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# Yields of the Field Experiments 1966

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## 66/R/HIA/B/1 and 66/R/FLA/B/1 Ley and Arable Rotations

### Rothamsted Research

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66/B/1.1

## LEY AND ARABLE ROTATIONS

(HLA and FLA)

Highfield and Fosters Field 1966, the 18th year.

For details of treatments, rotations etc., see 'Details' and 'Results' 63/B/1.1, 64/B/1.1, 65/B/1.1.

Winter wheat: Sulphate of ammonia is now used for the autumn N test. The basal PK is now applied at 0.45 cwt P2O5 and 0.90 cwt K2O ploughed in and 0.45 cwt P2O5 and 0.90 cwt K2O broadcast before sowing (all as (0:14:28)).

All-grass leys and clover-grass leys (2nd and 3rd years), and all-grass and clover-grass permanent and reseeded grass plots: Fertiliser is now applied to these plots in spring before cutting as follows:-

All-grass sub plots and all-grass leys: 0.6 cwt N and 0.6 cwt K2O as (16:0:16).

Clover-grass sub plots and clover-grass leys: 0.6 cwt K2O as muriate of potash.

Potatoes: Fertilisers are now as follows:-

Sub-plots with dung: 1.2 cwt N, 1.8 cwt P2O5, 1.8 cwt K2O broadcast before ridging as 15:15:15 plus 0:20:20.

Sub-plots without dung: 1.5 cwt N, 2.5 cwt P2O5, 2.5 cwt K2O broadcast before ridging as 15:15:15 plus 0:20:20.

Former reseeded grass plots ploughed up for wheat 1963, 1964, 1965:

These are now put through the arable sequence of treatment crops and were sown with ryegrass in spring 1966 on the plots which carried the barley test crop in 1965. These hay plots receive the same manurial treatment as those in the permanent arable sequence (but in 1966 the former were sown in spring, the latter in autumn).

Reseeded grass plots: Further ploughing up of these plots is discontinued.

ERRATUM to 'Results' 65/B/1.1. The first line (excluding headings) should read 'Highfield and Fosters Field 1965, the 17th year'.

## HIGHFIELD

1st year Treatment Crops:

All-grass ley: Ploughed: Sept 27, 1965. Basal PK compound applied: Mar 22, 1966. 'Nitro-Chalk' applied, seeds sown at 30 lb: Mar 23. Sprayed with dicamba at 0.08 lb and MCPA at

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1.13 lb in 40 gals: June 1. Cut four times: July 1, Aug 8, Sept 13, Oct 13. NK compound applied after first three cuts.  
Clover-grass ley: Ploughed: Sept 27, 1965. Basal PK compound applied: Mar 22, 1966. Seeds sown at 33 lb: Mar 23. Sprayed with MCPB/MCPA (Tropotox Plus at 5 pints in 40 gals): June 1. Cut three times: July 13, Sept 2, Oct 13. Muriate of potash applied after first two cuts.  
Lucerne: Ploughed: Sept 27, 1965. Basal PK compound applied: Mar 22, 1966. Seed drilled at 20 lb: Apr 29. Cut three times: July 13, Aug 31, Nov 8.  
Hay: Ploughed: Sept 27, 1965. Basal PK compound applied: Sept 29. Seeds sown at 38.5 lb: Oct 5. 'Nitro-Chalk' applied: Mar 22, 1966. Cut twice: June 1 and July 1. NK compound applied after first cut.  
Hay (after reseeded grass till 1962): Ploughed: Sept 27, 1965. Basal NPK compound applied: Mar 17, 1966. Seeds sown at 40 lb: Mar 18. Sprayed with dicamba at 0.08 lb and MCPA at 1.13 lb in 40 gals: June 1. Cut twice: June 29, July 22. NK compound applied after first cut. Variety: S22 Italian ryegrass.

#### 2nd year Treatment Crops:

All-grass ley: Basal PK compound applied: Dec 21, 1965. NK compound applied: Mar 22, 1966. Cut five times: May 19, June 28, Aug 8, Sept 13, Oct 13. NK compound applied after first four cuts.  
Clover-grass ley: Basal PK compound applied: Dec 21, 1965. Muriate of potash applied: Mar 22, 1966. Cut five times: May 19, June 28, Aug 8, Sept 13, Oct 13. Muriate of potash applied after first four cuts.  
Lucerne: Basal PK compound applied: Dec 21, 1965. Sprayed with paraquat at 2 lb ion in 40 gals: Mar 1, 1966. Cut four times: June 1, July 7, Sept 1, Nov 8.  
Sugar beet: Ploughed: Aug 12, 1965. Ploughed second time: Oct 27. Muriate of potash applied: Feb 8, 1966. Basal NPK compound applied: Mar 22. 'Nitro-Chalk' applied: Mar 28. Seed drilled at 10 lb: Mar 30. Singled: May 23. Sprayed with demeton-s-methyl (Metasystox at 12 fluid oz in 37 gals): June 14. Lifted: Nov 17.

#### 3rd year Treatment Crops:

All-grass ley: Basal PK compound applied: Dec 21, 1965. NK compound applied: Mar 22, 1966. Cut four times: May 19, June 28, Aug 8, Sept 13. NK compound applied after first three cuts.

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Clover-grass ley: Basal PK compound applied: Dec 2, 1965. Muriate of potash applied: Mar 22, 1966. Cut four times: May 19, June 28, Aug 8, Sept 13. Muriate of potash applied after first three cuts.

Lucerne: Basal PK compound applied: Dec 21, 1965. Sprayed with paraquat at 2 lb ion in 40 gals: Mar 1, 1966. Cut three times: June 1, July 7, Sept 1.

Oats: Ploughed: Jan 7, 1966. Seed combine drilled at 160 lb: Mar 7. 'Nitro-Chalk' applied: Mar 9. Sprayed with mecoprop at 2.25 lb a.e. in 40 gals: May 10. Combine harvested: Sept 3.

1st Test Crop, Wheat:-

Basal PK compound applied: Sept 13, 1965. Sulphate of ammonia applied: Sept 14. Ploughed: Sept 16. Basal PK compound applied: Oct 26. Seed drilled at 170 lb: Nov 2. 'Nitro-Chalk' applied: Apr 25, 1966. Sprayed with mecoprop at 2.25 lb a.e. in 40 gals: Apr 29. Combine harvested: Aug 23.

2nd Test Crop, Potatoes:-

Dung applied, plots ploughed: Oct 1, 1965. NPK fertilisers applied: Mar 29 - Apr 1, 1966. Rotary cultivated, potatoes machine planted: Apr 4. Sprayed with linuron at 1 lb and paraquat at 0.75 lb in 37 gals: May 16. Rotary ridged: June 17. Sprayed three times with mancozeb at 1.2 lb in 37 gals: June 30, July 22, Aug 5. Sprayed with undiluted BOV at 15 gals: Sept 16. Haulm destroyed mechanically: Sept 21. Lifted: Sept 27.

3rd Test Crop, Barley:-

Ground chalk applied, plots ploughed: Oct 27, 1965. Seed combine drilled at 140 lb: Mar 7, 1966. 'Nitro-Chalk' applied: Mar 9. Sprayed with mecoprop at 2.25 lb a.e. in 40 gals: May 10. Combine harvested: Aug 20.

Permanent grasses: 16th, 17th and 18th experimental years permanent (old) grass, all blocks, 16th, 17th and 18th years reseeded grass, blocks 1, 4, 6, 7, 9 and 12. Ground chalk applied to blocks 2 and 3, basal PK compound applied: Dec 20, 1965. 'Nitro-Chalk' applied to 'all grass' half plots, muriate of potash to 'clover-grass' half plots: Mar 22, 1966. Cut five times: May 19, June 28, Aug 8, Sept 13. Muriate of potash and NK compound applied to appropriate half plots after each cut.

FOSTERS

1st year Treatment Crop:-

All-grass ley: Ploughed: Sept 27, 1965. Basal PK compound applied: Mar 22, 1966. 'Nitro-Chalk' applied, seeds sown at 30 lb:

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Mar 23. Sprayed with dicamba at 0.08 lb and MCPA at 1.13 lb in 40 gals: June 1. Cut four times: July 1, Aug 8, Sept 12, Oct 13. NK compound applied after first three cuts.

Clover-grass ley: Ploughed: Sept 27, 1965. Basal PK compound applied: Mar 22, 1966. Seed sown at 33 lb: Mar 23. Sprayed with MCPB/MCPA (Tropotox Plus at 5 pints in 40 gals): June 1. Cut three times: July 13, Sept 2, Oct 13. Muriate of potash applied after first two cuts.

Lucerne: Ploughed: Sept 27, 1965. Basal PK compound applied: Mar 22, 1966. Seed sown at 20 lb: Apr 29. Cut three times: July 13, Aug 31, Nov 8.

Hay: Ploughed: Sept 27, 1965. Basal PK compound applied: Sept 29. Seed sown at 38.5 lb: Oct 5. 'Nitro-Chalk' applied: Mar 22, 1966. Cut twice: June 1, July 1. NK compound applied after first cut.

Hay (after reseeded grass till 1962): Ploughed: Sept 27, 1965. Basal NPK compound applied: Mar 17, 1966. Seed drilled at 40 lb: Mar 18. Sprayed with dicamba at 0.08 lb and MCPA at 1.13 lb in 40 gals: June 1. Cut twice: June 29, July 22. NK compound applied after first cut. Variety: S22 Italian Ryegrass.

#### 2nd year Treatment Crops:-

All-grass ley: Basal PK compound applied: Dec 21, 1965. NK compound applied: Mar 22, 1966. Cut five times: May 18, June 28, Aug 8, Sept 12, Oct 13. NK compound applied after first four cuts.

Clover-grass ley: Basal PK compound applied: Dec 21, 1965. Muriate of potash applied: Mar 22, 1966. Cut five times: May 18, June 28, Aug 8, Sept 12, Oct 13. Muriate of potash applied after first four cuts.

Lucerne: Basal PK compound applied: Dec 21, 1965. Sprayed with paraquat at 2 lb ion in 40 gals: Mar 1, 1966. Cut four times: June 1, July 7, Aug 31, Nov 8.

Sugar beet: Ploughed twice: Aug 12 and Oct 27, 1965. Muriate of potash applied: Feb 8, 1966. Basal NPK compound applied: Mar 22. 'Nitro-Chalk' applied: Mar 28. Seed drilled at 10 lb: Mar 30. Singled: May 25. Sprayed with demeton-s-methyl (Metasystox at 12 fluid oz in 37 gals): June 14. Lifted: Nov 17.

#### 3rd year Treatment Crops:-

All-grass leys: Basal PK compound applied: Dec 21, 1965. NK compound applied: Mar 22, 1966. Cut four times: May 18, June 28, Aug 8, Sept 12. NK compound applied after first three cuts.

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Clover-grass ley: Basal PK compound applied: Dec 21, 1965. Muriate of potash applied: Mar 22, 1966. Cut four times: May 18, June 28, Aug 8, Sept 12. Muriate of potash applied after first three cuts.

Lucerne: Basal PK compound applied: Dec 21, 1965. Sprayed with paraquat at 2 lb ion in 40 gals: Mar 1, 1966. Cut three times: June 1, July 7, Sept 1.

Oats: Ploughed: Jan 7, 1966. Seed drilled at 160 lb: May 7. 'Nitro-chalk' applied: May 9. Sprayed with mecoprop at 2.25 lb a.e. in 40 gals: May 10. Combine harvested: Sept 3.

1st Test Crop, Wheat:-

Basal PK compound and sulphate of ammonia applied, plots ploughed: Sept 13, 1965. Basal PK compound applied: Oct 26. Seed drilled at 170 lb: Nov 2. 'Nitro-Chalk' applied: Apr 25, 1966. Sprayed with mecoprop at 2.25 lb a.e. in 40 gals: Apr 29. Combine harvested: Aug 23.

2nd Test Crop, Potatoes:-

Dung applied, plots ploughed: Oct 1, 1965. NPK fertilisers applied: Mar 29 - Apr 1, 1966. Rotary cultivated, potatoes machine planted: Apr 4. Sprayed with linuron at 1 lb and paraquat at 0.75 lb in 37 gals: May 16. Rotary ridged: June 16. Sprayed three times with mancozeb at 1.2 lb in 37 gals: June 30, July 22, Aug 5. Sprayed with undiluted BUV at 15 gals: Sept 16. Haulm destroyed mechanically: Sept 22. Lifted: Sept 26.

3rd Test Crop, Barley:-

Ploughed: Oct 27, 1965. Seed combine drilled at 140 lb: Mar 7, 1966. 'Nitro-Chalk' applied: Mar 9. Sprayed with mecoprop at 2.25 lb a.e. in 40 gals: May 10. Combine harvested: Aug 20.

Permanent grasses:-

16th, 17th and 18th years reseeded grass, blocks 1, 3, 6, 8, 9 and 11. Basal PK compound applied: Dec 21, 1965. NK compound applied to 'all-grass' half plots and muriate of potash to 'clover-grass' half plots: Mar 22, 1966. Cut five times: May 18, June 28, Aug 8, Sept 12, Oct 12. Muriate of potash and NK compound applied to appropriate half plots after first four cuts.

Standard errors per sub plot. Test crops.

Potatoes. Total tubers:

Highfield: Whole plot:	1.572 or 6.9% (4 d.f.)
Sub plot:	1.540 or 6.8% (15 d.f.)
Fosters: Whole plot:	1.014 or 4.9% (4 d.f.)
Sub plot:	1.536 or 7.4% (15 d.f.)

66/B/1.6

SUMMARY OF RESULTS

WHEAT 1ST TEST CROP

1963 - 1965

	Lu	LC	LN	AH	Mean
GRAIN					
HIGHFIELD					
Mean	44.5	46.0	43.9	43.4	44.5
To test crop					
NO	51.2	45.2	36.5	31.9	
N1	42.1	51.7	44.8	44.6	
N2	50.3	45.1	46.2	50.1	
N3	34.3	41.9	48.1	47.2	
TO	46.4	46.9	44.7	41.9	45.0
T1	42.6	45.1	43.1	45.0	43.9
FOSTERS					
Mean.	56.4	53.1	54.0	49.2	53.2
To test crop					
NO	51.4	46.3	49.4	31.9	
N1	59.0	54.4	55.8	50.2	
N2	58.8	57.3	55.9	57.7	
N3	56.3	54.3	54.9	56.9	
TO	56.5	51.8	52.2	47.3	51.9
T1	56.2	54.4	55.8	51.1	54.4
Mean D.M. %:	Highfield	82.0			
	Fosters	80.8			

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WHEAT 1ST TEST CROP

1963 - 1965

	Lu	LC	LN	AH	Mean
STRAW					
HIGHFIELD					
Mean	52.4	42.4	38.0	44.2	44.2
To test crop					
NO	48.7	35.4	31.2	27.4	
N1	51.7	43.6	38.1	46.5	
N2	53.5	41.1	44.1	51.8	
N3	55.5	49.5	38.6	51.0	
TO	51.8	40.5	37.6	40.8	42.7
T1	52.9	44.4	38.4	47.6	45.8
FOSTERS					
Mean	52.4	46.4	47.8	37.6	46.1
To test crop					
NO	42.5	36.4	37.6	21.8	
N1	52.2	45.0	44.1	39.5	
N2	55.6	52.9	51.1	43.2	
N3	59.4	51.1	58.6	45.8	
TO	52.4	43.0	46.2	37.4	44.8
T1	52.5	49.7	49.5	37.8	47.4

Mean D.M. %: Highfield 63.3  
 Fosters 65.3



66/B/1.8

POTATOES 2ND TEST CROP. TOTAL TUBERS

1962 - 1964

	Lu	LC	LN	AH	R	Mean
HIGHFIELD						
	(1) and (2)					(±0.344)
F	22.35	21.57	22.77	21.13	25.76	22.72
D	21.93	22.95	23.83	21.38	24.06	22.83
Mean (±1.112)	22.14	22.26	23.30	21.26	24.91	22.77
FOSTERS						
	(1) and (2)					(±0.343)
F	21.52	21.07	20.87	19.84	22.11	21.08
D	20.90	19.79	20.58	19.89	21.65	20.56
Mean (±0.717)	21.21	20.43	20.72	19.87	21.88	20.82

Highfield (1) (±1.238) For use in horizontal and diagonal comparisons  
 (2) (±0.770) For use in vertical and interaction comparisons

Fosters (1) (±0.899) For use in horizontal and diagonal comparisons  
 (2) (±0.768) For use in vertical and interaction comparisons

66/B/1.9

POTATOES 2ND TEST CROP. % WARE

1962 - 1964

	Lu	LC	LN	AH	R	Mean
HIGHFIELD						
F	97.8	97.7	98.0	97.9	98.4	98.0
D	97.7	97.8	97.9	97.6	97.7	97.7
Mean	97.8	97.7	98.0	97.7	98.0	97.8
FOSTERS						
F	97.9	98.3	97.7	97.5	97.8	97.8
D	98.2	97.7	98.0	97.7	97.7	97.9
Mean	98.1	98.0	97.9	97.6	97.7	97.9

66/E/1.10

BARLEY 3RD TEST CROP

GRAIN

1961 - 1963

	Lu	Ley	CG	AH	R	Mean
HIGHFIELD						
Mean	49.9	53.2	51.1	49.9	52.3	51.3
1966						
NO	43.4	49.5	44.2	45.1	52.8	47.0
N1	50.0	54.8	51.5	48.7	53.7	51.7
N2	52.4	54.2	52.5	52.2	53.1	52.9
N3	54.0	54.5	56.2	53.9	49.6	53.6
1965						
F	50.8	52.4	51.0	49.0	54.0	51.6
D	49.0	54.1	51.2	50.9	50.5	51.1

Excluding AH

1966

1965	NO	N1	N2	N3	Mean
F	47.8	52.4	54.0	54.0	52.0
D	47.1	52.6	52.0	53.2	51.2

Mean D.M. %: 82.3

66/3/1.11

BARLEY 3RD TEST CROP

GRAIN

1961 - 1963

	Lu	Ley	CG	AH	R	Mean
FOSTERS						
Mean	50.8	53.7	51.9	51.2	54.1	52.4
1966						
NO	42.5	49.9	45.3	43.6	53.6	47.0
N1	50.9	56.9	51.0	-	58.0	-
N2	54.2	55.6	55.1	52.2	53.2	54.1
N3	55.6	52.5	56.4	55.0	51.8	54.3
N4	-	-	-	53.8	-	-
1965						
F	47.9	52.2	50.4	51.3	53.5	51.1
D	53.7	55.3	53.4	51.0	54.8	53.6

Excluding AH

1966

1965	NO	N1	N2	N3	Mean
F	43.8	51.8	54.5	54.0	51.0
D	51.9	56.6	54.5	54.3	54.3

Mean D.M. %: 81.6

66/B/1.12

TREATMENT CROPS ARABLE AND HAY ROTATION

HAY: DRY MATTER (Total of 2 cuts)

After arable crop			After reseeded grass ploughed 1962 - 63		
F	D	Mean	F	D	Mean
HIGHFIELD					
71.6	72.9	72.2	54.0	53.9	54.0
FOSTERS					
75.2	80.5	77.8	46.2	49.9	48.0

66/B/1.13

TREATMENT CROPS ARABLE AND HAY ROTATION

HIGHFIELD		FOSTERS
Mean		Mean
	SUGAR BEET	
	ROOTS	
23.69		20.77
	SUGAR %	
16.2		17.0
	TOTAL SUGAR	
76.7		70.8
	TOPS	
22.12		18.99
	OATS	
	GRAIN	
32.9		50.4

Oats, grain, mean D.M. %: Highfield 81.0  
 Fosters 79.4

66/B/1.14

LUCERNE: DRY MATTER

	HIGHFIELD 1964			FOSTERS 1964		
	F	D	Mean	F	D	Mean
1st year (3 cuts)	50.1	49.6	49.8	57.3	60.8	59.0
2nd year (4 cuts)			77.3			81.0
3rd year (3 cuts)			54.3			73.3

ALL-GRASS LEY: DRY MATTER

	HIGHFIELD 1964			FOSTERS 1964		
	F	D	Mean	F	D	Mean
1st year (4 cuts)	79.4	78.7	79.1	67.7	68.9	68.3
2nd year (5 cuts)			115.0			111.2
3rd year (4 cuts)			95.1			99.2

66/B/1.15

CLOVER-GRASS LEY: DRY MATTER

	HIGHFIELD 1964			FOSTERS 1964		
	F	D	Mean	F	D	Mean
1st year (3 cuts)	41.5	45.4	43.4	33.6	32.3	33.0
2nd year (5 cuts)			90.0			92.2
3rd year (4 cuts)			78.7			75.2

PERMANENT GRASS: DRY MATTER

	NO	N1	Mean
HIGHFIELD			
16th exptl year Blocks 9 and 12	55.4	105.8	80.6
Blocks 10 and 11	50.6	108.8	79.7
17th exptl year Blocks 5 and 8	58.8	104.6	81.7
Blocks 6 and 7	56.6	115.0	85.8
18th exptl year Blocks 1 and 4	59.0	110.5	84.7
Blocks 2 and 3	77.7	105.4	91.6

(NO) Clover-grass management

(N1) All-grass management



66/B/1.16

RESEDED GRASS: DRY MATTER

	HIGHFIELD			FOSTERS		
	NO	N1	Mean	NO	N1	Mean
16th exptl year	59.0	113.4	86.2	79.0	112.0	95.5
17th exptl year	59.1	114.7	86.9	76.2	116.8	96.5
18th exptl year	57.4	105.8	81.6	82.7	106.0	94.4

(NO) Clover-grass management  
 (N1) All-grass management