ROTHAMSTED RESEARCH

Yields of the Field Experiments 1958

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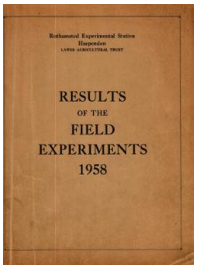

Long-term Experiments

Rothamsted Research

Rothamsted Research (1959) *Long-term Experiments ;* Yields Of The Field Experiments 1958, pp 19 - 75 **- DOI: https://doi.org/10.23637/ERADOC-1-181**

58/Ba/1.1

THREE COURSE ROTATION EXPERIMENT

7th year of revised scheme

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

Area of each plot (acres): Potatoes (sub plot), 0.0093; barley, 0.0200; sugar beet, 0.0204.

Cultivations, etc.:

Potatoes.

Straw applied, all plots ploughed: Dec 11 - 31, 1957. Fertilizers applied: Apr 15, 1958. Potatoes machine planted: Apr 17. Earthed up: July 7. Sprayed four times with copper fungicide; at 5 lb in 40 gallons per acre: July 12; at 3 lb and 1 pint of spreader in 40 gallons per acre: Aug 1, 6 and 16. Sprayed with sulphuric acid, 20% BOV at 100 gallons per acre: Sept 9. Lifted: Sept 23. Variety: Majestic.

Barley.

Ground chalk applied at 23 cwt per acre: Nov 23, 1957. Straw applied, all plots ploughed: Dec 11 - 31. Fertilizers applied: Mar 21, 1958. Seed drilled at 2¾ bushels per acre: Mar 22. Sprayed with MCPA at 4 pints in 40 gallons per acre: June 4. Harvested: Aug 26. Variety: Plumage Archer.

Sugar beet.

Straw applied, all plots ploughed: Dec 11 - 31, 1957. Fertilizers applied, seed drilled at 19 lb per acre: Apr 14,1958. Singled: June 5. Sprayed with demeton methyl at 12 oz in 40 gallons per acre: July 7. Lifted: Nov 24. Variety: Klein E.

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Summary of Results

Potatoes

Treatments applied: 1950	1951	1953, 1955 and 1957 / 1952, 1954, 1956 & 1958	0 –	0 K	0.4N –	0.4N K	St + 0.2N –	St + 0.2N K	St + 0.6N –	St + 0.6N K	K_s –	K_s K	K_s + 0.4N –	K_s + 0.4N K
			Total tubers: tons per acre											
	Ar	0			8.30	8.64								
		0.4N	11.00	10.23										
Ar		0			8.16	8.40								
		0.4N	9.80	10.46										
	St1 St2	0			7.92	9.26			9.60	9.43			9.71	10.48
		0.4N	11.07	10.99			12.88	12.48			12.33	11.98		
St1 St2		0			9.05	9.33								
		0.4N	11.59	11.25										
		St+ 0.2N			9.10	8.94								
		St+ 0.6N	11.52	11.90										
		K_s			8.86	9.53								
		K_s + 0.4N	11.19	12.02										
	Ad	0			8.48	9.13			9.78	10.00			9.15	8.52
Ad		0.4N	11.25	11.69										
		St+ 0.6N	11.35	11.65										
		K_s + 0.4N	10.04	11.91										

58/Ba/1.2

Potatoes

Treatments applied: 1950	1951	1953, 1955 and 1957 / 1952, 1954, 1956 & 1958	0 –	0 K	0.4N –	0.4N K	St + 0.2N –	St + 0.2N K	St + 0.6N –	St + 0.6N K	K_s –	K_s K	K_s + 0.4N –	K_s + 0.4N K
			Percentage ware ($1\frac{1}{2}$" riddle)											
	Ar	0			82.8	87.0								
		0.4N	88.2	90.9										
Ar		0			83.9	87.6								
		0.4N	85.2	86.8										
	St1 St2	0			82.5	83.2			87.1	88.4			88.3	85.8
		0.4N	84.0	85.4			87.2	87.3			89.3	87.6		
St1 St2		0			86.4	88.1								
		0.4N	92.1	91.1										
		St+ 0.2N			81.1	86.4								
		St+ 0.6N	90.7	91.0										
		K_s			88.4	89.4								
		K_s + 0.4N	87.7	90.5										
	Ad	0			84.2	87.5			88.2	86.8			85.4	87.4
Ad		0.4N	89.4	92.9										
		St+ 0.6N	88.6	90.1										
		K_s + 0.4N	87.3	88.4										

58/Ba/1.3

Barley

Treatments applied: 1950	1951	1953, 1955 and 1957 / 1952, 1954, 1956 & 1958	0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
Grain (at 85% dry matter): cwt per acre								
	Ar	0		20.0				
		0.4N	27.1					
Ar		0		21.2				
		0.4N	25.8					
	St1 St2	0		23.7		21.7		19.5
		0.4N	22.8		28.2		26.7	
St1 St2		0		22.3				
		0.4N	22.4					
		St+ 0.2N		23.5				
		St+ 0.6N	26.8					
		K_s		22.6				
		K_s + 0.4N	29.4					
	Ad	0		21.5		21.0		20.9
Ad		0.4N	30.0					
		St+ 0.6N	30.0					
		K_s + 0.4N	24.8					
Straw (at 85% dry matter): cwt per acre								
	Ar	0		19.0				
		0.4N	26.1					
Ar		0		19.1				
		0.4N	25.2					
	St1 St2	0		20.7		24.4		16.5
		0.4N	29.3		32.2		30.7	
St1 St2		0		19.5				
		0.4N	25.2					
		St+ 0.2N		21.1				
		St+ 0.6N	25.3					
		K_s		21.0				
		K_s + 0.4N	27.3					
	Ad	0		19.5		17.8		19.1
Ad		0.4N	29.5					
		St+ 0.6N	32.6					
		K_s + 0.4N	25.2					

Mean dry matter % as harvested Grain: 81.2
Straw: 79.3

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Sugar beet

Treatments applied: 1953, 1955 and 1957			0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
1950	1951	1952, 1954, 1956 & 1958						
Roots (washed): tons per acre								
	Ar	0		14.20				
		0.4N	15.47					
Ar		0		13.46				
		0.4N	15.51					
	St1 St2	0		12.57		15.25		13.95
		0.4N	16.80		17.53		15.84	
St1 St2		0		13.57				
		0.4N	15.20					
		St+ 0.2N		12.12				
		St+ 0.6N	16.29					
		K_s		13.56				
		K_s + 0.4N	17.08					
	Ad	0		13.99		13.70		14.78
Ad		0.4N	15.11					
		St+ 0.6N	14.06					
		K_s + 0.4N	16.72					
Sugar percentage								
	Ar	0		17.4				
		0.4N	17.2					
Ar		0		17.7				
		0.4N	17.4					
	St1 St2	0		17.4		17.3		18.0
		0.4N	17.4		17.3		17.6	
St1 St2		0		17.6				
		0.4N	17.4					
		St+ 0.2N		17.6				
		St+ 0.6N	17.1					
		K_s		17.8				
		K_s + 0.4N	17.3					
	Ad	0		17.4		17.4		16.6
Ad		0.4N	17.7					
		St+ 0.6N	17.8					
		K_s + 0.4N	17.0					

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Sugar beet

Treatments applied: 1953, 1955 and 1957	0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
Total sugar: cwt per acre						
1950 1951 1952 1954 1956 & 1958						
Ar — 0		49.6				
Ar — 0.4N	53.3					
Ar — 0		47.8				
Ar — 0.4N	54.1					
St1 St2 — 0		43.7		52.8		50.3
St1 St2 — 0.4N	58.6		60.7		55.7	
St1 St2 — 0		47.8				
St1 St2 — 0.4N	52.9					
St1 St2 — St+ 0.2N		42.7				
St1 St2 — St+ 0.6N	55.8					
St1 St2 — K_s		48.2				
St1 St2 — K_s + 0.4N	59.0					
Ad — 0		48.6		47.7		49.1
Ad — 0.4N	53.5					
Ad — St+ 0.6N	50.0					
Ad — K_s + 0.4N	56.7					
Tops: tons per acre						
Ar — 0		10.18				
Ar — 0.4N	9.44					
Ar — 0		8.28				
Ar — 0.4N	10.64					
St1 St2 — 0		7.93		11.80		9.16
St1 St2 — 0.4N	11.41		10.58		10.93	
St1 St2 — 0		9.68				
St1 St2 — 0.4N	10.10					
St1 St2 — St+ 0.2N		7.74				
St1 St2 — St+ 0.6N	10.21					
St1 St2 — K_s		9.29				
St1 St2 — K_s + 0.4N	11.67					
Ad — 0		9.94		9.33		9.53
Ad — 0.4N	11.06					
Ad — St+ 0.6N	9.40					
Ad — K_s + 0.4N	13.33					

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58/Ba/1.7

Sugar beet

Treatments applied: 1950	1951	1953, 1955 and 1957 / 1952, 1954, 1956 & 1958	0	0.4N	St + 0.2N	St + 0.6N	K_s	K_s + 0.4N
		Plant number: thousands per acre						
	Ar	0		32.4				
		0.4N	32.2					
Ar		0		32.1				
		0.4N	32.0					
	St1 St2	0		31.5		32.5		34.2
		0.4N	32.6		31.3		33.1	
St1 St2		0		32.1				
		0.4N	31.0					
		St+ 0.2N		31.7				
		St+ 0.6N	31.2					
		K_s		31.6				
		K_s+ 0.4N	32.9					
	Ad	0		33.2		32.4		31.1
Ad		0.4N	32.4					
		St+ 0.6N	33.1					
		K_s+ 0.4N	33.0					

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58/Ba/2.1

SIX COURSE ROTATION EXPERIMENT

The 29th year

Seasonal effects of fertilizers - Rothamsted Long Hoos IV and Woburn Stackyard 1958.

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

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

Cultivations, etc.:

Rothamsted

Sugar beet.
Ploughed twice: Aug 22 and Nov 2, 1957. Fertilizers applied, seed drilled at 19 lb per acre: Apr 14, 1958. Singled: June 4. Sprayed with demeton methyl, 12 oz in 40 gallons per acre: July 7. Lifted: Nov 24. Variety: Klein E.

Barley.
Sugar beet tops spread: Nov 21, 1957. Ploughed: Nov 22. Ground chalk applied at 23 cwt per acre: Nov 23. Fertilizers applied: Mar 21, 1958. Seed drilled at $2\frac{3}{4}$ bushels per acre: Mar 22. Clover seed undersown: Apr 25. Harvested: Aug 27. Variety: Plumage Archer.

Clover.
Seed undersown in barley at 40 lb per acre: May 20, 1957. Autumn fertilizers applied: Sept 23. Sulphate of ammonia applied: Apr 8, 1958. Cut: July 8. Variety: S123 Late Flowering Red.

Wheat.*
Ploughed twice: July 7 and Oct 9, 1957. Autumn fertilizers applied, seed drilled at $2\frac{3}{4}$ bu. per acre: Oct 14. Sulphate of ammonia applied: Apr 9, 1958. Sprayed with CMPP, 6 pints in 40 gallons per acre: Apr 30. Harvested: Sept 3 - 11. Variety: Yeoman.

Potatoes.
Ploughed twice: Aug 22 and Oct 9, 1957. Ridged, fertilizers applied, potatoes planted: Apr 19, 1958. Earthed up: July 8. Sprayed 4 times with copper fungicide, 5 lb in 40 gallons per acre: July 12 and at 3 lb and 1 pint of spreader in 40 gallons per acre: Aug 1, 6 and 16. Sprayed with sulphuric acid, 20% BOV at 100 gallons per acre: Sept 9. Lifted: Sept 25. Variety: Majestic.

Rye.
Ploughed: Oct 9, 1957. Ground chalk applied at 23 cwt per acre: Oct 14. Autumn fertilizers applied, seed drilled at 3 bushels per acre: Oct 15. Sulphate of ammonia applied: Apr 9, 1958. Sprayed with CMPP, 6 pints in 40 gallons per acre: Apr 30. Harvested: Aug 26. Variety: King II.

* Owing to severe lodging, yields from this crop were estimated from a 6 ft. wide sample cut from each plot (Area 0.0054 acres).

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Woburn

Sugar beet.
Ploughed twice: Aug 29 and Nov 30, 1957. Fertilizers applied, seed drilled at 10 lb per acre: Apr 17, 1958. Sprayed with miscible DDT at 3 pints in 40 gallons per acre: May 3. Singled: June 6. Sprayed with demeton methyl, 12 oz in 40 gallons per acre: June 26. Lifted: Oct 15. Variety: Klein E.

Barley.
Ploughed: Nov 29, 1957. Fertilizers applied: Mar 19, 1958. Seed drilled at 2½ bushels per acre: Mar 20. Harvested: Aug 25. Variety: Herta.

Clover.
Ploughed: Aug 9 and 17, 1957. PK fertilizers applied: Aug 30. Seed broadcast at 40 lb per acre: Sept 5. Ploughed: Mar 4, 1958. Nitrogen fertilizers applied: Mar 19. Resown: Mar 24. Cut: July 14. Variety: Crimson Clover.

Wheat.
Ploughed twice: July 8 and Aug 29, 1957. Autumn fertilizers applied: Oct 17. Seed drilled at 2½ bushels per acre: Oct 26. Sulphate of ammonia applied: Apr 21, 1958. Sprayed with CMPP, 6 pints in 40 gallons per acre: May 3. Harvested: Aug 26. Variety: Yeoman.

Potatoes.
Ploughed twice: Aug 29, 1957 and Jan 14, 1958. Fertilizers applied, and potatoes hand planted: Apr 21. Earthed up: June 18. Sprayed with copper fungicide, 5 lb in 80 gallons per acre: July 14. Twice sprayed with copper fungicide, 5 lb in 40 gallons per acre: July 29 and Aug 16. Sprayed with arsenious compound, 1 gallon in 40 gallons per acre: Sept 12. Lifted: Oct 7. Variety: Majestic.

Rye.
Ploughed: Oct 5, 1957. Ground chalk applied at 20 cwt per acre: Oct 10. Fertilizers applied: Oct 17. Seed drilled at 2½ bushels per acre: Oct 26. Sprayed with CMPP, 6 pints in 40 gallons per acre: May 3, 1958. Sulphate of ammonia applied: Apr 21. Harvested: Aug 26. 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	14.24	8.77	24.5*	26.1*
Response to: N	+6.52	+4.22	+9.4	+4.0
P	+1.25	+7.69	-3.5	-7.9
K	-1.28	+1.02	+1.2	+3.3
Mean dry matter % as harvested:			78.9	81.1
	Sugar Beet sugar percentage		Barley, straw: cwt per acre	
Mean	17.4	16.6	29.6*	32.3*
Response to: N	-0.4	+0.2	+6.6	+14.9
P	-1.0	+0.1	+11.5	+1.7
K	+0.2	+0.4	-0.6	+0.6
Mean dry matter % as harvested:			72.2	83.2
	Sugar Beet, total sugar: cwt per acre		Clover, hay, dry matter: cwt per acre	
Mean	49.6	29.4	47.7	14.9
Response to: N	+21.3	+14.1	-7.0	+10.7
P	+1.5	+25.8	-5.9	+13.3
K	-3.6	+4.1	+1.2	-6.2
Mean dry matter % as cut:			60.2	17.9
	Sugar Beet, tops: tons per acre		Wheat, grain: cwt per acre	
Mean	9.17	7.10	18.7*	20.6*
Response to: N	+3.27	+4.42	-6.7	+19.3
P	-0.24	+5.93	-3.4	+1.8
K	+0.80	-1.40	+2.6	+0.6
Mean dry matter % as harvested:			77.2	80.1
	Sugar Beet, plant number: thousands per acre		Wheat, straw: cwt per acre	
Mean	31.1	**	46.9*	28.4*
Response to: N	+0.4		+14.1	+31.0
P	-0.3		-7.9	+3.4
K	-1.0		+8.0	+0.1
Mean dry matter % as harvested:			75.5	82.4

* (At 85% dry matter). ** Not recorded.

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

	Rothamsted	Woburn	Rothamsted	Woburn
	Potatoes, total tubers: tons per acre		Rye, grain: cwt per acre	
Mean	7.75	6.48	23.2*	25.2*
Response to: N	+8.41	+4.04	+11.6	+14.4
P	+1.85	-2.91	-3.9	+3.3
K	+0.32	+3.23	+1.4	-0.6
Mean dry matter % as harvested:			81.2	80.4
	Potatoes, percentage ware		Rye, straw: cwt per acre	
	(1)	(2)		
Mean	87.2	75.0	41.5*	34.1*
Response to: N	+6.0	+0.2	+31.0	+19.8
P	-7.7	+10.0	-11.3	+6.4
K	+0.9	+5.8	+4.8	-3.3
Mean dry matter % as harvested:			83.4	82.3

* (At 85% dry matter)

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

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LEY AND ARABLE ROTATIONS

Highfield and Fosters Field 1958 - the 10th year.

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

Permanent and reseeded grass

The hay crops are now discontinued in favour of silage cuts, which are taken in alternate years not later than the end of May, the silage plots being grazed immediately afterwards.

Revised PK dressings

	P_2O_5	K_2O	
Wheat, barley and oats	0.15	0.3	combine drilled
2nd and 3rd year leys, permanent and reseeded grass, all grazed	0.3	0.6	broadcast in winter
Permanent and reseeded grass (silage plots)	0.6	1.2	broadcast in winter
2nd and 3rd year cut grass	1.2	1.2	broadcast in winter as compound fertilizer (16% P_2O_5, 16% K_2O)
		0.15 v.0.3	for every cut as compound fertilizer (16% N, 16% K_2O)
Treatment potatoes and 2nd and 3rd year lucerne	0.9	1.8	in ridges or broadcast in winter for lucerne.

Note: Unless otherwise stated all the above dressings are applied as compound fertilizer (10% P_2O_5, 20% K_2O). All other dressings remain unchanged, except as described below.

Revised N dressings

	N	
Permanent and reseeded grass (silage plots)	0.075 v. 0.15	as 'Nitro-Chalk' in early spring for silage cut; another equal dose in late July.

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58/Bb/1.2

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

Crop	Year of cycle	Field etc.	Rate	
Wheat (following lucerne)	"1st test"	Highfield	1.8	(3 years previous lucerne)
		Fosters	2.4	
Wheat (following cut grass)	"1st test"	Highfield	3.6	(3 years previous cutting)
		Fosters	3.0	
Cut grass	"1st treatment"		3.0	(3 years previous cutting)
	"2nd treatment"		2.4	(received supplement in 1957)
	"3rd treatment"	Highfield	3.6	(received supplement in 1957)
		Fosters	3.0	
Lucerne	"1st treatment"		3.0	(3 years previous lucerne)
	"2nd treatment"		1.2	(received supplement in 1957)
	"3rd treatment"		1.2	(received supplement in 1957)
Permanent and reseeded grass	"1st treatment"	Highfield (blocks 1 & 4) Fosters (blocks 1 & 3)	2.4	(2 previous hay crops taken)
	"2nd treatment"	Highfield (blocks 9 & 12) Fosters (blocks 6 & 11)	1.2	(1 previous hay crop taken)

The following should be added to the list for 1957:

Wheat (following 3rd year lucerne)	"1st test"	Highfield	3.7	(3 years previous lucerne)
		Fosters	4.0	
Wheat (following 3rd year cut grass)	"1st test"		4.2	(3 years previous cutting)

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

Cultivations, etc.:

HIGHFIELD

1st year Treatment Crops

Cut grass. Ploughed twice: Aug 27, 1957 and Oct 24. 1st dressing of supplementary K applied: Dec 28. 'Nitro-Chalk' and basal PK applied: Apr 21, 1958. Seeds sown at 33 lb per acre: Apr 22. Sprayed with MCPB at 5 pints in 40 gallons per acre: May 31. 2nd and 3rd dressings of supplementary K applied: June 20 and Oct 7. Cut 5 times: June 20, July 16, Aug 8, Oct 3, Oct 31. 'Nitro-Chalk' applied after every cut, except the last.

Grazed ley. Ploughed twice: Aug 27, 1957 and Oct 24. 'Nitro-Chalk' and basal PK applied: Apr 21, 1958. Seed sown at 44 lb per acre: Apr 22. Sprayed with MCPB at 5 pints in 40 gallons per acre: May 31. 'Nitro-Chalk' applied: July 29. Grazed: 7 circuits, June 20 - Oct 24.

Lucerne. Ploughed twice: Aug 27, 1957 and Oct 24. 1st dressing of supplementary K applied: Dec 28. Basal PK applied: Apr 21. 1958. Seed drilled at 28 lb per acre: Apr 22. 2nd and 3rd dressings of supplementary K applied: Aug 2 and Nov 3. Cut twice: July 31 and Oct 31. Variety: Du Puits.

Hay. Seeds undersown in barley at 28 lb per acre: May 10, 1957. Basal PK applied: Feb 7, 1958. 'Nitro-Chalk' applied: Apr 10. Cut: June 11

2nd year Treatment Crops

Cut grass. Supplementary K applied: Dec 24, 1957. Basal PK applied: Feb 7, 1958. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 10 and after every cut, except the last. Cut 6 times: May 12, June 10, July 4, Aug 7, Oct 3, Oct 31.

Grazed ley. Basal PK applied: Feb 6, 1958. 'Nitro-Chalk' applied: May 23 and June 29. Grazed: 8 circuits, Apr 24 - Oct 10.

Lucerne. Supplementary K applied: Dec 24, 1957. Basal PK applied: Feb 6, 1958. Cut 3 times: June 20, Aug 7, Oct 31.

Potatoes. Ploughed 3 times: June 24, 1957, Oct 8 and Feb 7 - 17, 1958. Basal PK, sulphate of ammonia and dung applied, potatoes planted: Apr 29. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. 1st dressing of supplementary K applied: Dec 24, 1957. Basal PK applied: Feb 7, 1958. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 10 and after every cut except the last. 2nd and 3rd dressings of supplementary K applied: June 11 and Oct 3. Cut 5 times: May 12, June 10, July 4, Aug 7, Oct 3.

Grazed ley. Basal PK applied: Feb 6, 1958. 'Nitro-Chalk' applied: May 20 and July 23. Grazed: 8 circuits, Apr 28 - Sept 26.

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Lucerne. Supplementary K applied: Dec 24, 1957. Sprayed with sodium trichloracetate at 20 lb in 80 gallons per acre: Jan 15, 1958. Basal PK applied: Feb 6. Plots 85 and 86 cut owing to crop failure: June 11 and ploughed June 16. Remaining plots cut 3 times: June 20, Aug 7, Oct 3.

Oats. Ploughed twice: Oct 11, 1957, Feb 17, 1958. Seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK, 'Nitro-Chalk' applied: Mar 20. Combine harvested: Sept 1. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Aug 28, 1957 and Oct 15. Ploughed leys: Oct 15. Seed drilled at $2\frac{3}{4}$ bushels per acre with basal PK: Oct 26. Supplementary K applied after cut grass and lucerne: Dec 27. 'Nitro-Chalk' applied: Apr 17, 1958. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 30. Combine harvested: Sept 1. Supplementary K applied to stubble: Sept 4. Variety: Yeoman.

2nd Test Crop, Potatoes

Ploughed 3 times: Aug 28, 1957, Oct 8, Feb 7 - 17, 1958. Supplementary K applied after cut grass and lucerne: Dec 28, 1957. Ridged, dung, sulphate of ammonia, basal PK and additional PK applied, potatoes planted: Apr 29, 1958. Earthed up: July 8. Sprayed 3 times with copper fungicide, at 5 lb in 40 gallons per acre: July 12, and at 3 lb and 1 pint of spreader in 40 gallons per acre: Aug 6 and Aug 16. Sprayed with sulphuric acid, 20% BOV, at 100 gallons per acre: Sept 10. Lifted: Sept 22. Variety: Majestic.

3rd Test Crop, Barley

Ploughed twice: Oct 11, 1957 and Feb 17, 1958. Ground chalk applied to blocks 6 and 7: Nov 21, 1957. Supplementary K and additional P and K applied: Feb 19, 1958. 'Nitro-Chalk' applied: Mar 20. Seed drilled at 2 bushels per acre with basal PK: Mar 21. Combine harvested: Sept 1. Variety: Proctor.

Permanent grasses. Basal PK applied to all plots: Feb 6, 1958.

8th year reseeded, 8th experimental year of permanent grass, Blocks 9 - 12.

Blocks 10 and 12. Supplementary K applied: Dec 24, 1957. 'Nitro-Chalk' applied: May 23, 1958. 2nd dressing of 'Nitro-Chalk' applied to reseeded plots: July 25 and to permanent grass plots: Aug 5. Grazed: 8 circuits, May 2 - Oct 30.

Blocks 9 and 11. Supplementary K applied: Dec 24, 1957. 'Nitro-Chalk' applied: Apr 10, 1958. Cut for silage: May 22. 2nd dressing of 'Nitro-Chalk' applied to reseeded plots: July 23 and to permanent grass plots: July 25. Grazed: 5 circuits, June 19 - Oct 25.

9th year reseeded, 9th experimental year of permanent grass, Blocks 5 - 8.

Blocks 7 and 8. Ground chalk applied to block 7: Nov 21, 1957. 'Nitro-Chalk' applied: May 20, 1958. 2nd dressing of 'Nitro-Chalk' applied to reseeded plots: July 23 and to permanent grass plots: Aug 2. Grazed: 8 circuits, Apr 28 - Oct 28.

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Blocks 5 and 6. Ground chalk applied to block 6: Nov 21, 1957. 'Nitro-Chalk' applied: Apr 10, 1958. Cut for silage: May 22. 2nd dressing of 'Nitro-Chalk' applied to reseeded plots: July 23 and to permanent grass plots: July 29. Grazed: 5 circuits, June 18 - Oct 23.

10th year reseeded, 10th experimental year of permanent grass, Blocks 1-4.
Blocks 1 and 3. Supplementary K applied: Dec 24, 1957. 'Nitro-Chalk' applied: May 16, 1958. 2nd dressing of 'Nitro-Chalk' applied to reseeded plots: July 23 and to permanent grass plots: Aug 2. Grazed: 8 circuits, Apr 24 - Oct 21.

Blocks 2 and 4. Supplementary K applied: Dec 24, 1957. 'Nitro-Chalk' applied: Apr 10, 1958. Cut for silage: May 22. 2nd dressing of 'Nitro-Chalk' applied: July 23. Grazed: Reseeded plots 6 circuits, permanent grass plots 5 circuits, June 15 - Nov 1.

FOSTERS

1st year Treatment Crops

Cut grass. Ploughed twice: Aug 27, 1957 and Oct 22. 1st dressing of supplementary K applied: Dec 27. 'Nitro-Chalk' and basal PK applied: Apr 21, 1958. Seeds sown at 33 lb per acre: Apr 22. Sprayed with MCPB at 5 pints in 40 gallons per acre: May 31. 2nd and 3rd dressing of supplementary K applied: June 25 and Oct 7. Cut 5 times: June 24, July 17, Aug 8, Oct 7, Oct 31. 'Nitro-Chalk' applied after each cut except the last.

Grazed ley. Ploughed twice: Aug 27, 1957 and Oct 22. 'Nitro-Chalk' and basal PK applied, seeds sown: Apr 22, 1958. Sprayed with MCPB at 5 pints in 40 gallons per acre: May 31. 'Nitro-Chalk' applied: July 23. Grazed: Plots 1 and 27, 6 circuits, plots 2 and 28, 5 circuits, June 19 - Oct 16.

Lucerne. Ploughed twice: Aug 27, 1957 and Oct 22. 1st dressing of supplementary K applied: Dec 27. Basal PK applied: Apr 21, 1958. Seeds sown: Apr 22. 2nd and 3rd dressings of supplementary K applied: Aug 1 and Nov 3. Cut twice: July 31, Oct 31.

Hay. Seeds undersown in barley at 28 lb per acre: May 10, 1957. Basal PK applied: Feb 7, 1958. 'Nitro-Chalk' applied: Apr 9. Cut: June 9.

2nd year Treatment Crops

Cut grass. 1st dressing of supplementary K applied: Dec 27, 1957. Basal PK applied: Feb 7, 1958. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 9 and after all cuts except the last. 2nd dressing of supplementary K applied: June 9. Cut 6 times: May 12, June 9, July 3, Aug 8, Oct 7 and Oct 31.

Grazed ley. Basal PK applied: Feb 17, 1957. 'Nitro-Chalk' applied: May 23, 1958 and July 23. Grazed: 8 circuits, Apr 25 - Oct 15.

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Lucerne. Supplementary K applied: Dec 27, 1957. Basal PK applied: Feb 17, 1958. Cut 3 times: June 23, Aug 6, Oct 31.

Potatoes. Ploughed 3 times: June 13, 1957, Sept 23 and Jan 13 - Feb 6, 1958. Ridged, dung, sulphate of ammonia and basal PK applied, potatoes planted: Apr 28. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. 1st dressing of supplementary K applied: Dec 27, 1957. Basal PK applied: Feb 7, 1958. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 9 and after each cut except the last. Cut 5 times: May 12, June 9, July 4, Aug 8, Oct 6. 2nd and 3rd dressing of supplementary K applied: June 9 and Oct 6.

Grazed ley. Basal PK applied: Feb 17, 1958. 'Nitro-Chalk' applied: May 20 and July 29. Grazed: 8 circuits, Apr 29 - Sept 25.

Lucerne. Supplementary K applied: Dec 27, 1957. Basal PK applied: Feb 17, 1958. Cut 3 times: June 23, Aug 6 and Oct 6.

Oats. Ploughed: Oct 10, 1957. 'Nitro-Chalk' applied, seed drilled at 3½ bushels per acre with basal PK: Mar 20, 1958. Combine harvested: Aug 31. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Aug 27, 1957 and Oct 14. Ploughed leys: Oct 14. Seed drilled at 2¾ bushels per acre with basal PK: Oct 26. Supplementary K to previous cut grass and lucerne plots: Dec 27. 'Nitro-Chalk' applied: Apr 16, 1958. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 30. Combine harvested: Aug 27. Supplementary K applied: Sept 3. Variety: Yeoman.

2nd Test Crop, Potatoes

Ploughed 3 times: Aug 29, 1957, Oct 10 and Feb 6, 1958. Supplementary K applied: Dec 27, 1957. Ridged, dung, sulphate of ammonia, basal PK and additional P and K applied, potatoes planted: Apr 28, 1958. Earthed up: July 7. Sprayed 4 times with copper fungicide at 5 lbs in 40 gallons per acre: July 12, and at 3 lb and 1 pint of spreader in 40 gallons per acre: Aug 1, Aug 6, Aug 16. Sprayed with sulphuric acid, 20% BOV, at 100 gallons per acre: Sept 10. Lifted: Sept 18. Variety: Majestic.

3rd Test Crop, Barley

Ploughed: Oct 10, 1957. Supplementary K applied: Feb 13, 1958. 'Nitro-Chalk' applied: Mar 20. Seed drilled at 2 bushels per acre with basal PK: Mar 21. Combine harvested: Aug 26. Variety: Proctor.

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Permanent grasses. Basal PK applied to all plots: Feb 17, 1958.
8th year reseeded grass, Blocks 6, 10, 11, 12.
Blocks 6 and 10. Supplementary K applied: Dec 27, 1957. 'Nitro-Chalk' applied: May 23, 1958 and Aug 1. Grazed: 8 circuits, May 3 - Oct 17.
Blocks 11 and 12. Supplementary K applied: Dec 27, 1957. 'Nitro-Chalk' applied: Apr 9, 1958 and July 29. Cut for silage: May 23. Grazed: 5 circuits, June 17 - Oct 9.

9th year reseeded grass, Blocks 5, 7, 8, 9.
Blocks 5 and 9. 'Nitro-Chalk' applied: May 20, 1958 and July 30. Grazed: 8 circuits, Apr 29 - Oct 13.
Blocks 7 and 8. 'Nitro-Chalk' applied: Apr 9, 1958 and July 25. Cut for silage: May 23. Grazed: 5 circuits, June 21 - Oct 5.

10th year reseeded grass, Blocks 1 - 4.
Blocks 1 and 2. Supplementary K applied: Dec 27, 1957. 'Nitro-Chalk' applied: May 16, 1958 and July 23. Grazed: 8 circuits, Apr 25 - Oct 1.
Blocks 3 and 4. Supplementary K applied: Dec 27, 1957. 'Nitro-Chalk' applied: Apr 9, 1958 and July 23. Cut for silage: May 23. Grazed: 5 circuits, June 13 - Sept 27.

Standard errors per plot. Test Crops.

Wheat, grain (at 85% dry matter).		Highfield:	1.93 cwt per acre or 6.0% (14 d.f.)
		Fosters:	1.06 cwt per acre or 2.7% (14 d.f.)
Potatoes, total tubers.	Highfield	$\frac{1}{4}$ plot:	1.347 tons per acre or 10.2% (14 d.f.)
		$\frac{1}{8}$ plot:	0.961 tons per acre or 7.3% (20 d.f.)
	Fosters	$\frac{1}{4}$ plot:	1.239 tons per acre or 8.8% (14 d.f.)
		$\frac{1}{8}$ plot:	0.659 tons per acre or 4.7% (20 d.f.)
Barley, grain (at 85% dry matter).		Highfield:	2.27 cwt per acre or 6.2% (15 d.f.)
		Fosters:	1.57 cwt per acre or 3.9% (15 d.f.)

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Summary of Results

Wheat 1st test crop

N: cwt per acre	Treatment crops 1955-1957 Lucerne	Ley	Cut Grass	Arable with hay	Mean
Grain (at 85% dry matter): cwt per acre					
Highfield					
Mean	34.6	26.4	32.6	36.2	32.4
To test crop					
0.3	36.1	27.0	33.1	38.3	33.6
0.6	33.2	25.8	32.1	34.1	31.3
Difference (±1.37)	-2.9	-1.2	-1.0	-4.2	-2.3 (±0.68)
To treatment crops					
Single rate		26.4	32.3	36.8	31.8
Double rate		26.4	32.9	35.6	31.6
Difference (±1.37)		0.0	+0.6	-1.2	-0.2 (±0.79)
Fosters					
Mean	41.0	36.4	38.1	39.3	38.7
To test crop					
0.3	39.8	35.4	36.6	36.7	37.1
0.6	42.2	37.4	39.5	41.8	40.2
Difference (±0.75)	+2.4	+2.0	+2.9	+5.1	+3.1 (±0.37)
To treatment crops					
Single rate		36.5	37.5	39.0	37.7
Double rate		36.3	38.6	39.6	38.1
Difference (±0.75)		-0.2	+1.1	+0.6	+0.4 (±0.43)

Note: Lodging was severe on the plots receiving the high rate of N.

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Wheat 1st test crop

N: cwt per acre	Excluding Lucerne: N to previous treatment crop: Single rate	Excluding Lucerne: N to previous treatment crop: Double rate	Excluding Lucerne: Mean	Arable with hay only: Dung to potatoes 1956: tons per acre: None	Arable with hay only: Dung to potatoes 1956: tons per acre: 12	Arable with hay only: Mean
Grain (at 85% dry matter): cwt per acre						
Highfield						
To test crop	(±0.79)		(±0.56)	(±1.37)		(±0.97)
0.3	32.8	32.8	32.8	39.1	37.4	38.3
0.6	30.9	30.4	30.6	35.0	33.2	34.1
Mean	31.8	31.6	31.7			
	(±0.56)					
To previous treatment crops				(±1.37)		(±0.97)
Single rate				37.4	36.3	36.8
Double rate				36.7	34.4	35.6
Mean				37.1	35.3	36.2
				(±0.97)		
Mean dry matter % as harvested: 82.1						
Fosters						
To test crop	(±0.43)		(±0.31)	(±0.75)		(±0.53)
0.3	35.8	36.6	36.2	35.5	38.0	36.7
0.6	39.5	39.6	39.6	40.6	43.1	41.8
Mean	37.7	38.1	37.9			
	(±0.31)					
To previous treatment crops				(±0.75)		(±0.53)
Single rate				38.5	39.6	39.0
Double rate				37.6	41.6	39.6
Mean				38.0	40.6	39.3
				(±0.53)		
Mean dry matter % as harvested: 75.6						

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Wheat 1st test crop

N: cwt per acre	Treatment crops 1955-1957 Lucerne	Ley	Cut grass	Arable with hay	Mean
Straw (at 85% dry matter): cwt per acre					
		Highfield			
Mean	57.6	62.9	41.7	46.4	52.1
To test crop					
0.3	57.2	55.7	39.0	47.0	49.7
0.6	57.9	70.0	44.5	45.8	54.5
Difference	+0.7	+14.3	+5.5	-1.2	+4.8
To treatment crops					
Single rate		65.8	40.6	46.3	50.9
Double rate		59.9	42.9	46.5	49.8
Difference		-5.9	+2.3	+0.2	-1.1
		Fosters			
Mean	48.7	52.1	45.5	44.6	47.7
To test crop					
0.3	44.3	49.1	41.8	39.9	43.8
0.6	53.1	55.1	49.3	49.4	51.7
Difference	+8.8	+6.0	+7.5	+9.5	+7.9
To treatment crops					
Single rate		54.6	43.6	45.2	47.8
Double rate		49.6	47.5	44.1	47.1
Difference		-5.0	+3.9	-1.1	-0.7

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Wheat 1st test crop

N: cwt per acre	Excluding Lucerne: N to previous treatment crop: Single rate	Excluding Lucerne: N to previous treatment crop: Double rate	Excluding Lucerne: Mean	Arable with hay only: Dung to potatoes 1956: tons per acre: None	Arable with hay only: Dung to potatoes 1956: tons per acre: 12	Arable with hay only: Mean
Straw (at 85% dry matter): cwt per acre						
Highfield						
To test crop						
0.3	49.6	44.9	47.2	46.1	47.9	47.0
0.6	52.2	54.6	53.4	44.8	46.7	45.8
Mean	50.9	49.8	50.3			
To previous treatment crops						
Single rate				45.7	46.9	46.3
Double rate				45.2	47.7	46.5
Mean				45.5	47.3	46.4

Mean dry matter % as harvested: 82.6

Fosters

To test crop						
0.3	45.0	42.3	43.6	36.6	43.2	39.9
0.6	50.7	51.9	51.3	46.0	52.7	49.4
Mean	47.8	47.1	47.4			
To previous treatment crops						
Single rate				45.9	44.5	45.2
Double rate				36.7	51.5	44.1
Mean				41.3	48.0	44.6

Mean dry matter % as harvested: 87.9

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

	Treatment crops 1954-1956				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	12.78	13.98	13.32	12.62	13.17
N: cwt per acre					
0.5	11.78	13.43	12.88	12.44	12.63
1.0	13.78	14.54	13.76	12.80	13.72
Difference (±0.952)	+2.00	+1.11	+0.88	+0.36	+1.09 (±0.476)
Dung: tons per acre					
None	13.14	13.61	13.82	11.30	12.97
12	12.42	14.35	12.82	13.95	13.38
Difference (±0.952)	-0.72	+0.74	-1.00	+2.65	+0.41 (±0.476)
P_2O_5: cwt per acre*					
0.9	12.28	13.41	13.00	13.13	12.95
1.8	13.28	14.56	13.64	12.11	13.40
Difference (±0.481)	+1.00	+1.15	+0.64	-1.02	+0.45 (±0.240)
K_2O: cwt per acre*					
0.9	12.93	13.60	13.60	12.25	13.09
1.8	12.63	14.37	13.04	12.99	13.26
Difference (±0.481)	-0.30	+0.77	-0.56	+0.74	+0.17 (±0.240)
Fosters					
Mean	14.13	14.12	14.80	13.42	14.12
N: cwt per acre					
0.5	12.91	13.36	13.65	11.60	12.88
1.0	15.36	14.89	15.95	15.23	15.36
Difference (±0.876)	+2.45	+1.53	+2.30	+3.63	+2.48 (±0.438)
Dung: tons per acre					
None	13.12	12.78	13.93	12.69	13.13
12	15.15	15.47	15.68	14.14	15.11
Difference (±0.876)	+2.03	+2.69	+1.75	+1.45	+1.98 (±0.438)
P_2O_5: cwt per acre*					
0.9	13.95	13.76	14.61	12.96	13.82
1.8	14.31	14.49	15.00	13.87	14.42
Difference (±0.330)	+0.36	+0.73	+0.39	+0.91	+0.60 (±0.165)
K_2O: cwt per acre*					
0.9	14.12	13.74	15.02	13.59	14.12
1.8	14.15	14.51	14.59	13.24	14.12
Difference (±0.330)	+0.03	+0.77	-0.43	-0.35	0.00 (±0.165)

*Including basal dressing

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

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Highfield						
N: cwt per acre	(±0.476)		(1) and (2)		(1) and (2)	
0.5	12.39	12.87	12.30	12.96	12.53	12.73
1.0	13.55	13.89	13.61	13.83	13.65	13.79
Dung: tons per acre			(1) and (2)		(1) and (2)	
None			12.64	13.30	12.89	13.05
12			13.27	13.50	13.29	13.47

Lucerne rotation only	K_2O: cwt per acre*		
	0.9	1.8	Mean
P_2O_5: cwt per acre*	(3) and (4)		
0.9	12.38	12.18	12.28
1.8	13.47	13.08	13.28
Mean	12.93	12.63	12.78

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Fosters						
N: cwt per acre	(±0.438)		(1) and (2)		(1) and (2)	
0.5	11.64	14.12	12.60	13.16	13.02	12.74
1.0	14.62	16.09	15.04	15.68	15.21	15.50
Dung: tons per acre			(1) and (2)		(1) and (2)	
None			12.83	13.43	13.02	13.24
12			14.81	15.41	15.21	15.00

Lucerne rotation only	K_2O: cwt per acre*		
	0.9	1.8	Mean
P_2O_5: cwt per acre*	(3) and (4)		
0.9	13.90	14.01	13.95
1.8	14.35	14.28	14.31
Mean	14.12	14.15	14.13

*Including basal dressing

Highfield	Fosters	
(1) ±0.240	(1) ±0.165	for use in horizontal and interaction comparisons.
(2) ±0.377	(2) ±0.331	for use in all others.
(3) ±0.952	(3) ±0.876	for use only in testing the PK interaction.
(4) ±0.754	(4) ±0.662	for use in all other comparisons.

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

	Treatment crops 1954-1956				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	89.5	89.4	89.8	87.7	89.1
N: cwt per acre					
0.5	88.1	88.8	88.8	86.1	87.9
1.0	90.8	90.0	90.7	89.3	90.2
Difference	+2.7	+1.2	+1.9	+3.2	+2.3
Dung: tons per acre					
None	90.5	90.0	89.7	86.9	89.3
12	88.5	88.7	89.9	88.4	88.9
Difference	-2.0	-1.3	+0.2	+1.5	-0.4
P_2O_5: cwt per acre*					
0.9	89.3	88.7	89.2	88.0	88.8
1.8	89.6	90.0	90.3	87.3	89.3
Difference	+0.3	+1.3	+1.1	-0.7	+0.5
K_2O: cwt per acre*					
0.9	89.7	88.6	89.2	87.0	88.6
1.8	89.2	90.1	90.4	88.4	89.5
Difference	-0.5	+1.5	+1.2	+1.4	+0.9
Fosters					
Mean	91.0	90.7	92.0	89.5	90.8
N: cwt per acre					
0.5	89.6	89.7	90.9	88.2	89.6
1.0	92.4	91.6	93.2	90.9	92.0
Difference	+2.8	+1.9	+2.3	+2.7	+2.4
Dung: tons per acre					
None	90.6	89.7	91.6	88.8	90.2
12	91.4	91.6	92.5	90.3	91.4
Difference	+0.8	+1.9	+0.9	+1.5	+1.2
P_2O_5: cwt per acre*					
0.9	91.5	90.9	92.1	89.8	91.1
1.8	90.5	90.4	92.0	89.3	90.5
Difference	-1.0	-0.5	-0.1	-0.5	-0.6
K_2O: cwt per acre*					
0.9	91.0	90.4	92.4	89.1	90.7
1.8	91.0	90.9	91.6	90.0	90.9
Difference	0.0	+0.5	-0.8	+0.9	+0.2

*Including basal dressing

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

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Highfield						
N: cwt per acre						
0.5	88.3	87.6	88.0	87.9	87.7	88.1
1.0	90.3	90.1	89.6	90.8	89.5	90.9
Dung: tons per acre						
None			89.3	89.2	88.8	89.7
12			88.3	89.5	88.4	89.3

Lucerne rotation only	K_2O: cwt per acre*		
	0.9	1.8	Mean
P_2O_5: cwt per acre*			
0.9	90.1	88.5	89.3
1.8	89.4	89.9	89.6
Mean	89.7	89.2	89.5

	Dung: tons per acre		P_2O_5: cwt per acre*		K_2O: cwt per acre*	
	None	12	0.9	1.8	0.9	1.8
Fosters						
N: cwt per acre						
0.5	88.9	90.3	89.8	89.4	89.7	89.4
1.0	91.5	92.5	92.3	91.7	91.7	92.3
Dung: tons per acre						
None			90.7	89.6	90.0	90.3
12			91.4	91.4	91.4	91.4

Lucerne rotation only	K_2O: cwt per acre*		
	0.9	1.8	Mean
P_2O_5: cwt per acre*			
0.9	90.8	92.2	91.5
1.8	91.2	89.7	90.5
Mean	91.0	91.0	91.0

*Including basal dressing

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

	Treatment crops 1953-1955				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	34.0	37.1	37.2	39.2	36.9
N: cwt per acre					
None	39.0	39.7	39.4	41.0	39.7
0.2	29.1	34.5	35.1	37.4	34.0
Difference (±1.61)	-9.9	-5.2	-4.3	-3.6	-5.7 (±0.80)
Dung to potatoes 1957: tons per acre					
None	34.2	38.1	37.2	39.3	37.2
12	33.9	36.1	37.3	39.1	36.6
Difference (±1.61)	-0.3	-2.0	+0.1	-0.2	-0.6 (±0.80)
Fosters					
Mean	41.5	40.2	39.8	38.9	40.1
N: cwt per acre					
None	41.9	42.1	40.8	36.2	40.3
0.2	41.1	38.2	38.8	41.5	39.9
Difference (±1.11)	-0.8	-3.9	-2.0	+5.3	-0.4 (±0.55)
Dung to potatoes 1957: tons per acre					
None	41.4	40.2	39.4	38.3	39.8
12	41.6	40.1	40.3	39.4	40.3
Difference (±1.11)	+0.2	-0.1	+0.9	+1.1	+0.5 (±0.55)

	Highfield N: cwt per acre		Fosters N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1957: tons per acre	(±0.80)		(±0.55)	
None	40.4	33.9	40.0	39.6
12	39.1	34.1	40.5	40.2

Mean dry matter % as harvested:
Highfield: 83.6
Fosters: 73.7

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

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

	Treatment crops 1953-1955				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	37.6	39.8	35.2	39.5	38.0
N: cwt per acre					
None	33.1	38.0	33.5	37.9	35.6
0.2	42.1	41.6	36.9	41.1	40.4
Difference	+9.0	+3.6	+3.4	+3.2	+4.8
Dung to potatoes 1957: tons per acre					
None	36.4	38.6	35.2	38.9	37.3
12	38.8	40.9	35.2	40.1	38.7
Difference	+2.4	+2.3	0.0	+1.2	+1.4
Fosters					
Mean	35.6	39.6	38.0	34.0	36.8
N: cwt per acre					
None	33.1	36.0	33.2	32.3	33.6
0.2	38.1	43.2	42.8	35.8	40.0
Difference	+5.0	+7.2	+9.6	+3.5	+6.4
Dung to potatoes 1957: tons per acre					
None	34.2	39.1	38.3	32.8	36.1
12	36.9	40.0	37.8	35.3	37.5
Difference	+2.7	+0.9	-0.5	+2.5	+1.4

	Highfield		Fosters	
	N: cwt per acre		N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1957: tons per acre				
None	34.3	40.2	32.3	39.9
12	36.9	40.6	35.0	40.0

Mean dry matter % as harvested:
Highfield: 79.3
Fosters: 86.9

58/Bb/1.18

Treatment crops Arable and Hay rotation

(values based on mean of 2 sub plots only)

	Highfield N: cwt per acre applied in 1958			Fosters N: cwt per acre applied in 1958		
	Single rate	Double rate	Mean	Single rate	Double rate	Mean
Hay (dry matter): cwt per acre						
No dung	73.4	72.1	72.8	61.5	63.3	62.4
Dung in 1956	70.6	79.1	74.9	70.1	73.8	72.0
Mean	72.0	75.6	73.8	65.8	68.5	67.2
Potatoes, total tubers: tons per acre						
No dung	13.55	12.59	13.07	10.12	12.78	11.45
Dung in 1958	13.11	14.26	13.69	12.66	14.47	13.56
Mean	13.33	13.43	13.38	11.39	13.62	12.51
Potatoes, percentage ware ($1\frac{1}{2}$" riddle)						
No dung	89.9	91.4	90.7	87.0	92.4	89.7
Dung in 1958	88.6	86.4	87.5	93.1	92.2	92.6
Mean	89.2	88.9	89.1	90.0	92.3	91.2
	Oats					
	None	0.2		0.2	0.4	
Grain (at 85% dry matter): cwt per acre						
No dung	23.5	19.7	21.6	35.2	35.9	35.5
Dung in 1957	26.3	17.1	21.7	32.9	34.9	33.9
Mean	24.9	18.4	21.6	34.0	35.4	34.7
Straw (at 85% dry matter): cwt per acre						
No dung	32.2	35.1	33.6	34.3	40.5	37.4
Dung in 1957	36.3	38.1	37.2	39.7	46.3	43.0
Mean	34.3	36.6	35.4	37.0	43.4	40.2

Highfield, Oats, Mean dry matter % as harvested Grain: 83.5 Straw: 67.8
Fosters, Oats, Mean dry matter % as harvested Grain: 83.4 Straw: 82.9

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Cut grass. Dry matter: cwt per acre

1st year	Corrective dressing of K_2O: cwt per acre 3.0	Highfield N: to previous 3 test crops Single rate	Highfield N: to previous 3 test crops Double rate	Highfield Dung to potatoes 1956: tons per acre None	Highfield Dung to potatoes 1956: tons per acre 12	Highfield Mean	Fosters N: to previous 3 test crops Single rate	Fosters N: to previous 3 test crops Double rate	Fosters Dung to potatoes 1956: tons per acre None	Fosters Dung to potatoes 1956: tons per acre 12	Fosters Mean
N (1) to cut grass (5 cuts)											
Single rate		56.4	64.5	60.3	60.6	60.4	51.6	49.8	46.3	55.1	50.7
Double rate		74.0	70.3	71.7	72.6	72.1	65.0	64.4	63.7	65.6	64.7
N: to test crops											
Single rate				65.2	65.2	65.2			54.8	61.7	58.3
Double rate				66.8	67.9	67.4			55.2	58.9	57.1
Mean				66.0	66.6	66.3			55.0	60.3	57.7

		Highfield N to cut grass (1) Single rate	Highfield N to cut grass (1) Double rate	Highfield Mean	Fosters N to cut grass (1) Single rate	Fosters N to cut grass (1) Double rate	Fosters Mean
2nd year (6 cuts)	2.4	75.1	96.7	85.9	81.4	90.1	85.8
3rd year (5 cuts)	*	73.1	92.3	82.7	73.9	87.2	80.6

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

*Highfield: 3.6
Fosters: 3.0

58/Bb/1.19

Lucerne. Dry matter: cwt per acre

1st year (2 cuts)	Corrective dressing of K_2O: cwt per acre	Highfield N to 3 previous test crops Single rate	Highfield N to 3 previous test crops Double rate	Highfield Mean	Fosters N to 3 previous test crops Single rate	Fosters N to 3 previous test crops Double rate	Fosters Mean
Dung to potatoes 1956							
None		36.5	42.2	39.4	41.2	40.5	40.9
12 tons		39.5	38.2	38.8	46.9	46.4	46.6
Mean		38.0	40.2	39.1	44.0	43.5	43.8
2nd year (3 cuts)	1.2			81.7			70.5
3rd year (3 cuts)	1.2			52.5			81.5

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

	Highfield N: cwt per acre (yearly) 0.15	Highfield N: cwt per acre (yearly) 0.30	Highfield Mean	Fosters N: cwt per acre (yearly) 0.15	Fosters N: cwt per acre (yearly) 0.30	Fosters Mean
1st year	31.2	33.9	32.5	19.8	21.6	20.7
2nd year	34.2	40.3	37.2	31.0	31.5	31.3
3rd year	31.4	36.2	33.8	31.3	35.6	33.5

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Reseeded Grass. Dry matter: cwt per acre

	Cut for silage N			Grazed Estimated from sampling cuts N		
	Single rate	Double rate	Mean	Single rate	Double rate	Mean
Highfield						
8th exptl.year						
Blocks 10 and 12				32.7*	41.8*	37.2*
Blocks 9 and 11	17.2	20.4	18.8	23.2*	30.3*	26.7*
9th exptl.year						
Blocks 7 and 8				28.1*	36.8*	32.5*
Blocks 5 and 6	23.7	26.8	25.2	19.7*	18.0*	18.9*
10th exptl.year						
Blocks 1 and 3				31.6*	35.0*	33.3*
Blocks 2 and 4	23.2	28.3	25.7	27.1*	25.9*	26.5*
Fosters						
8th exptl.year						
Blocks 6 and 10				50.6*	41.5*	46.0*
Blocks 11 and 12	14.8	14.2	14.5	38.3*	34.5*	36.4*
9th exptl.year						
Blocks 5 and 9				42.6*	35.3*	39.0*
Blocks 7 and 8	27.2	25.9	26.5	23.9*	23.5*	23.7*
10th exptl.year						
Blocks 1 and 2				34.2*	32.5*	33.4*
Blocks 3 and 4	27.4	27.2	27.3	29.0*	25.4*	27.2*

Permanent Grass. Dry matter: cwt per acre

Highfield						
8th exptl.year						
Blocks 10 and 12				42.1*	41.7*	41.9*
Blocks 9 and 11	25.2	26.1	25.6	29.3*	30.9*	30.1*
9th exptl.year						
Blocks 7 and 8				27.6*	40.3*	34.0*
Blocks 5 and 6	16.9	23.0	20.0	22.7*	25.5*	24.1*
10th exptl.year						
Blocks 1 and 3				34.5*	42.7*	38.6*
Blocks 2 and 4	20.9	21.3	21.1	23.0*	23.6*	23.3*

*Aftermath grazing.

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58/Bc/1.1

REFERENCE PLOTS

The effects of N P K and Dung on a sequence of five arable crops - Great Field IV 1956-1958.

The site selected for the experiment was ploughed out of old grassland in March 1956 and was shown by soil analysis to be low in available P and K. All crops in 1956 were spring sown. Similar effects are also illustrated on the original grass sward, which is cut for hay.

Design: Rotation:- Winter wheat; kale; barley; clover; potatoes.
6 rows (1 for each crop) of a 12 × 12 Latin Square.

Area of each plot: 0.0013 acres.

Treatments. All combinations of:-
Nitrogen: N_1 and no nitrogen.
Phosphate: P and no phosphate.
Potash: K and no potash
and the following additional treatments
N_2PK; dung; dung + N_1PK; dung + N_2PK.

Rates and forms of manuring.
All N as 'Nitro-Chalk': Potatoes and wheat, 0.6 or 1.2; barley, 0.45 or 0.90; kale, 1.0 or 2.0; clover, 0.15 or 0.30; grass, 1.0 or 2.0 cwt N per acre.
All P as granular superphosphate: 0.5 cwt P_2O_5 per acre.
All K as sulphate of potash: 1.0 cwt K_2O per acre.
Dung: 15 tons per acre to all crops in 1956 and 1957; omitted on clover in 1958.

Cultivations, etc.:
1956.
Spring wheat. Dung N P and K applied, drilled: Apr 7, 1956. Harvested: Sept 7. Variety: Koga II.
Kale. Dung N P and K applied, sown: Apr 10, 1956. Harvested: Nov 15. Variety: Thousand Head.
Barley. Dung N P and K applied, drilled: Apr 7, 1956. Harvested: Aug 28. Variety: Proctor.
Clover. Dung N P and K applied, sown: Apr 10, 1956. Cut twice: Aug 14 and Oct 25. Variety: Giant Hybrid.
Potatoes. Dung N P and K applied, planted: Apr 10, 1956. Harvested: Sept 3. Variety: King Edward.

Note: The whole area received hydrated lime at 32 cwt per acre on Apr 7, 1956.

1957
Winter wheat. Dung applied, hand dug: Sept 3, 1956. PK applied, drilled: Sept 18. First N dressing applied: Mar 4, 1957. Second N dressing applied: Mar 27. Harvested: Aug 7. Variety: Cappelle.

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Kale. Dung applied and hand dug: Nov 26, 1956. N P and K applied, sown: Mar 13, 1957. Harvested: Nov 26. Variety: Thousand Head.
Barley. Dung applied and hand dug: Nov 27, 1956. Drilled, N P and K applied: Mar 4, 1957. Harvested: July 24. Variety: Proctor.
Clover. Undersown in barley: Apr 7, 1956. Dung applied: Nov 26. P and K applied: Feb 15, 1957. N applied: Mar 11. Cut twice: June 18 and Aug 13. Variety: Giant Hybrid.
Potatoes. Dung applied and hand dug: Nov 27, 1956. N P and K applied: Mar 13, 1957. Planted: Mar 14. Harvested: Sept 4. Variety: King Edward.
Permanent grass. Dung P and K applied: Feb 15, 1957. First N dressing applied: Mar 11. Second N dressing applied: May 29. Cut twice: May 29 and Sept 18.

1958

Winter wheat. Dung applied and hand dug: Sept 5, 1957. PK applied, drilled: Sept 23. First N dressing applied: Apr 30, 1958. Harvested: Aug 6. Variety: Capelle.
Kale. Dung applied and hand dug: Jan 17, 1958. N P and K applied, sown: Apr 9. Harvested: Oct 30. Variety: Thousand Head.
Barley. Dung applied and hand dug: Feb 3, 1958. N P and K applied, drilled: Mar 25. Harvested: Aug 16. Variety: Proctor.
Clover. Undersown in barley: Mar 4, 1957. N P and K applied: Feb 17, 1958. Cut twice: June 26 and Aug 29. Variety: Giant Hybrid.
Potatoes. Dung applied and hand dug: Jan 17, 1958. N P and K applied, planted: Apr 8. Harvested: Sept 12. Variety: King Edward.
Permanent grass. Dung applied: Feb 4, 1958. First N dressing applied, P K applied: Feb 17. Second N dressing applied: June 4. Cut twice: June 4 and Sept 16.

Summary of Results

1956

	cwt per acre							tons per acre	
	Wheat		Barley		Clover			Potatoes	Kale
Treatment	Grain (at 85% D.M.)	Straw (at 85% D.M.)	Grain (at 85% D.M.)	Straw (at 85% D.M.)	1st cut (dry matter)	2nd cut (dry matter)	Total (dry matter)	Total tubers	Total weight
None	9.8	14.0	13.5	13.5	13.9	10.0	23.9	2.64	11.28
N_1	13.3	18.1	26.1	25.5	17.7	10.5	28.2	2.54	16.76
P	11.3	16.6	15.5	13.4	17.0	9.7	26.7	3.90	15.80
N_1P	10.7	17.8	16.0	15.6	17.7	11.3	29.0	2.52	13.98
K	19.9	23.2	16.2	15.2	22.2	15.2	37.4	6.85	11.90
N_1K	22.1	26.7	15.9	16.4	25.3	16.6	41.9	8.47	16.76
PK	20.9	26.5	20.7	19.2	27.8	18.4	46.2	7.08	13.11
N_1PK	26.4	35.2	22.9	21.8	29.6	18.9	48.5	7.94	21.53
N_2PK	24.1	33.8	26.4	30.4	30.3	17.8	48.1	7.68	23.00
D	34.9	47.5	39.9	34.8	38.6	21.9	60.5	9.50	17.97
N_1PKD	30.6	54.1	36.5	45.4	34.7	24.6	59.3	13.44	24.57
N_2PKD	34.2	45.6	35.9	38.1	35.6	22.8	58.4	13.77	27.34
Mean D.M.%	67.8	65.5	71.7	57.7	18.4	15.0	16.7		

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1957

cwt per acre

Treatment	Wheat Grain (at 85% D.M.)	Wheat Straw (at 85% D.M.)	Barley Grain (at 85% D.M.)	Barley Straw (at 85% D.M.)	Clover 1st cut (dry matter)	Clover 2nd cut (dry matter)	Total (dry matter)
None	27.8	50.2	24.1	18.0	31.8	32.8	64.6
N_1	32.5	41.1	28.1	21.1	39.4	31.0	70.4
P	33.8	53.5	29.2	22.6	31.9	24.5	56.4
N_1P	20.5	38.7	22.4	22.4	32.5	23.5	56.0
K	37.6	75.2	28.0	23.1	46.3	37.5	83.8
N_1K	40.9	78.6	30.4	24.4	39.9	33.3	73.2
PK	36.7	76.2	30.7	24.1	50.0	37.3	87.3
N_1PK	42.4	81.9	39.4	37.5	45.1	33.5	78.6
N_2PK	40.1	76.1	44.1	41.1	47.0	36.4	83.4
D	42.4	86.2	42.9	38.5	37.2	33.5	70.7
N_1PKD	39.4	80.0	45.9	42.0	41.0	37.9	78.9
N_2PKD	43.1	76.8	47.8	47.9	39.6	33.2	72.8

Treatment	tons per acre Potatoes Total tubers	Kale Total weight	cwt per acre Grass 1st cut (dry matter)	Grass 2nd cut (dry matter)	Total (dry matter)
None	1.42	13.88	28.0	23.4	51.4
N_1	2.49	14.36	30.1	26.3	56.4
P	1.47	13.30	18.5	22.2	40.7
N_1P	1.92	20.62	36.9	29.0	65.9
K	4.46	8.32	31.9	22.8	54.7
N_1K	6.42	12.36	49.4	31.2	80.6
PK	8.88	12.96	37.4	22.8	60.2
N_1PK	8.10	21.76	46.1	29.3	75.4
N_2PK	8.86	22.62	50.0	37.5	87.5
D	12.76	16.88	34.4	26.1	60.5
N_1PKD	16.26	20.80	44.7	33.2	77.9
N_2PKD	17.95	28.36	55.4	39.3	94.7

Mean dry matter % as harvested.

Wheat Grain, 85.0
Straw, 72.8

Barley Grain, 71.4
Straw, 54.6

Clover 1st cut, 28.0
2nd cut, 21.4
Total, 24.7

Grass 1st cut, 28.4
2nd cut, 31.0
Total, 29.7

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1958

Treatment	Wheat cwt per acre Grain (at 85% D.M.)	Wheat cwt per acre Straw (at 85% D.M.)	Barley cwt per acre Grain (at 85% D.M.)	Barley cwt per acre Straw (at 85% D.M.)	Clover cwt per acre (dry matter) 1st cut	Clover 2nd cut	Clover Total
None	45.3	59.4	24.5	23.6	24.8	10.7	35.5
N_1	43.1	56.6	19.8	36.5	31.1	9.5	40.6
P	44.7	67.2	26.1	33.6	33.0	14.9	47.9
N_1P	30.8	62.4	24.6	40.4	33.2	12.0	45.2
K	50.9	68.0	24.4	54.2	51.9	38.3	90.2
N_1K	56.0	73.5	32.2	40.4	46.3	32.6	78.9
PK	48.8	79.4	31.6	45.9	54.9	35.9	90.8
N_1PK	51.1	78.6	43.2	41.9	58.6	32.2	90.8
N_2PK	46.9	80.5	47.1	36.2	57.8	30.5	88.3
D	52.2	84.8	37.5	59.2	53.6	31.3	84.9
N_1PKD	46.4	97.9	40.9	33.1	54.4	41.4	95.8
N_2PKD	45.5	80.2	23.6	66.4	63.6	34.0	97.6

Treatment	Potatoes tons per acre Total tubers	Kale tons per acre Total weight	Grass cwt per acre (dry matter) 1st cut	Grass 2nd cut	Grass Total
None	4.72	12.59	21.3	37.4	58.7
N_1	8.00	16.93	27.2	34.7	61.9
P	4.37	16.93	17.5	36.6	54.1
N_1P	5.26	22.33	31.9	38.6	70.5
K	8.72	14.06	22.0	32.6	54.6
N_1K	8.77	21.36	44.1	45.3	89.4
PK	12.63	12.32	27.9	40.3	68.2
N_1PK	11.52	23.00	40.0	36.0	76.0
N_2PK	14.06	30.90	50.0	43.7	93.7
D	13.00	18.49	35.5	39.9	75.4
N_1PKD	16.95	32.73	39.7	53.3	93.0
N_2PKD	18.56	40.28	53.3	57.2	110.5

Mean dry matter % as harvested.

Wheat Grain, 62.4
Straw, 39.7

Barley Grain, 80.8
Straw, 54.1

Clover 1st cut, 21.0
2nd cut, 16.1
Total, 18.6

Grass 1st cut, 24.0
2nd cut, 22.4
Total, 23.2

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GREEN MANURING EXPERIMENT

Woburn Stackyard - 1958, the 5th year of the revised scheme.

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

Area of each plot: 0.0406 acres. Area harvested: Potatoes, 0.0221; barley, 0.0406 acres.

Cultivations, etc.:

Green manures after barley 1957 (for early potatoes 1958): Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, undersown: May 11, 1957. Varieties: Trefoil-English; Ryegrass-Western Wolths.

Early potatoes: Straw applied: Sept 23, 1957. "Fallow" plots ploughed: Oct 1, 1957. All plots ploughed: Feb 21, 1958. Basal fertilizer applied: Apr 14. 'Nitro-Chalk' applied, potatoes mechanically planted: Apr 15. Earthed up: June 18. Sprayed with copper fungicide at 5 lb in 80 gallons per acre: July 14. Lifted: July 29. Variety: Ulster Chieftain.

Green manures after early potatoes 1957 (for barley 1958): Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, sown: July 16, 1957. Varieties: Trefoil-English; Ryegrass-Western Wolths.

Barley: "Fallow" plots and "early" green manure plots ploughed: Oct 12, 1957, Feb 20, 1958. "Late" green manure plots ploughed: Feb 20. Ground chalk applied at 23 cwt per acre: Mar 5. 'Nitro-Chalk' applied, seed drilled at 2½ bushels per acre: Mar 20. Trefoil and ryegrass undersown: Apr 29. Harvested: Aug 20. Variety: Herta.

Standard errors per plot:

Potatoes. Total tubers: 1.200 tons per acre or 12.1% (18 d.f.)
Barley. Grain: 1.97 cwt per acre or 7.9% (20 d.f.)

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

	Green manure	Ploughed in	Dry matter	Nitrogen
For early potatoes	Trefoil		14.2	0.418
	Ryegrass		16.5	0.240
For barley	Trefoil	Early	32.8	1.170
	Ryegrass	Early	37.3	0.619
	Trefoil	Late	10.8	0.331
	Ryegrass	Late	23.1	0.417

Errata to the "Results of the Field Experiments" 1955, 1956 and 1957.
Pages 55/Bd/1.3 & 1.4; 56/Bd/1.4 & 1.5; 57/Bd/1.3 & 1.4.

Rearrange the headings of the main barley table in the order shown in 1958: the order of the means should not be altered.

The means of Trefoil and Ryegrass in the bottom left table should be altered accordingly., e.g. 55/Bd/1.3 the table should read:

25.6 37.6 (not 40.3) 36.9 (not 34.1) 34.9

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Summary of Results

Early potatoes, total tubers: tons per acre

	Straw: tons per acre		N: cwt per acre (including basal)		Dung to cabbages 1952: tons per acre		Mean
	None	1½	0.6	1.2	None	10	
Excluding plots fallow under old scheme							
Undersown green manures for potatoes	(±0.424)		(±0.424)		(±0.424)		(±0.300)
None	9.70	9.73	9.64	9.80	9.12	10.32	9.72
	(±0.600)		(±0.600)		(±0.600)		(±0.424)
Trefoil	11.14	10.36	10.20	11.30	9.71	11.79	10.75
Ryegrass	9.56	10.68	9.65	10.58	9.30	10.93	10.12
Straw: tons per acre			(±0.424)		(±0.424)		(±0.300)
None			9.77	10.29	9.12	10.93	10.03
1½			9.80	10.45	9.50	10.74	10.12
N: cwt per acre (including basal)							
0.6					8.92	10.64	9.78
1.2					9.71	11.03	10.37
Mean (±0.300)					9.31	10.84	10.08
Plots fallow under old scheme							
Straw: tons per acre			(±0.848)		(±0.848)		(±0.600)
None			8.44	10.17	8.58	10.04	9.31
1½			8.52	10.74	8.40	10.86	9.63
N: cwt per acre (including basal)							
0.6					7.12	9.84	8.48
1.2					9.85	11.06	10.45
Mean (±0.600)					8.49	10.45	9.47

	Undersown green manures for potatoes				
Old scheme	None Fallow	None	Trefoil	Ryegrass	Mean
		Excluding fallow			
	9.47 (±0.424)	9.72 (±0.300)	10.75 (±0.424)	10.12	9.95

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Barley, grain per acre

	Green manures: In barley for potatoes		Green manures: After potatoes for barley		N: cwt per acre (including basal)		Dung to cabbages 1953: tons per acre		
	None	Undersown	Trefoil	Ryegrass	0.23	0.46	None	10	Mean
Excluding plots fallow under old scheme									
Green manures ploughed in	(±0.70)		(±0.70)		(±0.70)		(±0.70)		(±0.49)
Early	22.2	23.4	23.6	22.0	20.8	24.7	21.9	23.7	22.8
Late	30.6	31.2	30.7	31.2	30.0	31.8	31.2	30.7	30.9
Green manures in barley for potatoes									
None			26.6	26.2	24.6	28.2	26.6	26.2	26.4
Undersown			27.7	26.9	26.3	28.3	26.4	28.2	27.3
Green manures after potatoes for barley									
Trefoil					26.0	28.3	27.2	27.1	27.1
Ryegrass					24.9	28.2	25.8	27.3	26.6
N: cwt per acre (including basal)									
0.23							25.2	25.6	25.4
0.46							27.8	28.7	28.3
Mean (±0.49)							26.5	27.2	26.9

Old scheme	Green manures after potatoes for barley: None	Trefoil	Ryegrass	Mean
	Fallow	Excluding fallow		
	17.6 (±0.70)	27.1	26.6 (±0.49)	25.0

Plots fallow under old scheme

N: cwt per acre (including basal)	(±1.40)		(±0.99)
0.23	16.2	14.8	15.5
0.46	20.1	19.4	19.7
Mean (±0.99)	18.2	17.0	17.6

58/Ba/1.3

Barley, straw: cwt per acre

	Green manures: In barley for potatoes: None	Green manures: In barley for potatoes: Undersown	Green manures: After potatoes for barley: Trefoil	Green manures: After potatoes for barley: Ryegrass	N: cwt per acre (including basal): 0.23	N: cwt per acre (including basal): 0.46	Dung to cabbages 1953: tons per acre: None	Dung to cabbages 1953: tons per acre: 10	Mean
Excluding plots fallow under old scheme									
Green manures ploughed in									
Early	19.3	23.9	24.1	19.1	19.6	23.6	19.8	23.4	21.6
Late	28.1	30.0	29.6	28.5	27.4	30.7	29.4	28.8	29.1
Green manures in barley for potatoes									
None			24.5	22.9	21.0	26.4	23.6	23.8	23.7
Undersown			29.2	24.7	26.0	27.9	25.5	28.4	27.0
Green manures after potatoes for barley									
Trefoil					25.4	28.4	26.5	27.3	26.9
Ryegrass					21.6	25.9	22.7	24.9	23.8
N: cwt per acre (including basal)									
0.23							23.2	23.8	23.5
0.46							25.9	28.4	27.2
Mean							24.6	26.1	25.3

Old scheme	Green manures after potatoes for barley: None Fallow	Trefoil (Excluding fallow)	Ryegrass (Excluding fallow)	Mean
	15.1	26.9	23.8	23.3

Plots fallow under old scheme

N: cwt per acre (including basal)	Dung to cabbages 1953: tons per acre: None	10	Mean
0.23	12.0	13.5	12.7
0.46	16.3	18.7	17.5
Mean	14.1	16.1	15.1

58/Bd/1.4

LEY AND ARABLE ROTATIONS

Woburn Stackyard 1958 - the 21st year.

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

In 1958, owing to the use of a new compound fertilizer (16% N, 16% K) the following alterations were made in fertilizer treatments:-

	Old treatment		New treatment	
	N	K	N	K
Carrots	0.48	0.6 in seedbed	0.6	0.6 in seedbed
1 year hay	0.48	0.6 in spring	0.6	0.6 in spring
	0.22	- for aftermath	0.22	- for aftermath
2nd & 3rd year	0.2	0.55 in spring	0.18	0.18 in spring
of grazed ley	0.2	- in early summer	0.18	0.18 in early summer
	0.2	- in late summer	0.18	0.18 in late summer

Under the revised scheme the total P & K balance for all four rotations as before, and at the same level.

Owing to acidity the following extra dressings of ground chalk were applied during the year 1957/8:-

To Block 2 (plots 17-32): 12 cwt per acre.
To Block 3 (plots 33-47): 19 cwt per acre.

The chalk was applied in winter 1957/8 except to potatoes, where it was applied shortly after lifting in 1958.

Cultivations, etc.,

Treatment crops

Ley rotations

Ley 1st year. Ploughed twice: Aug 30, 1957 and Nov 30. Ground chalk applied at 19 cwt per acre: Mar 5, 1958. Basal fertilizers and 'Nitro-Chalk' applied: Apr 18. Seed sown at 40 lb per acre: Apr 19. 'Nitro-Chalk' applied: 2nd dressing - June 30; 3rd dressing - Aug 13. Grazed 7 circuits: June 23 - Nov 3. Seeds mixture: 20 lb S24 Perennial Ryegrass, 11 lb S143 Cocksfoot, 6 lb Late Flowering Red Clover, 3 lb S100 White Clover.

Ley 2nd year. Potash and nitrogen fertilizer applied: Mar 24, May 29, Aug 8. Grazed 9 circuits: Apr 28 - Oct 24.

Ley 3rd year. Ground chalk applied at 12 cwt per acre: Mar 5. Potash and nitrogen fertilizer applied: Mar 24, May 30, Aug 8. Grazed 8 circuits: May 6 - Nov 5.

Lucerne 1st year. Ploughed twice: Aug 30, 1957 and Nov 30. Ground chalk applied at 19 cwt per acre: Mar 5, 1958. Basal fertilizers applied: Apr 18. Seed sown at 25 lb per acre: Apr 19. Sprayed with dieldrin at 2 pints in 40 gallons per acre: June 14. Cut twice: Aug 8, Oct 14. Variety: Du Puits.

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

Lucerne 2nd year. Basal potash applied: Mar 14. Cut 3 times: June 16, Aug 8, Oct 14.

*Lucerne 3rd year. Basal potash applied: Mar 14. Cut 3 times: June 16, Aug 8, Oct 14.

Arable rotations

Potatoes 1st course. Ploughed twice: Aug 30, 1957 and Nov 30. Basal fertilizers applied: Apr 16, 1958. Potatoes machine planted: Apr 17. Earthed up: June 19. Sprayed 3 times with copper fungicide: 5 lb in 80 gallons per acre, July 14; 5 lb in 40 gallons per acre, July 29 and Aug 16. Sprayed with arsenious compound, 1 gallon in 40 gallons per acre: Sept 12. Lifted: Oct 7. Variety: Majestic.

Rye 2nd course. Ploughed: Oct 5, 1957. Seed drilled at 2½ bushels per acre: Oct 26. 'Nitro-Chalk' applied: Apr 22,1958. Seeds hay mixture undersown on 4 plots: Apr 19. Harvested: Aug 31. Variety: King II.

Seeds hay 3rd course. Seeds undersown at 30 lb per acre in rye: May 11, 1957. Ploughed: Aug 26. Resown: Aug 28. Ground chalk applied at 12 cwt per acre: Mar 5, 1958. Potash and nitrogen fertilizer applied: Mar 24. 1st cut: June 16. 'Nitro-Chalk' applied: June 17. 2nd cut: Oct 14. Seeds mixture: 19 lb S24 Perennial Ryegrass, 9 lb Late Flowering Red Clover, 2 lb Alsike American.

Carrots 3rd course. Ploughed twice: Aug 26, 1957 and Nov 29. Ground chalk at 12 cwt per acre applied: Mar 5, 1958. Potash and nitrogen fertilizer applied: Apr 18. Carrots sown: Apr 19. Sprayed with dieldrin at 2 pints in 40 gallons per acre: June 14, and at 4 pints in 40 gallons per acre: Aug 11. Singled: June 9-18. Lifted: Oct 27. Variety: Scarlet Intermediate.

Test crops

Sugar beet 1st test crop. Dung applied, ploughed: Nov 29,1957. Basal and treatment fertilizers applied: Apr 17, 1958. Seed drilled at 12 lb per acre: Apr 18. Sprayed with miscible DDT at 3 pints in 40 gallons per acre: May 3. Singled: June 5. Sprayed with demeton methyl at 11 oz in 32 gallons per acre: June 26. Lifted: Oct 27. Variety: Klein E.

Barley 2nd test crop. Ploughed: Dec 6, 1957. Potash applied to equalize treatment dressings to 1957 sugar beet test crop: Feb 3, 1958. Ground chalk applied at 21 cwt per acre: Mar 5. 'Nitro-Chalk' applied: Mar 20. Seed drilled at 2½ bushels per acre: Mar 20. Harvested: Aug 27. Variety: Herta.

*Note: Plots 27 and 28 were fallowed and received no potash.

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

Standard errors per plot.	Test crops.		
Sugar beet.	Total sugar.	Whole plot:	1.35 cwt per acre or 2.4% (4 d.f.)
		½ plot:	2.32 cwt per acre or 4.1% (4 d.f.)
		⅛ plot:	4.91 cwt per acre or 8.6% (24 d.f.)
	Tops	Whole plot:	1.57 tons per acre or 7.6% (4 d.f.)
		½ plot:	1.23 tons per acre or 6.0% (4 d.f.)
		⅛ plot:	1.90 tons per acre or 9.2% (24 d.f.)
Barley.	Grain(at 85% Dry Matter)	Whole plot:	1.44 cwt per acre or 5.1% (4 d.f.)
		½ plot:	1.09 cwt per acre or 3.9% (4 d.f.)

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

Summary of Results

Treatment crops

Ley, sheep days of grazing per acre

1st year	2nd year	3rd year
1662	2361	2349

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

	1st cut	2nd cut	3rd cut	Total
1st year				
Dung in 1956: tons per acre				
None	17.2	12.9		30.1
15	23.6	16.0		39.6
Difference	6.4	3.1		9.5
Previous rotation				
Lucerne	13.5	13.5		27.0
Arable with hay	27.2	15.4		42.6
Mean	20.4	14.4		34.8
2nd year				
Dung in 1955: tons per acre				
None	5.2	10.4	6.8	22.4
15	14.1	18.4	11.1	43.6
Difference	8.9	8.0	4.3	21.2
Previous rotation				
Lucerne	9.6	14.6	9.3	33.5
Arable with sugar beet	9.7	14.2	8.6	32.5
Mean	9.6	14.4	8.9	32.9
3rd year				
Dung in 1954: tons per acre				
None	17.5	23.2	8.4	49.1
15	24.2	27.8	9.1	61.1
Difference	6.7	4.6	0.7	12.0

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

Treatment crops

	Potatoes		Rye	
	Total tubers: tons per acre	Percentage ware ($1\frac{5}{8}$" riddle)	Grain: (at 85% D.M.) cwt per acre	Straw: cwt per acre
Dung: tons per acre				
None	12.97	90.5	28.9	42.4
15*	15.00	91.0	28.8	42.8
Difference	+2.03	+0.5	-0.1	+0.4
Previous rotation				
Ley	16.04	94.2	29.8	45.0
Lucerne	14.95	89.8	29.8	45.6
Arable with hay	11.58	87.6	28.6	41.8
Arable with sugar beet	13.37	91.5	27.2	38.0
Mean	13.99	90.8	28.8	42.6

Hay

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

	1st cut	2nd cut	Total
Dung in 1954: tons per acre			
None	58.6	15.6	74.2
15	66.8	24.6	91.4
Difference	8.2	9.0	17.2
Previous rotation			
Lucerne	67.1	27.0	94.1
Arable with hay	58.2	13.3	71.5
Mean	62.7	20.1	82.8

Carrots

	Roots Washed: tons per acre	Tops: tons per acre
Dung in 1954: tons per acre		
None	6.22	0.88
15	8.32	1.10
Difference	2.10	0.22
Previous rotation		
Ley	7.56	1.00
Arable with sugar beet	6.98	0.98
Mean	7.27	0.99

* Dung applied: Potatoes - for test crop sugar beet in 1956.
Rye - for test crop potatoes in 1955.

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

1st Test crop
Sugar beet
Previous rotation

	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Roots (washed): tons per acre					
Mean	17.90	17.17	15.46	16.47	16.75
Dung: tons per acre					
None	16.92	15.76	13.60	14.14	15.10
15	18.87	18.58	17.32	18.80	18.39
Difference	1.95	2.82	3.72	4.66	3.29
Response to additional 0.72 cwt N per acre					
No dung	-0.44	-0.49	-0.54	+0.90	-0.14
Dung 15 tons per acre	+1.96	-0.99	-0.63	-0.08	+0.06
Response to additional 0.9 cwt K_2O per acre					
No dung	+2.97	+0.35	+1.39	+0.24	+1.24
Dung 15 tons per acre	+0.44	-0.44	+0.52	-1.32	-0.20
Sugar Percentage					
Mean	16.5	16.8	17.5	17.5	17.1
Dung: tons per acre					
None	16.5	17.0	17.7	17.5	17.2
15	16.5	16.5	17.2	17.5	16.9
Difference	0.0	-0.5	-0.5	0.0	-0.3
Response to additional 0.72 cwt N per acre					
No dung	-1.4	-0.7	-0.9	-0.5	-0.9
Dung 15 tons per acre	-0.3	-0.3	-0.1	-0.5	-0.3
Response to additional 0.9 cwt K_2O per acre					
No dung	+0.4	-0.3	+0.3	+0.2	+0.1
Dung 15 tons per acre	-0.1	+0.5	0.0	+0.1	+0.1

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

1st Test crop
Sugar beet
Previous rotation

	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Total sugar: cwt per acre					
Mean (±0.96)	59.1	57.6	54.0	57.7	57.1
Dung: tons per acre					
None (±1.50)*	56.0	53.8	48.3	49.6	51.9
15	62.2	61.4	59.6	65.7	62.2
Difference (±2.32)	6.2	7.6	11.3	16.1	10.3 (±1.16)
Response to additional 0.72 cwt N per acre		(±3.47)			(±1.74)
No dung	-6.1	-3.7	-4.3	+1.7	-3.1
Dung 15 tons per acre	+5.2	-4.2	-2.3	-2.2	-0.9
Response to additional 0.9 cwt K_2O per acre		(±3.47)			(±1.74)
No dung	+11.1	+0.4	+5.4	+1.4	+4.6
Dung 15 tons per acre	+0.9	+0.3	+1.9	-4.2	-0.3
Tops: tons per acre					
Mean (±1.113)	23.74	22.27	18.30	18.31	20.66
Dung: tons per acre					
None (±1.273)*	22.72	21.13	16.58	17.15	19.39
15	24.77	23.41	20.03	19.48	21.92
Difference (±1.235)	2.05	2.28	3.45	2.33	2.53 (±0.617)
Response to additional 0.72 cwt N per acre		(±1.346)			(±0.673)
No dung	+3.70	+2.90	+2.76	+4.73	+3.52
Dung 15 tons per acre	+3.86	+1.90	+2.83	+4.72	+3.32
Response to additional 0.9 cwt K_2O per acre		(±1.346)			(±0.673)
No dung	+2.94	+2.05	-0.79	-2.46	+0.44
Dung 15 tons per acre	+1.95	+0.22	-1.74	+0.50	+0.23

* For use in horizontal and diagonal comparisons only.

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1st Test Crop
Sugar beet

Plots receiving no additional N or K

Dung: tons per acre		Previous rotation: Ley	Lucerne	Arable with hay	Arable with roots	Mean
Roots (washed): tons per acre						
Mean		16.76	17.30	15.83	16.19	16.52
None		15.78	15.36	14.26	13.16	14.64
15		17.75	19.24	17.39	19.22	18.40
Difference		+1.97	+3.88	+3.13	+6.06	+3.76
Sugar percentage						
Mean		16.8	17.0	17.8	17.6	17.3
None		16.9	17.6	18.1	17.6	17.5
15		16.6	16.6	17.4	17.6	17.0
Difference		-0.3	-1.0	-0.7	0.0	-0.5
Total sugar: cwt per acre						
Mean	(±2.38)	56.1	58.8	56.1	57.0	57.0
None	(±3.36)*	53.4	54.0	51.6	46.4	51.3
15		58.8	63.6	60.5	67.7	62.7
Difference	(±4.85)	+5.4	+9.6	+8.9	+21.3	+11.4
Tops: tons per acre						
Mean	(±1.221)	20.46	21.09	17.67	17.49	19.18
None	(±1.726)*	19.38	19.43	16.07	17.32	18.05
15		21.55	22.75	19.27	17.66	20.31
Difference	(±2.060)	+2.17	+3.32	+3.20	+0.34	+2.26

*For use in horizontal and diagonal comparisons only.

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2nd Test crop
Barley

Previous rotation

Dung in 1957: tons per acre		Ley	Lucerne	Arable with hay	Arable with roots	Mean
Grain (at 85% Dry Matter): cwt per acre						
None	(±1.15)*	28.1	30.2	27.0	28.6	28.5
15		25.8	28.8	27.4	29.7	27.9
Mean	(±1.02)	26.9	29.5	27.2	29.1	28.1
Difference	(±1.09)	-2.3	-1.4	+0.4	+1.1	-0.6 (±0.54)
Straw (at 85% Dry Matter): cwt per acre						
None		30.4	28.1	25.9	25.9	27.5
15		30.6	31.6	31.4	32.3	31.4
Mean		30.5	29.8	28.6	29.1	29.4
Difference		+0.2	+3.5	+5.5	+6.4	+3.9

*For use in horizontal and diagonal comparisons only.

Note: There was early lodging on the plots receiving dung in 1957.

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58/Bf/1.1

WOBURN MARKET GARDEN EXPERIMENT

Organic manures and nitrogen - Lansome Field 1958, the 17th year.

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

Note: The results for the 1958-59 leeks will be included in the 1959 report.

Area of each plot (acres): 0.0125. Area harvested: Leeks - 0.0104; globe beet - 0.0106; early potatoes - 0.0085.

Cultivations, etc.:

Leeks 1957-58. Organic manures applied: July 19, 1957. Ploughed: July 22. 'Nitro-Chalk' and basal fertilizers applied: July 23. Planted: July 24. Second dressing of 'Nitro-Chalk' applied: Sept 9. Harvested: Mar 3 - Apr 10, 1958. Variety: Musselburgh.

Early potatoes. Organic manures applied: Dec 16, 1957. All plots ploughed: Dec 19. Fertilizers applied on the flat: Apr 14, 1958. Machine planted: Apr 14. Earthed up: June 18. Sprayed with copper fungicide at 5 lb in 80 gallons per acre: July 14. Lifted: July 22. Variety: Arran Pilot.

Globe beet. Ploughed, organic manures applied: Apr 25, 1958. Ground chalk at 23 cwt per acre applied: Apr 30. 'Nitro-Chalk' and basal fertilizers applied: May 8. Seed drilled at 14 lb per acre: May 9. Sprayed with miscible DDT at 3 pints in 40 gallons per acre: May 28. Singled: June 25 - July 9. Second dressing of 'Nitro-Chalk' applied: July 16. Harvested: Aug 11 - Sept 18. Variety: Detroit.

Standard errors per plot:

Leeks 1957-58.	Saleable produce:	0.423 tons per acre or 7.6%	(17 d.f.)
Early potatoes.	Total tubers:	0.892 tons per acre or 12.3%	(17 d.f.)
Globe beet.	Saleable bulbs:	1.45 tons per acre or 18.4%	(17 d.f.)

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

Summary of Results

Organic manures	Level of manuring: tons per acre	N: cwt per acre None	0.3	0.6	0.9	Mean
Leeks 1957-58. Saleable produce: tons per acre						
			(±0.299)			(±0.211)
None		2.14	3.46	4.93	4.93	2.80*
Dung	10	3.58	4.98			4.28
	20	6.18	6.59			6.38
Sludge compost	10	5.37	6.02			5.70
	20	6.22	7.02			6.62
Sludge	10	6.52	5.90			6.21
	20	6.34	6.89			6.61
Vegetable compost	10	4.48	5.93			5.20
	20	6.06	7.24			6.65
Mean (±0.106)		5.59+	6.32+			5.54**
Leeks 1957-58. Percentage saleable (by number)						
None		78.2	92.5	98.5	99.5	85.4*
Dung	10	96.2	99.0			97.6
	20	98.1	98.8			98.4
Sludge compost	10	97.3	100.0			98.6
	20	100.0	97.7			98.9
Sludge	10	100.0	97.7			98.8
	20	97.8	100.0			98.9
Vegetable compost	10	98.3	99.4			98.8
	20	99.8	99.1			99.4
Mean		98.4+	99.0+			97.4**
Early potatoes. Total tubers: tons per acre						
			(±0.630)			(±0.446)
None		3.62	6.13	6.71	6.97	4.87*
Dung	10	6.68	6.91			6.80
	20	7.49	8.57			8.03
Sludge compost	10	6.85	7.56			7.20
	20	8.03	9.02			8.52
Sludge	10	6.91	7.84			7.37
	20	8.86	8.24			8.55
Vegetable compost	10	6.12	7.72			6.92
	20	7.33	7.29			7.31
Mean (±0.223)		7.28+	7.89+			7.24**

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

Globe beet

Organic manures	Level of manuring: tons per acre	N: cwt per acre None	0.3	0.6	0.9	Mean
Saleable bulbs: tons per acre						
			(±1.024)			(±0.724)
None		1.12	2.28	4.41	4.20	1.70*
Dung	10	3.79	7.14			5.46
	20	11.66	11.88			11.77
Sludge compost	10	7.61	8.51			8.06
	20	10.62	12.72			11.67
Sludge	10	9.70	7.71			8.71
	20	9.06	11.58			10.32
Vegetable compost	10	5.86	6.60			6.23
	20	8.33	12.28			10.31
Mean (±0.362)		8.33+	9.80+			7.85**
Total produce (whole plants): tons per acre						
None		3.31	4.66	8.01	7.85	3.99*
Dung	10	7.06	11.83			9.44
	20	18.52	19.82			19.17
Sludge compost	10	12.70	13.83			13.27
	20	17.10	21.40			19.25
Sludge	10	15.99	13.28			14.64
	20	15.35	19.62			17.48
Vegetable compost	10	9.65	11.04			10.34
	20	13.73	19.48			16.60
Mean		13.76+	16.29+			13.21**
Plant number: thousands per acre						
None		101.2	88.8	99.3	98.6	95.0*
Dung	10	98.6	103.9			101.3
	20	102.2	99.6			100.9
Sludge compost	10	101.0	94.4			97.7
	20	95.6	101.2			98.4
Sludge	10	100.3	99.8			100.0
	20	97.3	91.2			94.2
Vegetable compost	10	101.4	92.6			97.0
	20	99.9	98.5			99.2
Mean		99.5+	97.6+			98.3**

*Mean over None and 0.3 cwt N per acre only.

+Excluding 'no organics'.

**General mean.

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58/Bg/1.1

IRRIGATION EXPERIMENT

Second year of revised scheme (the 8th year)

The effects of irrigation and nitrogen - Woburn Butt Close 1958.

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

Muriate of potash was applied to certain grass plots at 0.6 cwt K_2O per acre after the second cut and each subsequent cut except the last. This made possible a test of (0 v Irrigation) (0 v K) on the main grass plots.

Area of each sub-plot (acres): Cut grass, 0.0264; remainder, 0.0278.
Area harvested (acres): Sugar beet, 0.0176; spring wheat, 0.0089; spring beans, 0.0082; cut grass, 0.0165.

Rainfall and Irrigation: inches

Week ending	Rain-fall	Cut grass B and C	Sugar beet A	Sugar beet B	Sugar beet C	Wheat A and C	Beans C
May 5	.18	.75					
12	.14						
19	.81	.75					
26	.30		-	.50	.50	.50	.50
June 2	.77	.50				.50	.50
9	1.11						
16	1.05	.50					
23	.83						
30	1.97						
July 7	.84						
14	.11						
21	.01	.78	.75	-	.75	.50	
28	1.24	.50	.50	-	.50		
Aug 4	.23						
11	.32						
18	.83	.50					
25	.76						
Sept 1	.43						
8	.51						
15	.40						
22	.59						
29	.76						
Total	14.19	4.28	1.25	.50	1.75	1.50	1.00

Note: (1) On grass 0 = A, B = C; on wheat 0 = B, A = C.
(2) Owing to weather conditions the experimental insecticide spray treatment of beans was omitted.

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Cultivations, etc.:

Sugar beet. Ploughed: Sept 2, Oct 9, 1957 and Mar 18, 1958. Ground chalk applied: Mar 6. Salt applied: Mar 17. 'Nitro-Chalk' applied: Apr 15. Seed drilled at 10 lb per acre: Apr 17. Basal fertilizer applied: Apr 18. Singled: May 27-28. Sprayed with miscible DDT at 3 pints in 40 gallons per acre: May 3. Sprayed with demeton methyl at 12 oz in 40 gallons per acre: June 26. Lifted: Oct 20-21. Variety: Klein E.

Spring wheat. Ploughed: Dec 10-19, 1957. Fertilizers applied, seed drilled at 3 bushels per acre: Mar 25, 1958. Combine harvested: Sept 1. Variety: Peko.

Spring beans. Ploughed: Sep 30, 1957 and Jan 14, 1958. Dung applied: Jan 14. Seed combine drilled at 200 lb per acre: Mar 25. Combine harvested: Oct 15. Variety: Garton's Spring Tick.

Grass. Basal fertilizers applied: Dec 2, 1957. 'Nitro-Chalk' applied: Apr 14, 1958. Cut 8 times (all plots): May 14, June 3, June 24, July 15, Aug 6, Sept 5, Oct 8, Nov 14; 'Nitro-Chalk' applied after each cut, except the last. Muriate of potash applied after second and subsequent cuts except the last. Variety: Cocksfoot S37.

Standard errors per plot.

Sugar beet.	Total sugar,	whole plot:	4.78 cwt per acre or 10.5% (6 d.f.)
		sub plot:	5.05 cwt per acre or 11.1% (8 d.f.)
	Tops,	whole plot:	2.41 tons per acre or 21.4% (6 d.f.)
		sub plot:	1.46 tons per acre or 12.9% (8 d.f.)
Spring wheat.	Grain (at 85% D.M.),	Whole plot:	2.46 cwt per acre or 9.8% (8 d.f.)
		Sub plot:	1.81 cwt per acre or 7.2% (10 d.f.)
Spring beans.	Grain (at 85% D.M.),	Whole plot:	2.51 cwt per acre or 14.1% (8 d.f.)
		Sub plot:	1.54 cwt per acre or 8.6% (10 d.f.)
Cut grass.	Dry matter, Totals of Cuts 1 & 2.	Whole plot:	1.40 cwt per acre or 7.3% (8 d.f.)
		Sub plot:	1.02 cwt per acre or 5.3% (10 d.f.)
	Totals of Cuts 3-8.	Whole plot:	3.87 cwt per acre or 6.2% (6 d.f.)
		Sub plot:	4.24 cwt per acre or 6.8% (8 d.f.)

Summary of Results

Sugar beet

N: cwt per acre	Irrigation 0	A	B	C	Mean
Roots (washed): tons per acre					
0.6	12.70	11.64	11.63	11.76	11.93
1.2	15.54	15.28	15.96	16.40	15.79
Mean	14.12	13.46	13.79	14.08	13.86
Difference	2.84	3.64	4.33	4.64	3.86
Sugar Percentage					
0.6	16.6	16.5	16.8	16.3	16.5
1.2	16.1	16.5	16.2	16.5	16.3
Mean	16.4	16.5	16.5	16.4	16.4
Difference	-0.5	0.0	-0.6	+0.2	-0.2
Total sugar: cwt per acre		(±3.44)*			
0.6	42.1	38.1	39.0	38.3	39.4
1.2	50.4	50.3	51.5	54.2	51.6
Mean (±2.75)	46.2	44.2	45.2	46.2	45.4
Diff.(±4.12)	8.3	12.2	12.5	15.9	12.2 (±2.06)
Tops: tons per acre		(±1.513)*			
0.6	9.58	9.19	8.32	7.94	8.76
1.2	14.82	13.57	13.53	13.14	13.77
Mean (±1.391)	12.20	11.38	10.92	10.54	11.26
Diff.(±1.189)	5.24	4.38	5.21	5.20	5.01 (±0.594)

* For use in horizontal and diagonal comparisons only.

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Spring Wheat

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

N: cwt per acre	Irrigation 0 & B	A & C	Mean
	(±1.13)*		
0.4	24.3	23.0	23.6
0.8	27.6	25.4	26.5
Mean (±1.00)	25.9	24.2	25.1
Diff.(±1.42)	3.3	2.4	2.9 (±0.74)

* For use in horizontal and diagonal comparisons only.

Mean dry matter % as harvested: 79.8

Spring Beans

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

Dung: tons per acre	Irrigation 0	C	Mean
	(±1.12)*		
None	18.0	18.9	18.5
12	16.9	17.4	17.2
Mean (±1.02)	17.5	18.2	17.8
Diff.(±0.89)	-1.1	-1.5	-1.3 (±0.63)

* For use in horizontal and diagonal comparisons only.

Mean dry matter % as harvested: 74.3

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Cut Grass

Total of Cuts 1 & 2. Dry matter: cwt per acre

N: cwt per acre+	Irrigation 0 & A	Irrigation B & C	Mean
	(±0.64)		
0.3	16.6	18.8	17.7
0.6	19.3	22.4	20.9
Mean (±0.57)	17.9	20.6	19.3
Diff. (±0.59)	2.7	3.6	3.2 (±0.42)

Mean dry matter % as cut: 21.3

Total of Cuts 3-8. Dry matter: cwt per acre

N: cwt per acre+	Irrigation 0 & A	Irrigation B & C	K_2O: cwt per acre including basal 1.2	K_2O: cwt per acre including basal 4.8++	Mean
	(±2.00)*		(±2.00)*		
0.3	56.9	57.6	55.9	58.7	57.3
0.6	68.3	65.8	62.7	71.4	67.1
Mean	62.6	61.7	59.3	65.1	62.2
	(±1.58)		(±1.58)		
Difference	11.4	8.2	6.8	12.7	9.8 (±1.73)
	(±2.45)		(±2.45)		

K_2O: cwt per acre ++ including basal	Irrigation 0 & A	Irrigation B & C	Mean
	(±2.23)		
1.2	60.5	58.0	59.3
4.8	64.7	65.5	65.1
Diff. (±3.16)	4.2	7.5	5.8

* For use in horizontal and diagonal comparisons only.

+ For each cut

++ Total for 6 cuts

Mean dry matter % as cut: 17.7

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