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65/R/HIA/B/1 and 65/R/FLA/B/1 Ley and Arable Rotations

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65/B/1.1

LEY AND ARABLE ROTATIONS

(HIA and FIA)

Highfield and Fosters Field 1964, the 17th year.

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

Winter wheat: A further test of 0 v 0.6 N (T0 v T1) is now applied as 'Nitro-Chalk' in December or early January. The 1965 crop received additional K2O at 0.6 cwt on the plough furrow, as muriate of potash.

Potatoes: All fertiliser tests on potatoes are discontinued, except the comparison of dung and PK (0.5 cwt P2O5, 1.0 cwt K2O as (0:14:28)) on quarter plots. The basal compound is now (15:15:15) applied at 1.2 cwt N, 1.2 cwt P2O5 and 1.2 cwt K2O.

Sugar beet: The N test is discontinued. The basal nitrogen is 1.5 cwt N, partly applied in the basal compound (now 15:15:15) and partly as 'Nitro-Chalk'.

Hay: This is no longer undersown. Italian ryegrass is sown in autumn or spring. The manuring remains the same but the basal NPK is applied in the seedbed (for spring sowing) or in early spring (for autumn sowing).

Lucerne: An infestation with stem eelworm (*Ditylenchus dipsaci*) made it necessary to plough out one whole plot of third year lucerne on each field.

NOTES: (1) The wheat following ryegrass (replacing 3rd year 'all-grass' ley) on Fosters was badly thinned in spring by stem-boring larvae.

(2) Weather prevented the last cutting planned for 1st and 2nd year all-grass and clover-grass leys, also permanent and reseeded grasses.

Cultivations, etc.:

HIGHFIELD

1st year Treatment Crops:

All-grass ley: Ploughed: Oct 16, 1964. Basal PK compound applied: Apr 5, 1965. Seeds sown at 30 lb, 'Nitro-Chalk' applied: Apr 6. Sprayed with 2,4-D butoxyethylester at 0.44 lb a.e. in 40 gals: June 2. Cut 3 times: July 2, Aug 5, Sept 9. NK compound applied after each cut.

Clover-grass ley: Ploughed: Oct 16, 1964. Basal PK compound applied: Apr 5, 1965. Seeds sown at 33 lb: Apr 6. Sprayed

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with MCPA/MCPB (Tropotox Plus at 4 pints in 40 gals): June 2.
Cut 3 times: July 2, Aug 5, Sept 9. Muriate of potash applied after each cut.

Lucerne: Ploughed: Oct 16, 1964. Basal PK compound applied: Apr 5, 1965. Seed drilled at 20 lb: Apr 6. Cut 3 times: July 9, Sept 7, Nov 3.

Hay: Ploughed (undersown seeds having failed): Oct 22, 1964. Basal NPK compound applied, seeds sown at 38.5 lb: Apr 6, 1965. Sprayed with 2,4-D butoxyethylester at 0.44 lb a.e. in 40 gals: June 2. Cut twice: July 2, Aug 5. NK compound applied after first cut.

2nd year Treatment Crops:-

All-grass ley: Basal PK compound applied: Nov 26, 1964. 'Nitro-Chalk' applied: Apr 9, 1965. Cut 4 times: May 20, July 1, Aug 5, Sept 9. NK compound applied after each cut.

Clover-grass ley: Basal PK compound applied: Nov 26, 1964. Cut 4 times: May 21, July 1, Aug 5, Sept 9. Muriate of potash applied after each cut.

Lucerne: Basal PK compound applied: Nov 26, 1964. Sprayed with paraquat at 2 lb ion in 44 gals: Feb 25, 1965. Cut four times: May 25, July 9, Sept 7, Nov 3.

Sugar beet: Ploughed: July 27, 1964. Muriate of potash applied: Feb 11, 1965. Basal NPK compound applied: Apr 1. 'Nitro-Chalk' applied, plots rotary cultivated, seed drilled at 5.25 lb: Apr 2. Singled: May 20. Sprayed with menazon (Saphicol at 0.75 pints in 37 gals): July 1. Lifted: Nov 16.

3rd year Treatment Crops:-

All-grass ley: Basal PK compound applied: Nov 26, 1964. 'Nitro-Chalk' applied: Apr 9, 1965. Cut 4 times: May 21, July 1, Aug 5, Sept 9. NK compound applied after first 3 cuts.

Clover-grass ley: Basal PK compound applied: Nov 26, 1964. Cut 4 times: May 21, July 1, Aug 5, Sept 9, 1965. Muriate of potash applied after first 3 cuts.

Lucerne: Basal PK compound applied: Nov 26, 1964. Sprayed with paraquat at 2 lb ion in 44 gals: Feb 25, 1965. Plots 107 and 108 cut and ploughed up (no yields taken): May 6 and reploughed: July 21. Cut 3 times: May 25, July 9, Sept 6.

Oats: Ploughed: Nov 30, 1964. Seed combine drilled at 170 lb, 'Nitro-Chalk' applied: Mar 15, 1965. Sprayed with MCPA at 1.13 lb and dicamba at 0.08 lb in 40 gals: May 19. Combine harvested: Aug 28.

1st Test Crop, Wheat:-

Ploughed: Oct 21, 1964. Additional K fertiliser applied: Oct 28. Seed combine drilled at 170 lb: Oct 30. 'Nitro-Chalk' applied: Dec 18, spring dressing: Apr 14, 1965. Sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): Apr 23. Combine

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harvested: Sept 12.

2nd Test Crop, Potatoes:-

Dung applied, plots ploughed: Nov 5, 1964. Fertilisers applied: Apr 21, 1965. Plots rotary cultivated, potatoes machine planted: Apr 23. Earthed up: June 14. Sprayed 3 times with mancozeb at 1.2 lb in 37 gals: June 30, July 27, Aug 10. Sprayed with diquat (Reglone at 4 pints in 40 gals): Sept 6. Haulm destroyed mechanically: Sept 14. Lifted: Oct 20.

3rd Test Crop, Barley:-

Ground chalk applied: Sept 28, 1964. Additional ('balancing') P and K applied: Oct 5. Ploughed: Oct 8. 'Nitro-Chalk' applied: Feb 18, 1965. Seed combine drilled at 140 lb: Mar 15. Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in 40 gals): May 11. Combine harvested: Sept 6.

Permanent grasses: 15th, 16th and 17th experimental years permanent (old) grass, all blocks, 15th, 16th and 17th years reseeded grass, blocks 1, 4, 6, 7, 9 and 12. Ground chalk applied to blocks 10 and 11: Nov 11, 1964. Basal PK compound applied: Nov 26. 'Nitro-Chalk' applied to 'all-grass' half plots: Apr 9, 1965. Cut four times: May 21, July 2, Aug 5, Sept 10 (reseeded), Sept 27 (old). Muriate of potash and NK compound applied to appropriate half plots after each cut.

FESTERS

1st year Treatment Crops:-

All-grass ley: Ploughed: Oct 15, 1964. Basal PK compound applied: Apr 5, 1965. Seed sown at 30 lb, 'Nitro-Chalk' applied: Apr 6. Sprayed with 2,4-D butoxyethylester at 0.44 lb a.e. in 40 gals: June 2. Cut 3 times: July 6, Aug 4, Sept 9. NK compound applied after each cut.

Clover-grass ley: Ploughed: Oct 15, 1964. Basal PK compound applied: Apr 5, 1965. Seed sown at 33 lb: Apr 6. Sprayed with MCPB/MCPA (Tropotox plus at 4 pints in 40 gals): June 2. Cut 3 times: July 6, Aug 4, Sept 9. Muriate of potash applied after each cut.

Lucerne: Ploughed: Oct 15, 1964. Basal PK compound applied: Apr 5, 1965. Seed sown at 20 lb: Apr 6. Cut 3 times: July 9, Sept 6, Nov 2.

Hay: Ploughed (undersown seeds having failed): Oct 22, 1964. Basal NPK compound applied, seed sown at 38.5 lb: Apr 6, 1965. Sprayed with 2,4-D butoxyethylester at 0.44 lb in 40 gals: June 2. Cut twice: July 1, Aug 6. NK compound applied after first cut.

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2nd year Treatment Crops:-

All-grass ley: Basal PK compound applied: Nov 26, 1964. 'Nitro-Chalk' applied: Apr 9, 1965. Cut 4 times: May 20, July 1, Aug 4, Sept 9. NK compound applied after each cut.
Clover-grass ley: Basal PK compound applied: Nov 26, 1964. Cut 4 times: May 20, July 1, Aug 4, Sept 9, 1965. Muriate of potash applied after each cut.
Lucerne: Basal PK compound applied: Nov 26, 1964. Sprayed with paraquat at 2 lb ion in 44 gals: Feb 25, 1965. Cut 4 times: May 25, July 9, Sept 6, Nov 2.
Sugar beet: Ploughed: July 27, 1964. Muriate of potash applied: Feb 11, 1965. Basal NPK compound applied: Apr 1. 'Nitro-Chalk' applied, plots rotary cultivated, seed drilled at 5.25 lb: Apr 2. Singled: May 25. Sprayed with menazon (Saphicol at 0.75 pints in 37 gals): July 1. Lifted: Nov 16.

3rd year Treatment Crops:-

All-grass ley: Basal PK compound applied: Nov 26, 1964. 'Nitro-Chalk' applied: Apr 9, 1965. Cut 4 times: May 20, July 1, Aug 5, Sept 9. NK compound applied after first 3 cuts.
Clover-grass ley: Basal PK compound applied: Nov 26, 1964. Cut 4 times: May 20, July 1, Aug 5, Sept 9, 1965. Muriate of potash applied after first 3 cuts.
Lucerne: Basal PK compound applied: Nov 26, 1964. Sprayed with paraquat at 2 lb ion in 44 gals: Feb 25, 1965. Plots 51 and 52 cut and ploughed up (no yields taken): May 6 and reploughed: July 21. Cut 3 times: May 25, July 9, Sept 6.
Oats: Ploughed: Nov 30, 1964. Seed drilled at 170 lb: Mar 15, 1965. 'Nitro-Chalk' applied: Mar 16. Sprayed with MCPA at 1.13 lb and dicamba at 0.08 lb in 40 gals: May 19. Combine harvested: Aug 28.

1st Test Crop, Wheat:-

Ploughed: Oct 21, 1964. Additional K fertiliser applied: Oct 27. Seed combine drilled at 170 lb: Oct 30. 'Nitro-Chalk' applied: Dec 18, spring dressing: Apr 14, 1965. Sprayed with mecoprop/2,4-D (Methoxone Extra at 7 pints in 40 gals): Apr 23. Combine harvested: Sept 12.

2nd Test Crop, Potatoes:-

Dung applied, plots ploughed: Nov 4, 1964. Fertilisers applied: Apr 21, 1965. Rotary cultivated, potatoes machine planted: Apr 22. Earthed up: June 14. Sprayed 3 times with mancozeb at 1.2 lb in 37 gals: July 1, July 27, Aug 10. Sprayed with diquat (Reglone at 4 pints in 40 gals): Sept 6. Haulm destroyed mechanically: Sept 14. Lifted: Oct 19.

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3rd Test Crop, Barley:-

Additional ('balancing') P and K applied: Oct 5, 1964. Ploughed:
Oct 8. 'Nitro-Chalk' applied: Feb 18, 1965. Seed combine
drilled at 140 lb: Mar 15. Sprayed with mecoprop/2,4-D
(Methoxone Extra at 6 pints in 40 gals): May 11. Combine harvested:
Sept 2.

Permanent grasses:-

15th, 16th and 17th years reseeded grass, blocks 1, 3, 6, 8, 9 and
11. Basal PK compound applied: Nov 26, 1964. 'Nitro-Chalk'
applied to 'all-grass' half plots: Apr 9, 1965. Cut 4 times:
May 20, July 1, Aug 4, Sept 10. Muriate of potash and NK
compound applied to appropriate half plots after each cut.

Standard errors, per sub plot. Test crops.

Potatoes. Total tubers:

Highfield:	Whole plot:	1.309	or	6.2%	(4 d.f.)
	Sub plot:	1.783	or	8.4%	(15 d.f.)
Fosters:	Whole plot:	0.921	or	4.6%	(4 d.f.)
	Sub plot:	1.818	or	9.2%	(15 d.f.)

65/B/1.6

SUMMARY OF RESULTS

WHEAT 1ST TEST CROP

1962 - 1964

	Lu	LC	LN	AH	R	Mean
GRAIN						
HIGHFIELD						
Mean	43.5	46.5	48.9	47.1	49.6	47.1
To test crop						
NO	43.6	44.9	47.7	40.9	50.3	
N1	45.9	48.1	51.5	50.2	49.2	
N2	42.2	46.4	48.4	49.1	48.7	
N3	42.4	46.8	48.1	48.0	50.0	
T0	47.6	46.1	49.5	47.3	50.0	48.1
T1	39.5	47.0	48.4	46.8	49.1	46.1
FOSTERS						
Mean	50.2	48.0	43.2	46.0	47.4	47.0
To test crop						
NO	48.4	46.1	42.4	36.5	47.6	
N1	53.0	50.8	44.5	46.9	48.9	
N2	49.7	48.6	43.6	50.0	45.7	
N3	49.6	46.6	42.3	50.6	47.4	
T0	50.3	48.1	42.1	43.5	46.8	46.2
T1	50.0	48.0	44.2	48.5	48.0	47.7

Mean D.M. %: Highfield 74.2
 Fosters 75.9

NOTES: (1) In the 1964 tables wheat only, the order of rotations is different from that above. In future the order will be as above i.e. Lu LC LN AH R.

(2) N levels are different on AH from remainder see 64/B/1.23.

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WHEAT 1ST TEST CROP

1962 - 1964

	Lu	LC	LN	AH	R	Mean
STRAW						
HIGHFIELD						
Mean	48.1	43.5	48.4	39.9	54.3	46.8
To test crop						
NO	49.0	37.8	42.4	34.3	51.9	
N1	49.9	45.7	52.6	43.5	57.6	
N2	46.7	42.9	51.1	40.5	53.3	
N3	47.0	47.5	47.4	41.2	54.5	
TO	47.7	39.9	47.0	37.6	52.0	44.8
T1	48.6	47.1	49.8	42.2	56.7	48.9
FOSTERS						
Mean	45.4	44.3	37.5	40.0	40.5	41.5
To test crop						
NO	44.9	40.0	38.0	30.0	44.1	
N1	48.5	46.0	37.5	43.6	38.2	
N2	46.4	44.8	36.2	42.3	42.7	
N3	41.7	46.3	38.5	44.0	37.1	
TO	44.4	42.1	35.1	36.1	38.7	39.3
T1	46.3	46.4	40.0	43.8	42.4	43.8
Mean D.M. %:	Highfield 80.3		Fosters 81.9			

NOTES: (1) In the 1964 tables wheat only, the order of rotations is different from that above. In future the order will be as above i.e. Lu LC LN AH R.

(2) N levels are different on AH from remainder see 64/B/1.23.

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POTATOES 2ND TEST CROP. TOTAL TUBERS

1961 - 1963

	Lu	Ley	CG	AH	R	Mean
HIGHFIELD						
	(1) and (2)					(±0.399)
F	20.64	21.72	20.67	20.35	21.96	21.07
D	23.28	20.92	19.56	22.53	21.02	21.46
Mean (±0.925)	21.96	21.32	20.11	21.44	21.49	21.26
FOSTERS						
	(1) and (2)					(±0.407)
F	18.48	20.15	18.32	18.16	20.50	19.12
D	20.52	21.55	19.72	19.73	21.33	20.57
Mean (±0.651)	19.50	20.85	19.02	18.94	20.91	19.85

Highfield (1) (±1.120) For use in horizontal and diagonal comparisons
 (2) (±0.892) For use in vertical and interaction comparisons

Fosters (1) (±0.915) For use in horizontal and diagonal comparisons
 (2) (±0.909) For use in vertical and interaction comparisons

65/B/1.9

POTATOES 2ND TEST CROP. % WARE

1961 - 1963

	Lu	Ley	CG	AH	R	Mean
HIGHFIELD						
F	96.7	97.3	97.3	96.9	97.2	97.1
D	97.4	97.0	96.5	97.6	97.0	97.1
Mean	97.1	97.1	96.9	97.3	97.1	97.1
FOSTERS						
F	97.3	97.3	97.5	97.3	97.3	97.3
D	97.7	97.6	97.6	97.7	97.5	97.6
Mean	97.5	97.5	97.5	97.5	97.4	97.5

65/B/1.10

BARLEY 3RD TEST CROP

GRAIN

1960 - 1962

	Lu	Ley	CG	AH	R	Mean
HIGHFIELD						
Mean	43.8	44.8	48.1	47.0	42.9	45.3
1965						
N0	44.3	45.2	46.5	50.5	45.2	46.3
N1	44.3	45.4	48.3	48.5	42.0	45.7
N2	43.4	44.2	48.4	47.7	42.4	45.2
N3	43.1	44.2	49.0	41.4	42.0	43.9
1964						
F	43.8	45.5	47.9	46.0	43.4	45.3
D	43.7	44.0	48.2	48.1	42.4	45.3

Excluding AH

1965

1964	N0	N1	N2	N3	Mean
F	45.4	44.7	45.8	44.6	45.1
D	45.2	45.3	43.4	44.4	44.6

Mean D.M. %: 74.4

65/B/1.11

BARLEY 3RD TEST CROP

GRAIN

1960 - 1962

	Lu	Ley	CG	AH	R	Mean
FOSTERS						
Mean	46.7	45.7	45.3	47.6	44.0	45.9
1965						
NO	47.0	46.3	48.1	46.4	45.5	46.7
N1	47.2	45.7	46.0	-	43.6	-
N2	46.8	44.7	43.1	46.7	43.1	44.9
N3	45.8	46.1	44.2	50.2	43.7	46.0
N4	-	-	-	47.1	-	-
1964						
F	46.9	46.5	44.3	47.2	45.2	46.0
D	46.5	44.9	46.4	48.0	42.8	45.7

Excluding AH

1965

1964	NO	N1	N2	N3	Mean
F	46.6	46.4	45.0	45.0	45.7
D	46.9	44.8	43.9	45.0	45.1

Mean D.M. %: 74.8

65/B/1.12

TREATMENT CROPS ARABLE AND HAY ROTATION

HAY: DRY MATTER (Total 2 cuts)

1964

	NO	N1	N2	N3	Mean
HIGHFIELD					
1963					
F	57.6	55.4	55.6	57.5	56.5
D	58.3	54.7	56.4	55.6	56.2
Mean	58.0	55.0	56.0	56.6	56.4
FOSTERS					
F	53.1	56.4	54.9	60.4	56.2
D	63.4	58.0	60.4	56.3	59.5
Mean	58.3	57.2	57.6	58.3	57.9

65/B/1.13

TREATMENT CROPS ARABLE AND HAY ROTATION

HIGHFIELD		FOSTERS
Mean		Mean
	SUGAR BEET	
	ROOTS	
20.53		17.92
	SUGAR %	
17.8		18.5
	TOTAL SUGAR	
72.9		66.4
	TOPS	
22.59		20.14
	OATS	
	GRAIN	
51.0		54.3

Oats, grain, mean D.M. %: Highfield 68.9
 Fosters 68.9

65/B/1.14

LUCERNE: DRY MATTER

	HIGHFIELD 1963			FOSTERS 1963		
	F	D	Mean	F	D	Mean
1st year (3 cuts)	40.6	46.8	43.7	49.2	55.3	52.3
2nd year (4 cuts)			105.2			99.0
3rd year (3 cuts)			74.8*			71.1*

* Based on one whole plot only.

ALL-GRASS LEY: DRY MATTER

	HIGHFIELD 1963			FOSTERS 1963		
	F	D	Mean	F	D	Mean
1st year (3 cuts)	55.5	56.8	56.1	55.6	58.8	57.2
2nd year (4 cuts)			98.9			100.1
3rd year (4 cuts)			78.6			78.3

65/B/1.15

CLOVER-GRASS LEY: DRY MATTER

	HIGHFIELD			FOSTERS		
	F	D	Mean	F	D	Mean
1st year (3 cuts)	39.0	40.5	39.7	31.7	35.4	33.6
2nd year (4 cuts)			60.5			69.0
3rd year (4 cuts)			56.5			60.5

PERMANENT GRASS: DRY MATTER

	NO	N1	Mean
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HIGHFIELD

15th exptl year			
Blocks 9 and 12	44.4	102.2	73.3
Blocks 10 and 11	46.3	100.3	73.3
16th exptl year			
Blocks 5 and 8	41.4	103.8	72.6
Blocks 6 and 7	36.0	101.9	69.0
17th exptl year			
Blocks 1 and 4	40.0	103.6	71.8
Block 2	47.1	101.3	74.2

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

65/B/1.16

RESEEDED GRASS: DRY MATTER

	HIGHFIELD			FOSTERS		
	NO	N1	Mean	NO	N1	Mean
15th exptl year	42.5	98.2	70.4	52.4	94.6	73.5
16th exptl year	38.1	97.1	67.6	55.0	99.0	77.0
17th exptl year	47.7	96.8	72.2	58.7	95.9	77.3

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