

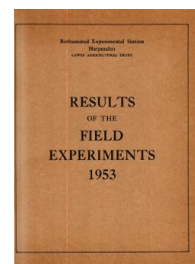
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Yields of the Field Experiments 1953

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53/BC/1 Ley and Arable Rotations - Rothamsted

Rothamsted Research

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53/Bc/1.1

LEY AND ARABLE ROTATIONS

Highfield and Fosters Field 1953 - the 5th year.

For details of treatments, rotation, etc., see "Results of the Field Experiments 1952", Section Bc/1.

Cultivations, etc.:

HIGHFIELD

1st year Treatment Crops

Cut grass, Grazed ley, Lucerne, Hay. Ploughed (not hay plots):
Aug 16, 1952, Oct 4 and Nov 18. Basal dressing applied:
Mar 23, 1953.

Cut grass: Nitrochalk applied, seeds hand sown at 38 lb per acre:
Mar 25. Cut: 5 times, June 20, July 7, July 30, Aug 18, Oct 15.
Nitrochalk applied after each cut except the last.

Grazed ley: Nitrochalk applied, seeds hand sown at 55 lb per acre:
Mar 25. Nitrochalk applied: July 24. Grazed: 9 circuits,
June 7 - Sept 27.

Lucerne: Seed drilled at 28 lb per acre: Mar 25. Cut twice:
July 28 and Oct 15. Variety: Du Puits.

Hay: Seeds undersown in barley at 38 lb per acre: Apr 9, 1952.
Crop: failed. Seeds resown: Aug 29. Nitrochalk applied:
Mar 27, 1953. Cut: June 11.

2nd year Treatment Crops

Cut grass, Grazed ley, Lucerne, Potatoes. Basal dressing to leys
applied: Dec 18, 1952.

Cut grass: Nitrochalk applied: Mar 27, 1953 and after each cut
except the last. Cut 5 times: May 5, May 29, July 7, Aug 7,
Oct 15.

Grazed ley: Nitrochalk applied: Mar 27, 1953 and July 24. Grazed:
11 circuits, Apr 15 - Oct 1.

Lucerne: Cut: 3 times, July 3, Aug 18, Oct 15.

Potatoes: For cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass, Grazed ley, Lucerne, Barley. Basal dressing to leys
applied: Dec 18, 1952.

Cut grass: Nitrochalk applied: Mar 27, 1953 and after each cut
except the last. Cut: 5 times, May 5, May 29, July 7, Aug 7,
Oct 15.

Grazed ley: Nitrochalk applied: Mar 27, 1953 and July 24. Grazed:
11 circuits, Apr 19 - Oct 5.

Lucerne: Cut: 3 times, July 3, Aug 18, Oct 15.

Barley: For cultivations see Barley Test Crop.

53/Bc/1.2

1st Test Crop, Wheat

Ploughed: Aug 16, 1952 and again Oct 4. Ploughed leys: Oct 4.
Seed drilled at 3 bushels per acre with basal dressing: Oct 31.
Nitrochalk applied: Apr 24, 1953. Harvested: Aug 14. Variety:
Yeoman.

2nd Test Crop, Potatoes

Ploughed: Wheat stubble Aug 20, 1952, hay plots (treatment crop)
Aug 28. Ploughed all plots: Nov 18. Ridged, basal dressing,
dung, sulphate of ammonia applied, potatoes planted: Apr 8, 1953.
Earthed up: June 24. Sprayed with copper fungicide: $5\frac{1}{2}$ lb in
40 gallons July 28, $5\frac{1}{2}$ lb in 10 gallons Aug 8. Lifted: Sept 30.
Variety: Majestic.

3rd Test Crop, Barley

Ploughed: Nov 15, 1952. Ground chalk applied at $19\frac{1}{2}$ cwt per acre
to blocks 10 and 11: Feb 25, 1953. Seed drilled at 3 bushels per
acre with basal dressing: Feb 28. Nitrochalk applied: Mar 2.
Harvested: Aug 18. Variety: Plumage Archer.

Permanent Grasses

3rd year Reseeded and Permanent Grass.

Basal dressing applied: Dec 18, 1952. Ground chalk applied at
 $19\frac{1}{2}$ cwt per acre to blocks 10 and 11: Feb 25, 1953. Nitrochalk
applied: Mar 27. Cut: June 11-16. Nitrochalk applied: June 17.
Grazed: 4 circuits, July 5 - Sept 23.

4th year Reseeded and Permanent Grass.

Basal dressing applied: Dec 18, 1952. Nitrochalk applied:
Mar 27, 1953 and July 24. Grazed: 7 circuits, Apr 23 - Sept 7.

5th year Reseeded and Permanent Grass.

Basal dressing applied: Dec 18, 1952. Nitrochalk applied:
Mar 27, 1953 and July 24. Grazed: 8 circuits, Apr 15 - Sept 15.

FOSTERS

1st year Treatment Crops

Cut grass, Grazed ley, Lucerne, Hay. Ploughed (not hay plots):
Aug 8, 1952, Oct 8 and Nov 13. Basal dressing applied:
Mar 23, 1953.

Cut grass: Nitrochalk applied, seeds hand sown at 38 lb per acre:
Mar 25. Cut: 5 times, June 21, July 8, July 30, Aug 21,
Oct 16. Nitrochalk applied after each cut except the last.

Grazed ley: Nitrochalk applied, seeds sown at 55 lb per acre:
Mar 25. Nitrochalk applied: July 24. Grazed: 5 circuits,
June 20 - Sept 22.

Lucerne: Seed drilled at 28 lb per acre: Mar 25. Cut twice:
July 29 and Oct 16. Variety: Du Puits.

Hay: Seeds undersown in barley at 38 lb per acre: Apr 18, 1952.
Crop failed. Ploughed, seeds resown: Aug 29. Nitrochalk
applied: Mar 26, 1953. Cut: June 10.

53/Bc/1.3

2nd year Treatment Crops

Cut grass, Grazed ley, Lucerne, Potatoes. Basal dressing to leys applied: Dec 13, 1952.

Cut grass: Nitrochalk applied: Mar 26, 1953 and after each cut except the last. Cut: 5 times, May 11, June 10, July 8, Aug 7, Oct 16.

Grazed ley: Nitrochalk applied: Mar 26, 1953 and July 27. Grazed: 9 circuits, May 2 - Sept 30.

Lucerne: Cut: 3 times, July 6, Aug 17, Oct 16.

Potatoes: For cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass, Grazed ley, Lucerne, Barley.

Cut grass: Basal dressing applied: Dec 13, 1952. Nitrochalk applied: Mar 26, 1953 and after each cut except the last. Cut: 5 times, May 11, June 10, July 8, Aug 7, Oct 14.

Grazed ley: Basal dressing applied: Dec 13, 1952. Nitrochalk applied: Mar 26, 1953 and July 24. Grazed: 8 circuits, May 6 - Sept 26.

Lucerne: Basal dressing applied: Dec 15, 1952. Cut: 3 times, July 6, Aug 17, Oct 14.

Barley: For cultivations see Barley Test Crop.

1st Test Crop, Wheat

Ploughed: Aug 7, 1952 and again Oct 8. Ploughed leys: Sept 29. Seed drilled at 3 bushels per acre with basal dressing: Oct 30. Nitrochalk applied: Apr 24, 1953. Harvested: Aug 13. Variety: Yeoman.

2nd Test Crop, Potatoes

Ploughed: Wheat stubble Aug 8, 1952, hay plots (treatment crop) Aug 29. Ploughed all plots: Oct 8 and Nov 14. Ridged, basal dressing applied: Mar 31, 1953. Dung, sulphate of ammonia applied, potatoes planted: Apr 1. Earthed up: June 24. Sprayed with copper fungicide: 5½ lb in 40 gallons July 28, 5½ lb in 10 gallons Aug 8. Pulverized haulms: Sept 14. Lifted: Sept 29. Variety: Majestic.

3rd Test Crop, Barley

Ploughed: Nov 10, 1952. Seed drilled at 3 bushels per acre with basal dressing: Feb 28, 1953. Nitrochalk applied: Mar 2. Harvested: Aug 12. Variety: Plumage Archer.

Permanent Grasses

3rd year Reseeded Grass.

Basal dressing applied: Dec 13, 1952. Nitrochalk applied: Mar 26, 1953. Cut: June 10. Nitrochalk applied: June 13. Grazed: 4 circuits, July 2-Sept 28.

53/Bc/1.4

4th year Reseeded Grass.

Basal dressing applied: Dec 13, 1952. Nitrochalk applied:
Mar 26, 1953 and July 24. Grazed: 6 circuits, May 2 - Sept 26.

5th year Reseeded Grass.

Basal dressing applied: Dec 13, 1952. Nitrochalk applied:
Mar 26, 1953 and July 24. Grazed: 9 circuits, May 2 - Oct 2.

Standard errors per $\frac{1}{4}$ plot. Test crops.

Wheat, grain	Highfield: 1.12 cwt per acre or 2.9% (13 d.f.)
	Fosters: 2.44 cwt per acre or 6.4% (11 d.f.) [#]
Potatoes, total tubers.	Highfield: 0.888 tons per acre of 5.9% (15 d.f.)
	Fosters: 0.605 tons per acre or 5.4% (15 d.f.)
Barley, grain.	Highfield: 1.48 cwt per acre or 8.2% (21 d.f.)
	Fosters: 1.29 cwt per acre or 4.2% (21 d.f.)

[#]2 missing sub plot values

Erratum to Results of the Field Experiments 1952, page 52/Bc/1.7.
Delete all standard errors except those of the differences of
means of two levels of N.

53/Bc/1.5

Summary of Results

Wheat 1st test crop

Grain: cwt per acre

Previous rotation 1950, 1951, 1952

cwt N per acre	Previous rotation 1950, 1951, 1952				Mean
	Lucerne	Ley	Cut Grass	Arable with hay	
<u>Highfield</u>					
Mean	41.8	38.6	31.6	44.5	39.2
To test crop					
0.3	42.9	39.4	34.1	44.8	40.3
0.6	40.7	37.8	29.2	44.3	38.0
Difference (± 0.79)	-2.2	-1.6	-4.9	-0.5	-2.3 (± 0.39)
To treatment crops					
Single rate		39.7	32.4	45.2	39.1
Double rate		37.5	30.8	43.9	37.4
Difference (± 0.79)		-2.2	-1.6	-1.3	-1.7 (± 0.46)
<u>Fosters</u>					
Mean	41.3	37.2	37.4	36.3	38.0
To test crop					
0.3	38.9	36.2	37.3	34.8	36.8
0.6	43.7	38.1	37.5	37.7	39.3
Difference (± 1.73)	+4.8	+1.9	+0.2	+2.9	+2.5 (± 0.86)
To treatment crops					
Single rate		38.0	38.9	35.5	37.5
Double rate		36.3	35.9	37.0	36.4
Difference (± 1.73)		-1.7	-3.0	+1.5	-1.1 (± 1.00)

53/Bc/1.6

Wheat 1st test crop

Grain: cwt per acre

cwt N per acre	Excluding Lucerne			Arable with hay only		
	N to previous treatment crop		Mean	Dung: tons per acre to potatoes 1951		Mean
	Single rate	Double rate		None	12	

Highfield

To test crop	(± 0.46)		(± 0.32)	(± 0.79)		(± 0.56)
0.3	41.1	37.8	39.4	45.4	44.1	44.8
0.6	37.1	37.1	37.1	42.4	46.2	44.3
Mean	39.1	37.4	38.3	43.9	45.2	44.5
	(± 0.32)			(± 0.56)		
To previous treatment crops				(± 0.79)		(± 0.56)
Single rate				43.9	46.5	45.2
Double rate				44.0	43.8	43.9
Mean				43.9	45.2	44.5
				(± 0.56)		

Fosters

To test crop	(± 1.00)		(± 0.70)	(± 1.73)		(± 1.22)
0.3	36.1	36.1	36.1	33.5	36.1	34.8
0.6	38.8	36.7	37.8	37.8	37.7	37.7
Mean	37.5	36.4	36.9	35.6	36.9	36.3
	(± 0.70)			(± 1.22)		
To previous treatment crops				(± 1.73)		(± 1.22)
Single rate				35.0	36.0	35.5
Double rate				36.2	37.8	37.0
Mean				35.6	36.9	36.3
				(± 1.22)		

53/Bc/1.7

Wheat 1st test crop

Straw: cwt per acre

cwt N per acre	Previous rotation 1950, 1951, 1952				Mean
	Lucerne	Ley	Cut Grass	Arable with hay	

Highfield

Mean	72.6	65.2	50.5	77.0	66.3
To test crop					
0.3	71.2	64.0	52.5	74.9	65.7
0.6	74.1	66.4	48.6	79.1	67.0
Difference	+2.9	+2.4	-3.9	+4.2	+1.3
To treatment crops					
Single rate		65.3	53.4	77.5	65.4
Double rate		65.1	47.6	76.6	63.1
Difference		-0.2	-5.8	-0.9	-2.3

Fosters

Mean	67.2	65.2	60.6	63.8	64.2
To test crop					
0.3	65.6	60.2	58.7	61.5	61.5
0.6	68.8	70.2	62.5	66.0	66.9
Difference	+3.2	+10.0	+3.8	+4.5	+5.4
To treatment crops					
Single rate		67.8	63.2	63.1	64.7
Double rate		62.7	58.0	64.5	61.7
Difference		-5.1	-5.2	+1.4	-3.0

53/Bc/1.8

Wheat 1st test crop

Straw: cwt per acre

cwt N per acre	Excluding Lucerne			Arable with hay only		
	Single rate	Double rate	Mean	Dung: tons per acre to potatoes 1951	None	12

Highfield

To test crop							
0.3	65.7	62.0	63.8	69.8	80.1	74.9	
0.6	65.1	64.2	64.7	77.5	80.7	79.1	
Mean	65.4	63.1	64.2	73.6	80.4	77.0	
To previous treatment crops							
Single rate				74.7	80.2	77.5	
Double rate				72.6	80.6	76.6	
Mean				73.6	80.4	77.0	

Fosters

To test crop							
0.3	60.2	60.1	60.2	60.7	62.3	61.5	
0.6	69.2	63.3	66.2	61.2	70.8	66.0	
Mean	64.7	61.7	63.2	61.0	66.6	63.8	
To previous treatment crops							
Single rate				59.9	66.3	63.1	
Double rate				62.1	66.9	64.5	
Mean				61.0	66.6	63.8	

53/Bc/1.9

Potatoes 2nd test crop

Total tubers: tons per acre

	Previous rotation 1949, 1950, 1951				Mean
	Lucerne	Ley	Cut Grass	Arable with hay	
<u>Highfield</u>					
N: cwt per acre					
0.5	14.02	14.93	14.34	16.56	14.96
1.0	15.07	15.90	14.26	15.96	15.30
Difference (± 0.628)	+1.05	+0.97	-0.08	-0.60	+0.34 (± 0.314)
Dung: tons per acre					
None	12.27	14.00	11.73	15.06	13.27
12	16.81	16.82	16.87	17.47	16.99
Difference (± 0.628)	+4.54	+2.82	+5.14	+2.41	+3.72 (± 0.314)
Mean	14.54	15.41	14.30	16.26	15.13

Fosters

N: cwt per acre					
0.5	11.63	11.17	9.82	11.58	11.05
1.0	12.47	11.99	10.49	11.35	11.58
Difference (± 0.428)	+0.84	+0.82	+0.67	-0.23	+0.53 (± 0.214)
Dung: tons per acre					
None	10.00	10.44	8.71	10.51	9.91
12	14.11	12.72	11.60	12.42	12.71
Difference (± 0.428)	+4.11	+2.28	+2.89	+1.91	+2.80 (± 0.214)
Mean	12.05	11.58	10.16	11.46	11.31

	Highfield		Fosters	
	N: cwt per acre		N: cwt per acre	
	0.5	1.0	0.5	1.0
	(± 0.314)		(± 0.214)	
Dung: tons per acre				
None	13.24	13.29	9.86	9.96
12	16.68	17.31	12.23	13.19

53/Bc/1.10

Potatoes 2nd test crop

Percentage Ware

	Previous rotation 1949, 1950, 1951				Mean
	Lucerne	Ley	Cut Grass	Arable with hay	
<u>Highfield</u>					
N: cwt per acre					
0.5	88.0	80.8	80.5	84.7	83.5
1.0	85.5	81.0	77.5	82.9	81.7
Difference	-2.5	+0.2	-3.0	-1.8	-1.8
Dung: tons per acre					
None	84.0	79.8	79.1	86.4	82.3
12	89.5	82.0	79.0	81.1	82.9
Difference	+5.5	+2.2	-0.1	-5.3	+0.6
Mean	86.7	80.9	79.0	83.8	82.6

Fosters

N: cwt per acre					
0.5	89.8	81.2	87.0	82.4	85.1
1.0	86.5	86.0	87.8	84.5	86.2
Difference	-3.3	+4.8	+0.8	+2.1	+1.1
Dung: tons per acre					
None	89.4	82.6	87.6	82.0	85.4
12	86.9	84.6	87.2	84.9	85.9
Difference	-2.5	+2.0	-0.4	+2.9	+0.5
Mean	88.1	83.6	87.4	83.4	85.6

	Highfield		Fosters	
	N: cwt per acre 0.5	1.0	N: cwt per acre 0.5	1.0
Dung: tons per acre				
None	83.6	81.0	84.6	86.2
12	83.4	82.4	85.6	86.2

53/Bc/1.11

Barley 3rd test crop (not yet in full cycle)

Dung to potatoes 1952: tons per acre	N: cwt per acre to test crop		Mean	Dung to potatoes 1952: tons per acre	N: cwt per acre to test crop		Mean
	0.2	0.4			0.2	0.4	

Highfield

Fosters

Grain (at 85% Dry Matter):
cwt per acre

Grain: cwt per acre

	(± 0.52)		(± 0.37)		(± 0.46)		(± 0.32)
None	18.2	16.9	17.6	None	29.9	30.2	30.1
12	18.6	18.3	18.5	12	30.7	30.8	30.8
Mean (± 0.37)	18.4	17.6	18.0	Mean (± 0.32)	30.3	30.5	30.4

Straw: cwt per acre

None	33.0	41.2	37.1
12	37.4	43.0	40.2
Mean	35.2	42.1	38.7

53/Bc/1.12

Treatment crops Arable and Hay rotation
(values based on Mean of 2 sub plots only)

	Highfield			Fosters		
	N: cwt per acre applied in 1953			N: cwt per acre applied in 1953		
	Single rate	Double rate	Mean	Single rate	Double rate	Mean
Hay (dry matter): cwt per acre						
No dung	59.8	68.8	64.3	22.1	41.6	31.8
Dung in 1951	56.5	52.9	54.7	27.3	45.1	36.2
Mean	58.2	60.8	59.5	24.7	43.4	34.0
Potatoes, total tubers: tons per acre						
No dung	11.65	13.46	12.56	10.07	10.32	10.19
Dung in 1953	15.74	16.00	15.87	11.82	12.08	11.95
Mean	13.70	14.73	14.21	10.94	11.20	11.07
Potatoes, percentage ware						
No dung	78.8	85.2	82.0	84.6	88.4	86.6
Dung in 1953	85.2	84.0	84.6	84.8	87.7	86.2
Mean	82.0	84.6	83.3	84.7	88.1	86.4
Barley, grain (at 85% dry matter): cwt per acre			Barley, grain: cwt per acre			
No dung	15.6	15.5	15.6	32.1	31.1	31.6
Dung in 1952	19.1	15.0	17.0	32.3	30.7	31.5
Mean	17.3	15.3	16.3	32.2	30.9	31.5
			Barley, straw: cwt per acre			
No dung	No yields of straw recorded			37.5	41.5	39.5
Dung in 1952				38.3	45.2	41.8
Mean				37.9	43.4	40.6

53/Bc/1.13

Cut grass

Dry Matter: cwt per acre

<u>1st year</u>	Highfield					Fosters				
	N: to previous 3 test crops		Dung to potatoes 1951 tons per acre		Mean	N: to previous 3 test crops		Dung to potatoes 1951 tons per acre		Mean
	Single rate	Double rate	None	12		Single rate	Double rate	None	12	
N(1) to out grass										
Single rate	75.1	71.4	71.0	75.5	73.2	40.8	45.2	43.1	42.9	43.0
Double rate	75.5	81.8	72.1	85.2	78.7	47.5	52.5	50.2	49.7	50.0
N to test crops										
Single rate			71.1	79.5	75.3			44.6	43.7	44.1
Double rate			72.0	81.2	76.6			48.8	48.9	48.8
Mean			71.6	80.3	75.9			46.7	46.3	46.5

	Highfield			Fosters		
	N to cut grass (1) Single rate	Double rate	Mean	N to cut grass (1) Single rate	Double rate	Mean
<u>2nd year</u> (5 cuts)	66.9	79.2	73.1	71.3	83.2	77.2
<u>3rd year</u> (5 cuts)	63.2	73.2	68.2	62.8	71.1	67.0

(1) 0.15 v. 0.3 cwt N as Nitrochalk for every cut.

Lucerne

Dry Matter: cwt per acre

<u>1st year</u> (2 cuts)	Highfield			Fosters		
	N to 3 previous test crops Single rate	Double rate	Mean	N to 3 previous test crops Single rate	Double rate	Mean
Dung to potatoes 1951						
None	58.3	59.0	58.7	42.6	41.1	41.8
12 tons	57.6	60.7	59.2	43.7	48.3	46.0
Mean	58.0	59.9	58.9	43.1	44.7	43.9

	Highfield	Fosters
<u>2nd year</u> (3 cuts)	Mean 103.1	Mean 107.3
<u>3rd year</u> (3 cuts)	Mean 84.7	Mean 113.2

53/Bc/1.14

Grazed Ley

Dry Matter: cwt per acre (estimated from sampling cuts)

	Highfield			Fosters		
	N: cwt per acre (yearly)			N: cwt per acre (yearly)		
	Single rate 0.15	Double rate 0.30	Mean	Single rate 0.15	Double rate 0.30	Mean
1st year	41.1	47.4	44.3	31.7	31.3	31.5
2nd year	64.9	62.8	63.8	60.4	54.1	57.3
3rd year	61.5	63.4	62.4	51.1	51.6	51.4

Reseeded Grass

Dry Matter: cwt per acre

	Cut for hay			Grazed Estimated from sampling cuts		
	Single rate	N		Single rate	N	
		Double rate	Mean		Double rate	Mean
4th year, grazing				42.7	50.5	46.6
5th year, grazing				54.9	58.0	56.4
3rd year, hay	53.2	57.5	55.3	31.7 [*]	33.0 [*]	32.4 [*]

Highfield

4th year, grazing				42.7	50.5	46.6
5th year, grazing				54.9	58.0	56.4
3rd year, hay	53.2	57.5	55.3	31.7 [*]	33.0 [*]	32.4 [*]

Fosters

4th year, grazing				40.2	39.9	40.0
5th year, grazing				40.4	40.6	40.5
3rd year, hay	40.4	40.5	40.4	30.4 [*]	31.8 [*]	31.1 [*]

Permanent Grass

Dry Matter: cwt per acre

Highfield

Grazing, Blocks 5-8				33.1	40.4	36.8
Grazing, Blocks 1-4				40.0	45.1	42.5
Hay, Blocks 9-12	35.5	39.7	37.6	37.5	35.3	36.4

^{*}Aftermath grazing.