridges	Potash: None	Potash: Ploughed in	Potash: In ridges	Mean
Total tubers: tons per acre	(a)	(b) and (c)		(a)	(b) and (c)		
Shallow	4.90	5.34	6.95	4.63	5.90	6.95	5.53
Deep	3.82	3.61	5.01	3.58	3.86	5.24	4.06
No dung	3.17	3.01	4.65	2.35	3.76	5.55	3.50
Dung	5.55	5.94	7.31	5.85	5.99	6.64	6.08
Mean	4.36	4.47	5.98	4.10	4.88	6.10	4.79
Percentage ware							
Shallow	85.0	84.7	79.8	81.7	86.1	85.0	83.6
Deep	81.4	80.1	81.1	78.9	83.1	83.2	81.0
No dung	80.0	77.8	78.2	75.4	81.7	83.4	79.0
Dung	86.4	87.0	82.7	85.2	87.5	84.7	85.6
Mean	83.2	82.4	80.4	80.3	84.6	84.1	82.3

Series I: Spring Oats

Responses to treatments

	Mean	Ploughing: Shallow	Ploughing: Deep	Dung: Abs.	Dung: Pres.	Phosphate: Abs.	Phosphate: Pres.	Potash: Abs.	Potash: Pres.
Grain: Mean yield 34.9 cwt per acre									
Ploughing	(±0.41)					(±0.58)			
deep-shallow	2.2	-	-	1.9	2.5	-1.2	5.6	1.6	2.8
Dung	4.1	3.8	4.4	-	-	4.7	3.5	2.2	6.0
Superphosphate	2.0	-1.4	5.4	2.6	1.4	-	-	2.9	1.1
Potash	0.8	0.2	1.4	-1.1	2.7	1.7	-0.1	-	-
Straw: Mean yield 36.7 cwt per acre									
Ploughing									
deep-shallow	0.0	-	-	2.4	-2.4	-2.4	2.4	-0.5	0.5
Dung	5.9	8.3	3.5	-	-	7.0	4.8	1.4	10.4
Superphosphate	2.8	0.4	5.2	3.9	1.7	-	-	1.9	3.7
Potash	3.7	3.2	4.2	-0.8	8.2	2.8	4.6	-	-

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

	(a)	(b)	(c)
Standard Error Total tubers	0.431	0.624	0.617

LEY AND ARABLE ROTATIONS

Highfield and Fosters Field - 1951.

For details of treatments and rotations etc. see Appendix Z 1950.

Cultivations, etc.:

Highfield

Wheat (Blocks 10 and 11). Ploughed: Oct 2. Seed drilled at 3¼ bushels per acre with basal fertilizers: Oct 19. Ground chalk applied: Mar 1. Nitrochalk applied: May 18. Harvested: Aug 18. Variety: Yeoman.

Potatoes (Blocks 5,6,7,8). Ploughed: Aug 25. Ridged: May 10. Dung, sulphate of ammonia and basal fertilizers applied, potatoes planted: May 16. Earthed up ridges: July 12 and again Aug 1. Sprayed with copper sulphate solution, 5 lb per acre: Aug 15 and again Sept 11. Sprayed with 20% sulphuric acid: Sept 29. Lifted: Oct 15. Variety: Majestic.

Barley (Blocks 1-4). Ploughed: Nov 3. Ground chalk applied to Blocks 1 and 4: Mar 31. Seed drilled at 3 bushels per acre with basal fertilizers: Apr 17. Nitrochalk applied: Apr 19. Harvested: Sept 10. Variety: Plumage Archer. The crop had been laid for a long time and the grain eaten by birds and therefore no yields were recorded.

Hay, Cut Grass, Grazed Ley, Lucerne and Reseeded Grass, all 1st year (Blocks 9 and 12, Reseeded Grass 9-12). Ploughed: Oct 2. Ground chalk applied: Mar 1. Basal fertilizers applied: Apr 23. Nitrochalk applied (none to Lucerne): May 21.

Hay. Seeds sown at 38 lb per acre: Apr 24. Cut: Aug 14.
Cut Grass. Seeds sown at 38 lb per acre: Apr 24. Cut: 4 times - June 5, July 9, Aug 20 and Oct 1. Nitrochalk applied after each cut except the last.
Grazed Ley. Seeds sown at 55 lb per acre: Apr 24. Nitrochalk applied: May 21. Grazed: 7 circuits July 6 - Oct 10.
Lucerne. Seed drilled at 33 lb per acre: Apr 24. Cut: twice - July 30 and Oct 2. Variety: Du Puits.
Reseeded Grass. Seeds sown at 55 lb per acre: Apr 24. Nitrochalk applied: July 20. Grazed: 7 circuits July 6 - Oct 10.

Permanent Grass. 1st year (Blocks 9-12). Ground chalk applied: Mar 1. Basal fertilizers applied: Apr 23. Nitrochalk applied: May 21. Pre-grazing cut: July 6. Nitrochalk applied: July 20. Grazed: 5 circuits July 6 - Oct 10.

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Cut Grass, Grazed Ley, Lucerne, Reseeded Grass, Permanent Grass all 2nd year (Blocks 5 and 8, Reseeded and Permanent Grass 5-8). Basal fertilizers applied: Mar 29. Nitrochalk applied (none to Lucerne): May 22.

Cut Grass. Cut: 4 times - May 31, July 9, Aug 20 and Oct 3. Nitrochalk applied after each cut except the last.
Grazed Ley, Pre-grazing cut: June 1. Nitrochalk applied: July 12. Grazed: 7 circuits June 28 - Oct 2.
Lucerne. Cut: 3 times - July 7, Aug 13, Oct 3.
Reseeded Grass, Pre-grazing cut: June 1. Nitrochalk applied: July 20. Grazed: 5 circuits June 28 - Oct 2.
Permanent Grass. Cut: June 1. Nitrochalk applied: July 20. Grazed: 5 circuits June 28 - Oct 18.

Cut grass 3rd year (Blocks 2 and 3). Basal fertilizers applied: Mar 29. Nitrochalk applied: May 21. Cut: 4 times - June 5, July 9, Aug 20 and Oct 1. Nitrochalk applied after each cut except the last.

Grazed Ley, 3rd year (Blocks 2 and 3). Basal fertilizers applied: Mar 29. Nitrochalk applied: May 21. Pre-grazing cut: June 4. Nitrochalk applied: July 14. Grazed: 6 circuits July 2 - Sept 26.
Lucerne, 3rd year (Blocks 2 and 3). Basal fertilizers applied: Mar 29. Cut: 3 times - July 7, Aug 13, Oct 2.
Reseeded grass, 3rd year (Blocks 1-4). Basal fertilizers applied: Mar 29. Ground chalk applied: Mar 31. Nitrochalk applied: May 18. Cut: June 18. Nitrochalk applied: July 5. Grazed: 5 circuits July 14-Oct 26.
Permanent grass, 3rd year (Blocks 1-4). Basal fertilizers applied: Mar 29. Ground chalk applied: Mar 31. Nitrochalk applied: May 18. Cut: June 19. Nitrochalk applied: July 5. Grazed: 5 circuits July 14-Oct 26.

Fosters

Wheat (Blocks 10 and 12). Ploughed: Sept 19. Seed drilled at 3 bushels per acre with basal fertilizers: Oct 21. Ground chalk applied: Feb 7 and again Mar 1. Nitrochalk applied: May 7. Harvested: Aug 18. Variety: Yeoman.

Potatoes (Blocks 5,7,8,9). Ploughed: Aug 21 and again Nov 14. Ridged: May 10. Dung, sulphate of ammonia and basal fertilizers applied: May 15. Potatoes planted: May 16. Earthed up ridges: July 6. Sprayed with copper sulphate solution, 5 lb per acre: Aug 15 and again Sept 8. Sprayed with 20% sulphuric acid: Sept 29. Lifted: Oct 13. Variety: Majestic.

Barley (Blocks 1-4). Ploughed: Nov 1. Seed drilled at 3½ bushels per acre with basal fertilizers: Apr 17. Nitrochalk applied: Apr 18. Harvested: Aug 30. Variety: Plumage Archer.

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Hay, Cut Grass, Grazed Ley, Lucerne and Reseeded Grass, all 1st year (Blocks 6 and 11, Reseeded Grass 6, 10,11,12). Ploughed: Sept 19. Ground chalk applied: Feb 7 and again Mar 1. Basal fertilizers applied: Apr 20. Nitrochalk applied (none to Lucerne): May 8.

Hay. Seeds sown at 38 lb per acre: Apr 20. The crop failed and no yields were recorded.
Cut Grass. Seeds sown at 38 lb per acre: Apr 20. Cut: Oct 5.
Grazed Ley. Seeds sown at 55 lb per acre: Apr 20. Nitrochalk applied: July 21. Grazed: 5 circuits July 11-Sept 27.
Lucerne. Seed drilled at 33 lb per acre: Apr 20. Cut: Oct 5. Variety: Du Puits.
Reseeded Grass. Seeds sown at 55 lb per acre: Apr 20. Grazed: 4 circuits July 13-Oct 21.

Cut Grass, Grazed Ley, Lucerne and Reseeded Grass, all 2nd year (Blocks 5 and 7, Reseeded Grass 5-9). Basal fertilizers applied: Mar 21. Nitrochalk applied (none to Lucerne): May 8.

Cut Grass. Cut: 4 times - June 8, July 10, Aug 22 and Oct 5. Nitrochalk applied after each cut except the last.
Grazed Ley. Cut: June 7. Nitrochalk applied: June 21. Grazed: 6 circuits July 3 - Oct 1.
Lucerne. Cut: 3 times - July 5, Aug 10, Oct 5.
Reseeded Grass. Cut: June 7. Nitrochalk applied: June 21. Grazed: 4 circuits July 3 - Oct 5.

Cut Grass, Grazed Ley, Lucerne and Reseeded Grass, all 3rd year. (Blocks 2 and 4, Reseeded Grass 1-4). Basal fertilizers applied: Mar 28. Nitrochalk applied (none to Lucerne): May 8.

Cut Grass. Cut: 4 times - June 8, July 10, Aug 22, Oct 4. Nitrochalk applied after each cut except the last.
Grazed Ley. Cut: June 7. Nitrochalk applied: July 21. Grazed: 6 circuits July 17 - Oct 5.
Lucerne. Cut: 3 times - July 5, Aug 10 and Oct 4.
Reseeded Grass. Cut: June 18. Nitrochalk applied: July 3. Grazed: 4 circuits July 11 - Oct 13.

Standard errors per sub plot:

Per ¼ plot.	Wheat, grain.	Highfield: 3.68 cwt per acre or 11.4% (23 d.f.)
		Fosters: 1.63 cwt per acre or 5.4% (23 d.f.)
	Potatoes, total clean tubers.	Highfield: 1.56 tons per acre or 15.6% (21 d.f.)
		Fosters: 1.17 tons per acre or 13.0% (21 d.f.)
	Barley.	Highfield: No yield recorded
		Fosters: 1.72 cwt per acre or 5.7% (21 d.f.)
	Hay, dry matter.	Highfield 1.16 cwt per acre or 9.8% (3 d.f.)
		Fosters: No yield recorded.

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Cut Grass, dry matter. Highfield: 5.24 cwt per acre or 8.6% (11 d.f.)
Fosters: 3.63 cwt per acre or 7.0% (11 d.f.)

Summary of Results

Wheat: cwt per acre

	Highfield			Fosters		
	cwt N per acre			cwt N per acre		
	0.3	0.6	Mean	0.3	0.6	Mean
	(±0.92)			(±0.41)		
Grain	32.7	32.1	32.4	23.1	32.5	30.3
Straw	50.6	51.5	51.0	38.1	46.7	42.4

Potatoes

		Highfield			Fosters		
		cwt N per acre			cwt N per acre		
	Dung: tons per acre	0.5	1.0	Mean	0.5	1.0	Mean
Total clean tubers: tons per acre				(±0.390)			(±0.293)
	None	10.26	9.29	9.78	8.44	8.14	8.29
			(±0.552)			(±0.414)	
	15	10.69	9.73	10.21	9.21	10.14	9.68
	Mean	10.48	9.51	9.99	8.83	9.14	8.99
			(±0.390)			(±0.293)	
Percentage Ware	None	88.2	90.5	89.4	91.2	89.7	90.4
	15	89.2	89.7	89.4	90.0	91.1	90.6
	Mean	88.7	90.1	89.4	90.6	90.4	90.5

Barley: cwt per acre

Highfield

	Dung: tons per acre applied in 1950	Fosters cwt N per acre 0.2	0.4	Mean
				(±0.43)
Grain	None	27.9	30.5	29.2
	Crop failed		(±0.61)	
	15	29.3	32.7	31.0
	Mean	28.6	31.6	30.1
			(±0.43)	
Straw	None	27.7	30.0	28.8
	15	30.1	33.4	31.8
	Mean	28.9	31.7	30.3

One year Hay: Dry Matter: cwt per acre

cwt N per acre 0.3	0.6	Mean
12.4	11.5	11.9
	(±0.58)	

Crop failed

Cut Grass: Dry Matter: cwt per acre

	No. of cuts	cwt N per acre for each cut 0.15	0.30	Mean	No. of cuts	cwt N per acre for each cut 0.15	0.30	Mean
		(±2.62)		(±1.85)		(±1.81)		(±1.28)
1st year	4	40.6	44.5	42.5	1	17.8	15.4	16.6
2nd year	4	64.9	68.3	66.6	4	70.0	72.7	71.4
3rd year	4	67.0	78.9	73.0	4	63.7	71.2	67.5
Mean		57.5	63.9	60.7		50.5	53.1	51.8
		(±1.51)				(±1.05)		

Lucerne: Dry Matter: cwt per acre

	No. of cuts		No. of cuts	
1st year	2	33.3	1	13.0
2nd year	3	72.6	3	84.2
3rd year	3	73.3	3	88.8

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Grazed Plots

Estimates from sample cuts of amount of Dry Matter cwt per acre, eaten by sheep.

		Highfield			Fosters		
		cwt N per acre			cwt N per acre		
		0.15	0.30	Mean	0.15	0.30	Mean
Permanent Grass							
1st year blocks	Pre-grazing cut+	19.0	17.3	18.2			
	Grazing	33.6	34.5	34.0			
2nd year blocks	Pre-grazing cut+	22.2	25.9	24.0			
	Grazing	31.4	28.9	30.2			
3rd year blocks	Hay	47.0	47.5	47.2			
	Aftermath grazing*	22.0	24.7	23.4			
Ley & Reseeded Grass							
1st year L & R.G.	Grazing	42.7	40.7	41.7	23.0	25.9	24.4
2nd year L & R.G.	Pre-grazing cut+	30.8	28.6	29.7	38.9	39.8	39.3
	Grazing	26.0	30.4	28.2	24.2	24.3	24.3
3rd year L	Pre-grazing cut+	35.6	43.8	39.7	32.9	35.5	34.2
	Grazing	30.1	24.5	27.3	30.9	29.9	30.4
3rd year R.G.	Hay	49.5	50.3	49.9	46.9	47.9	47.4
	Aftermath grazing*	16.6	19.7	18.2	24.4	25.8	25.1

+ Owing to pressure of spring work it was necessary to take a preliminary cut before grazing on Permanent Grass 1st and 2nd year blocks, Ley 2nd and 3rd years, Reseeded Grass 2nd year.

* An additional dressing of nitrochalk at the indicated rates was applied to the aftermath.

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

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51/Bd/1.1

GREEN MANURING EXPERIMENT

Woburn Stackyard - 1951, the 15th year

For details of treatments etc. see Appendix Z 1950.

Cultivations, etc.:

Green manures (Lower half). Clover and ryegrass undersown in barley: Mar 22. Ploughed fallow, lupin and rape plots: Aug 30, Oct 20 and Mar 21. Sulphate of ammonia applied, lupins and rape sown: Apr 19. Rape dusted with D.D.T: May 12 and 26.

Cabbages (Lower half). Dung and straw applied to fallow, clover and ryegrass plots, and ploughed in: June 8. Basal fertilizers applied, cabbages planted and watered in, on 'early' half plots of fallow, lupins and ryegrass: June 13. Owing to dry weather the cabbages on 'early' half plots failed, and decision was made to replant: July 9. Dung and straw applied to lupin and rape plots and ploughed in: July 10. Reploughed rape plots: July 12. Basal fertilizers applied to remaining plots, cabbages planted and watered in on all plots: July 25. Harvested: Jan 9. Variety: January King.

Barley (Upper half). Ploughed: Mar 29 Ground chalk (44½ cwt per acre) applied: Apr 5. Seed drilled at 3 bushels per acre: Apr 16. Ground chalk (43 cwt per acre) applied: Apr 17. Sulphate of ammonia applied, clover and ryegrass undersown: Apr 18. Harvested: Sept 3. Variety: Plumage Archer.

Standard errors per plot:

Cabbages, weight of headed cabbages: 0.383 tons per acre or 20.4% (9 d.f.)

Barley, grain: 1.99 cwt per acre or 12.6% (7 d.f.)*

*2 missing values.

Summary of Results

Lower Half - Cabbages

	Green Manure					
	None	Lupins	Clover	Rape	Rye-grass	Mean
Weight of headed cabbages: tons per acre (±0.192)						(±0.086)
No Dung	1.36	1.74	2.43	0.84	1.62	1.60
Dung	1.84	2.81	3.03	0.82	2.28	2.15
No Straw	1.52	2.23	2.85	1.08	2.10	1.96
Straw	1.67	2.33	2.61	0.58	1.80	1.80
Sulph. amm.						
2 cwt per acre	1.09	1.88	2.61	0.42	1.32	1.46
4 cwt per acre	2.11	2.67	2.85	1.24	2.58	2.29
Sulph. amm. to barley*						
Low	1.37	2.28	2.65	0.70	1.64	1.73
High	1.83	2.27	2.81	0.95	2.26	2.02
Mean (±0.135)	1.60	2.28	2.73	0.83	1.95	1.88
Total produce: tons per acre						
No Dung	4.44	5.26	5.83	3.87	4.86	4.85
Dung	4.88	6.22	6.42	3.62	5.61	5.35
No Straw	4.59	5.64	6.50	4.43	5.47	5.33
Straw	4.72	5.83	5.75	3.05	5.01	4.87
Sulph. amm						
2 cwt per acre	3.89	5.28	5.72	3.04	4.61	4.51
4 cwt per acre	5.42	6.20	6.53	4.44	5.86	5.69
Sulph. amm. to barley*						
Low	4.33	5.60	5.94	3.78	4.93	4.92
High	4.98	5.87	6.31	3.70	5.54	5.28
Mean	4.66	5.74	6.13	3.74	5.24	5.10

*Sulphate of ammonia to barley and green manure crops, 1950.

Lower Half - Cabbages

Green Manure

	None	Lupins	Clover	Rape	Rye-grass	Mean
Headed cabbages as percentage of total number						
No dung	20.2	24.4	30.2	12.6	23.1	22.1
Dung	25.0	33.9	36.5	12.0	27.6	27.0
No Straw	21.0	30.3	34.8	15.1	27.2	25.7
Straw	24.2	28.0	32.0	9.5	23.5	23.4
Sulph. amm. 2 cwt per acre	17.2	26.1	33.6	7.5	20.1	20.9
Sulph. amm. 4 cwt per acre	27.9	32.2	33.2	17.1	30.6	28.2
Sulph. amm. to barley* Low	21.0	30.0	34.2	10.9	21.5	23.5
Sulph. amm. to barley* High	24.2	28.4	32.6	13.6	29.2	25.6
Mean	22.6	29.2	33.4	12.3	25.4	24.6

Differential Responses

Response to	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
Weight of headed cabbages: tons per acre									
	(±0.121)					(±0.173)			
Dung	0.56	-	-	0.62	0.50	0.33	0.79	0.65	0.47
Straw	-0.16	-0.10	-0.22	-	-	-0.09	-0.23	-0.34	0.02
Sulph. amm.	0.82	0.59	1.05	0.89	0.75	-	-	0.87	0.77
Sulph. amm. to barley*	0.30	0.39	0.21	0.12	0.48	0.35	0.25	-	-
Total produce: tons per acre									
Dung	0.50	-	-	0.66	0.34	0.47	0.53	0.50	0.50
Straw	-0.46	-0.30	-0.62	-	-	-0.38	-0.54	-0.57	-0.35
Sulph. amm.	1.19	1.16	1.22	1.27	1.11	-	-	1.20	1.18
Sulph. amm. to barley*	0.37	0.37	0.37	0.26	0.48	0.38	0.36	-	-
Headed cabbages as percentage of total number									
Dung	4.9	-	-	5.9	3.9	3.8	6.0	6.4	3.4
Straw	-2.2	-1.2	-3.2	-	-	-1.2	-3.2	-4.0	-0.4
Sulph. amm.	7.3	6.2	8.4	8.3	6.3	-	-	7.4	7.2
Sulph. amm. to barley*	2.1	3.6	0.6	0.3	3.9	2.2	2.0	-	-

*Sulphate of ammonia to barley and green manure crops, 1950

Upper Half - Barley

	Green Manure					
	None	Lupins	Clover	Rape	Rye-grass	Mean
Grain: cwt per acre (±1.00)						(±0.45)
No Dung to cabbages 1950	13.7	18.7	14.4	14.2	13.5	14.9
Dung to cabbages	17.1	17.2	17.0	16.7	16.0	16.8
No straw to cabbages 1950	13.4	17.4	15.0	15.1	13.1	14.8
Straw to cabbages	17.3	18.5	16.4	15.8	16.4	16.9
Sulph.Amm. to cabbages 1950						
2 cwt per acre	16.0	17.4	15.1	15.3	12.2	15.2
4 cwt per acre	14.7	18.5	16.4	15.6	17.4	16.5
Sulph.Amm. to barley						
Nil	12.5	14.4	14.7	12.1	13.6	13.5
1½ cwt per acre	18.2	21.5	16.7	18.8	16.0	18.2
Mean (±0.71)	15.4	18.0	15.7	15.4	14.8	15.9
Straw: cwt per acre						
No Dung to cabbages 1950	14.0	15.2	16.8	14.4	13.8	14.8
Dung to cabbages	16.8	17.6	18.5	15.4	16.4	17.3
No straw to cabbages 1950	14.2	16.1	19.8	14.2	14.4	15.7
Straw to cabbages	16.6	18.6	15.5	15.5	15.8	16.4
Sulph.Amm. to cabbages 1950						
2 cwt per acre	14.7	19.0	18.7	15.5	14.0	16.4
4 cwt per acre	16.2	15.7	16.6	14.3	16.2	15.8
Sulph.Amm. to barley						
Nil	13.2	15.4	15.0	11.5	14.4	13.9
1½ cwt per acre	17.7	19.3	20.3	18.3	15.8	18.3
Mean	15.4	17.3	17.6	14.9	15.1	16.1

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Upper Half - Barley

Differential Responses

Response to	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					
	(±0.63)					(±0.90)			
Dung to cabbages 1950	1.9	-	-	1.9	1.9	2.9	0.9	0.3	3.5
Straw to cabbages 1950	2.1	2.1	2.1	-	-	2.7	1.5	0.8	3.4
Sulph.amm. to cabbages 1950	1.3	2.3	0.3	1.9	0.7	-	-	1.6	1.0
Sulph.amm. to barley	4.8	3.2	6.4	3.5	6.1	5.1	4.5	-	-
				Straw: cwt per acre					
Dung to Cabbages 1950	2.5	-	-	1.2	3.8	2.6	2.4	2.3	2.7
Straw to Cabbages 1950	0.7	-0.6	2.0	-	-	0.7	0.7	1.2	0.2
Sulph.amm. to cabbages 1950	-0.6	-0.5	-0.7	-0.6	-0.6	-	-	0.8	-2.0
Sulph.amm. to barley	4.4	4.2	4.6	4.9	3.9	5.8	3.0	-	-

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LEY AND ARABLE ROTATIONS

Woburn Stackyard - 1951 the 14th year.

For details of rotations etc., see Appendix Z 1950.

Cultivations, etc.:

Block I. Barley. Ploughed: Oct 4. Ground chalk applied: Apr 5. Seed drilled at 3 bushels per acre, basal fertilizers applied: Apr 16. Harvested: Aug 31. Variety: Plumage Archer.

Block II. Ley - first year. Ploughed: Aug 29 and again Oct 19. Basal fertilizers applied, seeds sown: Apr 19. Nitrochalk applied: Apr 20. Topped: June 18 and July 9. Grazed by sheep: July 16-20, Aug 13-21, Aug 30 - Sept 7, and Sept 27 - Oct 6. Seeds mixture per acre: 21 lb S23 Perennial Ryegrass, 12 lb S143 Cocksfoot, 6 lb Late flowering Montgomery Red Clover, 3 lb S100 White Clover.

Lucerne - first year. Ploughed: Aug 31 and again Oct 19. Basal fertilizers applied, seed drilled at 28 lb per acre: Apr 19. Dusted with DDT: May 25 and June 1. First cut: Aug 10. Second cut: Oct 8. Variety: Du Puits.

Potatoes. Ploughed: Aug 30 and Oct 19. Ridged, basal fertilizers applied: May 3. Potatoes planted: May 7. Earthed up ridges: July 11. Sprayed with Copper fungicide, 5 lb per acre: Aug 18 and again Sept 8. Sprayed with 15% Sulphuric acid: Sept 26. Lifted: Oct 4. Variety: Irish Majestic.

Block III. Potatoes. Ploughed: Oct 19. Ridged, dung applied: May 10. Potatoes planted: May 11. Earthed up ridges: July 11. Sprayed with Copper fungicide, 5 lb per acre: Aug 18 and again Sept 8. Sprayed with 15% Sulphuric acid: Aug 26. Lifted: Oct 5. Variety: Irish Majestic.

Block IV. Ley - second year. Nitrochalk applied: June 23. Grazed by sheep: May 26-30, June 3-8, 16-22, July 2-8, 20-28, Aug 26-28, Sept 10-19.

Lucerne - second year. First cut: July 5. Second cut: Aug 10. Third cut: Oct 10.

Rye. Ploughed: Oct 4. Seed drilled at 3 bushels per acre: Oct 19. Basal nitrochalk applied: Apr 19. Harvested: Aug 15. Variety: King II.

Block V. Ley - third year. Grazed by sheep: May 22-26, May 30 - June 3, June 12-25, July 8-14, July 28 - Aug 5, Aug 21-26, Sept 19-27, Oct 9-19.

Lucerne - third year. First cut: July 5. Second cut: Aug 10. Third cut: Oct 8.

Hay. Seeds mixture undersown in Rye: Mar 28 1950. 2 cwt Nitrochalk per acre applied: Apr 19. First cut: June 8. 1 cwt Nitrochalk per acre applied: June 20. Second cut: Sept 26. Seeds mixture per acre: 27 lb S24 Perennial Ryegrass, 12 lb Montgomery Red Clover, 3 lb Canadian Alsike Clover.

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Sugar beet. Ploughed: Aug 30, Oct 4 and Mar 30.
Basal fertilizers applied: Apr 19. Seed drilled at 18 lb per acre: Apr 24. Singled: June 4. Lifted: Oct 10.
Variety: Klein E.

Standard errors per plot:
Block I. Barley
Grain. whole plot: 2.06 cwt per acre or 11.9% (4 d.f.)
sub plot: 2.73 cwt per acre or 15.8% (4 d.f.)

Block III. Potatoes
Total tubers. whole plot: 0.756 tons per acre or 5.5% (4 d.f.)
sub-plot: 0.694 tons per acre or 5.1% (4 d.f.)

Summary of Results

Barley

Block I

Previous Rotation

	Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean	
			Grain: cwt per acre			
No Dung (±1.99)(1)	15.8	19.9	16.3	14.2	16.6	
Dung in 1950	17.0	22.6	16.4	15.8	17.9	
Mean (±1.45)	16.4	21.2	16.4	15.0	17.3	
Increase (±2.73)	1.2	2.7	0.1	1.6	1.3	(±1.36)
			Straw: cwt per acre			
No Dung	16.2	19.6	16.4	15.0	16.8	
Dung in 1950	17.8	21.3	18.4	16.4	18.5	
Mean	17.0	20.4	17.4	15.7	17.6	
Increase	1.6	1.7	2.0	1.4	1.7	

Standard error (1) for use in comparisons other than vertical

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Block II

Ley. 1st year

	Sheep days of grazing per acre	No. of sheep carried per acre for the year
Mean	556	1.5

Lucerne. 1st year

Yield of Lucerne Hay (85% Dry Matter) cwt per acre

	1st Crop	2nd Crop	Total
No Dung	8.1	11.0	19.1
Dung in 1949	8.1	11.6	19.7
Mean	8.1	11.3	19.4
Increase	0.0	0.6	0.6
Previous Rotation			
Lucerne	9 7	12.1	21.8
Arable with Sugar Beet	6.5	10.5	17.0

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Block II

Potatoes

	Total tubers tons per acre	Percentage Ware
No Dung	10.03	84.0
Dung in 1949	11.28	86.6
Mean	10.66	85.3
Increase	1.25	2.6
Previous Rotation		
Ley	11.46	87.6
Lucerne	10.56	82.4
Arable with Hay	10.62	85.8
Arable with Sugar Beet	9.98	85.4

Block III

Potatoes

	Previous Rotation				
	Ley	Lucerne	Arable with hay	Arable with sugar beet	Mean
	Total tubers: tons per acre				
No Dung (±0.637)(1)	14.72	12.62	10.80	10.84	12.24
Dung in 1951	15.98	15.68	14.36	14.18	15.05
Mean (±0.534)	15.35	14.15	12.58	12.51	13.65
Increase (±0.694)	1.26	3.06	3.56	3.34	2.81 (±0.347)
	Percentage Ware				
No Dung	96.0	91.4	91.6	93.2	93.1
Dung in 1951	90.0	92.8	95.1	94.9	93.2
Mean	93.0	92.1	93.4	94.0	93.1
Increase	-6.0	1.4	3.5	1.7	0.1

Standard error (1) for use in comparisons other than vertical

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Block IV

Ley. 2nd year

	Sheep days of grazing per acre	No. of sheep carried per acre for the year
Mean	1857	5.1

Lucerne. 2nd year

Yield of Lucerne Hay (85% Dry Matter) cwt per acre

	1st Crop	2nd Crop	3rd Crop	Total
No Dung	32.7	11.8	10.6	55.1
Dung in 1948	40.0	13.5	13.0	66.5
Mean	36.4	12.6	11.8	60.8
Increase	7.3	1.7	2.4	11.4
Previous Rotation				
Lucerne	49.9	13.1	13.4	76.4
Arable with Hay	22.8	12.2	10.2	45.2

Rye

	Grain: cwt per acre	Straw: cwt per acre
No Dung	28.1	38.7
Dung in 1948	29.5	41.9
Mean	28.8	40.3
Increase	1.4	3.2
Previous Rotation		
Ley	29.3	42.4
Lucerne	30.8	39.8
Arable with Hay	27.7	37.9
Arable with Sugar Beet	27.5	41.0

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Block V

Ley. 3rd year

		Sheep days of grazing per acre	No. of sheep carried per acre for the year
Mean	1947		5.3

Lucerne. 3rd year

Yield of Lucerne Hay (85% Dry Matter) cwt per acre

	1st Crop	2nd Crop	3rd Crop	Total
No Dung	40.7	19.4	9.6	69.7
Dung in 1947	44.2	19.4	10.5	74.1
Mean	42.4	19.4	10.0	71.9
Increase	3.5	0.0	0.9	4.4
Previous Rotation				
Lucerne	40.2	17.7	9.5	67.4
Arable with Sugar Beet	44.7	21.1	10.6	76.4

Hay

Yield (85% Dry Matter) cwt per acre

	1st Crop	2nd Crop	Total
No Dung	53.6	17.8	71.4
Dung in 1947	56.8	17.8	74.6
Mean	55.2	17.8	73.0
Increase	3.2	0.0	3.2
Previous Rotation			
Ley	59.9	24.4	84.3
Arable with Hay	50.5	11.2	61.7

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51/Be/1.7

Block V

Sugar Beet

	Clean Beet tons per acre	Tops tons per acre	Total Sugar cwt per acre	Sugar %
No Dung	10.16	10.04	33.6	16.53
Dung in 1947	9.92	9.66	33.0	16.62
Mean	10.04	9.85	33.3	16.57
Increase	-0.24	-0.38	-0.6	0.09
Previous Rotation				
Lucerne	11.30	10.28	37.5	16.62
Arable with Sugar Beet	8.78	9.42	29.0	16.53

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51/Bf/1.1

WOBURN MARKET GARDEN EXPERIMENT

Organic manures and nitrochalk - Lansome 1951 the 10th year.

The present cropping comprises two series, each carrying in turn the crops of a two-course rotation: 1st year - Globe beet followed by Spring Cabbages; 2nd year - Leeks.

System of replication (each series): 4 randomized blocks of 10 plots each, certain interactions being confounded with block differences.

Area of each plot: 0.0125 acre.

Treatments applied to each crop:
Organic manures: Dung; sewage sludge compost; sewage sludge (West Middlesex); vegetable compost, each at 15 and 20 tons per acre.
Nitrochalk; None; 0.3 cwt N per acre on plots receiving organic manure. None; 0.3, 0.6, 0.9 cwt N per acre on plots not receiving organic manure. The last two rates are applied in two equal dressings.

Basal manuring per acre: 0.3 cwt P_2O_5; 0.3 cwt K_2O, applied as granular fertilizer (13¾% P_2O_5; 13¾% K_2O).

Cultivations, etc:
Globe beet. Organic manures applied and ploughed in: May 11. Basal manure and nitrochalk applied (first dressing to 0.6 and 0.9 N plots), seed drilled at 13 lb per acre: May 15. Dusted against flea beetle: June 2 and again June 9. Singled: July 9. Second application of nitrochalk to 0.6 and 0.9 N plots: July 12. Lifted: July 31-Sept 13, 1951. Variety: Detroit.

Spring Cabbages 1951-52. Organic manures applied and ploughed in: Sept 17. Basal manures applied: Sept 18. Cabbages planted and watered in: Sept 19. Sprayed with D.D.T: Oct 10. Nitrochalk applied (first dressing to 0.6 and 0.9 N plots): Mar 3. Second dressing of nitrochalk to 0.6 and 0.9 N plots: Mar 14. Cut: May 6-July 7, 1952. Variety: Durham Early.

Leeks 1951-52. Organic manures applied and ploughed in: Apr 27. Basal manures and nitrochalk applied (first dressing to 0.6 and 0.9 N plots): July 16. Leeks planted and watered in: July 23. Second dressing of nitrochalk to 0.6 and 0.9 N plots: Sept 11. Harvested. Jan 8-Mar 28, 1952. Variety: Musselburgh.

Standard errors per plot:
Globe beet, weight of saleable bulbs: 1.25 tons per acre or 20.4% (17 d.f.)
Spring Cabbages, weight of headed cabbages: 0.844 tons per acre or 23.1% (17 d.f.)
Leeks, saleable weight: 0.517 tons per acre or 8.8% (17 d.f.)

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Summary of Results

Globe Beet

Organic Manures	Level of manuring (tons/acre)	Nitrochalk, cwt N per acre: None	0.3	0.6	0.9	Mean
Weight of saleable bulbs: tons per acre						
			(±0.884)			(±0.625)
None		3.98	4.83	4.68	6.42	4.41*
Dung	10	6.68	5.50			6.09
	20	6.07	7.10			6.59
Sludge compost	10	4.95	7.61			6.28
	20	7.05	6.96			7.00
Sludge	10	5.23	5.46			5.34
	20	6.14	8.62			7.38
Vegetable compost	10	5.46	7.14			6.30
	20	6.27	6.46			6.37
Mean (±0.313)		5.98†	6.86†			6.13
Total produce: tons per acre						
None		7.48	8.92	8.62	13.57	8.20*
Dung	10	10.98	10.23			10.61
	20	10.75	12.05			11.40
Sludge compost	10	8.36	12.26			10.31
	20	11.67	11.39			11.53
Sludge	10	8.71	9.92			9.32
	20	10.86	14.29			12.58
Vegetable compost	10	9.21	11.57			10.39
	20	10.37	11.11			10.74
Mean		10.12†	11.60†			10.62
Plant number: thousands per acre						
None		54.4	50.1	47.6	65.8	52.3*
Dung	10	61.2	52.0			56.6
	20	52.6	51.4			52.0
Sludge compost	10	43.8	55.6			49.8
	20	63.4	55.6			59.5
Sludge	10	42.5	50.0			46.3
	20	50.0	63.8			56.9
Vegetable compost	10	50.2	58.9			54.5
	20	52.4	57.0			54.7
Mean		52.0†	55.5†			53.9

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

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Spring Cabbages

Organic Manures	Level of manuring (tons/acre)	Nitrochalk, cwt N per acre: None	0.3	0.6	0.9	Mean
Weight of headed cabbages: tons per acre			(±0.597)			(±0.422)
None		0.61	2.08	2.88	3.94	1.34*
Dung	10	2.64	2.59			2.62
	20	3.63	5.05			4.34
Sludge compost	10	2.37	3.66			3.02
	20	3.88	4.93			4.40
Sludge	10	3.56	5.34			4.45
	20	6.04	6.72			6.38
Vegetable compost	10	2.43	4.69			3.56
	20	2.39	3.61			3.00
Mean (±0.211)		3.37†	4.57†			3.65
Total produce: tons per acre						
None		1.72	4.10	4.86	5.64	2.92*
Dung	10	4.36	4.68			4.52
	20	5.78	6.86			6.32
Sludge compost	10	4.30	5.88			5.10
	20	5.96	6.63			6.30
Sludge	10	6.18	7.50			6.84
	20	8.01	8.82			8.42
Vegetable compost	10	4.26	6.00			5.13
	20	4.72	5.57			5.14
Mean		5.45†	6.49†			5.59
Percentage headed cabbages, (by number)						
None		14.2	32.0	43.2	53.6	23.1*
Dung	10	45.0	42.1			43.6
	20	49.2	66.4			57.8
Sludge compost	10	42.2	52.4			47.3
	20	52.7	62.4			57.5
Sludge	10	44.0	59.6			51.8
	20	64.0	70.6			67.4
Vegetable compost	10	40.8	68.2			54.4
	20	36.8	51.6			44.2
Mean		46.8†	59.2†			49.5

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

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Leeks

Organic Manures	Level of manuring (tons/acre)	Nitrochalk, cwt N per acre: None	0.3	0.6	0.9	Mean
	Saleable weights: tons per acre (±0.366)					(±0.258)
None		2.62	3.92	4.93	4.63	3.27*
Dung	10	5.16	5.89			5.52
	20	7.54	7.40			7.47
Sludge compost	10	5.31	6.03			5.67
	20	6.72	6.92			6.82
Sludge	10	6.00	5.94			5.97
	20	6.79	7.21			7.00
Vegetable compost	10	4.80	6.05			5.43
	20	6.51	7.28			6.90
Mean (±0.129)		6.10†	6.59†			5.88
	Percentage saleable (by number)					
None		86.8	94.0	95.7	95.2	90.4*
Dung	10	95.8	97.3			96.5
	20	97.9	97.5			97.7
Sludge compost	10	95.8	97.9			96.9
	20	97.8	97.0			97.4
Sludge	10	97.8	97.2			97.5
	20	98.0	98.3			98.1
Vegetable compost	10	98.2	97.0			97.6
	20	97.8	97.6			97.7
Mean		97.4†	97.5†			96.5

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

IRRIGATION EXPERIMENT

The 1st Year

The effects of irrigation and nitrogen - Woburn Butt Close 1951.

The present cropping comprises four series; three of these in turn carry the crops of a 3-course rotation:-

1st year: Early potatoes followed by winter cabbages
2nd year: Sugar beet
3rd year: Barley

The fourth series remains in long term grass for cutting.

System of replication: 3 randomized blocks of 4 plots each, plots being split into two for the application of nitrogen.

Treatments: All combinations of:-
Whole plots. Irrigation: None - 0, and three rates A, B, and C applied to crops as under.
Sub plots. Nitrogen: 2 levels applied to crops as under.

Irrigation in inches

Week ending	Early Potatoes A	B	C	Sugar Beet A	B	C	Barley A	B	C	Cut Grass A	B	C
June 18		.14	.35					.56	.77		.57	.76
25		.40	.50		1.20	1.40	.30	.47	.50	.33	.67	.79
July 2		.67	.65						.20			
9					.50	.67		.67	.61			.67
16		.83	.67						.69			
23						.68				.33	.50	.67
30												
Aug 6						.67			.48			.67
13												
20				1.67						.33	.50	
27												
Total: inches	NIL	2.04	2.17	1.67	1.70	3.42	0.30	1.70	3.25	0.99	2.24	3.56

Note. The irrigations shown above were not those originally intended since water was not available until the week ending June 18, and then only at low pressure. The full supply came in late summer in the middle of the wet period.

On Potatoes A was the same as 0.

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Levels of nitrogen (in addition to N in basal dressing):

	cwt N per acre		
Early Potatoes:	None;	0.5	Applied as sulphate of ammonia
Winter Cabbages (after potatoes):	0.5;	1.0	Applied as nitrochalk
Sugar beet:	None;	0.4	Applied as nitrochalk
Barley:	None;	0.2	Applied as sulphate of ammonia
Cut grass:	0.15;	0.30	Applied as nitrochalk after each cut

Basal manurings: cwt per acre.

	N	P_2O_5	K_2O
Early potatoes	0.5	0.5	0.75
Winter Cabbages (after potatoes)		NIL	
Sugar beet	0.4	0.4	0.6
Barley	0.2	0.2	0.3
Cut grass (yearly)		0.6	0.6

Cultivations, etc.:
Early Potatoes: Ploughed: Mar 8. Potatoes planted by machine: Apr 25. Fertilizers applied: Apr 25. Earthed up ridges: July 3 Lifted: July 31. Variety: Ulster Chieftain.
Winter Cabbages: Planted and watered in: Aug 2. Cut: Feb 5, 22, Mar 19, 25 and 26. Variety: January King.
Sugar beet: Seed drilled: Apr 24. Fertilizers applied: Apr 25. Singled: June 4. Lifted: Nov 13. Variety: Klein E.
Barley: Seed drilled: Apr 24. Fertilizers applied: Apr 25. Harvested: Aug 29. Variety: Plumage Archer.
Cut grass: Seeds mixture broadcast: Apr 24. Basal fertilizers applied: Apr 25. Cut: July 11, Aug 13, Sept 4, Oct 9. Nitrochalk applied after first three cuts. Seeds mixture (lb per acre): Italian Ryegrass (English leafy) - 6; S26 Cocksfoot - 16; S100 White Clover - 4; Canadian Alsike - 2.

Previous crop, all plots: Potatoes.

Standard errors per plot:

Early Potatoes.	Total clean tubers,	whole plot:	0.238 tons per acre or 4.2% (7 d.f.)
		sub plots:	0.307 tons per acre or 5.4% (9 d.f.)
Cabbages.	Weight headed cabbages,	whole plot:	0.274 tons per acre or 11.2% (6 d.f.)
		sub plot:	0.558 tons per acre or 22.7% (8 d.f.)

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Sugar beet.	Total sugar,	whole plot:	2.60 cwt per acre or 5.0% (6 d.f.)
		sub plot:	3.18 cwt per acre or 6.1% (8 d.f.)
	Tops,	whole plot:	0.581 tons per acre or 5.2% (6 d.f.)
		sub plot:	1.24 tons per acre or 11.1% (8 d.f.)
Barley.	Grain,	whole plot:	1.45 cwt per acre or 5.2% (6 d.f.)
		sub plot:	1.98 cwt per acre or 7.1% (8 d.f.)
Cut grass (total of 4 cuts)	Hay (85% D.M.)	whole plot:	4.95 cwt per acre or 8.9% (6 d.f.)
		sub plot:	2.90 cwt per acre or 5.2% (8 d.f.)

Summary of Results

Early Potatoes. Total tubers tons per acre

cwt N per acre	Irrigation 0	B	C	Mean
	(±0.130)*	(±0.183)*		
0	3.78	6.76	7.66	5.49
0.5	3.88	6.97	8.56	5.82
Mean	3.83 (±0.097)	6.86 (±0.137)	8.11	5.66
Difference	0.10 (±0.177)	0.21 (±0.251)	0.90	0.33 (±0.125)

*for use in comparisons other than vertical.

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Winter Cabbages

cwt N per acre	Irrigation to previous potato crop 0	A	B	C	Mean
Weight of headed cabbage: tons per acre (±0.278)*					
0.5	2.47	2.31	1.80	1.71	2.07
1.0	3.27	2.96	2.13	2.98	2.85
Mean (±0.158)	2.87	2.63	1.98	2.34	2.46
Difference (±0.456)	0.80	0.65	0.38	1.27	0.78 (±0.228)
Total produce: tons per acre					
0.5	6.22	6.19	5.52	5.75	5.92
1.0	7.75	7.60	6.64	7.51	7.37
Mean	6.98	6.89	6.08	6.63	6.65
Difference	1.53	1.41	1.12	1.76	1.45
Percentage (by number) of Headed Cabbages					
0.5	36.7	33.0	27.2	27.3	31.1
1.0	40.9	38.1	30.9	38.7	37.2
Mean	38.8	35.6	29.1	33.0	34.1
Difference	4.2	5.1	3.7	11.4	6.1

*for use in comparisons other than vertical

Sugar Beet

cwt N per acre	Irrigation 0	A	B	C	Mean
Clean beet: tons per acre					
0	12.56	13.76	13.41	13.48	13.30
0.4	16.50	16.05	17.55	18.17	17.07
Mean	14.53	14.91	15.48	15.82	15.19
Difference	3.94	2.29	4.14	4.69	3.77
Sugar percentage					
0	17.34	17.22	17.21	17.06	17.21
0.4	17.23	16.73	17.43	17.21	17.15
Mean	17.28	16.98	17.32	17.13	17.18
Difference	-0.11	-0.49	0.22	0;15	-0.06
Total sugar: cwt per acre			(±1.98)*		
0	43,5	47.5	46.2	46.0	45.8
0.4	56.8	53.7	61.1	62.5	58.6
Mean (±1.50)	50.2	50.6	53.7	54.3	52.2
Difference (±2.60)	13.3	6.2	14.9	16.5	12.8 (±1.30)

*for use in comparisons other than vertical.

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Sugar Beet

cwt N per acre	Irrigation 0	A	B	C	Mean
	Tops: tons per acre				
			(±0.606)*		
0	7.96	9.04	8.08	9.62	8.68
0.4	12.66	14.28	12.45	14.68	13.52
Mean (±0.336)	10.31	11.66	10.27	12.15	11.10
Difference (±1.010)	4.70	5.24	4.37	5.06	4.84 (±0.505)

*for use in comparisons other than vertical.

	Noxious nitrogen: mg./100 g.				
0	26.7	28.3	30.0	26.7	27.9
0.4	28.3	30.0	30.0	28.3	29.2
Mean	27.5	29.2	30.0	27.5	28.5
Difference	1.6	1.7	0.0	1.6	1.3

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cwt N per acre	Irrigation 0	A	B	C	Mean
Barley, grain: cwt per acre					
			(±1.16)*		
0	21.7	22.1	25.8	29.0	24.6
0.2	30.1	29.5	31.7	33.2	31.1
Mean (±0.84)	25.9	25.8	28.8	31.1	27.9
Difference (±1.61)	8.4	7.4	5.9	4.2	6.5 (±0.81)
Barley, straw: cwt per acre					
0	22.2	22.5	26.7	32.5	26.0
0.2	29.6	27.7	32.1	36.1	31.4
Mean	25.9	25.1	29.4	34.3	28.7
Difference	7.4	5.2	5.4	3.6	5.4
Cut Grass (Total of 4 cuts): Hay at 85% D.M. : cwt per acre					
after each cut			(±3.09)*		
0.15	40.5	42.9	51.5	60.1	48.8
0.30	56.9	57.9	65.3	70.0	62.5
Mean (±2.86)	48.7	50.4	58.4	65.1	55.6
Difference (±2.36)	16.4	15.0	13.8	9.9	13.7 (±1.18)

*for use in comparisons other than vertical.