ROTHAMSTED RESEARCH

Yields of the Field Experiments 1959

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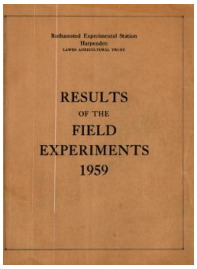

Long-term Experiments

Rothamsted Research

Rothamsted Research (1960) *Long-term Experiments ;* Yields Of The Field Experiments 1959, pp 23 - 66 **- DOI: https://doi.org/10.23637/ERADOC-1-179**

59/Ba/1.3

Summary of Results

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

	Rothamsted	Woburn	Rothamsted	Woburn
	Sugar Beet, roots (washed): tons per acre		Barley, grain: cwt per acre	
Mean	11.55	12.39	21.5*	28.6*
Response to: N	+2.67	+1.09	+20.0	+8.3
P	-0.99	+1.01	+0.9	+6.8
K	+0.17	-1.73	+1.7	-2.0
Mean dry matter % as harvested:			84.8	84.4
	Sugar Beet, sugar percentage		Barley, straw: cwt per acre	
Mean	18.7	18.8	20.6*	18.3*
Response to: N	-0.5	-1.0	+23.5	+2.6
P	+1.1	+0.5	+2.7	+5.2
K	+0.4	-0.2	+1.4	-3.4
Mean dry matter % as harvested:			86.5	84.8
	Sugar Beet, total sugar: cwt per acre		Clover, hay, dry matter: cwt per acre	
Mean	43.3	46.5	37.6	
Response to: N	+8.5	+1.8	+2.5	(Ploughed in)
P	-0.9	+4.9	-5.7	
K	+1.8	-7.2	+7.0	
Mean dry matter % as harvested:			81.4	
	Sugar Beet, tops: tons per acre		Wheat, grain: cwt per acre	
Mean	6.10	6.52	30.6*	16.2*
Response to: N	+2.59	+3.21	+0.9	+17.5
P	-2.19	+0.55	+9.3	+1.2
K	-0.52	-0.77	+4.0	-1.7
Mean dry matter % as harvested:			85.2	86.4
	Sugar Beet, plant number: thousands per acre		Wheat, straw: cwt per acre	
Mean	26.8	**	51.8*	20.0*
Response to: N	-3.7		+21.6	+19.8
P	+0.5		+3.4	+5.6
K	+0.3		+6.8	-4.4
Mean dry matter % as harvested:			88.4	92.3

*(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	
		Without Mg	With Mg		
Mean	8.59	8.17	7.98	29.4*	27.1*
Response to: N	+4.42	+3.08	+3.82	+16.5	+19.6
P	+3.14	-1.88	-1.80	+0.9	-6.1
K	+0.31	+0.57	+0.48	+2.9	-0.4
Mean dry matter % as harvested:				84.6	86.3
	Potatoes, percentage ware			Rye, straw: cwt per acre	
	(1)	(2)			
Mean	90.5	77.1	77.9	40.2*	29.2*
Response to: N	+5.1	+8.0	+7.8	+36.3	+13.0
P	-3.5	+4.6	+12.2	+3.5	-8.7
K	-1.3	+3.6	+5.4	+1.0	+3.6
Mean dry matter % as harvested:				88.7	90.9

*(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 1959 - the 11th year.

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

The following addition should be made to the 1958 details:-
Sheep grazing: Live weight records were discontinued this year.

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

Crop	Year of cycle	Field etc.	Rate	
Permanent grass	"1st treatment"	Highfield (blocks 6 & 7)	2.5	(2 previous hay crops taken)
Reseeded grass	"1st treatment"	Highfield (blocks 6 & 7) Fosters (blocks 8 & 9)	3.0	(2 previous hay crops taken)
Lucerne	"1st treatment"	Highfield Fosters	3.0 4.0	(3 years previous lucerne)
Cut grass	"1st treatment"	Highfield Fosters	3.5 4.0	(3 years previous cutting)

The following should be added to the list for 1957:

Permanent and reseeded grass	"2nd treatment"	Highfield (blocks 5 & 8) Fosters (blocks 5 & 7)	1.0	(1 previous hay crop taken)

Cultivations, etc.:

HIGHFIELD

1st year Treatment Crops

Cut grass. Ploughed twice: Sept 4, 1958 and Nov 20. Supplementary K applied: Nov 24. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied Apr 10. Seeds sown at 33 lb per acre: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. Cut 3 times: June 26, Aug 8, Sept 16. 'Nitra-Shell' applied after every cut except the last.

Grazed ley. Ploughed twice: Sept 4, 1958 and Nov 20. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied: Apr 10. Seed sown at 44 lb per acre: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. 'Nitra-Shell' applied: July 16. Grazed: 4 circuits, June 5 - Aug 12.

Lucerne. Ploughed twice: Sept 4, 1958 and Nov 20. Supplementary K applied: Nov 24. Basal PK compound applied: Apr 8, 1959. Seed drilled at 28 lb per acre: Apr 13. Cut twice: July 22 and Sept 8. Variety: Du Puits.

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Hay. Seeds undersown in barley at 28 lb per acre: Apr 24, 1958. Basal PK compound applied: Feb 16, 1959. 'Nitra-Shell' applied: Mar 25. Cut: June 9.

2nd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 16, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3 and after every cut, except the last. Cut 4 times: May 25, June 25, Aug 8, Sept 16.

Grazed ley. Basal PK compound applied: Feb 14, 1959. 'Nitra-Shell' applied: June 1 and July 16. Grazed: 5 circuits, Apr 22 - Aug 8.

Lucerne. Basal PK compound applied: Feb 14, 1959. Cut 4 times: June 9, July 9, Aug 31, Nov 12.

Potatoes. Ploughed twice: June 16 and Nov 20, 1958. Ridged: Apr 14, 1959. Basal PK compound applied: Apr 23. Sulphate of ammonia and dung applied, potatoes planted: Apr 25. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 16, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3, and after every cut except the last. Cut 4 times: May 25, July 3, Aug 10, Sept 8.

Grazed ley. Basal PK compound applied: Feb 14, 1959. 'Nitra-Shell' applied: June 6 and July 16. Grazed: 7 circuits, Apr 26 - Aug 30.

Lucerne. Basal PK compound applied: Feb 14, 1959. Cut 3 times: June 9, July 9, Aug 31.

Oats. Ploughed: Oct 15, 1958. Seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK compound: Mar 13, 1959. 'Nitra-Shell' applied: Mar 14. First sowing damaged by birds. Resown: Apr 11. Combine harvested: Aug 17. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Sept 5 and Oct 20, 1958. Ploughed ley: Oct 11*. Seed combine drilled at $2\frac{3}{4}$ bushels per acre with basal PK compound: Oct 27. 'Nitra-Shell' applied: Mar 26, 1959. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 20. Combine harvested: Aug 15. Variety: Cappelle.

2nd Test Crop, Potatoes

Ploughed: Sept 5 and Nov 20, 1958. Ridged: Apr 14, 1959. Basal PK applied: Apr 23. Sulphate of ammonia, additional P and K and dung applied, potatoes planted: Apr 25. Earthed up: June 30. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 24. Sprayed with sulphuric acid, 15% BOV, at 100 gallons per acre: Sept 18. Lifted: Sept 30. Variety: Majestic.

*Note: Plots 85 and 86 were also ploughed on June 16, 1958 owing to failure of the lucerne.

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3rd Test Crop, Barley

Ploughed: Oct 15, 1958. Additional P and K applied: Jan 5, 1959. Ground chalk applied to blocks 10 and 11: Feb 9. Seed combine drilled at 2 bushels per acre with basal PK compound: Mar 14. 'Nitra-Shell' applied: Mar 16. Combine harvested: Aug 7. Variety: Proctor.

Permanent grasses. Basal PK compound applied to all plots: Feb 13 - 16, 1959.

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

Blocks 10 and 12. 'Nitra-Shell' applied: Mar 25, 1959. Cut for silage: June 6. 2nd dressing of 'Nitra-Shell' applied to permanent grass plots: July 20 and to reseeded plots: July 21. Grazed: 3 circuits, July 17 - Sept 9.

Blocks 9 and 11. 'Nitra-Shell' applied: June 9, 1959. 2nd dressing of 'Nitra-Shell' applied to permanent grass plots: July 23 and to reseeded plots: July 25. Grazed: 6 circuits, May 2 - Sept 11.

10th year reseeded, 10th experimental year of permanent grass, Blocks 5 - 8.

Blocks 7 and 8. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied: Mar 25, 1959. Cut for silage: June 6. 2nd application of 'Nitra-Shell' applied: July 16. Grazed: 3 circuits, July 9 - Sept 5.

Blocks 5 and 6. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied: June 6 and July 17, 1959. Grazed: 6 circuits, Apr 26 - Sept 7.

11th year reseeded, 11th experimental year of permanent grass, Blocks 1 - 4.

Blocks 1 and 3. 'Nitra-Shell' applied: Mar 25, 1959. Cut for silage: June 6. 2nd dressing of 'Nitra-Shell' applied: July 16. Grazed: 3 circuits, July 6 - Aug 28.

Blocks 2 and 4. 'Nitra-Shell' applied: June 1 and July 16, 1959. Grazed: 6 circuits, Apr 22 - Sept 1.

FOSTERS

1st year Treatment Crops

Cut grass. Ploughed twice: Sept 11 and Nov 19, 1958. Supplementary K applied: Nov 21. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied: Apr 10. Seeds sown at 33 lb per acre: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. Cut 3 times: July 3, Aug 7, Sept 16. 'Nitra-Shell' applied after each cut except the last.

Grazed ley. Ploughed twice: Sept 11 and Nov 19, 1958. Basal PK compound applied: Apr 8, 1959. 'Nitra-Shell' applied: Apr 10. Seeds sown: Apr 11. Sprayed with MCPB at 4 pints in 40 gallons per acre: May 28. 2nd application of 'Nitra-Shell': July 17. Grazed: 4 circuits, June 8 - Aug 17.

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Lucerne. Ploughed twice: Sept 11 and Nov 19, 1958. Supplementary K applied: Nov 21. Basal PK compound applied: Apr 8, 1959. Seeds sown at 28 lb per acre: Apr 11. Cut twice: July 7 and Sept 1.

Hay. Seeds undersown in barley at 28 lb per acre: Apr 24, 1958. Basal PK applied: Feb 17, 1959. 'Nitra-Shell' applied: Mar 25. Cut: June 4.

2nd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 17, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3 and after all cuts except the last. Cut 4 times: May 25, July 3, Aug 10, Sept 16.

Grazed ley. Basal PK compound applied: Feb 16. 'Nitra-Shell' applied: June 2 and July 17. Grazed: 5 circuits, Apr 23 - Aug 9.

Lucerne. Basal PK compound applied: Feb 16, 1959. Cut 4 times: June 8, July 7, Aug 28, Nov 12.

Potatoes. Ploughed twice: June 16 and Nov 19, 1958. Ridged: Apr 14, 1959. Dung, sulphate of ammonia and basal PK compound applied, potatoes planted: Apr 23. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. Basal PK compound applied: Feb 17, 1959. Nitrogen and potash applied as compound fertilizer (16% N, 16% K_2O): Apr 3 and after each cut except the last. Cut 4 times: May 25, July 3, Aug 11, Sept 1.

Grazed ley. Basal PK compound applied: Feb 16, 1959. 'Nitra-Shell' applied: June 6 and July 17. Grazed: 6 circuits, Apr 27 - Aug 30.

Lucerne. Basal PK compound applied: Feb 16, 1959. Cut 3 times: June 8, July 7, Aug 28.

Oats. Ploughed: Oct 16, 1958. Seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK compound: Mar 13. 'Nitra-Shell' applied: Mar 14. Combine harvested: Aug 5. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Sept 11 and Oct 20, 1958. Ploughed leys: Oct 9. Seed drilled at $2\frac{3}{4}$ bushels per acre with basal PK compound: Oct 27. 'Nitra-Shell applied: Mar 26, 1959. Sprayed with CMPP at 6 pints in 40 gallons per acre: Apr 20. Combine harvested: Aug 8. Variety: Cappelle.

2nd Test Crop, Potatoes

Ploughed twice: Sept 11 and Nov 19. Ridged: Apr 14, 1959. Dung, sulphate of ammonia, basal PK compound applied, potatoes planted: Apr 24. Earthed up: July 1. Sprayed with copper fungicide at 5 lb in 40 gallons per acre: Aug 24. Sprayed with sulphuric acid, 15% BOV, at 100 gallons per acre: Sept 17. Haulms destroyed mechanically: Sept 26. Lifted: Sept 30. Variety: Majestic.

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3rd Test Crop, Barley

Ploughed: Oct 16, 1958. Additional P and K applied: Dec 15. Seed drilled at 2 bushels per acre with basal PK compound: Mar 14, 1959. 'Nitra-Shell' applied: Mar 16. Combine harvested: Aug 8. Variety: Proctor.

Permanent grasses. Basal PK compound applied to all plots: Feb 16 - 17, 1959.

9th year reseeded grass, Block 6, 10, 11, 12.

Blocks 6 and 10. 'Nitra-Shell' applied: Mar 25 and July 18 - 22, 1959. Cut for silage: June 4. Grazed: 2 circuits, July 14 - Aug 17.

Blocks 11 and 12. 'Nitra-Shell' applied: June 6 and July 17, 1959. Grazed: 6 circuits, May 1 - Sept 6.

10th year reseeded grass, Blocks 5, 7, 8, 9.

Blocks 5 and 9. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied Mar 25 and July 18 - 22, 1959. Cut for silage: June 4. Grazed 2 circuits, July 14 - Aug 21.

Blocks 7 and 8. Supplementary K applied: Nov 11, 1958. 'Nitra-Shell' applied: June 6, July 17, 1959. Grazed: 7 circuits, Apr 27 - Sept 4.

11th year reseeded grass, Blocks 1 - 4.

Blocks 1 and 2. 'Nitra-Shell' applied: Mar 25 and July 28, 1959. Cut for silage: June 4. Grazed: 2 circuits, July 22 - Aug 29.

Blocks 3 and 4. 'Nitra-Shell' applied: June 2 and July 17, 1959. Grazed: 6 circuits, Apr 23 - Sept 2.

Standard errors per plot. Test Crops.

Wheat, grain (at 85% dry matter).		Highfield:	4.13 cwt per acre or 8.7% (14 d.f.)
		Fosters:	3.94 cwt per acre or 8.6% (14 d.f.)
Potatoes, total tubers.	Highfield	$\frac{1}{4}$ plot:	0.702 tons per acre or 4.8% (14 d.f.)
		$\frac{1}{8}$ plot:	0.781 tons per acre or 5.3% (20 d.f.)
	Fosters	$\frac{1}{4}$ plot:	0.540 tons per acre or 4.1% (14 d.f.)
		$\frac{1}{8}$ plot:	0.224 tons per acre or 1.7% (20 d.f.)
Barley, grain (at 85% dry matter).		Highfield:	2.33 cwt per acre or 4.9% (15 d.f.)*
		Fosters:	2.14 cwt per acre or 4.6% (14 d.f.)

*1 missing value.

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Summary of Results

Wheat 1st test crop

N: cwt per acre	Treatment crops 1956 - 1958 Lucerne	Ley	Cut grass	Arable with hay	Mean
Grain (at 85% dry matter): cwt per acre					
Highfield					
Mean	47.3	48.5	47.8	45.6	47.3
To test crop					
0.3	45.6	48.4	45.5	42.6	45.5
0.6	49.0	48.6	50.2	48.6	49.1
Difference (±2.92)	+3.4	+0.2	+4.7	+6.0	+3.6 (±1.46)
To treatment crops					
Single rate		49.0	46.6	44.6	46.7
Double rate		48.0	49.1	46.6	47.9
Difference (±2.92)		-1.0	+2.5	+2.0	+1.2 (±1.69)
Fosters					
Mean	51.0	45.6	45.4	40.9	45.7
To test crop					
0.3	48.7	43.1	42.4	36.6	42.7
0.6	53.3	48.1	48.4	45.1	48.7
Difference (±3.10)	+4.6	+5.0	+6.0	+8.5	+6.0 (±1.55)
To treatment crops					
Single rate		44.7	47.0	39.7	43.8
Double rate		46.4	43.8	42.0	44.1
Difference (±3.10)		+1.7	-3.2	+2.3	+0.3 (±1.79)

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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 1957: tons per acre: None	Arable with hay only: Dung to potatoes 1957: tons per acre: 12	Arable with hay only: Mean
Grain (at 85% dry matter): cwt per acre						
Highfield						
To test crop			(±1.68)			(±2.92)
0.3	45.2	45.7	45.5	41.9	43.3	42.6
0.6	48.3	50.0	49.1	47.9	49.3	48.6
Mean	46.7	47.9	47.3			
			(±1.19)			
To previous treatment crops						(±2.92)
Single rate				44.3	45.0	44.6
Double rate				45.5	47.7	46.6
Mean				44.9	46.3	45.6
					(±2.06)	
Mean dry matter % as harvested: 78.3						
Fosters						
To test crop			(±1.61)			(±2.79)
0.3	40.8	40.5	40.7	36.1	37.1	36.6
0.6	46.8	47.6	47.2	44.7	45.6	45.1
Mean	43.8	44.1	43.9			
			(±1.14)			
To previous treatment crops						(±2.79)
Single rate				37.6	41.9	39.7
Double rate				43.2	40.8	42.0
Mean				40.4	41.3	40.9
					(±1.97)	
Mean dry matter % as harvested: 85.6						

Wheat 1st test crop

N: cwt per acre	Treatment crops 1956 - 1958 Lucerne	Ley	Cut grass	Arable with hay	Mean
Straw (at 85% dry matter): cwt per acre					
Highfield					
Mean	53.5	46.9	41.7	36.9	44.7
To test crop					
0.3	51.3	46.5	38.6	34.4	42.7
0.6	55.7	47.2	44.9	39.5	46.8
Difference	+4.4	+0.7	+6.3	+5.1	+4.1
To treatment crops					
Single rate		47.7	41.8	36.5	44.9
Double rate		46.0	41.6	37.4	44.6
Difference		-1.7	-0.2	+0.9	-0.3
Fosters					
Mean	42.6	39.6	34.0	28.7	36.2
To test crop					
0.3	38.7	36.5	31.5	25.2	33.0
0.6	46.5	42.7	36.6	32.1	39.5
Difference	+7.8	+6.2	+5.1	+6.9	+6.5
To treatment crops					
Single rate		41.1	35.6	27.8	34.8
Double rate		38.0	32.5	29.5	33.3
Difference		-3.1	-3.1	+1.7	-1.5

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 1957: tons per acre None	Arable with hay only: Dung to potatoes 1957: tons per acre 12	Arable with hay only: Mean
Straw (at 85% dry matter): cwt per acre						
Highfield						
To test crop						
0.3	42.9	42.5	42.7	34.6	34.1	34.4
0.6	46.9	46.6	46.8	39.7	39.3	39.5
Mean	44.9	44.6	44.7			
To previous treatment crops						
single rate				37.6	35.4	36.5
Double rate				36.8	38.1	37.4
Mean				37.2	36.7	36.9

Mean dry matter % as harvested 89.2

Fosters

To test crop						
0.3	31.2	30.9	31.0	24.4	26.0	25.2
0.6	38.5	35.8	37.1	31.3	32.9	32.1
Mean	34.8	33.3	34.1			
To previous crop treatment crops						
Single rate				26.0	29.7	27.8
Double rate				29.8	29.2	29.5
Mean				27.9	29.5	28.7

Mean dry matter % as harvested: 91.5

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

	Treatment crops 1955-1957				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	14.74	14.77	15.67	13.64	14.70
N: cwt per acre					
0.5	14.92	15.06	15.80	13.23	14.75
1.0	14.57	14.49	15.54	14.05	14.66
Difference (±0.497)	-0.35	-0.57	-0.26	+0.82	-0.09 (±0.248)
Dung: tons per acre					
None	14.43	14.76	15.63	12.95	14.44
12	15.06	14.78	15.71	14.33	14.97
Difference (±0.497)	+0.63	+0.02	+0.08	+1.38	+0.53 (±0.248)
P_2O_5: cwt per acre*					
0.9	15.08	14.38	15.22	14.15	14.71
1.8	14.41	15.16	16.11	13.12	14.70
Difference (±0.391)	-0.67	+0.78	+0.89	-1.03	-0.01 (±0.195)
K_2O: cwt per acre*					
0.9	14.63	14.59	15.49	13.46	14.54
1.8	14.85	14.95	15.85	13.81	14.87
Difference (±0.391)	+0.22	+0.36	+0.36	+0.35	+0.33 (±0.195)
Fosters					
Mean	14.13	13.58	13.36	12.14	13.30
N: cwt per acre					
0.5	14.30	13.55	13.44	12.20	13.37
1.0	13.96	13.61	13.28	12.09	13.23
Difference (±0.382)	-0.34	+0.06	-0.16	-0.11	-0.14 (±0.191)
Dung: tons per acre					
None	13.09	12.58	12.58	11.22	12.37
12	15.17	14.58	14.13	13.06	14.24
Difference (±0.382)	+2.08	+2.00	+1.55	+1.84	+1.87 (±0.191)
P_2O_5: cwt per acre*					
0.9	13.99	13.53	13.11	11.72	13.08
1.8	14.28	13.63	13.61	12.57	13.52
Difference (±0.112)	+0.29	+0.10	+0.50	+0.85	+0.44 (±0.056)
K_2O: cwt per acre*					
0.9	13.88	13.67	12.95	12.18	13.17
1.8	14.38	13.49	13.77	12.10	13.44
Difference (±0.112)	+0.50	-0.18	+0.82	-0.08	+0.27 (±0.056)

*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	(±0.248)		(1) and (2)		(1) and (2)	
0.5	14.38	15.12	14.81	14.69	14.65	14.85
1.0	14.50	14.82	14.61	14.71	14.44	14.88
Dung: tons per acre			(1) and (2)		(1) and (2)	
None			14.48	14.40	14.17	14.70
12			14.93	15.00	14.91	15.03

Lucerne rotation only	K_2O: cwt per acre* 0.9	1.8	Mean
P_2O_5: cwt per acre*	(3) and (4)		
0.9	14.87	15.28	15.08
1.8	14.40	14.43	14.41
Mean	14.63	14.85	14.74

	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	(±0.191)		(1) and (2)		(1) and (2)	
0.5	12.46	14.29	13.13	13.62	13.24	13.51
1.0	12.28	14.19	13.04	13.43	13.10	13.37
Dung: tons per acre			(1) and (2)		(1) and (2)	
None			12.18	12.56	12.04	12.70
12			13.99	14.48	14.30	14.17

Lucerne rotation only	K_2O: cwt per acre* 0.9	1.8	Mean
P_2O_5: cwt per acre*	(3) and (4)		
0.9	13.63	14.35	13.99
1.8	14.14	14.42	14.28
Mean	13.88	14.38	14.13

*Including basal dressing.

Highfield	Fosters	
(1) ±0.195	(1) ±0.056	for use in horizontal and interaction comparisons.
(2) ±0.223	(2) ±0.141	for use in all others.
(3) ±0.497	(3) ±0.382	for use only in testing the PK interaction.
(4) ±0.447	(4) ±0.282	for use in all other comparisons.

https://doi.org/10.23637/ERADOC-1-179

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

	Treatment crops 1955-1957				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	87.9	87.9	91.6	90.6	89.5
N: cwt per acre					
0.5	87.8	87.0	91.1	89.6	88.9
1.0	88.1	88.8	92.1	91.5	90.1
Difference	+0.3	+1.8	+1.0	+1.9	+1.2
Dung: tons per acre					
None	87.5	86.6	91.2	88.9	88.5
12	88.3	89.2	92.0	92.3	90.4
Difference	+0.8	+2.6	+0.8	+3.4	+1.9
P_2O_5: cwt per acre*					
0.9	88.8	87.5	91.5	91.1	89.7
1.8	87.0	88.3	91.7	90.1	89.3
Difference	-1.8	+0.8	+0.2	-1.0	-0.4
K_2O: cwt per acre*					
0.9	87.2	87.4	91.8	89.7	89.0
1.8	88.6	88.4	91.4	91.4	89.9
Difference	+1.4	+1.0	-0.4	+1.7	+0.9
Fosters					
Mean	96.0	95.3	94.5	95.6	95.3
N: cwt per acre					
0.5	95.9	95.0	94.5	95.4	95.2
1.0	96.0	95.6	94.5	95.8	95.5
Difference	+0.1	+0.6	0.0	+0.4	+0.3
Dung: tons per acre					
None	95.7	94.7	93.3	95.2	94.7
12	96.3	95.9	95.6	96.0	95.9
Difference	+0.6	+1.2	+2.3	+0.8	+1.2
P_2O_5: cwt per acre*					
0.9	95.3	95.5	94.6	95.3	95.2
1.8	96.6	95.1	94.3	95.8	95.5
Difference	+1.3	-0.4	-0.3	+0.5	+0.3
K_2O: cwt per acre*					
0.9	96.0	95.1	94.2	96.1	95.3
1.8	96.0	95.5	94.8	95.1	95.3
Difference	0.0	+0.4	+0.6	-1.0	0.0

*Including basal dressing

https://doi.org/10.23637/ERADOC-1-179

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	87.5	90.2	89.2	88.5	88.4	89.4
1.0	89.6	90.7	90.2	90.0	89.7	90.5
Dung: tons per acre						
None			88.8	88.3	87.7	89.4
12			90.7	90.2	90.4	90.5

Lucerne rotation only	K_2O: cwt per acre*		
	0.9	1.8	Mean
P_2O_5: cwt per acre*			
0.9	87.5	90.1	88.8
1.8	86.9	87.1	87.0
Mean	87.2	88.6	87.9

	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	94.5	95.9	94.8	95.6	94.9	95.4
1.0	94.9	96.0	95.6	95.4	95.7	95.2
Dung: tons per acre						
None			94.5	95.0	95.0	94.5
12			95.9	96.0	95.7	96.2

Lucerne rotation only	K_2O: cwt per acre*		
	0.9	1.8	Mean
P_2O_5: cwt per acre*			
0.9	95.2	95.5	95.3
1.8	96.8	96.5	96.6
Mean	96.0	96.0	96.0

*Including basal dressing

https://doi.org/10.23637/ERADOC-1-179

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

	Treatment crops 1954-1956				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	46.4	48.1	46.7	49.9	47.8
N: cwt per acre					
None	47.5	49.2	46.6	49.0	48.1
0.2	45.3	47.1	46.7	50.7	47.5
Difference (±1.65)	-2.2	-2.1	+0.1	+1.7	-0.6 (±0.82)
Dung to potatoes 1958: tons per acre					
None	48.1	49.2	49.0	49.1	48.9
12	44.7	47.0	44.4	50.6	46.7
Difference (±1.65)	-3.4	-2.2	-4.6	+1.5	-2.2 (±0.82)
Fosters					
Mean	50.6	47.2	47.1	43.0	47.0
N: cwt per acre					
None	48.0	44.8	45.5	40.2	44.6
0.2	53.3	49.6	48.7	45.9	49.4
Difference (±1.51)	+5.3	+4.8	+3.2	+5.7	+4.8 (±0.76)
Dung to potatoes 1958: tons per acre					
None	50.7	46.1	46.3	41.9	46.2
12	50.6	48.3	47.9	44.2	47.7
Difference (±1.51)	-0.1	+2.2	+1.6	+2.3	+1.5 (±0.76)

	Highfield N: cwt per acre		Fosters N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1958: tons per acre	(±0.82)		(±0.76)	
None	49.5	48.3	43.8	48.7
12	46.7	46.6	45.4	50.1

Mean dry matter % as harvested:
Highfield: 84.5
Fosters: 85.7

https://doi.org/10.23637/ERADOC-1-179

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

	Treatment crops 1954-1956				
	Lucerne	Ley	Cut Grass	Arable with hay	Mean
Highfield					
Mean	39.1	37.6	34.9	33.8	36.3
N: cwt per acre					
None	32.3	35.6	33.1	30.8	33.0
0.2	46.0	39.6	36.6	36.7	39.7
Difference	+13.7	+4.0	+3.5	+5.9	+6.7
Dung to potatoes 1958: tons per acre					
None	39.9	37.4	33.5	32.3	35.7
12	38.4	37.8	36.2	35.3	36.9
Difference	-1.5	+0.4	+2.7	+3.0	+1.2
Fosters					
Mean	29.9	27.6	29.5	26.2	28.3
N: cwt per acre					
None	28.8	25.3	27.6	23.2	26.2
0.2	31.1	30.0	31.4	29.2	30.4
Difference	+2.3	+4.7	+3.8	+6.0	+4.2
Dung to potatoes 1958: tons per acre					
None	29.8	28.5	30.2	24.6	28.3
12	30.0	26.8	28.8	27.9	28.4
Difference	+0.2	-1.7	-1.4	+3.3	+0.1

	Highfield		Fosters	
	N: cwt per acre		N: cwt per acre	
	None	0.2	0.2	0.4
Dung to potatoes 1958: tons per acre				
None	33.3	38.2	25.9	30.6
12	32.6	41.2	26.5	30.3

Mean dry matter % as harvested:
Highfield: 91.4
Fosters: 89.9

https://doi.org/10.23637/ERADOC-1-179

59/Bb/1.16

Treatment crops Arable and Hay rotation

(values based on mean of 2 sub plots only)

	Highfield N: cwt per acre applied in 1959			Fosters N: cwt per acre applied in 1959		
	Single rate	Double rate	Mean	Single rate	Double rate	Mean
Hay (dry matter): cwt per acre						
No dung	60.2	60.4	60.3	60.1	58.3	59.2
Dung in 1957	54.4	67.7	61.0	61.7	76.2	68.9
Mean	57.3	64.0	60.7	60.9	67.3	64.1
Potatoes, total tubers: tons per acre						
No dung	10.49	11.45	10.97	11.73	10.33	11.03
Dung in 1959	12.25	14.47	13.36	12.57	11.73	12.15
Mean	11.37	12.96	12.17	12.15	11.03	11.59
Potatoes, percentage ware ($1\frac{1}{2}$" riddle)						
No dung	89.4	88.0	88.7	96.4	92.9	94.6
Dung in 1959	89.8	94.8	92.3	94.1	95.5	94.8
Mean	89.6	91.4	90.5	95.2	94.2	94.7
Oats						
	None	0.2		0.2	0.4	
Grain (at 85% dry matter): cwt per acre						
No dung	16.7	16.4	16.6	42.6	42.4	42.5
Dung in 1958	15.5	16.0	15.8	43.2	43.6	43.4
Mean	16.1	16.2	16.2	42.9	43.0	42.9
Straw (at 85% dry matter): cwt per acre						
No dung	15.7	20.0	17.8	29.6	30.4	30.0
Dung in 1958	18.6	20.9	19.8	25.8	30.0	27.9
Mean	17.2	20.4	18.8	27.7	30.2	28.9

Highfield, Oats, Mean dry matter % as harvested Grain: 78.4 Straw: 84.8
Fosters, Oats, Mean dry matter % as harvested Grain: 81.6 Straw: 88.8

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Cut grass. Dry matter: cwt per acre

1st year	Highfield N to previous 3 test crops: Single rate	Highfield N to previous 3 test crops: Double rate	Highfield Dung to potatoes 1957: tons per acre: None	Highfield Dung to potatoes 1957: 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 1957: tons per acre: None	Fosters Dung to potatoes 1957: tons per acre: 12	Fosters Mean
N (1) to cut grass (3 cuts)										
Single rate	40.3	39.0	36.5	42.9	39.7	21.7	24.8	22.9	23.5	23.2
Double rate	42.7	44.4	42.7	44.3	43.5	25.0	26.6	24.9	26.7	25.8
N: test crops										
Single rate			39.5	43.5	41.5			23.0	23.6	23.3
Double rate			39.7	43.7	41.7			24.8	26.6	25.7
Mean			39.6	43.6	41.6			23.9	25.1	24.5

	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 (4 cuts)	54.8	70.8	62.8	42.9	58.7	50.8
3rd year (4 cuts)	43.4	60.2	51.8	52.8	63.1	58.0

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

Corrective dressing of K_2O cwt per acre to cut grass 1st year:
Highfield: 3.5
Fosters: 4.0

59/Bb/1.17

Lucerne. Dry Matter: cwt per acre

1st Year (2 cuts)	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 1957						
None	32.0	32.5	32.2	37.3	36.2	36.7
12 tons	36.4	34.1	35.2	38.3	37.6	37.9
Mean	34.2	33.3	33.7	37.8	36.9	37.3
2nd year (4 cuts)			98.6			110.3
3rd year (3 cuts)			58.0			70.2

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	13.8	16.6	15.2	9.2	11.5	10.3
2nd year	15.5	21.2	18.4	15.6	16.1	15.9
3rd year	21.4	27.5	24.5	23.0	20.9	22.0

Corrective dressing of K_2O cwt per acre to Lucerne 1st year:
Highfield: 3.0
Fosters: 4.0

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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						
9th exptl. year						
Blocks 9 and 11				25.8	23.7	24.7
Blocks 10 and 12	37.2	40.3	38.7	18.4*	20.5*	19.5*
10th exptl. year						
Blocks 5 and 6				21.8	22.1	22.0
Blocks 7 and 8	47.6	58.2	52.9	14.2*	13.8*	14.0*
11th exptl. year						
Blocks 2 and 4				19.7	21.4	20.5
Blocks 1 and 3	48.7	54.5	51.6	16.2*	19.4*	17.8*
Fosters						
9th exptl. year						
Blocks 11 and 12				29.6	34.2	31.9
Blocks 6 and 10	39.4	43.0	41.2	11.0*	11.3*	11.2*
10th exptl. year						
Blocks 7 and 8				23.5	28.2	25.8
Blocks 5 and 9	47.3	46.5	46.9	8.5*	8.9*	8.7*
11th exptl. year						
Blocks 3 and 4				32.4	32.9	32.6
Blocks 1 and 2	52.6	53.0	52.8	10.9*	14.1*	12.5*

Corrective dressing of K_2O cwt per acre to Reseeded Grass 10th experimental year: Highfield Blocks 6 and 7; Fosters Blocks 8 and 9: 3.0

Permanent Grass. Dry matter: cwt per acre

Highfield						
9th exptl. year						
Blocks 9 and 11				19.3	21.7	20.5
Blocks 10 and 12	40.3	46.5	43.4	12.7*	14.1*	13.4*
10th exptl. year						
Blocks 5 and 6				14.8	18.4	16.6
Blocks 7 and 8	35.3	42.4	38.8	19.3*	18.2*	18.8*
11th exptl. year						
Blocks 2 and 4				18.6	25.2	21.9
Blocks 1 and 3	43.0	51.4	47.2	20.1*	19.9*	20.0*

* Aftermath grazing.

Corrective dressing of K_2O cwt per acre to Permanent Grass 10th experimental year. Highfield Blocks 6 and 7: 2.5

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REFERENCE PLOTS

The effects of N P K and Dung on a sequence of five arable crops and on permanent grass - Great Field IV 1959.

From 1959 cropping year onwards dung is applied only to the root crops of the rotation. The rate of dressing is now 20 tons per acre for these two crops.

Permanent grass still has an annual dressing of dung at 15 tons per acre.

Area of each plot: 0.0013 acres.

Cultivations, etc.:

Winter wheat. Dug by hand: Sept 17, 1958. PK applied, seed drilled: Oct 17. First N dressing applied: Mar 2, 1959. Second N dressing applied: May 1. Harvested: July 31. Variety: Cappelle.

Kale. Dung applied, plots dug by hand: Nov 19, 1958. N P and K applied, seed sown: Apr 3, 1959. Harvested: Nov 17. Variety: Thousand head.

Barley. Dug by hand: Nov 10, 1958. N P and K applied, seed drilled and undersown: Apr 2, 1959. Harvested: July 27. Variety: Proctor.

Grass - clover ley. Undersown in barley: Mar 25, 1958. N P and K applied: Mar 2, 1959. Cut three times: Oct 30, 1958, June 6 and Aug 13, 1959. Varieties: S22 ryegrass and Giant Hybrid red clover.

Potatoes. Dung applied, plots dug by hand: Dec 1, 1958. N P and K applied on flat, setts planted: Apr 2, 1959. Harvested: Sept 14. Variety: King Edward.

Permanent grass. Dung applied: Dec 2, 1958. First N dressing and PK applied: Feb 17, 1959. Second N dressing applied: June 2. Cut twice: June 2 and Sept 24.

For details of the previous years results see "Results of the Field Experiments" 58/Bc/1 in which the rates of N P and K are given.

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Summary of Results

Treatment	cwt per acre Wheat Grain (at 85% D.M.)	Wheat Straw (at 85% D.M.)	Barley Grain (at 85% D.M.)	Barley Straw (at 85% D.M.)	Ley 1st cut (dry matter)	Ley 2nd cut (dry matter)	Ley 3rd cut (dry matter)	Total	tons per acre Potatoes Total tubers	Kale Total weight	cwt per acre Permanent grass 1st cut (dry matter)	Permanent grass 2nd cut (dry matter)	Total
None	44.9	48.4	21.3	16.8	9.0	31.1	11.7	51.8	3.46	6.49	30.3	11.2	41.5
N_1	52.1	57.5	18.4	14.4	9.9	38.9	10.9	59.7	4.38	11.14	28.6	11.4	40.0
P	49.8	55.5	30.8	28.4	9.4	33.1	11.9	54.4	6.43	6.75	29.2	12.3	41.5
N_1P	53.2	66.1	29.2	24.9	9.4	41.5	13.1	64.0	4.14	15.17	36.9	13.3	50.2
K	46.8	57.4	27.9	23.3	11.4	42.6	25.5	79.5	7.28	4.71	27.5	11.1	38.6
N_1K	47.4	57.5	31.1	25.2	10.8	46.1	20.4	77.3	7.84	11.87	56.8	17.7	74.5
PK	52.5	76.1	29.3	26.2	14.4	47.3	27.3	89.0	8.72	7.86	47.4	14.1	61.5
N_1PK	59.6	80.7	34.0	29.3	15.0	65.1	18.8	98.9	12.14	11.80	50.8	16.6	67.4
N_2PK	47.2	89.9	36.6	31.9	14.7	62.8	13.9	91.4	14.80	18.73	54.7	21.7	76.4
D	51.3	65.3	30.5	26.8	15.6	53.0	23.0	91.6	16.06	10.42	55.9	11.6	67.5
N_1PKD	60.1	82.6	35.1	29.9	16.3	65.0	23.8	105.1	20.11	16.10	54.7	23.1	77.8
N_2PKD	52.7	77.6	41.5	42.0	16.2	66.7	19.9	102.8	19.46	24.09	71.4	29.0	100.4
Mean dry matter % as harvested:	68.6	54.6	69.8	51.8	16.1	28.0	30.0	24.7			25.5	40.4	33.0

59/Bc/1.2

59/Bd/1.1

GREEN MANURING EXPERIMENT

Woburn Stackyard - 1959, the 6th year of the revised scheme.

For history, treatments etc., see "Details of the Classical and Long Term Experiments" 1956. In 1959 the barley was combine harvested for the first time, yields being estimated from one combine cut per plot. Weights of straw were not recorded.

Area of each plot (acres): 0.0406. Area harvested: Potatoes - 0.0221; barley - 0.0301.

Cultivations, etc.:

Green manures after barley 1958 (for early potatoes 1959): Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, undersown: Apr 29, 1958. Varieties: Trefoil - English; Ryegrass - Western Wolths.

Early potatoes: Straw applied: Sept 25, 1958. "Fallow" plots ploughed: Sept 26 and Nov 26. All plots ploughed: Feb 6, 1959. Basal fertilizer and 'Nitra-Shell' applied, potatoes mechanically planted: Mar 25. Earthed up: June 12. Sprayed with dieldrin at 2 pints in 40 gallons per acre: June 26. Lifted: July 21. Variety: Ulster Chieftain.

Green manures after early potatoes 1958 (for barley 1959): Trefoil at 30 lb per acre, ryegrass at 40 lb per acre, sown: Aug 1, 1958. Varieties: Trefoil - English; Ryegrass - Western Wolths.

Barley: "Fallow" plots and "early" green manure plots ploughed: Oct 23, 1958. "Late" green manure plots ploughed: Feb 5, 1959. Ground chalk applied at 18 cwt per acre: Feb 9. 'Nitra-Shell' applied: Mar 12. Seed drilled at 3 bushels per acre: Mar 13. Trefoil and ryegrass undersown: Mar 12, failed and resown: Aug 7. Combine harvested: Aug 4. Variety: Herta.

Standard errors per plot:

Potatoes. Total tubers: 0.523 tons per acre or 12.5% (18 d.f.)

Barley. Grain (at 85% D.M): 3.00 cwt per acre or 12.1% (20 d.f.)

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

	Green manures	Ploughed in	Dry matter	Nitrogen
For early potatoes	Trefoil		20.9	0.672
	Ryegrass		26.8	0.352
For barley	Trefoil	Early	20.1	0.629
	Ryegrass	Early	33.0	0.462
	Trefoil	Late	14.7	0.453
	Ryegrass	Late	44.1	0.595

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59/Bd/1.2

Summary of Results

Early potatoes, total tubers: tons per acre

	Straw: tons per acre		N: cwt per acre (including basal)		Dung to cabbages 1953: tons per acre		Mean
	None	1½	0.6	1.2	None	10	
Excluding plots fallow under old scheme							
Undersown green manures for potatoes	(±0.185)		(±0.185)		(±0.185)		(±0.131)
None	4.12	4.05	4.01	4.16	4.02	4.15	4.08
	(±0.262)		(±0.262)		(±0.262)		(±0.185)
Trefoil	4.21	4.40	4.37	4.24	4.22	4.38	4.30
Ryegrass	4.63	4.86	4.88	4.61	4.28	5.22	4.74
Straw: tons per acre			(±0.185)		(±0.185)		(±0.131)
None			4.24	4.29	4.09	4.44	4.27
1½			4.39	4.29	4.18	4.50	4.34
N: cwt per acre (including basal)							
0.6					4.10	4.54	4.32
1.2					4.17	4.41	4.29
Mean (±0.131)					4.13	4.47	4.30
Plots fallow under old scheme							
Straw: tons per acre			(±0.370)		(±0.370)		(±0.262)
None			3.52	3.56	3.42	3.66	3.54
1½			3.96	4.07	3.84	4.19	4.02
N: cwt per acre (including basal)							
0.6					3.58	3.90	3.74
1.2					3.68	3.95	3.82
Mean (±0.262)					3.63	3.92	3.78

	Undersown green manures for potatoes				
	None	None	Trefoil	Ryegrass	
Old scheme	Fallow	Excluding fallow			Mean
	3.78 (±0.185)	4.08 (±0.131)	4.30 (±0.185)	4.74	4.20

https://doi.org/10.23637/ERADOC-1-179

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

	Green manures: In barley for potatoes		Green manures: After potatoes for barley		N: cwt per acre (including basal)		Dung to cabbages 1952: tons per acre		
	None	Undersown	Trefoil	Ryegrass	0.23	0.46	None	10	Mean
Excluding plots fallow under old scheme									
Green manures ploughed in	(±1.06)		(±1.06)		(±1.06)		(±1.06)		(±0.75)
Early	22.1	24.4	23.1	23.4	21.6	24.9	22.4	24.1	23.2
Late	26.7	30.0	30.0	26.7	25.6	31.1	27.6	29.1	28.4
Green manures in barley for potatoes									
None			25.3	23.5	22.5	26.3	23.4	25.4	24.4
Undersown			27.8	26.5	24.6	29.8	26.5	27.9	27.2
Green manures after potatoes for barley									
Trefoil					25.8	27.3	25.4	27.8	26.6
Ryegrass					21.3	28.7	24.6	25.5	25.0
N: cwt per acre (including basal)									
0.23							22.5	24.7	23.6
0.46							27.4	28.6	28.0
Mean (±0.75)							25.0	26.6	25.8

Plots fallow under old scheme

Old scheme	Green manures after potatoes for barley: None Fallow	Trefoil (Excluding fallow)	Ryegrass (Excluding fallow)	Mean
	20.7 (±1.06)	26.6	25.0 (±0.75)	24.8

N: cwt per acre (including basal)			
	(±2.12)		(±1.50)
0.23	13.2	19.3	16.3
0.46	26.2	24.0	25.1
Mean (±1.50)	19.7	21.6	20.7

Mean dry matter % as harvested: 84.4

59/Bd/1.3

59/Be/1.1

LEY AND ARABLE ROTATIONS

Woburn Stackyard 1959 - the 22nd year.

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

Combine harvesting: In 1959 the combine harvester was introduced for barley and rye; the whole plot area was harvested for yield estimates.

Cultivations, etc.,

Treatment crops

Ley rotations

Ley 1st year. Ploughed twice: Sept 17 and Nov 21, 1958. PK fertilizers and 'Nitra-Shell' applied: Mar 31, 1959. Seed sown at 40 lb per acre: Apr 7. Sprayed with DNBP at 9 pints in 80 gallons per acre: June 4. 'Nitra-Shell' applied: 2nd dressing - Aug 31; 3rd dressing - Oct 7. Grazed 3 circuits: June 30 - Oct 30. Seeds mixture: 20 lb S24 Perennial Ryegrass, 11 lb S143 Cocksfoot, 6 lb Late Flowering Red Clover, 3 lb S100 White Clover per acre.

Ley 2nd year. Potash and nitrogen fertilizer applied: Mar 17, June 10 and Aug 31. Grazed 5 circuits: Apr 22 - Aug 29.

Ley 3rd year. Potash and nitrogen fertilizer applied: Mar 17, June 10 and Aug 31. Grazed 5 circuits: Apr 14 - Aug 21.

Lucerne 1st year. Ploughed twice: Sept 17 and Nov 21, 1958. PK fertilizer applied: Mar 31. Seed sown at 25 lb per acre: Apr 7.* Sprayed with dieldrin at 2 pints in 40 gallons per acre against birds: June 4. Cut twice: July 10, Sept 2. Variety: Du Puits.

Lucerne 2nd year. Muriate of potash applied: Apr 13. Cut 3 times: June 12, July 10, Sept 2.

Lucerne 3rd year. Plots 3, 4, 9 and 10 were fallowed because of stem eelworm and received no potash. Ploughed: Apr 30, June 13, Sept 2, 1959.

Arable rotations

Potatoes 1st course. Ploughed twice: Sept 17 and Nov 21, 1958. Compound fertilizer applied: Mar 31, 1959. Potatoes machine planted: Apr 1. Earthed up: June 22. Sprayed with zineb at 2 lb and demeton methyl (against aphids) at 12 fluid oz (50% active ingredients) in 40 gallons per acre: Aug 15. Haulm destroyed mechanically: Sept 22. Lifted: Sept 30. Variety: Majestic.

Rye 2nd course. Ploughed: Oct 16, 1958. Seed drilled at $2\frac{1}{2}$ bushels per acre: Oct 21. 'Nitra-Shell' applied: Apr 13, 1959. Seeds hay mixture undersown on 4 plots: Apr 7. Combine harvested: Aug 18. Variety: King II.

*Sprayed with dieldrin at 2 pints in 40 gallons per acre against weevil: Apr 30.

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Seeds hay 3rd course. Seeds undersown at 30 lb per acre in rye: Apr 19, 1958. Potash and nitrogen fertilizer applied: Mar 17, 1959. Cut once: May 29. 'Nitra-Shell' applied: June 2. Seeds mixture: 19 lb S24 Perennial Ryegrass, 9 lb Late Flowering Red Clover, 2 lb Alsike American per acre.

Carrots 3rd course. Ploughed twice: Sept 15 and Nov 21, 1958. Potash and nitrogen fertilizers applied: Apr 7, 1959. Seed drilled at 5 lb per acre: Apr 14. Sprayed with dieldrin against carrot fly at 2 pints in 40 gallons per acre: June 4 and June 26. Lifted (2 rows per plot): Oct 28. Variety: Scarlet Intermediate.

Test crops

Sugar beet 1st test crop. Dung applied: Nov 19, 1958. Ploughed: Nov 20. Treatment fertilizers applied: Apr 3, 1959. Basal compound fertilizers applied, seed drilled at 12 lb per acre: Apr 6. Sprayed with dieldrin against mangold fly at 2 pints in 40 gallons per acre: May 26. Sprayed with demeton methyl against virus yellow at 12 fluid oz (50% active ingredients) in 40 gallons per acre: June 3 and June 20. Singled: May 26. Lifted: Nov 4. Variety: Klein E.

Barley 2nd test crop. Ground chalk applied at 18 cwt per acre: Dec 24, 1958. Ploughed: Jan 5 - Jan 23, 1959. Muriate of potash applied to sub plots to equalize treatment dressings to 1958 sugar beet test crop; 'Nitra-Shell' applied: Mar 1. Seed drilled at 3 bushels per acre: Mar 13. Combine harvested: Aug 5. Variety: Herta.

Standard errors per plot. Test crops.

Sugar beet.	Total sugar.	Whole plot:	10.10 cwt per acre or 21.0% (4 d.f.)
		½ plot:	6.70 cwt per acre or 14.0% (4 d.f.)
		⅛ plot:	3.68 cwt per acre or 7.7% (24 d.f.)
	Tops	Whole plot:	1.614 tons per acre or 19.9% (4 d.f.)
		½ plot:	1.453 tons per acre or 17.9% (4 d.f.)
		⅛ plot:	0.834 tons per acre or 10.3% (24 d.f.)
Barley.	Grain (at 85% dry matter)	Whole plot:	0.78 cwt per acre or 2.2% (4 d.f.)
		½ plot:	2.05 cwt per acre or 5.9% (4 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Treatment crops

Ley, sheep days of grazing per acre

1st year	2nd year	3rd year
566	1066	1253

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

	1st cut	2nd cut	3rd cut	Total
1st year				
Dung in 1957: tons per acre				
None	9.8	25.8		35.6
15	13.7	29.0		42.7
Difference	+3.9	+3.2		+7.1
Previous rotation				
Lucerne	10.8	28.6		39.4
Arable with roots	12.6	26.1		38.7
Mean	11.7	27.4		39.1
2nd year				
Dung in 1956: tons per acre				
None	21.3	6.6	11.0	38.9
15	32.8	10.4	13.8	57.0
Difference	+11.5	+3.8	+2.8	+18.1
Previous rotation				
Lucerne	22.2	6.3	10.0	38.5
Arable with hay	32.0	10.7	14.7	57.4
Mean	27.1	8.5	12.4	48.0

https://doi.org/10.23637/ERADOC-1-179

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: (at 85% D.M.) cwt per acre
Dung: tons per acre				
None	11.91	79.0	32.6	34.0
15*	12.49	81.4	35.7	36.4
Difference	+0.58	+2.4	+3.1	+2.4
Previous rotation				
Ley	14.57	84.5	34.8	36.4
Lucerne	12.68	83.9	36.2	36.2
Arable with hay	10.90	76.2	34.2	34.5
Arable with roots	10.64	76.2	31.4	33.8
Mean	12.20	80.2	34.1	35.2

Hay

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

Dung in 1955: tons per acre	
None	58.2
15	61.5
Difference	+3.3
Previous rotation	
Ley	69.3
Arable with hay	50.4
Mean	59.8

Carrots

	Roots washed: tons per acre	Tops tons per acre
Dung in 1955: tons per acre		
None	5.84	2.36
15	6.28	2.42
Difference	0.44	0.06
Previous rotation		
Lucerne	6.91	2.83
Arable with roots	5.22	1.96
Mean	6.06	2.39

*Dung applied: Potatoes for test crop sugar beet in 1957.
Rye - for test crop sugar beet in 1956.

https://doi.org/10.23637/ERADOC-1-179

59/Be/1.5

1st Test crop

Sugar beet

Previous rotation

	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Roots (washed): tons per acre					
Mean	15.88	13.56	12.12	13.00	13.64
Dung: tons per acre					
None	15.43	12.62	10.24	12.04	12.58
15	16.33	14.50	14.01	13.96	14.70
Difference	+0.90	+1.88	+3.77	+1.92	+2.12
Response to additional 0.72 cwt N per acre					
No dung	-2.88	-0.81	-0.70	-1.12	-1.38
Dung 15 tons per acre	-0.14	-0.38	-0.69	+0.01	-0.30
Response to additional 0.9 cwt K_2O per acre					
No dung	+0.88	+1.62	+0.12	+0.74	+0.84
Dung 15 tons per acre	+1.59	+0.58	+0.81	+0.92	+0.97
Sugar Percentage					
Mean	17.4	17.4	17.6	17.8	17.5
Dung: tons per acre					
None	17.6	17.4	17.6	17.7	17.6
15	17.2	17.4	17.5	18.0	17.5
Difference	-0.4	0.0	-0.1	+0.3	-0.1
Response to additional 0.72 cwt N per acre					
No dung	-1.2	-1.2	-1.2	-0.9	-1.1
Dung 15 tons per acre	-0.8	-0.6	-0.6	-0.5	-0.6
Response to additional 0.9 cwt K_2O per acre					
No dung	+0.4	+0.6	0.0	+0.9	+0.5
Dung 15 tons per acre	-0.2	+0.2	+0.2	+0.1	+0.1

https://doi.org/10.23637/ERADOC-1-179

1st Test Crop

Sugar beet

Previous rotation

	Ley	Lucerne	Arable with hay	Arable with roots	Mean
Total sugar: cwt per acre					
Mean (±7.14)	55.4	47.4	42.5	46.5	48.0
Dung: tons per acre					
None (±7.89)*	54.6	44.3	36.1	42.8	44.5
15	56.2	50.5	49.0	50.2	51.5
Difference (±6.70)	+1.6	+6.2	+12.9	+7.4	+7.0
					(±3.35)
Response to additional 0.72 cwt N per acre		(±2.60)			(±1.30)
No dung	-13.8	-5.9	-4.9	-6.0	-7.7
Dung 15 tons per acre	-3.4	-3.2	-4.2	-1.6	-3.1
Response to additional 0.9 cwt K_2O per acre		(±2.60)			(±1.30)
No dung	+4.2	+7.2	+0.4	+4.6	+4.1
Dung 15 tons per acre	+5.0	+2.4	+3.2	+3.8	+3.6
Tops: tons per acre					
Mean (±1.142)	8.64	8.46	7.69	7.69	8.12
Dung: tons per acre					
None (±1.353)*	8.75	8.54	7.27	8.17	8.18
15	8.54	8.37	8.10	7.20	8.05
Difference (±1.453)	-0.21	-0.17	+0.83	-0.97	-0.13
					(±0.726)
Response to additional 0.72 cwt N per acre		(±0.590)			(±0.295)
No dung	-0.26	+1.70	+0.54	+0.38	+0.59
Dung 15 tons per acre	+1.12	-0.23	+0.34	+0.21	+0.36
Response to additional 0.9 cwt K_2O per acre		(±0.590)			(±0.295)
No dung	+1.08	+1.58	+0.60	+0.63	+0.97
Dung 15 tons per acre	+0.65	+0.95	+0.46	-0.53	+0.38

*For use in horizontal and diagonal comparisons only.

https://doi.org/10.23637/ERADOC-1-179

1st Test Crop

Sugar beet

Plots receiving no additional N or K

Previous rotation

Dung: tons per acre		Ley	Lucerne	Arable with hay	Arable with roots	Mean
Roots (washed): tons per acre						
Mean		15.98	13.16	12.48	13.50	13.78
None		16.52	12.44	10.54	12.98	13.12
15		15.44	13.89	14.42	14.01	14.44
Difference		-1.08	+1.45	+3.88	+1.03	+1.32
Sugar percentage						
Mean		17.9	17.8	18.0	18.2	18.0
None		18.0	17.8	18.1	18.0	18.0
15		17.7	17.9	17.9	18.4	18.0
Difference		-0.3	+0.1	-0.2	+0.4	0.0
Total sugar: cwt per acre						
Mean	(±5.80)	57.3	47.1	44.8	49.2	49.6
None	(±7.73)*	59.7	44.6	38.1	46.7	47.3
15	(±7.73)*	54.8	49.6	51.6	51.6	51.9
Difference	(±7.42)	-4.9	+5.0	+13.5	+4.9	+4.6
Tops: tons per acre						
Mean	(±1.023)	7.96	7.15	7.24	7.80	7.54
None	(±1.363)*	8.23	7.01	6.76	8.00	7.50
15	(±1.363)*	7.70	7.29	7.73	7.61	7.58
Difference	(±1.622)	-0.53	+0.28	+0.97	-0.39	+0.08

*For use in horizontal and diagonal comparisons only.

2nd Test Crop

Barley

Dung in 1958: tons per acre		Previous rotation: Ley	Lucerne	Arable with hay	Arable with roots	Mean
Grain (at 85% dry matter): cwt per acre						
None	(±1.17)*	36.1	33.9	36.0	33.6	34.9
15		34.2	31.5	36.5	36.5	34.7
Mean	(±0.55)	35.2	32.7	36.2	35.0	34.8
Difference	(±2.05)	-1.9	-2.4	+0.5	+2.9	-0.2 (±1.02)
Straw (at 85% dry matter): cwt per acre						
None		26.7	24.2	22.9	22.3	24.0
15		30.0	28.9	27.9	28.1	28.7
Mean		28.4	26.5	25.4	25.2	26.3
Difference		+3.3	+4.7	+5.0	+5.8	+4.7

*For use in horizontal and diagonal comparisons only.

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59/Bf/1.1

WOBURN MARKET GARDEN EXPERIMENT

Organic manures and nitrogen - Lansome Field 1959, the 18th year.

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

Note: The results for the 1959-60 leeks will be included in the 1960 report.

Area of each plot (acres): 0.0125. Area harvested: Leeks - 0.0104; globe beet - 0.0104; early potatoes - 0.0084.

Cultivations, etc.:

Leeks 1958-59. Organic manures applied: July 25, 1958. Ploughed: July 28. 'Nitro-Chalk' and basal fertilizers applied: July 30. Planted: Aug 1. Second dressing of 'Nitro-Chalk' applied: Sept 18. Harvested: Mar 4 - Apr 15, 1959. Variety: Musselburgh.

Early potatoes. Ploughed: Sept 24 and Nov 27, 1958. Organic manures applied: Nov 27. Fertilizers applied on the flat: Mar 24, 1959. Machine planted: Mar 27. Earthed up: June 3. Lifted: July 14. Variety: Arran Pilot.

Globe beet. Ground chalk at 18 cwt per acre applied: Apr 16, 1959. Organic manures applied, ploughed: Apr 20. 'Nitra-Shell' and basal fertilizers applied: Apr 29. Seed drilled at 14 lb per acre: May 6. Sprayed with dieldrin at 2 pints in 40 gallons per acre: May 14. Singled: June 8 - 17. Second dressing of 'Nitra-Shell' applied: June 19. Harvested: July 22 - Sept 3. Variety: Detroit.

Standard errors per plot:

Leeks 1958-59.	Saleable produce:	0.552 tons per acre or 10.0%	(17 d.f.)
Early potatoes.	Total tubers:	0.560 tons per acre or 10.2%	(17 d.f.)
Globe beet.	Saleable bulbs:	1.112 tons per acre or 14.2%	(17 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Organic manures	Level of manuring: tons per acre	N: cwt per acre None	0.3	0.6	0.9	Mean
Leeks 1958-59. Saleable produce: tons per acre						
			(±0.390)			(±0.276)
None		1.80	4.04	4.40	4.67	2.92*
Dung	10	5.61	6.18			5.90
	20	6.33	6.64			6.48
Sludge compost	10	5.86	6.13			6.00
	20	6.02	6.19			6.11
Sludge	10	5.33	5.75			5.54
	20	5.61	5.19			5.40
Vegetable compost	10	5.38	6.11			5.75
	20	6.16	6.49			6.32
Mean (±0.138)		5.79+	6.08+			5.49**
Leeks 1958-59. Percentage saleable (by number)						
None		68.5	96.6	97.4	96.8	82.6*
Dung	10	98.2	99.1			98.6
	20	99.1	97.6			98.4
Sludge compost	10	96.5	99.3			97.9
	20	98.7	97.4			98.0
Sludge	10	99.2	97.4			98.3
	20	98.0	97.6			97.8
Vegetable compost	10	98.6	98.3			98.4
	20	98.6	97.6			98.1
Mean		98.4+	98.0+			96.5**
Early potatoes. Total tubers: tons per acre						
			(±0.396)			(±0.280)
None		2.82	4.31	4.96	4.34	3.56*
Dung	10	4.63	6.00			5.32
	20	6.40	6.28			6.34
Sludge compost	10	5.68	5.35			5.52
	20	6.55	7.81			7.18
Sludge	10	5.21	5.30			5.25
	20	5.38	6.43			5.90
Vegetable compost	10	4.58	4.98			4.78
	20	5.68	6.90			6.29
Mean (±0.140)		5.51+	6.13+			5.48**

*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						
			(±0.786)			(±0.556)
None		1.69	3.68	5.76	4.77	2.69*
Dung	10	8.15	8.62			8.39
	20	10.47	11.64			11.05
Sludge compost	10	7.27	8.87			8.07
	20	8.79	9.30			9.05
Sludge	10	6.65	7.53			7.09
	20	8.99	7.86			8.42
Vegetable compost	10	8.01	9.12			8.57
	20	8.99	10.40			9.69
Mean (±0.278)		8.41+	9.17+			7.83**
Total produce (whole plants): tons per acre						
None		3.26	5.87	8.75	7.55	4.57*
Dung	10	10.78	12.04			11.41
	20	13.74	15.64			14.69
Sludge compost	10	10.34	12.09			11.22
	20	12.53	12.64			12.58
Sludge	10	9.68	10.80			10.24
	20	12.55	11.05			11.80
Vegetable compost	10	10.84	12.30			11.57
	20	12.06	14.23			13.15
Mean		11.56+	12.60+			10.94**
Plant number: thousands per acre						
None		61.4	74.2	81.0	71.6	67.8*
Dung	10	79.4	90.3			84.9
	20	88.3	84.1			86.2
Sludge compost	10	86.3	72.4			79.4
	20	81.5	71.5			76.5
Sludge	10	76.0	77.7			76.9
	20	81.7	62.9			72.3
Vegetable compost	10	81.7	80.5			81.1
	20	83.5	93.0			88.3
Mean		82.3+	79.1+			79.0**

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

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59/Bg/1.1

IRRIGATION EXPERIMENT

Third year of revised scheme (the 9th year)

The effects of irrigation and nitrogen - Woburn Butt Close 1959.

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

In 1959 the number of irrigation treatments on sugar beet was reduced to 2, and demeton methyl spray was applied to give a test of (0 v. full irrigation) × (0 v. insecticide).

As the spring beans had made excessive growth the irrigation treatment (C) was altered after June 29 as follows:

C_1 unchanged; C_2 at about half the rate of C_1; C_3 no further irrigation.

Area of each sub-plot (acres): Cut grass, 0.0264; remainder, 0.0279.

Area harvested (acres): Sugar beet, 0.0176; spring wheat, 0.0095; spring beans, 0.0167; cut grass, 0.0165.

Rainfall and Irrigation: inches

Week ending	Rain-fall	Grass C	Sugar beet C	Wheat A	Wheat B	Wheat C	Beans C_1	Beans C_2	Beans C_3
May 4	0.63	-	-	-	-	-	-		
11	0.01	0.50	-	-	-	-	-		
18	0.01	0.50	0.50	-	0.50	0.50	0.50		
25	0.27	0.50	-	-	0.50	0.50	-		
June 1	-	0.33	0.33	-	0.33	0.33	0.33		
8	0.14	0.70	0.70	-	0.83	0.83	1.00		
15	0.30	0.50	0.75	-	0.50	0.50	0.75		
22	0.01	0.50	0.75	0.50	-	0.50	0.75		
29	0.48	0.75	0.75	0.75	-	0.75	0.50		
July 6	0.02	-	-	-	-	-	0.50	-	-
13	1.37	0.50	0.50	0.75	-	0.75	0.25	0.25	-
20	0.05	-	-	-	-	-	-		-
27	0.12	1.00	1.00				0.75	0.38	-
Aug 3	1.26	-	-						
10	-	-	-						
17	0.83	-	0.50						
24	-	-	-						
31	-	0.50	0.50						
Sept 7	-	0.50	0.50						
14	-	-	0.50						
21	-	-	-						
28	0.08	-	-						
Total	5.58	6.78	7.28	2.00	2.66	4.66	5.33	4.46	3.83

https://doi.org/10.23637/ERADOC-1-179

Cultivations, etc.:

Sugar beet. Ploughed: Oct 30 and Dec 6, 1958. Ground chalk applied: Dec 4. Salt applied: Mar 12, 1959. Basal fertilizer and 'Nitra-Shell' applied: Apr 1. Seed drilled at 10 lb per acre: Apr 3. Singled: May 19 - 22. Sprayed with dieldrin at 2 pints in 40 gallons per acre: May 26. Sprayed with demeton methyl (50% active ingredients) at 12 fluid oz in 40 gallons per acre: June 4 and June 22. Lifted: Oct 19 - 22. Variety: Klein E.

Spring wheat. Ploughed: Nov 18, 1958. Fertilizers applied: Mar 13, 1959. Seed drilled at 3 bushels per acre: Mar 17. Combine harvested: Aug 21. Variety: Peko.

Spring beans. Ploughed: Sept 15 and Dec 3, 1958. Dung applied: Dec 2. Seed combine drilled at 200 lb per acre: Feb 26, 1959. Combine harvested: Aug 7 and 22. Variety: Garton's Spring Tick.

Grass. Basal fertilizers applied: Nov 24, 1958. 'Nitra-Shell' and 0.6 cwt muriate of potash per acre applied: Mar 24, 1959. Cut six times (all plots): May 6 and 27, June 22, July 14, Aug 11, Sept 9. 'Nitra-Shell' applied after each cut, except the last. 2nd dressing of 0.6 cwt muriate of potash per acre applied after the third cut. Variety: Cocksfoot S37.

Standard errors per plot.

Sugar beet.	Total sugar,	whole plot:	5.88 cwt per acre or 8.0% (6 d.f.)
		sub plot:	4.23 cwt per acre or 5.7% (8 d.f.)
	Tops,	whole plot:	1.467 cwt per acre or 16.5% (6 d.f.)
		sub plot:	0.870 cwt per acre or 9.8% (8 d.f.)
Spring wheat.	Grain (at 85% D.M.),	whole plot:	2.55 cwt per acre or 11.3% (6 d.f.)
		sub plot:	2.74 cwt per acre or 12.1% (8 d.f.)
Cut grass.	Dry matter, Total of cuts 1 - 3	whole plot:	2.10 cwt per acre or 8.0% (6 d.f.)
		sub plot:	1.37 cwt per acre or 5.2% (8 d.f.)
	Total of cuts 4 - 6	whole plot:	2.23 cwt per acre or 10.1% (6 d.f.)
		sub plot:	1.95 cwt per acre or 8.8% (8 d.f.)
	Total of cuts 1 - 6	whole plot:	3.36 cwt per acre or 7.0% (6 d.f.)
		sub plot:	3.18 cwt per acre or 6.6% (8 d.f.)

https://doi.org/10.23637/ERADOC-1-179

Summary of Results

Sugar beet

Roots washed: tons per acre

Spray	Irrigation 0	Irrigation C
None	14.64	21.91
Demeton methyl	14.81	22.40

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
0.6	14.90	21.70	18.06	18.54	18.30
1.2	14.55	22.61	18.50	18.67	18.58
Mean	14.73	22.16	18.28	18.61	18.44
Difference	-0.35	+0.91	+0.44	+0.13	+0.28

Sugar percentage

Spray	Irrigation 0	Irrigation C
None	20.1	19.7
Demeton methyl	20.5	19.9

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
0.6	20.8	20.3	20.3	20.8	20.5
1.2	19.8	19.4	19.6	19.6	19.6
Mean	20.3	19.8	19.9	20.2	20.1
Difference	-1.0	-0.9	-0.7	-1.2	-0.9

Total sugar: cwt per acre

Spray	Irrigation 0	Irrigation C
	(±3.40)	
None	58.5	86.4
Demeton methyl	60.8	89.0

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
	(±2.69)*		(±2.69)*	
0.6	61.8	87.8	72.8	76.8	74.8
1.2	57.5	87.6	72.1	73.0	72.6
Mean (±2.40)	59.7	87.7	72.5	74.9	73.7
Difference (±2.44)	-4.3	-0.2	-0.7	-3.8	-2.2 (±1.73)

*for use in horizontal and diagonal comparisons only.

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Sugar beet
Tops: tons per acre

Spray	Irrigation 0	Irrigation C
	(±0.847)	
None	7.79	10.23
Demeton methyl	6.78	10.67

N: cwt per acre	Spray None	Spray Demeton methyl	Mean
		(±0.649)*	
0.6	7.91	7.79	7.85
1.2	10.11	9.66	9.88
Mean (±0.599)	9.01	8.73	8.87
Difference (±0.503)	+2.20	+1.87	+2.03 (±0.355)

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

N: cwt per acre	Irrigation 0	A	B	C	Mean
			(±1.85)*		(±0.79)
0.4	18.2	18.9	23.9	28.7	22.4
0.8	17.0	16.4	27.8	30.0	22.8
Mean (±1.48)	17.6	17.6	25.9	29.4	22.6
Difference (±2.24)	-1.2	-2.5	+3.9	+1.3	+0.4 (±1.12)

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

Dung: tons per acre	Treatment 0	OS	C_1	C_1S	C_2	C_2S	C_3	C_3S	Mean
None	10.3+	8.9+	28.5	25.6	25.3	23.6	23.0	23.1	17.2
12	11.9+	9.2+	24.6	26.3	23.5	26.4	22.4	24.8	17.6
Mean	11.1	9.1	26.6	26.0	24.4	25.0	22.7	24.0	17.4
Difference	+1.6	+0.3	-3.9	+0.7	-1.8	+2.8	-0.6	+1.7	+0.4

Mean dry matter % as harvested: 84.9

*for use in horizontal and diagonal comparisons only.

+means of 3 sub plots. All other values in body of table are based on 1 sub plot only.

Cut grass

Total of cuts 1 - 3. Dry matter: cwt per acre

K_2O: cwt per acre including basal	Irrigation 0	Irrigation C	K_2O: cwt per acre including basal 1.2	K_2O: cwt per acre including basal 1.8	Mean
	(±1.21)				
1.2	19.8	32.5			
1.8	16.6	35.3			
N: cwt per acre+					
	(±0.94)*		←	(±0.94)*	
0.3	15.4	29.3	22.6	22.1	22.4
0.6	20.9	38.5	29.6	29.8	29.8
Mean (±0.86)	18.2	33.9	26.1	26.0	26.1
Difference (±0.79)	+5.5	+9.2	+7.0	+7.7	+7.4 (±0.56)

Total of cuts 4 - 6. Dry matter: cwt per acre

K_2O: cwt per acre including basal	Irrigation 0	Irrigation C	K_2O: cwt per acre including basal 1.2	K_2O: cwt per acre including basal 2.4	Mean
	(±1.29)				
1.2	13.0	27.5			
2.4	13.8	34.6			
N: cwt per acre+					
	(±1.07)*		←	(±1.07)*	
0.3	12.4	27.8	18.6	21.6	20.1
0.6	14.5	34.3	22.0	26.8	24.4
Mean (±0.91)	13.4	31.1	20.3	24.2	22.2
Difference (±1.12)	+2.1	+6.5	+3.4	+5.2	+4.3 (±0.79)

*for use in horizontal and diagonal comparisons only.

+for each cut.

Mean dry matter % as cut:
Total of cuts 1 - 3: 23.6
Total of cuts 4 - 6: 24.7

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Cut grass

Total of cuts 1 - 6. Dry matter: cwt per acre

K_2O: cwt per acre including basal	Irrigation 0	Irrigation C	K_2O: cwt per acre including basal 1.2	K_2O: cwt per acre including basal 2.4	Mean
	(±1.94)				
1.2	32.8	60.1			
2.4	30.4	69.9			
N: cwt per acre[+]					
	(±1.65)*		←	(±1.65)*	
0.3	27.8	57.1	41.2	43.7	42.5
0.6	35.4	72.9	51.7	56.6	54.2
Mean (±1.37)	31.6	65.0	46.4	50.2	48.3
Difference (±1.83)	+7.6	+15.8	+10.5	+12.9	+11.7 (±1.30)

*for use in horizontal and diagonal comparisons only.

[+]for each cut.

Mean dry matter % as cut:
Total of cuts 1 - 6: 24.2

WINTER WHEAT

Seed rates, sowing dates and levels of nitrogen (after non-cereal crop) - Great Field I 1959.

Design: 3 randomized blocks of 9 plots each, plots being split into 2 for the application of nitrogen.

Area of each sub plot: 0.0148 acres. Area harvested: 0.0096 acres.

Treatments. All combinations of:-

Whole plots. Seed rates: 2; 3; 4 bushels per acre.
Sowing dates: Oct 16; Nov 21, 1958; Jan 8*, 1959.

Sub plots. Nitrogen (in addition to basal): 0.47; 0.93 cwt N per acre applied as 'Nitro-Chalk' in two equal parts in February and April.

*Note. Sowing on one block delayed by bad weather until Jan 24, 1959.

Basal dressing: 3 cwt compound fertilizer (10% P_2O_5, 20% K_2O) per acre broadcast in seed bed, 3 cwt compound fertilizer (5% N, 12½% P_2O_5, 12½% K_2O) per acre combine drilled with seed.

Cultivations, etc.: Ploughed: Sept 12, 1958. Compound fertilizer applied: First sowing - Oct 16; second sowing - Nov 21; third sowing - Jan 8, 1959 (plots 2, 4 and 5 - Jan 26). First dressing of N applied: Feb 16. Sprayed with TCB/MCPA at 4 pints in 40 gallons per acre: Apr 21. Second dressing of N applied: Apr 22. Combine harvested: Aug 17. Variety: Cappelle. Previous crop: Potatoes.

Note. Counts of plant shoot and ear number, and estimates of plant height and % area lodged were made. Severe lodging occurred in early July and the mean % areas lodged at harvest were:

Sowing date	%	Seed rate bu. p.a.	%	N c.p.a.	%
Oct 16	94	2	46	0.6	42
Nov 21	66	3	57	1.1	73
Jan 8	14	4	70		

Standard errors per plot, Grain (at 85% dry matter):
Whole plot: 2.48 cwt per acre or 4.9% (16 d.f.)
Sub plot: 3.38 cwt per acre or 6.7% (18 d.f.)

Errata to 'Results of the Field Experiments' 1958 page 58/Ca/1.2

Rates of N cwt per acre should read '0.6' and '1.2' not '0.4' and '0.8'.
S.E. of means of seed rates and sowing dates should read '0.79' not '0.56'.