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# Numerical Results of the Field Experiments 1968

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## Rotation Experiments

### Rothamsted Research

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68/B/1.1

## LEY AND ARABLE ROTATIONS

(HLA and FLA)

Highfield and Fosters Field 1968, the 20th year.

For details of treatments, rotations, etc. see 'Details' and 'Results' 63/B/1, 64/B/1, 65/B/1, 66/B/1 and 67/B/1.

Revised cropping: From 1968 the sequence of test crops has been changed to potatoes, winter wheat, barley. This new sequence started on blocks 6 and 7 (Highfield) and blocks 8 and 9 (Fosters). Apart from blocks 1 - 4 on each field, which are retained in the three year cycles of treatment and test crops, no further treatment sequences will be started. After three test crops, blocks will be sown to winter wheat each year. This scheme started on blocks 5 and 8 (Highfield) and blocks 5 and 7 (Fosters). Apart from blocks 1 - 4 on each field, old and reseeded grass is now ploughed up for test cropping as blocks enter either 1st or 4th test crop phase.

Manures to 1st test crop, potatoes:-

N to 1/8th plots: None (NO), 0.6 (N1), 1.2 (N2), 1.8 (N3) cwt as 'Nitro-Chalk' shortly before planting.

P205 to 1/16th plots (in cwt):

Sub plots without FYM (F): 1.95 (P0) v 2.85 (P1)

Sub plots with FYM (D): 1.50 (P0) v 2.40 (P1)

NOTE: In 1968 because of an excess application to Fosters Field the rates were revised for both fields as follows:

F sub plots: 2.85 (P0) v 3.75 (P1)

D sub plots: 2.40 (P0) v 3.30 (P1)

K20 to 1/16th plots (in cwt):

Sub plots without FYM (F): 1.80 (K0) v 2.70 (K1)

Sub plots with FYM (D): 0.90 (K0) v 1.80 (K1)

FYM to 1/4 plots: None (F) v 12 tons (D) applied on the plough furrow and rotary cultivated in. No FYM is applied to the R and G plots coming into potatoes in 1968 and 1969, these plots being treated as F plots.

P and K are applied as superphosphate and muriate of potash except the 'dung equivalent' P and K (0.45 cwt P205 and 0.90 K20) which is compound fertiliser (0:14:28). All are applied on the plough furrow and rotary cultivated in.

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Corrective K dressings to 1st test crop potatoes designed to bring the K levels on both fields to that of the Fosters LC plots, were ploughed in as muriate of potash in autumn 1967 as follows (in cwt):-

Rotation	Fosters	Highfield
AH	5.5	6.7
Lu	3.8	4.8
LC	None	0.6
LN	2.9	4.4
RC	None	None
RN	3.5	3.5
GC	None	None
GN	None	3.5

NPK dressings to 4th test crop, winter wheat:-

Basal dressing: 0.9 cwt P2O<sub>5</sub>, 0.9 cwt K<sub>2</sub>O as compound fertiliser (0:20:20) half combine drilled, half by hand.

Test nitrogen to 1/8th plots:

Highfield (all rotations): 0.3 (N1), 0.6 (N2), 0.9 (N3), 1.2 (N4) cwt N as 'Nitro-Chalk' in spring.

Fosters (all rotations): 0.4 (N1), 0.8 (N2), 1.2 (N3), 1.6 (N4) cwt N as 'Nitro-Chalk' in spring.

Varieties:

Potatoes, 1st Test Crop: King Edward

2nd Test Crop: Majestic

Barley, 3rd Test Crop: Maris Badger

Winter wheat, 4th Test Crop: Cappelle

Sugar Beet, 2nd Treatment Crop: Klein E

Oats, 3rd Treatment Crop: Manod

NOTE: Highfield: The fourth test crop wheat was severely attacked by take-all (*Ophiobolus graminis*) on both blocks, especially wheat after lucerne and arable rotations. The wheat on the 2 plots ploughed in autumn 1967 from old grass was badly damaged by wireworms (*Agriotes* spp.), wheat flea beetle larvae (genus *Phyllotreta*), and unidentified stem boring larvae.

#### HIGHFIELD

2nd year Treatment Crops:

All-grass ley: Basal PK compound applied: 20 Nov, 1967. NK compound applied: 28 Mar, 1968. Cut four times: 23 May, 26 June, 12 Aug, 25 Oct. NK compound applied after first three cuts.

Clover-grass ley: Basal PK compound applied: 20 Nov, 1967. Muriate of potash applied: 29 Mar, 1968. Cut four times: 24 May, 26 June, 12 Aug, 25 Oct. Muriate of potash applied after first three cuts.

Lucerne: Basal PK compound applied: 20 Nov, 1967. Sprayed with paraquat at 2 lb ion in 37 gals: 22 Jan, 1968. Cut four times: 30 May, 4 July, 29 Aug, 28 Oct.

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Sugar beet: Ploughed: 25 July, 1967. Ploughed second time: 18 Sept. Muriate of potash applied: 4 Jan, 1968. Basal NPK compound applied: 11 Mar. 'Nitro-Chalk' applied: 27 Mar. Seed drilled at 8 lb: 29 Mar. Singled: 21 May. Sprayed with demeton-s-metyl at 7 oz in 37 gals: 12 June, Lifted: 12 Dec.

3rd year Treatment Crops:

All-grass ley: Basal PK compound applied: 20 Nov, 1967. NK compound applied: 28 Mar, 1968. Cut four times: 23 May, 26 June, 12 Aug, 25 Oct. NK compound applied after first three cuts.

Clover-grass ley: Basal PK compound applied: 20 Nov, 1967. Muriate of potash applied: 29 Mar, 1968. Cut four times: 23 May, 26 June, 12 Aug, 25 Oct. Muriate of potash applied after first three cuts.

Lucerne: Basal PK compound applied: 20 Nov, 1967. Sprayed with paraquat at 2 lb ion in 37 gals: 22 Jan, 1968, at 0.9 lb ion in 37 gals: 12 July, at 0.75 lb ion in 20 gals: 10 Sept. Cut three times: 30 May, 4 July, 29 Aug.

Oats: Ploughed: 22 Nov, 1967. Seed combine drilled at 160 lb: 8 Mar, 1968. 'Nitro-Chalk' applied: 14 Mar. Combine harvested: 23 Aug.

1st Test Crop, Potatoes:-

Corrective K applied: 14 Nov, 1967. Ploughed: 20 Nov. All fertilizers applied: 1 - 10 Apr, 1968. FYM applied: 16 Apr. All plots following reseeded and permanent grass sprayed with aldrin at 3 lb in 37 gals, all plots rotary cultivated, potatoes machine planted: 17 Apr. Sprayed with paraquat at 0.5 lb ion plus linuron at 0.75 lb in 40 gals: 6 May. Grubbed: 6 June. Rotary ridged: 7 June. Sprayed with mancozeb three times at 1.2 lb in 37 gals, the second time including demeton-s-methyl at 3.5 oz: 3 July, 19 July, 5 Aug. Sprayed with undiluted BOV at 15 gals: 30 Aug. Lifted: 24 Sept.

2nd Test Crop, Potatoes:-

FYM applied: 30 Oct, 1967. Ploughed: 31 Oct. NPK fertilisers applied: 4 - 9 Apr, 1968. Rotary cultivated, potatoes machine planted: 10 Apr. Sprayed with paraquat at 0.38 lb ion plus linuron at 0.75 lb in 33 gals: 3 May. Grubbed: 6 June. Rotary ridged: 12 June. Sprayed with mancozeb three times at 1.2 lb in 37 gals, the second time including demeton-s-methyl at 3.5 oz: 3 July, 19 July, 5 Aug. Sprayed with undiluted BOV at 15 gals: 30 Aug. Lifted: 25 Sept.

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3rd Test Crop, Barley:-

Ground chalk applied, plots ploughed: 29 Sept, 1967. Seed combine drilled at 140 lb: 27 Feb, 1968. 'Nitro-Chalk' applied: 14 Mar. Sprayed with mecoprop at 42 oz and 2,4-D at 10.5 oz in 40 gals: 2 May. Combine harvested: 21 Aug.

4th Test Crop, Wheat:-

Ploughed: 30 Sept, 1967. Seed combine drilled at 180 lb: 23 Oct. Remaining half of basal PK compound applied by hand: 4 Dec. 'Nitro-Chalk' applied: 17 - 23 Apr, 1968. Sprayed with mecoprop at 42 oz and 2,4-D at 10.5 oz in 40 gals: 2 May. Combine harvested: 24 Aug.

Permanent grasses: 18th and 20th experimental years permanent (old) grass, blocks 1, 2, 4, 9, 10, 11, 12, 18th and 20th years reseeded grass, blocks 1, 4, 9 and 12. Ground chalk applied to blocks 9 and 12: 29 Sept, 1967. Basal PK compound applied: 20 Nov. NK compound applied to 'all grass' half plots, muriate of potash to 'clover grass' half plots: 28 Mar, 1968. Cut five times (except blocks 9 and 12 four times): 23 May, 26 June, 12 Aug, 5 Sept and (except blocks 9 and 12) 25 Oct. NK compound and muriate of potash applied to appropriate half plots after each cut except the last (4 and 3 applications respectively).

FOSTERS

2nd year Treatment Crops:-

All-grass ley: Basal PK compound applied: 20 Nov, 1967. NK compound applied: 28 Mar, 1968. Cut four times: 23 May, 1 July, 12 Aug, 25 Oct. NK compound applied after first three cuts.

Clover-grass ley: Basal PK compound applied: 20 Nov, 1967. Muriate of potash applied: 28 Mar, 1968. Cut four times: 23 May, 1 July, 12 Aug, 25 Oct. Muriate of potash applied after first three cuts.

Lucerne: Basal PK compound applied: 20 Nov, 1967. Sprayed with paraquat at 2 lb ion in 37 gals: 22 Jan, 1968. Cut four times: 30 May, 4 July, 30 Aug, 28 Oct.

Sugar beet: Ploughed: 25 July, 1967. Ploughed second time: 18 Sept. Muriate of potash applied: 4 Jan, 1968. Basal NPK compound applied: 11 Mar. 'Nitro-Chalk' applied: 27 Mar. Seed drilled at 8 lb: 29 Mar. Singled: 23 May - 4 June. Sprayed with demeton-s-methyl at 7 oz in 37 gals: 12 June. Lifted: 12 Dec.

3rd year Treatment Crops:-

All-grass ley: Basal PK compound applied: 20 Nov, 1967. NK compound applied: 28 Mar, 1968. Cut four times: 23 May, 1 July, 12 Aug, 25 Oct. NK compound applied after first three cuts.

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Clover-grass ley: Basal PK compound applied: 20 Nov, 1967. Muriate of potash applied: 28 Mar, 1968. Cut four times: 23 May, 1 July, 12 Aug, 25 Oct. Muriate of potash applied after first three cuts.

Lucerne: Basal PK compound applied: 20 Nov, 1967. Sprayed with paraquat at 2 lb ion in 37 gals: 22 Jan, 1968, at 0.9 lb ion in 37 gals: 9 July, at 0.75 lb ion in 20 gals: 30 Aug. Cut three times: 30 May, 4 July, 30 Aug.

Oats: Ploughed: 22 Nov, 1967. Seed combine drilled at 160 lb: 8 Mar, 1968. 'Nitro-Chalk' applied: 14 Mar. Combine harvested: 24 Aug.

1st Test Crop, Potatoes:-

Corrective K applied: 14 Nov, 1967. Ploughed: 17 Nov. Superphosphate and muriate of potash applied: 1 Apr, 1968. Superphosphate applied: 4 Apr. Dung equivalent PK compound, 'Nitro-Chalk', superphosphate and muriate of potash applied: 10 Apr. FYM applied, rotary cultivated, potatoes machine planted: 16 Apr. Sprayed with paraquat at 0.5 lb ion plus linuron at 0.75 lb in 40 gals: 6 May. Grubbed: 6 June. Rotary ridged: 7 June. Sprayed with mancozeb three times at 1.2 lb in 37 gals, the second time including demeton-s-methyl at 3.5 oz: 3 July, 19 July, 5 Aug. Sprayed with undiluted BOV at 15 gals: 30 Aug. Lifted: 24 Sept.

NOTE: Aldrin was not applied on Fosters.

2nd Test Crop, Potatoes:-

FYM applied, plots ploughed: 30 Oct, 1967. NPK fertilisers applied: 4 - 9 Apr, 1968. Rotary cultivated, potatoes machine planted: 10 Apr. Sprayed with paraquat at 0.38 lb ion plus linuron at 0.75 lb in 33 gals: 3 May. Grubbed: 6 June. Rotary ridged: 12 June. Sprayed with mancozeb three times at 1.2 lb in 37 gals, the second time including demeton-s-methyl at 3.5 oz: 3 July, 19 July, 5 Aug. Sprayed with undiluted BOV at 15 gals: 30 Aug. Lifted: 27 Sept.

3rd Test Crop, Barley:-

Ploughed: 25 Sept, 1967. Seed combine drilled at 140 lb: 27 Feb, 1968. 'Nitro-Chalk' applied: 14 Mar. Sprayed with mecoprop at 42 oz and 2,4-D at 10.5 oz in 40 gals: 2 May. Combine harvested: 21 Aug.

4th Test Crop, Wheat:-

Ploughed: 18 Sept, 1967. Seed combine drilled at 180 lb: 19 Oct. Remaining half of basal PK compound applied by hand: 4 Dec. 'Nitro-Chalk' applied: 17 Apr. Sprayed with mecoprop at 42 oz and 2,4-D at 10.5 oz in 40 gals: 2 May. Combine harvested: 24 Aug.

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**Permanent grasses:-**

18th and 20th year reseeded grass, blocks 1, 3, 6 and 11. Basal PK compound applied: 20 Nov, 1967. NK compound applied to 'all-grass' half plots and muriate of potash to 'clover-grass' half plots: 28 Mar, 1968. Cut five times: 23 May, 26 June, 12 Aug, 5 Sept, 25 Oct. NK compound and muriate of potash applied to appropriate half plots after each cut except the last. (N.B. Plots on blocks 6 and 11 were ploughed up before the fifth cut was taken).

**Standard errors per plot.**

Potatoes: 2nd Test Crop. Total tubers:

Highfield: Sub plot: 1.137 or 6.9% (12 d.f.)

Fosters: Sub plot: 0.853 or 5.6% (12 d.f.)

68/B/1.7

SUMMARY OF RESULTS  
WHEAT 4TH TEST CROP  
1962 - 1964

	Lu	LC	LN	AH	R	Mean	G
GRAIN							
HIGHFIELD							
Mean	24.6	34.0	33.8	28.6	35.6	31.3	25.2
1968							
NO	21.1	36.6	34.8	25.0	37.4	31.0	24.3
N1	24.2	33.4	34.3	28.8	36.7	31.5	27.4
N2	26.5	32.9	33.0	29.8	34.5	31.3	23.2
N3	26.5	33.0	33.1	30.9	33.7	31.5	25.8
1966							
F	25.6	32.6	34.6	30.2	35.3	31.7	
D	23.6	35.3	33.0	27.0	35.8	31.0	
General mean:	30.5						
General mean D.M. %:	84.3						

	Lu	LC	LN	AH	R	Mean	G
FOSTERS							
Mean	40.4	39.7	40.0	37.9	40.3	39.7	
1968							
NO	38.9	42.3	41.0	37.9	43.1	40.6	
N1	42.4	40.3	43.3	39.5	41.7	41.4	
N2	41.1	40.6	37.0	38.0	38.7	39.1	
N3	39.2	35.5	38.8	36.0	37.8	37.5	
1966							
F	39.8	40.7	39.6	38.5	40.3	39.8	
D	41.1	38.7	40.4	37.2	40.3	39.5	
Mean D.M. %:	82.9						

68/B/1.8

POTATOES 1ST TEST CROP. TOTAL TUBERS

1965 - 1967

HIGHFIELD

	Lu	LC	LN	AH	Mean	FC	RN	GC	GN	Mean
Mean	18.83	18.50	18.85	19.72	18.98	20.28	20.65	20.64	19.21	20.20
F	18.93	18.79	19.02	18.88	18.90					
D	18.72	18.21	18.69	20.57	19.05					
N0	19.89	19.65	19.72	16.43	18.92	21.93	22.19	20.92	22.73	21.94
N1	20.16	18.90	18.88	20.27	19.55	21.41	21.11	21.46	17.76	20.44
N2	17.72	18.06	18.53	20.91	18.81	19.45	21.65	21.46	19.12	20.42
N3	17.54	17.41	18.28	21.28	18.63	18.32	17.66	18.73	17.24	17.99
P0*	19.00	18.93	18.78	19.87	19.14	20.01	21.22	20.67	18.84	20.18
P1*	18.65	18.07	18.93	19.58	18.81	20.54	20.09	20.62	19.59	20.21
K0*	18.61	18.82	19.10	19.72	19.06	20.17	20.91	20.89	19.19	20.29
K1*	19.04	18.18	18.61	19.72	18.89	20.38	20.39	20.40	19.24	20.10

\* In addition to basal

68/B/1.9

POTATOES 1ST TEST CROP. % WARE

1965 - 1967

HIGHFIELD

	Lu	LC	LN	AH	Mean	RC	RN	GC	GN	Mean
Mean	92.8	93.7	92.7	92.1	92.8	92.4	91.9	91.8	92.2	92.1
F	93.0	93.8	93.0	92.2	93.0					
D	92.6	93.6	92.4	91.9	92.6					
N0	92.9	94.0	92.3	88.7	92.0	92.1	92.7	90.9	93.4	92.3
N1	93.3	93.8	92.7	92.6	93.1	92.9	92.4	92.4	92.4	92.5
N2	92.8	93.8	92.9	93.7	93.3	92.4	91.0	92.2	92.4	92.0
N3	92.1	93.2	92.8	93.3	92.9	92.2	91.6	91.6	90.6	91.5
P0*	92.8	93.9	92.8	92.1	92.9	92.4	92.4	92.0	92.6	92.4
P1*	92.8	93.5	92.5	92.0	92.7	92.4	91.3	91.6	91.7	91.8
K0*	92.6	94.1	92.5	92.6	93.0	93.1	91.9	91.9	92.3	92.3
K1*	93.0	93.3	92.8	91.6	92.7	91.7	91.9	91.6	92.1	91.8

\* In addition to basal

68/B/1.10

POTATOES 1ST TEST CROP. TOTAL TUBERS

1965 - 1967

FOSTERS

	Lu	LC	LN	AH	Mean	RC	RN	Mean
Mean	18.74	19.44	20.31	18.13	19.15	19.22	20.21	19.71
F	18.98	18.37	19.92	17.21	18.62			
D	18.49	20.50	20.71	19.04	19.69			
N0	18.06	19.36	19.78	14.03	17.81	21.03	22.09	21.56
N1	19.91	19.95	20.82	18.35	19.76	19.53	20.23	19.88
N2	18.60	20.28	20.53	20.03	19.86	18.89	20.33	19.61
N3	18.38	18.16	20.12	20.11	19.19	17.41	18.18	17.80
PO*	18.54	19.49	20.51	18.12	19.16	19.23	20.12	19.68
P1*	18.93	19.39	20.12	18.13	19.14	19.20	20.29	19.75
KO*	18.65	19.50	20.56	18.44	19.29	19.89	20.26	20.08
K1*	18.82	19.37	20.07	17.81	19.02	18.54	20.15	19.35

\* In addition to basal

68/B/1.11

POTATOES 1ST TEST CROP. % WARE

1965 - 1967

FOSTERS

	Lu	LC	LN	AH	Mean	RC	RN	Mean
Mean	93.0	94.3	93.3	92.2	93.2	92.5	93.0	92.8
F	93.2	94.6	93.4	91.8	93.3			
D	92.8	94.0	93.2	92.6	93.2			
NO	93.5	94.6	93.4	88.2	92.4	93.5	93.3	93.4
N1	93.1	94.1	93.2	92.8	93.3	93.6	93.7	93.6
N2	93.3	94.9	93.1	93.7	93.7	92.1	93.2	92.6
N3	92.2	93.8	93.6	94.2	93.4	91.0	92.1	91.5
PO*	92.9	93.9	93.2	92.4	93.1	92.1	92.7	92.4
P1*	93.1	94.8	93.5	92.0	93.3	92.9	93.3	93.1
KO*	93.0	94.4	93.6	92.4	93.3	92.2	93.1	92.6
K1*	93.0	94.3	93.0	92.0	93.1	92.9	93.0	92.9

\* In addition to basal

68/B/1.12

POTATOES 2ND TEST CROP. TOTAL TUBERS

1964 - 1966

	Lu	LC	LN	AH	Mean
HIGHFIELD					
Mean	16.68	16.11	16.78	16.16	16.43
		(±0.568)			(±0.284)
F	16.87	15.92	15.96	15.92	16.17
D	16.49	16.31	17.60	16.40	16.70
To wheat 1967		(±0.568)*			(±0.284)
NO2	15.89	15.81	16.65	15.82	16.04
N13	17.47	16.42	16.91	16.49	16.82
FOSTERS					
Mean	15.47	14.63	15.66	14.85	15.15
		(±0.426)*			(±0.213)
F	15.19	15.15	15.49	14.19	15.01
D	15.76	14.12	15.83	15.50	15.30
To wheat 1967		(±0.426)*			(±0.213)
NO2	15.14	14.45	15.79	15.05	15.11
N13	15.81	14.81	15.52	14.64	15.20

\* For use in vertical and interaction comparisons

68/B/1.13

POTATOES 2ND TEST CROP. % WARE

1964 - 1966

	Lu	LC	LN	AH	Mean
HIGHFIELD					
Mean	95.5	95.6	95.2	96.0	95.6
F	95.8	95.8	94.9	96.8	95.8
D	95.2	95.5	95.4	95.3	95.4
To wheat 1967					
NO2	95.3	95.8	95.0	96.6	95.7
N13	95.6	95.5	95.3	95.5	95.5
FOSTERS					
Mean	96.3	96.8	96.7	97.1	96.7
F	96.1	96.8	97.2	97.2	96.9
D	96.4	96.7	96.2	96.9	96.5
To wheat 1967					
NO2	96.2	96.4	96.7	97.4	96.7
N13	96.3	97.1	96.7	96.7	96.7

68/B/1.14

BARLEY 3RD TEST CROP

GRAIN

1963 - 1965

	Lu	LC	LN	AH	Mean
HIGHFIELD					
Mean	40.3	41.9	41.0	38.4	40.4
1968					
NO	37.2	41.2	40.8	34.1	38.3
N1	40.8	42.0	39.6	37.0	39.8
N2	41.5	43.4	41.4	41.1	41.9
N3	41.8	41.0	42.4	41.5	41.7
1967					
F	39.0	41.5	41.0	38.4	40.0
D	41.7	42.3	41.1	38.4	40.9
Excluding AH					
1968					
1967	NO	N1	N2	N3	Mean
F	38.4	39.8	41.1	42.6	40.5
D	41.0	41.8	43.1	40.9	41.7

Mean D.M. %: 83.2

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BARLEY 3RD TEST CROP

GRAIN

1963 - 1965

	Lu	LC	LN	AH	Mean
FOSTERS					
Mean	38.4	37.1	37.8	35.9	37.3
1968					
NO	32.7	34.4	33.3	28.9	32.3
N1	39.0	36.4	38.6	-	-
N2	41.1	40.0	39.4	37.4	39.5
N3	40.7	37.7	39.9	39.1	39.4
N4	-	-	-	38.1	-
1967					
F	37.8	36.9	36.8	35.3	36.7
D	39.0	37.4	38.7	36.4	37.9

Excluding AH

1968

1967	NO	N1	N2	N3	Mean
F	31.7	37.1	39.9	39.9	37.2
D	35.2	38.8	40.5	39.0	38.4

Mean D.M. %: 80.1

68/B/1.16

TREATMENT CROPS ARABLE AND HAY ROTATION

HIGHFIELD			FOSTERS		
AH	R	Mean	AH	R	Mean
SUGAR BEET					
ROOTS					
22.62	23.95	23.28	21.99	22.16	22.08
SUGAR %					
15.3	14.8	15.0	15.8	15.3	15.5
TOTAL SUGAR					
69.1	70.8	69.9	69.5	67.8	68.6
TOPS					
17.85	22.05	19.95	18.21	22.69	20.45
OATS					
GRAIN					
31.5	37.0	34.2	39.2	40.2	39.7

Mean D.M. %: Oats, grain: Highfield: 82.5  
 Fosters: 81.4

68/B/1.17

LUCERNE: DRY MATTER

	HIGHFIELD			FOSTERS		
	F	D	Mean	F	D	Mean
2nd year (4 cuts)	63.9	68.2	66.0	83.5	87.3	85.4
3rd year (3 cuts)	30.1	26.4	28.2	40.5	40.6	40.5

ALL-GRASS LEY: DRY MATTER

	HIGHFIELD			FOSTERS		
	F	D	Mean	F	D	Mean
2nd year (4 cuts)	100.9	99.0	99.9	101.5	100.3	100.9
3rd year (4 cuts)	94.9	97.0	96.0	103.2	109.7	106.4

CLOVER-GRASS LEY: DRY MATTER

	HIGHFIELD			FOSTERS		
	F	D	Mean	F	D	Mean
2nd year (4 cuts)	69.8	72.0	70.9	74.9	77.5	76.2
3rd year (4 cuts)	50.6	53.4	52.0	57.6	57.3	57.5

68/B/1.18

PERMANENT GRASS: DRY MATTER

	GC	GN	Mean
HIGHFIELD			
18th Exptl year Blocks 9 and 12	35.5	95.2	65.4
Blocks 10 and 11	38.8	109.3	74.0
20th Exptl year Blocks 1 and 4	41.2	102.6	71.9
Block 2	39.3	107.7	73.5

RESEDED GRASS: DRY MATTER

	HIGHFIELD			FOSTERS			
	RC	RN	Mean	RC	RN	Mean	
18th Exptl year Blocks 9 and 12	39.4	97.0	68.2	18th Exptl year Blocks 6 and 11	51.7	85.8	68.8
20th Exptl year Blocks 1 and 4	51.4	99.4	75.4	20th Exptl year Blocks 1 and 3	56.6	100.3	78.5

(GC, RC) Clover-grass management  
(GN, RN) All-grass management

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LEY AND ARABLE ROTATIONS

(WLA)

Woburn Stackyard 1968 - the 31st year.

For history, treatments etc., see 'Details' 1967 and 'Results' 63/B/4, 64/B/4, 65/B/4, 66/B/4 and 67/B/4.

First test crop: Barley replaced sugar beet and received a basal application of 280 lb (0:20:20) combine drilled.

Corrective K dressings (in cwt K<sub>2</sub>O) as muriate of potash

	No FYM half plots	FYM half plots
Continuous rotations		
Ley	0	1
Sainfoin	3	3
Arable with hay	5	4
Arable	2	2
Alternating rotations		
Arable with hay/ley	0	0.5
Arable/sainfoin	5	3
Ley/arable with hay	5	3
Lucerne/arable	5	3

Nitrogen test on eighth plots: After arable rotations:  
0.4 (N1), 0.8 (N2), 1.2 (N3), 1.6 (N4) cwt N as 'Nitro-Chalk' 21.  
After ley and sainfoin:  
None (N0), 0.4 (N1), 0.8 (N2), 1.2 (N3) cwt N as 'Nitro-Chalk' 21.

First treatment crops: All plots received a basal application of 92 lb MgO as Epsom salts.

- Potatoes: 1. Fumigant on quarter plots: None (0), 400 lb (F) chloropicrin.  
2. Nitrogen on twelfth plots: 1.0 (N1), 1.5 (N2), 2.0 (N3).  
3. Fungicide seed dressing on strips of 6 twenty-fourth plots: None (0), thiram (T) (about 15 lb per acre of dust (50% a.i.) applied to tubers before planting).

NOTE: The thiram dressed seed was chitted and the undressed seed was not chitted because of an error.

Cultivations, etc.:

Treatment crops.

Ley 1st year: Ploughed: 18 Sept, 1967. NPK applied:  
29 Mar, 1968. Mg applied: 3 Apr. Seed sown at 40 lb:  
11 Apr. NK applied: 9 July. Grazed 7 circuits: 17 June -  
15 Oct.

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Ley 2nd year: NK applied: 26 Mar, 1968, 26 June. Grazed 9 circuits: 28 Apr - 15 Oct.

Ley 3rd year: NK applied: 26 Mar, 1968, 17 June. Grazed 10 circuits: 19 Apr - 23 Oct.

Sainfoin 1st year: Ploughed: 18 Sept, 1967. N and K applied: 28 Mar, 1968. P applied: 29 Mar. Mg applied: 3 Apr. Seed drilled at 70 lb: 11 Apr. Cut once: 6 Aug.

Sainfoin 2nd year: N and K applied: 26 Mar, 1968. First cut: 6 June. Sprayed with paraquat at 0.38 lb ion in 30 gals: 10 June. Second cut: 12 Aug. Sprayed with paraquat at 0.38 lb ion in 30 gals: 14 Aug.

Sainfoin 3rd year: N and K applied: 26 Mar, 1968. First cut: 6 June. Sprayed with paraquat at 0.38 lb ion in 30 gals: 10 June. Rotary cultivated to kill having failed after first cut: 19 July. Sprayed with paraquat at 0.38 lb ion in 30 gals: Aug 14,

Potatoes: Ploughed: 18 Sept, 1967. Fumigant applied: 10 Nov. Mg applied: 3 Apr, 1968. PK applied: 4 Apr. Test nitrogen applied: 8 Apr. Rotary cultivated, potatoes planted: 10 Apr. Sprayed with linuron at 0.5 lb plus paraquat at 0.38 lb in 50 gals: 3 May. Grubbed: 1 June. Ridged: 14 June. Sprayed with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5 oz in 38 gals: 12 July. Sprayed with mancozeb at 1.2 lb in 38 gals: 30 July, 6 Aug. Sprayed with undiluted BOV at 15 gals: 4 Sept. Lifted: 2 Oct.

Rye: Ploughed: 18 Sept, 1967. Seed combine drilled at 150 lb: 13 Oct. Seeds undersown (AH plots): 29 Mar, 1968. 'Nitro-Chalk' applied: 8 Apr. Combine harvested: 23 Aug.

Seeds hay: Seeds undersown in rye at 30 lb: 24 Apr, 1967. NPK applied: 26 Mar, 1968. NK applied: 18 June. Cut twice: 6 June, 12 Aug.

Carrots: Ploughed: 12 Oct, 1967. NPK applied: 5 Apr, 1968. Seed drilled at 3.5 lb: 11 Apr. Sprayed with linuron at 0.5 lb in 50 gals: 28 May. Sprayed with DDT at 0.5 pints in 20 gals: 30 May. Sprayed with menazon at 0.25 lb in 50 gals: 18 June. Lifted: 12 - 13 Nov.

#### Test crops.

Barley, 1st test crop: Half corrective K applied: 25 Oct, 1967. Ploughed: 13 Nov. Remaining corrective K applied: 13 Feb, 1968. Seed combine drilled at 140 lb: 6 Mar. Test 'Nitro-Chalk'

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applied: 14 Mar. Sprayed with ioxynil/mecoprop (Actril C at 5 pints in 25 gals): 26 Apr. Combine harvested: 21 Aug.

Barley, 2nd test crop: Magnesian limestone applied at 45 cwt. Ploughed: 17 Nov, 1967. Seed combine drilled at 140 lb: 9 Mar, 1968. 'Nitro-Chalk' applied: 11 Mar. Sprayed with ioxynil/mecoprop (Actril C at 5 pints in 25 gals): 26 Apr. Combine harvested: 20 Aug.

Standard errors per plot.

Barley, 2nd test crop, grain:

Whole plot: 1.86 or 6.4% (4 d.f.)

Sub plot: 1.32 or 4.5% (4 d.f.)

68/B/2.4

SUMMARY OF RESULTS

TREATMENT CROPS

SAINFOIN, DRY MATTER

	1st cut	2nd cut	Total
1ST YEAR			
DO	22.8		
D1	20.0		
LU*	22.6		
AH	20.2		
Mean	21.4		
Mean D.M. %:	15.3		
2ND YEAR			
DO	45.3	16.8	62.1
D1	46.0	14.7	60.7
LU	42.6	13.7	56.3
AR	48.7	17.8	66.5
Mean	45.6	15.8	61.4
Mean D.M. %:	14.0	25.8	19.9
3RD YEAR			
DO	46.8		
D1	44.8		
LU	44.6		
AH	46.9		
Mean	45.8		
Mean D.M. %:	14.0		

\* Lucerne 1963 - 64, sainfoin 1965.

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TREATMENT CROPS					
POTATOES					
	LE	LU**	AH	AR	Mean
TOTAL TUBERS					
DO	19.76	20.16	12.97	14.83	16.93
D1*	19.05	19.99	14.74	15.55	17.33
O	17.78	18.12	8.53	9.05	13.37
F	21.02	22.02	19.18	21.33	20.89
N2	18.87	18.60	13.64	15.20	16.58
N3	18.98	20.99	14.40	15.46	17.46
N4	20.35	20.63	13.53	14.90	17.35
O	19.10	20.75	14.33	14.13	17.08
T	19.70	19.40	13.37	16.25	17.18
Mean	19.40	20.07	13.85	15.19	17.13
% WARE					
DO	96.8	97.0	95.8	95.3	96.2
D1*	96.4	96.8	96.8	96.0	96.5
O	96.7	97.2	95.0	94.2	95.8
F	96.6	96.6	97.6	97.1	97.0
N2	96.6	96.5	96.0	95.7	96.2
N3	96.4	96.8	96.4	95.8	96.4
N4	96.9	97.3	96.4	95.6	96.5
O	96.7	97.2	96.7	95.0	96.4
T	96.6	96.6	95.8	96.3	96.3
Mean	96.6	96.9	96.3	95.7	96.4

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TREATMENT CROPS

RYE

GRAIN

DO	29.7
D1*	33.0
Ley	32.2
LU**	26.9
AH	36.0
AR	30.4
Mean	31.4

HAY

DRY MATTER

	1st cut	2nd cut	Total
1964			
DO	64.1	37.7	101.8
D1*	63.4	39.1	102.5
AH	64.3	37.8	102.1
LU	63.2	39.0	102.2
Mean	63.7	38.4	102.1

Mean D.M. %: Rye, Grain: 84.1

\* FYM applied: Potatoes - for test crop sugar beet in 1966  
 Rye - for test crop sugar beet in 1965  
 Hay - for test crop sugar beet in 1963

\*\* Lucerne 1963 - 64, sainfoin 1965.

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CARROTS

	ROOTS	TOPS
1964		
DO	33.97	4.69
D1*	34.57	5.04
AR	34.06	4.09
Ley	34.48	5.64
Mean	34.27	4.86

\* FYM applied for test crop sugar beet in 1964

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1ST TEST CROP

BARLEY

GRAIN

	NO	N1	N2	N3	N4
D0 Ley	31.7	28.0	25.8	23.1	-
SA	30.7	30.1	28.0	23.0	-
AH	-	31.5	27.3	22.9	24.2
AR	-	32.9	31.0	30.0	23.1
D1 Ley	34.4	29.1	20.8	22.8	-
SA	32.7	27.1	26.6	23.1	-
AH	-	32.0	27.6	22.7	23.9
AR	-	33.7	31.5	27.9	23.1
	Ley	SA	AH	AR	Mean
CON	26.4	28.0	26.8	29.4	27.7
ALT	27.5	27.4	26.2	28.9	27.5
Mean	27.0	27.7	26.5	29.2	27.6

Mean D.M. %: 80.4

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1ST TEST CROP

BARLEY

STRAW

	NO	N1	N2	N3	N4
DO Ley	37.5	36.5	31.5	38.5	-
SA	39.1	37.6	43.0	30.4	-
AH	-	33.0	36.6	38.2	31.5
AR	-	30.9	39.4	39.5	35.7
D1 Ley	30.8	39.7	42.0	25.0	-
SA	31.5	36.0	36.8	32.7	-
AH	-	40.5	40.5	27.4	31.4
AR	-	32.3	43.7	38.4	28.4
	Ley	SA	AH	AR	Mean
CON	36.1	36.4	35.1	34.9	35.6
ALT	34.2	35.4	34.7	37.2	35.4
Mean	35.2	35.9	34.9	36.0	35.5

Mean D.M. %: 79.5

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2ND TEST CROP

BARLEY

GRAIN

	Ley	SA	AH	AR	Mean
		(1) and (2)			(±0.47)
1967					
D0	29.1	28.8	31.1	30.4	29.9
D1	27.9	27.7	30.3	27.7	28.4
Mean (±1.32)	28.5	28.3	30.7	29.0	29.1

Mean D.M. %: 79.2

- (1) (±1.47) For use in horizontal and diagonal comparisons only  
 (2) (±0.93) For use in vertical and interaction comparisons only

68/B/3.1

REFERENCE PLOTS

ROTHAMSTED (R) GREAT FIELD IV AND HIGHFIELD IX

AND

WOBURN (W) STACKYARD SERIES C, 1968

(ERA, ERG, WERA and WERF)

For details of previous years' results and for rates of fertilisers, etc., see 'Results' 58/Bc/1, 59/Bc/1, 60/B/3, 61/B/2, 62/B/2, 63/B/2, 64/B/2, 65/B/2, 66/B/2 and 67/B/2. For conifer seedbeds and transplants see 63/B/2, 64/B/2, 65/B/2, 66/B/2, 67/B/2.

Great Field IV (R): A test of none v 44 lb Mg as magnesium sulphate is applied to half plots on potatoes (excluding additional plots).

Stackyard Series C (W): The test of manganese sulphate and magnesium sulphate to oats is discontinued. A test of none v 44 lb Mg as magnesium sulphate is applied to half plots on potatoes and sugar beet. Balancing dressings are applied to untreated half plots after harvest. The variety of oats is now Pendrwm.

Conifer seedbeds and transplants. Bed 2. Grand Fir (*Abies grandis*) replaced Norway Spruce (*Picea abies*) in both the transplants and seedbeds.

Cultivations, etc.:-

Great Field IV (R):-

Winter wheat: Plots dug by hand, P, K, Mg, Ca and S applied: 27 Sept, 1967. Seed drilled: 6 Oct. First N dressing applied (excluding additional plots): 1 Mar, 1968. Second N dressing applied, all N applied to additional plots: 24 Apr. Trace element spray applied: 26 Apr. Harvested: 29 Aug.

Kale: FYM applied, plots dug by hand: 13 Nov, 1967. P, K, Mg, Ca and S applied: 23 Feb, 1968. Plots rotary cultivated, seed drilled, first N dressing applied to additional plots: 27 Mar. N applied (excluding additional plots): 24 Apr. Second N dressing applied to additional plots: 23 May. Sprayed with dimethoate at 4 oz in 50 gals: 31 May. Trace element spray applied: 11 June. Sprayed with malathion, dimethoate and DDT (Pestex at 10 fluid oz in 50 gals): 11 July. Harvested: 18 Oct.

Barley: Dug by hand: 10 Nov, 1967. P, K, Ca, Mg and S applied: 23 Feb, 1968. Plots rotary cultivated, seed drilled: 8 Mar. N applied: 4 Apr. Trace element spray applied: 14 May. Harvested: 21 Aug.

Grass-clover ley: Undersown in barley: 14 Apr, 1967. P, K, Ca, Mg and S applied: 23 Feb, 1968. N applied: 1 Mar. Trace element spray applied: 18 Apr. Cut four times: 23 Oct, 1967, 31 May, 1968, 19 July, 3 Oct.

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Potatoes: FYM applied, plots dug by hand: 15 Nov, 1967. P, K, Ca, Mg and S applied: 23 Feb, 1968. First N dressings applied to additional plots, all N applied to remaining plots, plots rotary cultivated, Mg applied to half plots, potatoes planted: 27 Mar. Second N dressing applied to additional plots: 23 May. Earthed up: 24 May. Sprayed with dimethoate at 4 oz in 50 gals: 31 May. Trace element spray applied: 11 June. Sprayed with malathion, dimethoate and DDT (Pestex at 10 fluid oz in 50 gals): 11 July. Sprayed twice with dimethoate, fentin acetate and maneb (Rogor 20W at 1.5 lb and Fennite at 1.5 lb in 80 gals): 15 July and 12 Aug. Lifted: Plots of main experiment with neither K nor FYM and no fertiliser plots of additional plots: 30 Aug, remainder: 24 Sept.

Permanent grass: FYM, P and K applied: 23 Feb, 1968. N applied, first dressing: 1 Mar, second: 20 May, third: 19 July. Cut three times: 20 May, 19 July, 3 Oct.

- NOTES: (1) Yields of dry matter were obtained for each crop.  
(2) The percentages of N, P and K, and on additional plots of N, P, K, Mg, Ca and S, were measured for each crop.  
(3) The percentage of Mg was measured in potato tubers on the main experiment.

Stackyard Series C (W):-

Winter oats: Plots dug by hand: 20 Sept, 1967. P and K applied: 28 Sept. Seed drilled: 18 Oct. First N dressing applied: 12 Mar, 1968. Second N dressing applied: 30 Apr. Sprayed with ioxynil at 9 oz and mecoprop at 27 oz in 50 gals: 3 May. Harvested: 12 Aug.

Sugar beet: Balancing Mg applied to half plots: 5 Oct, 1967. FYM applied, plots dug by hand: 4 Dec. P and K applied: 22 Mar, 1968. First N dressing applied, plots rotary cultivated, Mg applied to half plots, seed drilled: 26 Mar. Singled, second N dressing applied: 5 June. Sprayed twice with malathion, dimethoate and DDT (Pestex at 10 fluid oz in 50 gals): 12 June and 3 July. Sprayed with dimethoate (Rogor 20W at 1.5 lb in 50 gals): 18 July. Harvested: 10 Oct.

Barley: Plots dug by hand: 5 Dec, 1967. P and K and first N dressing applied, plots rotary cultivated, seed drilled: 12 Mar, 1968. Second N dressing applied: 30 Apr. Harvested: 21 Aug.

Grass-clover ley: Undersown in barley: 16 Mar, 1967. N, P and K applied: 12 Mar, 1968. Cut four times: 18 Oct, 1967, 28 May, 1968, 18 July, 10 Oct.

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Potatoes: FYM applied: 4 Dec, 1967. Plots dug by hand: 5 Dec. P and K applied: 22 Mar, 1968. First N dressing applied, plots rotary cultivated, potatoes planted, Mg applied to half plots: 28 Mar. Second N dressing applied, plots earthed up: 5 June. Sprayed with malathion, dimethoate and DDT (Pestex at 10 fluid oz in 50 gals): 12 June. Sprayed twice with dimethoate, fentin acetate and maneb (Rogor 20W at 1.5 lb and Fennite at 1 lb in 50 gals): 18 July and 12 Aug. Lifted plots with neither K nor FYM: 10 Sept, remainder: 23 Sept.

Permanent grass: FYM, first N dressing and P and K applied: 12 Mar, 1968. Second N dressing applied: 28 May. Third N dressing applied: 23 July. Cut three times: 28 May, 18 July, 10 Oct.

- NOTES: (1) Samples were taken for determination of dry matter for each crop, and the percentage of N, P and K.  
(2) The percentage of Mg in the leaves of sugar beet and in potato tubers was determined.  
(3) Surface soil samples were taken from each block for a determination of soil pH.

Grazed Reference Plots (Highfield IX (R)):-

Cultivations, etc.: P and K fertilisers applied, ground chalk applied to appropriate plots: 6 Dec, 1967. First N dressings applied: 13 Mar, 1968. Sample cuts taken four times: 6 May, 27 June from 2 blocks, 1 July from remaining 2 blocks, 3 Sept, 28 Oct. Sampling cages moved after each cut. N dressing applied after each cut except the last.

- NOTES: (1) The percentages of N, P and K in the dry grass were measured.  
(2) Visual estimates were made of the percentage surface area covered by clover leaves.

Conifer seedbeds and transplants:

Bed 1: Formalin (250 ml. in 4 l. water per sq. yd.) applied: 18 Jan, 1968. All manures (other than N) dug in: 19 Mar. Seed sown: 28 - 29 Mar. T.V.O. pre-emergence spray: 22 Apr. N top dressed: 14 June, 12 July, 2 Aug, 13 Sept.

Bed 2: Seedbeds as for Bed 1. Transplants plots lined out: 28 - 29 Mar, 1968. All manures (other than N) as for seedbeds. N top dressed on transplants: 6 May, 14 June, 12 July, 2 Aug.

- NOTES: (1) Height assessments and samples for analyses as in 1967.  
(2) Plots lacking N, P, K and Mg had typical deficiency symptoms.

68/B/3.4

Standard errors per plot.

Highfield IX (R), Grass Dry matter:

1st cut:	3.51 or 20.3% (39 d.f.)
2nd cut:	4.14 or 9.8% (39 d.f.)
3rd cut:	3.81 or 10.8% (39 d.f.)
4th cut:	3.64 or 17.4% (39 d.f.)
Total of 4 cuts:	8.25 or 7.1% (39 d.f.)

Stackyard Series (C) W, Sitka Spruce Bed 1:

Mean height:	0.189 or 8.8% (11 d.f.)
Plant number:	92.7 or 10.6% (11 d.f.)

NOTE: In 1968 (and previous years) the sub plot tests of Mg and Mn are ignored in the tables. The figures presented are means over sub plot treatment.

SUMMARY OF RESULTS

GREAT FIELD IV (R): ORIGINAL PLOTS

Treatment	WINTER GRAIN		WHEAT: STRAW		KALE: TOTAL WEIGHT		BARLEY: GRAIN STRAW		LEY: DRY MATTER				PERMANENT GRASS: DRY MATTER					
	GRAIN	STRAW	GRAIN	STRAW	GRAIN	STRAW	GRAIN	STRAW	1st cut	2nd cut	3rd cut	4th cut	Total of 4 cuts	TOTAL TUBERS	1st cut	2nd cut	3rd cut	Total of 3 cuts
None	23.8	31.5	9.38	17.3	0.7	16.3	7.3	4.4	28.7	4.24	8.3	15.6	14.5	38.4	8.3	15.6	14.5	38.4
N1	22.2	33.2	10.07	15.8	0.6	30.3	10.9	6.9	48.7	3.46	12.2	14.3	21.6	48.1	12.2	14.3	21.6	48.1
P	16.0	26.7	14.41	18.1	2.3	28.5	17.3	7.8	55.9	3.03	8.0	12.4	16.0	36.4	8.0	12.4	16.0	36.4
N1P	12.4	23.5	20.84	15.8	1.8	30.6	9.3	6.2	47.9	3.22	15.9	16.7	23.9	56.5	15.9	16.7	23.9	56.5
K	30.2	40.5	12.16	14.8	5.4	30.6	22.0	9.5	67.5	15.20	9.6	13.6	21.1	44.3	9.6	13.6	21.1	44.3
N1K	34.2	54.8	11.46	24.6	7.0	40.2	23.3	11.3	81.8	16.73	22.7	21.7	24.0	68.4	22.7	21.7	24.0	68.4
PK	33.6	48.7	12.50	19.3	7.9	39.8	23.3	10.7	81.7	16.88	12.9	18.6	19.9	51.4	12.9	18.6	19.9	51.4
N1PK	38.7	54.4	24.14	38.7	4.6	38.8	16.3	10.0	69.7	19.25	22.2	21.6	26.7	70.5	22.2	21.6	26.7	70.5
N2PK	42.2	65.4	31.42	45.9	4.2	50.6	13.8	14.4	83.0	23.39	35.6	24.4	21.0	81.0	35.6	24.4	21.0	81.0
D	38.7	53.6	20.32	22.8	9.2	38.8	31.1	16.1	95.2	23.73	28.7	19.6	27.5	75.8	28.7	19.6	27.5	75.8
N1PKD	44.7	69.8	34.20	42.1	3.6	45.0	18.9	15.7	83.2	26.87	40.1	24.0	31.4	95.5	40.1	24.0	31.4	95.5
N2PKD	41.5	72.6	39.58	54.0	2.3	52.0	18.0	14.7	87.0	31.04	45.3	26.1	27.2	98.6	45.3	26.1	27.2	98.6
Mean D.M. %:	83.1	77.2		76.6	19.3	20.8	20.9	19.4	20.1		23.2	24.8	21.7	23.2	23.2	24.8	21.7	23.2

68/B/3.5

GREAT FIELD IV (R): ADDITIONAL PLOTS

LEY: DRY MATTER

Treatment	WINTER WHEAT:		KALE: TOTAL WEIGHT	BARLEY:		1st cut	2nd cut	3rd cut	4th cut	Total of 4 cuts	POTATOES: TOTAL TUBERS
	GRAIN	STRAW		GRAIN	STRAW						
None	30.2	39.5	9.72	15.2	11.3	2.2	22.2	9.2	6.4	40.0	6.01
N2PK	49.6	73.4	37.33	43.3	40.1	6.2	52.8	16.3	17.4	92.7	22.54
N2 PK Mg Ca	45.2	69.5	36.46	44.9	45.3	7.6	44.2	20.7	15.9	88.4	18.84
N2 PK Mg S	50.6	65.4	36.46	46.6	47.1	6.3	48.2	17.3	18.6	90.4	17.50
N2 PK Ca S	49.6	71.2	28.82	45.6	45.4	4.7	53.6	20.4	18.1	96.8	19.29
N2 PK Mg Ca S	46.4	72.4	36.12	46.7	47.8	8.8	48.0	19.2	17.4	93.4	18.60
N2 PK Mg Ca S TE	48.7	67.4	37.16	48.9	43.8	6.3	48.4	18.6	16.3	89.6	20.10
Mean D.M. %:	83.8	81.4		84.1	82.2	17.0	22.3	21.6	18.4	19.8	

68/B/3.6

68/B/3.7

STACKYARD SERIES C (W)

Treatment	OATS		SUGAR BEET			BARLEY	
	GRAIN	STRAW	ROOTS	SUGAR %	TOTAL SUGAR	GRAIN	STRAW
None	17.5	15.8	4.78	14.2	13.6	11.9	12.1
N1	34.5	35.3	6.33	13.3	16.8	26.6	29.2
P	16.7	15.5	5.56	13.7	15.2	14.8	13.1
N1P	35.6	35.4	6.18	13.4	16.6	23.4	26.4
K	16.2	15.6	8.49	15.5	26.3	13.5	11.6
N1K	34.0	43.4	11.88	15.7	37.3	26.5	30.8
PK	16.8	16.6	8.64	15.5	26.8	13.3	11.5
N1PK	30.2	47.8	12.50	15.3	38.2	27.4	32.2
N2PK	38.7	59.6	13.43	14.8	39.8	28.4	44.6
D	21.6	18.6	14.66	15.8	46.3	20.7	18.8
N1PKD	34.5	50.1	14.82	15.4	45.6	25.4	40.6
N2PKD	34.2	72.2	19.91	15.4	61.3	26.5	37.6
Mean D.M. %:	78.1	53.2				82.2	68.5

68/B/3.8

STACKYARD SERIES C (W)

Treatment	LEY: DRY MATTER					Total of 4 cuts	POTATOES		PERMANENT GRASS: DRY MATTER			
	1st cut	2nd cut	3rd cut	4th cut	TOTAL TUBERS		1st cut	2nd cut	3rd cut	Total of 3 cuts		
None	3.3	14.6	15.6	10.5	44.0	4.16	14.9	7.7	13.0	35.6		
N1	2.4	27.4	13.5	9.2	52.5	4.07	20.8	15.6	20.8	57.2		
P	3.4	15.1	13.2	10.1	41.8	3.82	14.2	8.3	12.6	35.1		
N1P	3.8	27.6	12.0	7.9	51.3	4.10	21.4	16.1	19.7	57.2		
K	10.9	21.3	26.9	15.2	74.3	5.10	18.6	9.0	13.7	41.3		
N1K	8.5	30.6	25.6	14.1	78.8	9.80	31.2	18.6	27.5	77.3		
PK	12.0	14.7	23.3	16.6	66.6	7.96	21.1	9.9	14.3	45.3		
N1PK	9.8	34.6	23.4	16.8	84.6	10.68	32.2	19.6	25.0	76.8		
N2PK	6.3	43.2	15.7	14.9	80.1	15.31	36.2	21.1	28.4	85.7		
D	10.9	19.9	23.5	15.5	69.8	16.20	29.7	9.9	16.6	56.2		
N1PKD	10.1	38.2	24.5	15.9	88.7	22.73	38.8	17.8	30.8	87.4		
N2PKD	7.4	45.8	21.2	15.4	89.8	27.76	45.7	25.5	33.0	104.2		
Mean D.M. %:	17.5	19.4	22.5	19.1	19.6		19.0	24.1	20.9	21.3		

68/B/3.9

STACKYARD C (W). Bed 1

SITKA SPRUCE

Treatment	MEAN HEIGHT: INCHES	PLANT NUMBER: PER SQ YARD
	(±0.134)	(±65.5)
None	1.68 (1)	890 (2)
PK Mg	1.34	870
NK Mg	1.43	867
NP Mg	1.81	927
NPK	1.82	828
NPK Mg	2.53 (1)	807 (2)
NPK Mg F	2.99	825
C	2.24	858
C NPK Mg	2.99	1008
L NPK Mg	2.73	951
Mean	2.15	877

(1) (±0.094)

(2) (±46.4)

Bed 2 plots 1 - 6 (Transplant)

	O	A	B	Mean
	MEAN HEIGHT: INCHES			
SS	8.59	14.43	15.13	12.71
GF	6.55	7.66	8.93	7.72

68/B/3.10

Bed 2 Plots 7 - 12 Seed bed

	O	A	B	Mean
MEAN HEIGHT: INCHES				
SS	1.10	2.63	2.78	2.17
GF	1.11	1.71	1.77	1.53
PLANT NUMBERS: PER SQ YD				
SS	954	948	1146	1016
GF	588	690	726	668

68/B/3.11

HIGHFIELD IX (R)

GRASS: DRY MATTER

	1st cut	2nd cut	3rd cut	4th cut	Total of 4 cuts
PK	(±1.75)	(±2.07)	(±1.90)	(±1.82)	(±4.12)
NO 00	8.5	30.5	32.8	17.9	89.7
N1 00	13.7	40.3	36.7	20.8	111.5
A1 00	14.4	44.0	34.1	21.8	114.4
NO 10	11.5	33.5	31.5	18.4	95.0
N1 10	17.5	42.1	36.1	26.1	121.7
A1 10	22.7	44.2	34.1	23.3	124.3
NO 01	10.4	33.9	31.1	13.4	88.8
N1 01	20.3	46.3	35.0	20.1	121.7
A1 01	21.5	46.0	32.2	25.6	125.3
NO 11	8.2	33.0	35.3	16.7	93.3
N1 11	25.9	47.6	37.1	21.5	132.1
A1 11	24.1	46.4	39.1	23.9	133.4
N2 11	21.5	50.6	36.5	20.8	129.3
A2 11	21.9	52.7	40.0	22.4	136.9
Mean	17.3	42.2	35.1	20.9	115.5

Mean D.M. %: 1st cut: 17.4  
 2nd cut: 18.1  
 3rd cut: 16.8  
 4th cut: 13.6  
 Total of 4 cuts: 16.5



68/B/4.1

WOBURN MARKET GARDEN

(WMG)

Residues of organic manures, P and K on spring beans -  
Lansome I 1968.

For history (treatments) etc. see 'Details 1967' and 'Results'  
63/B/5, 64/B/5, 65/B/5, 66/B/5 and 67/B/5.

Area of each plot: 0.0109. Area harvested: 0.0041.

Treatment symbols: (No manures applied 1968).

Farmyard manure: 10 (D1), 20 (D2) tons.

Sewage sludge: 10 (S1), 20 (S2) tons.

Sewage sludge/  
straw compost: 10 (T1), 20 (T2) tons.

Vegetable compost: 10 (C1), 20 (C2) tons.

Peat: 12.5 (PT) tons.

PK fertiliser: None (P0K0), 1.5 cwt P205, 1.5 cwt K20 until  
1967 (P1K1). 1.5 cwt P205, 3.0 cwt K20 until  
1964 on Series B and 1965 on Series A, then  
3.0 cwt P205, 3.0 cwt K20 on both until 1967  
(P2K2).

Basal applications: Manures: None. Weedkiller: Simazine at 0.75 lb  
in 33 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 37 gals.

Cultivations, etc.: Ploughed: 25 Nov, 1967. Seed drilled at 200 lb:  
28 Feb, 1968. Weedkiller applied: 1 Mar. Insecticide applied:  
17 June. Series B combine harvested: 20 Sept, Series A: 23 Sept.  
Variety: Tarvin.

68/B/4.2

SUMMARY OF RESULTS

GRAIN

SERIES A

Organic 1942-61* 1963-67		POKO	PK1	P2K2	Mean
0	0		35.1	32.2	33.6
S1	0		34.3**		
S2	0		35.7**		
T1	0		35.2**		
T2	0		35.1**		
D1	D1	34.0	32.5		33.3
D2	D2	34.9	32.6		33.7
C1	D1	33.2	36.0		34.6
C2	D2	32.1	35.5		33.8

General mean: 34.3

Mean D.M. %: 74.9

\* Last applied to leeks 1961/62

\*\* PK1 until 1965

68/B/4.3

GRAIN

SERIES B

Organic			POKO	P1K1	P2K2	Mean
1942-62	1963-64	1966-67				
O	O	O		29.0	30.8	29.9
O	O	PT		30.1	29.1	29.6
S1	O	O	31.7*			
S2	O	O	32.3*			
T1	O	O	32.3*			
T2	O	O	33.2*			
D1	D1	D1	28.9	31.0		
D1	D1	O	34.2	30.6		
D2	D2	D2	30.7	30.6		
D2	D2	O	29.8	28.3		
C1	D1	D1	29.9	31.6		
C2	D2	D2	27.5	29.2		

General mean: 30.9

Mean D.M. %: 69.7

\* P1K1 until 1964



68/B/5.1

## RESIDUAL PHOSPHATE ROTATION

(RP)

The long term and residual effects of phosphate fertilisers - Great Field IV and Sawyers I, the 9th year. For treatments and previous years' results see 'Details' 1967 and 'Results' 67/B/6.

### Area of each plot:

Great Field IV: 0.0193. Area harvested: Potatoes and barley - 0.0129, swedes - 0.0096.

Sawyers I: 0.0212. Area harvested: Potatoes and barley - 0.0141, swedes - 0.0106.

The basal nitrogen for barley is now 0.8 cwt N on Sawyers and 0.4 cwt N on Great Field IV, applied as 'Nitro-Chalk'.

Cultivations, etc. (both fields):- Ploughed: 20 Nov, 1967.

Potatoes: Fertilisers applied: 28 Mar, 1968. Plots rotary cultivated, potatoes planted: 28 Mar. Sprayed with paraquat at 0.38 lb ion and linuron at 0.75 lb in 36 gals: 3 May. Sprayed 3 times with mancozeb at 1.2 lb in 37 gals: 3 July, 19 July, 5 Aug. The spraying on 19 July included demeton-s-methyl at 3.5 oz. Sprayed with undiluted BOV at 15 gals: 30 Aug. Lifted: 2 Oct.

Barley: Fertilisers applied, seed drilled at 140 lb: 29 Feb, 1968. Combine harvested: 20 Aug.

Swedes: Fertilisers applied: 21 May, 1968. Seed drilled at 1.25 lb: 22 May. Singled: 26 June - 10 July. Lifted: 19 Nov.

### Standard errors per plot.

#### Sawyers I:

Potatoes: 0.899 or 7.0% (11 d.f.)

Barley: 2.29 or 7.5% (11 d.f.)

Swedes: 1.586 or 12.9% (11 d.f.)

68/B/5.2

SUMMARY OF RESULTS

POTATOES

Treat- -ment	TOTAL TUBERS		PERCENTAGE WARE	
	Great Field IV Mean	Sawyers I Mean	Great Field IV Mean	Sawyers I Mean
		(±0.636)		
O	11.87	12.27	97.8	97.7
A1	12.91	13.30	97.2	97.8
A2	12.32	13.48	96.2	97.3
A3	13.41	14.46	97.5	96.7
A4	14.25	14.89	96.1	97.2
T1	10.26	9.97	95.4	96.5
T2	13.16	12.20	97.3	98.2
R2	12.12	12.90	96.7	97.5
R3	13.89	13.79	97.0	97.0
R4	15.23	14.81	97.4	97.0
G1	11.42	10.79	96.6	96.6
S1	12.39	11.76	96.6	97.8
Mean	12.77	12.88	96.8	97.3

BARLEY

	GRAIN		STRAW	
			(±1.62)	
O	25.4	27.6	31.4	35.3
A1	26.1	31.7	33.0	40.8
A2	25.8	33.5	33.6	50.1
A3	23.1	30.8	43.0	48.4
A4	24.9	31.0	32.5	45.0
T1	25.6	32.0	29.3	37.0
T2	26.8	31.4	32.1	38.2
R2	22.2	27.4	39.8	48.0
R3	26.6	33.4	44.8	44.4
R4	22.4	25.1	59.5	45.0
G1	27.6	32.2	27.5	37.2
S1	25.3	29.8	30.1	39.0
Mean	25.2	30.5	36.4	42.4
Mean D.M. %:	82.0	82.4	86.1	91.7

68/B/5.3

SWEDES, ROOTS

Treat-ment	Great Field IV Mean	Sawyers I Mean
		(±1.122)
O	8.20	3.05
A1	20.09	13.20
A2	21.30	15.15
A3	23.71	15.81
A4	19.77	15.36
T1	14.31	7.32
T2	18.34	10.57
R2	21.21	14.06
R3	22.04	17.76
R4	22.83	17.47
G1	15.37	7.93
S1	11.71	9.70
Mean	18.24	12.28

Table 1

Table 1. Summary of the data for the 1000 Genomes Project

Region	Number of individuals	Number of SNPs	Number of variants
Admixed African	100	10,000,000	10,000,000
Admixed European	100	10,000,000	10,000,000
Admixed East Asian	100	10,000,000	10,000,000
Admixed South Asian	100	10,000,000	10,000,000
Admixed Latino American	100	10,000,000	10,000,000
YRI	100	10,000,000	10,000,000
CEU	100	10,000,000	10,000,000
CHB	100	10,000,000	10,000,000
GIH	100	10,000,000	10,000,000
ASW	100	10,000,000	10,000,000
CEU+CHB	200	10,000,000	10,000,000
CEU+CHB+CHD	300	10,000,000	10,000,000
CEU+CHB+CHD+YRI	400	10,000,000	10,000,000
CEU+CHB+CHD+YRI+ASW	500	10,000,000	10,000,000
CEU+CHB+CHD+YRI+ASW+GIH	600	10,000,000	10,000,000
CEU+CHB+CHD+YRI+ASW+GIH+LCE	700	10,000,000	10,000,000
CEU+CHB+CHD+YRI+ASW+GIH+LCE+HCB	800	10,000,000	10,000,000
CEU+CHB+CHD+YRI+ASW+GIH+LCE+HCB+JPT	900	10,000,000	10,000,000
CEU+CHB+CHD+YRI+ASW+GIH+LCE+HCB+JPT+KHL	1000	10,000,000	10,000,000

68/B/6.1

CULTIVATION - WEEDKILLER ROTATION

(CW)

Great Harpenden I 1968 - the 8th year

A comparison of weed-control by various cultivation methods and by pre-emergence weedkillers.

For previous history, rotations, treatments etc., see 'Results' 61/B/10, 62/B/10, 63/B/10, 64/B/9, 65/B/8, 66/B/7 and 'Details' 1967.

A comparison is now made of none v paraquat (G) applied to stubbles after beans, wheat and barley. This is made on half-plots, in all combinations with the test of O v H (post-emergence weedkiller to wheat and barley). The interaction (O v G) x (O v H) is confounded with blocks. Both tests are cumulative, except that in certain years H has been applied to all sub-plots. The first application of paraquat was in autumn 1967, at 0.75 lb ion in 32 gals.

NOTE: As in 1967 A and B plots after potatoes before barley received spring-tine cultivation and no other cultivations.

Area harvested: Beans - 0.0121, wheat, potatoes and barley - 0.0107.

Basal dressing to winter wheat: 2.5 cwt (6:15:15) combine drilled and 3 cwt 'Nitro-Chalk' in spring. All other crops as 1967.

Ground chalk: Spring beans - 23 cwt, winter wheat and potatoes - 46 cwt, barley - 92 cwt.

Cultivations, etc.:-

Spring beans: Paraquat applied to G sub-plots: 12 Oct, 1967. Ground chalk applied: 23 Nov. T plots deep-tine cultivated twice and B plots once: 24 Nov. P and C plots ploughed: 27 Nov. R plots rotary cultivated, depth 6 ins: 6 Dec. P,R,T, B and C plots spring-tine cultivated: 1 Mar, 1968. P,R, T and C plots spring-tine cultivated: 4 Mar. A plots rotary cultivated, seed drilled at 200 lb: 5 Mar. S plots sprayed: 8 Mar. M and C plots tractor-hoed three times: 26 Apr, 20 May and 31 May. Combine harvested: 11 Sept. Variety: Maris Bead.

Winter wheat: Paraquat applied to G sub-plots: 12 Oct, 1967. Ground chalk applied: 23 Nov. T plots deep-tine cultivated twice: 24 Nov. P, C and A plots ploughed: 27 Nov. P,T,A, B and C plots spring-tine cultivated twice, R plots rotary

68/B/6.2

cultivated, seed drilled at 190 lb: 5 Dec. All plots harrowed: 25 Mar, 1968. 'Nitro-Chalk' applied: 12 Apr. H sub-plots and B plots sprayed with mecoprop at 42 oz and 2,4-D at 10.5 oz in 33 gals: 4 May. Combine harvested: 25 Aug. Variety: Cappelle.

Potatoes: Paraquat applied to G sub-plots: 12 Oct, 1967. Ground chalk applied: 23 Nov. T plots deep-tine cultivated twice: 24 Nov. P and C plots ploughed: 27 Nov. R plots rotary cultivated, depth 6 ins: 5 Dec. Basal compound fertiliser applied: 13 Mar, 1968. T plots deep-tine cultivated, P,C and R plots spring-tine cultivated (R plots in error), R plots rotary cultivated, P,C and T plots spring-tine cultivated. A and B plots rotary cultivated, potatoes machine planted: 29 Mar. M and C plots chain harrowed: 26 Apr. S plots sprayed: 3 May. M and C plots grubbed: 20 May, mechanically weeded: 24 May, rotary ridged: 28 May. M, C and Y plots grubbed: 7 June. M, C and Y plots rotary ridged: 12 June. All plots sprayed 3 times with mancozeb at 1.2 lb in 37 gals (the second time including demeton-s-methyl at 3.5 oz): 4 July, 19 July, 5 Aug. Sprayed with undiluted BOV at 15 gals: 30 Aug. Haulm destroyed mechanically 13 Sept. Lifted: 1 Oct.

Barley: All plots spring-tine cultivated twice and sprayed twice with sodium trichloroacetate at 18 lb in 32 gals: 28 Sept and 25 Oct, 1967. All plots spring-tine cultivated: 17 Nov. T plots deep-tine cultivated twice: 24 Nov. Ground chalk applied: 7 Dec. P and C plots ploughed, R plots rotary cultivated, depth 4 - 5 ins: 20 Dec. All plots spring-tine cultivated, seed drilled at 140 lb: 1 Mar, 1968. All plots rolled: 13 Mar. H sub-plots and B plots sprayed with mecoprop at 36 oz and 2,4-D at 9 oz in 33 gals: 4 May. Combine harvested: 21 Aug.

Standard errors per plot.

Spring beans:	Grain, whole plot:	1.43 or 6.9% (8 d.f.)
	sub plot:	0.91 or 4.4% (8 d.f.)
Winter wheat:	Grain, whole plot:	2.40 or 6.5% (8 d.f.)
	sub plot:	1.65 or 4.5% (8 d.f.)
Potatoes:	Total tubers, Whole plot:	1.472 or 8.7% (8 d.f.)
	Sub plot:	0.887 or 5.3% (8 d.f.)
Barley:	Grain, Whole plot:	2.80 or 7.9% (8 d.f.)
	Sub plot:	2.88 or 8.1% (9 d.f.)

68/B/6.3

SUMMARY OF RESULTS

SPRING BEANS

GRAIN

	P	R	T	Mean
Mean ( $\pm 0.58$ )	22.3	21.2	19.9	21.1
M ( $\pm 1.01$ )	22.9	20.4	21.1	21.5 ( $\pm 0.58$ )
S ( $\pm 0.71$ )	22.0	21.6	19.3	21.0 ( $\pm 0.41$ )
	(1) and (2)			
O	22.4	20.4	20.4	21.1
G	22.2	22.0	19.4	21.2

(1) ( $\pm 0.64$ ) For use in horizontal and diagonal comparisons only

(2) ( $\pm 0.37$ ) For use in vertical and interaction comparisons only

A	AG	B	BG	C	CG
20.4	18.4	16.9	17.2	22.7	22.6

General mean: 20.8

Mean D.M. %: 76.9

68/B/6.4

WHEAT

GRAIN

	P	R	T	Mean
Mean ( $\pm 0.98$ )	35.2	38.1	38.2	37.2
M ( $\pm 1.70$ )	38.0	37.5	38.9	38.1 ( $\pm 0.98$ )
S ( $\pm 1.20$ )	33.9	38.5	37.9	36.7 ( $\pm 0.69$ )
	(1) and (2)			
O	35.2	38.1	38.0	37.1
G	35.2	38.2	38.5	37.3
	(1) and (2)			
O	34.9	38.6	39.1	37.5
H	35.6	37.7	37.3	36.9

(1) ( $\pm 1.09$ ) For use in horizontal and diagonal comparisons only  
 (2) ( $\pm 0.67$ ) For use in vertical and interaction comparisons only

A	AG	AH	AGH	BH	BGH	C	CG
32.9	38.0	34.0	30.4	30.9	35.3	39.8	39.9

General mean: 36.8

Mean D.M. %: 83.2

68/B/6.5

POTATOES: TOTAL TUBERS

	P	R	T	Mean
Mean ( $\pm 0.425$ )	18.19	15.72	16.59	16.84
		( $\pm 0.736$ )		( $\pm 0.425$ )
M	17.42	14.91	15.81	16.05
S	18.31	15.71	16.42	16.81
SY	18.83	16.55	17.55	17.65
		(1) and (2)		( $\pm 0.209$ )
O	18.12	15.47	16.24	16.61
G	18.25	15.98	16.95	17.06

A AG B BG C CG

15.70 17.37 14.86 15.01 19.66 19.01

- (1) ( $\pm 0.496$ ) For use in horizontal and diagonal comparisons only  
 (2) ( $\pm 0.362$ ) For use in vertical and interaction comparisons only

General mean: 16.86

68/B/6.6

POTATOES: % WARE

	P		R		T		Mean
Mean	98.9		98.9		98.9		98.9
M	98.9		98.7		98.8		98.8
S	98.8		98.8		98.9		98.8
SY	99.0		99.0		99.1		99.1
Q	98.9		99.0		98.8		98.9
G	98.9		98.7		99.0		98.9
A	AG	B	BG	C	CG		
99.0	99.2	98.8	99.2	98.8	99.1		

General Mean: 98.9

68/B/6.7

BARLEY GRAIN				
	P	R	T	Mean
Mean ( $\pm 0.81$ )	36.3	35.0 ( $\pm 1.40$ )	35.8	35.7 ( $\pm 0.81$ )
M	36.5	36.2	35.4	36.0
S	33.9	35.2	36.9	35.3
SY	38.5	33.4	35.0	35.6
		(1) and (2)		( $\pm 0.68$ )
O	35.2	33.1	33.2	33.9
H	37.3	36.8	38.3	37.5
	A	AH	B	C
	33.4	36.5	34.7	32.2

- (1) ( $\pm 1.16$ ) For use in horizontal and diagonal comparisons only  
 (2) ( $\pm 1.17$ ) For use in vertical and interaction comparisons only

General mean: 35.2

Mean D.M.%: 85.0

TABLE 1

SUMMARY OF DATA

Year	Miles			Total Miles
	A	B	C	
1950	100	200	300	600
1951	120	240	360	720
1952	150	300	450	900
1953	180	360	540	1080
1954	200	400	600	1200
1955	220	440	660	1320
1956	240	480	720	1440
1957	260	520	780	1560
1958	280	560	840	1680
1959	300	600	900	1800
1960	320	640	960	1920
1961	340	680	1020	2040
1962	360	720	1080	2160
1963	380	760	1140	2280
1964	400	800	1200	2400
1965	420	840	1260	2520
1966	440	880	1320	2640
1967	460	920	1380	2760
1968	480	960	1440	2880
1969	500	1000	1500	3000
1970	520	1040	1560	3120
1971	540	1080	1620	3240
1972	560	1120	1680	3360
1973	580	1160	1740	3480
1974	600	1200	1800	3600
1975	620	1240	1860	3720
1976	640	1280	1920	3840
1977	660	1320	1980	3960
1978	680	1360	2040	4080
1979	700	1400	2100	4200
1980	720	1440	2160	4320
1981	740	1480	2220	4440
1982	760	1520	2280	4560
1983	780	1560	2340	4680
1984	800	1600	2400	4800
1985	820	1640	2460	4920
1986	840	1680	2520	5040
1987	860	1720	2580	5160
1988	880	1760	2640	5280
1989	900	1800	2700	5400
1990	920	1840	2760	5520
1991	940	1880	2820	5640
1992	960	1920	2880	5760
1993	980	1960	2940	5880
1994	1000	2000	3000	6000
1995	1020	2040	3060	6120
1996	1040	2080	3120	6240
1997	1060	2120	3180	6360
1998	1080	2160	3240	6480
1999	1100	2200	3300	6600
2000	1120	2240	3360	6720
2001	1140	2280	3420	6840
2002	1160	2320	3480	6960
2003	1180	2360	3540	7080
2004	1200	2400	3600	7200
2005	1220	2440	3660	7320
2006	1240	2480	3720	7440
2007	1260	2520	3780	7560
2008	1280	2560	3840	7680
2009	1300	2600	3900	7800
2010	1320	2640	3960	7920
2011	1340	2680	4020	8040
2012	1360	2720	4080	8160
2013	1380	2760	4140	8280
2014	1400	2800	4200	8400
2015	1420	2840	4260	8520
2016	1440	2880	4320	8640
2017	1460	2920	4380	8760
2018	1480	2960	4440	8880
2019	1500	3000	4500	9000
2020	1520	3040	4560	9120
2021	1540	3080	4620	9240
2022	1560	3120	4680	9360
2023	1580	3160	4740	9480
2024	1600	3200	4800	9600
2025	1620	3240	4860	9720
2026	1640	3280	4920	9840
2027	1660	3320	4980	9960
2028	1680	3360	5040	10080
2029	1700	3400	5100	10200
2030	1720	3440	5160	10320
2031	1740	3480	5220	10440
2032	1760	3520	5280	10560
2033	1780	3560	5340	10680
2034	1800	3600	5400	10800
2035	1820	3640	5460	10920
2036	1840	3680	5520	11040
2037	1860	3720	5580	11160
2038	1880	3760	5640	11280
2039	1900	3800	5700	11400
2040	1920	3840	5760	11520
2041	1940	3880	5820	11640
2042	1960	3920	5880	11760
2043	1980	3960	5940	11880
2044	2000	4000	6000	12000
2045	2020	4040	6060	12120
2046	2040	4080	6120	12240
2047	2060	4120	6180	12360
2048	2080	4160	6240	12480
2049	2100	4200	6300	12600
2050	2120	4240	6360	12720

(1) The total length has increased at the rate of 100 miles per year.

(2) The total length has increased at the rate of 100 miles per year.

(3) The total length has increased at the rate of 100 miles per year.

68/B/7.1

## INTENSIVE CEREALS

(WIC)

Woburn Stackyard Classical Site 1968 - the third year

For treatments, and previous years' results, see 'Results' 66/B/9 and 67/B/9.

Area of each sub-plot: 0.0103. Area harvested: Ley - 0.0022, wheat - 0.0033, barley - 0.0066, potatoes - 0.0034.

Wheat blocks only: A test of magnesium was introduced on eighth plots: None (0), 162 lb MgO as Epsom salts (MG).

### Basal applications:

All crops: 1.0 cwt P2O5, 2.0 cwt K2O, half ploughed in, half worked into the seedbed.

Potatoes: 1.2 cwt N as 'Nitro-Chalk'.

Ley: 0.4 cwt N as 'Nitro-Chalk'.

### Cultivations, etc.:

All plots: Half PK applied: 14 Sept, 1967. Ploughed: 15 - 16 Sept.

Ley: Mg and remaining PK applied, seeds sown at 29 lb: 20 Sept.

'Nitro-Chalk' applied: 27 Mar, 1968. Cut twice: 5 June, 6 Aug.

Potatoes: Sprayed with paraquat at 0.5 lb in 33 gals on the permanent

barley blocks: 2 Mar. Remaining PK, 'Nitro-Chalk', and Mg

applied: 26 Mar. Rotary cultivated, potatoes planted: 27 Mar.

Earthed up: 22 May. Grubbed, rotary ridged: 13 June. Sprayed

with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5 oz in 38

gals on the permanent wheat blocks only: 12 July. Sprayed with

mancozeb at 1.2 lb in 38 gals: 18 July, 30 July. Sprayed with

undiluted BOV at 15 gals: 4 Sept. Lifted: 24 Sept.

Wheat: Remaining PK and Mg applied, seed drilled at 170 lb:

13 Oct, 1967. 'Nitro-Chalk' applied: 9 Apr, 1968. Sprayed with

ioxynil/mecoprop (Actril C at 6 pints in 25 gals): 25 Apr.

Combine harvested: 22 Aug.

Barley: Sprayed with paraquat at 0.5 lb in 33 gals: 2 Mar.

Remaining PK applied: 4 Mar. Seed drilled at 140 lb: 6 Mar.

'Nitro-chalk' applied 15 Mar. Sprayed with ioxynil/mecoprop

(Actril C at 5 pints in 25 gals): 26 Apr. Combine harvested:

20 Aug.

68/B/7.2

NOTE: (1) Estimates of eyespot (*Cercospora herpotrichoides*) and take-all (*Ophiobolus graminis*) were made in May and June on barley and in April and July on wheat.

Standard errors per plot:

Ley, dry matter: Wheat blocks 1/4 plot  
1st cut: 4.56 or 11.1% (4 d.f.)  
2nd cut: 1.06 or 8.6% (4 d.f.)  
Total of 2 cuts: 4.28 or 8.0% (4 d.f.)  
Wheat, grain:  
1/4 plot: 2.02 or 8.4% (12 d.f.)  
1/8 plot: 1.63 or 6.8% (16 d.f.)  
Barley, grain:  
1/4 plot: 2.16 or 7.7% (12 d.f.)  
Potatoes, total tubers: Wheat blocks  
1/4 plot: 1.528 or 14.3% (4 d.f.)

68/B/7.3

SUMMARY OF RESULTS

LEY (C4)

PERMANENT WHEAT BLOCK

N in 1966

	N1	N2	N3	N4	Mean
1ST CUT					
(±3.22)*					(±1.61)
O	35.2	42.4	43.1	42.2	40.7
MG	39.5	40.3	41.7	44.5	41.5
Mean	37.3	41.4	42.4	43.4	41.1
2ND CUT					
(±0.75)*					(±0.38)
O	9.0	9.8	9.9	12.4	10.3
MG	14.3	14.2	14.1	14.4	14.3
Mean	11.7	12.0	12.0	13.4	12.3
TOTAL OF 2 CUTS					
(±3.02)*					(±1.51)
O	44.2	52.3	53.0	54.6	51.0
MG	53.8	54.5	55.8	58.9	55.8
Mean	49.0	53.4	54.4	56.8	53.4
Mean D.M. %:	1st cut:	22.7			
	2nd cut:	22.4			
	Total of 2 cuts:	22.5			

\* For use in vertical and interaction comparisons only

68/B/7.4

LEY (C4)

PERMANENT BARLEY BLOCK

N in 1966

N1	N2	N3	N4	Mean
1ST CUT				
49.7	46.0	46.6	46.9	47.3
2ND CUT				
14.8	14.6	16.0	17.1	15.6
TOTAL OF 2 CUTS				
64.4	60.6	62.6	64.0	62.9

Mean D.M. %: 1st cut: 22.7  
 2nd cut: 20.4  
 Total of 2 cuts: 21.6

68/B/7.5

WHEAT (C1, C2, C3, C6)

GRAIN

Crop in		N1	N2	N3	N4	O	MG	Mean		
1966	1967									
		( $\pm 1.43$ )*				( $\pm 0.58$ )*		( $\pm 1.48$ )		
L	P	28.2	34.5	32.6	29.0	31.2	31.0	31.1		
P	W	21.8	27.2	28.4	28.9	25.7	27.4	26.6		
W	W	13.2	18.5	24.5	22.1	19.2	19.9	19.6		
W	W	17.2	17.7	20.3	20.7	18.0	19.9	19.0		
						(1) and (2)		( $\pm 0.71$ )		
						N1	20.3	19.9	20.1	
						N2	23.7	25.2	24.4	
						N3	25.8	27.1	26.4	
						N4	24.5	25.9	25.2	
						Mean ( $\pm 0.29$ )		23.5	24.6	24.0

(1) ( $\pm 0.82$ ) For use in vertical and diagonal comparisons only

(2) ( $\pm 0.58$ ) For use in horizontal and interaction comparisons only

\* For use in horizontal and interaction comparisons only

Mean D.M. %: 85.0

68/B/7.6

WHEAT (C1, C2, C3, C6)

STRAW

Crop in		N1	N2	N3	N4	O	MG	Mean	
1966	1967								
L	P	31.9	40.0	39.0	36.6	36.5	37.2	36.9	
P	W	26.4	36.6	36.0	37.6	33.2	35.1	34.1	
W	W	19.3	27.0	32.6	31.0	27.3	27.7	27.5	
W	W	20.5	24.8	28.3	26.7	24.3	25.8	25.1	
						N1	23.9	25.1	24.5
						N2	31.6	32.6	32.1
						N3	33.6	34.4	34.0
						N4	32.2	33.7	33.0
						Mean	30.3	31.5	30.9

Mean D.M. %: 80.2

68/B/7.7

BARLEY (C1, C2, C3, C6)

PERMANENT BARLEY BLOCKS

GRAIN

Crop in 1966	Crop in 1967	N1	N2	N3	N4	Mean
		(±1.53)*				(±1.56)
L	P	30.2	34.3	29.1	26.8	30.1
P	B	25.5	31.6	29.3	25.5	27.9
B	B	21.8	28.8	27.0	25.9	25.9
B	B	24.4	31.2	28.9	27.8	28.1
Mean (±0.76)		25.5	31.5	28.6	26.5	28.0

\* For use in horizontal and interaction comparisons only

Mean D.M. %: 81.0

68/B/7.8

POTATOES (C5)

PERMANENT WHEAT BLOCKS

N in 1967

	N1	N2	N3	N4	Mean
TOTAL TUBERS					
(±1.080)*					
□	11.17	9.51	12.02	9.23	10.48
MG	11.72	9.79	11.94	10.08	10.88
Mean	11.45	9.65	11.98	9.66	10.68
% WARE					
□	94.9	96.4	95.2	94.9	95.4
MG	96.2	96.2	96.9	96.1	96.3
Mean	95.6	96.3	96.0	95.5	95.9

68/B/7.9

POTATOES (C5)

PERMANENT BARLEY BLOCKS

N in 1967

N1	N2	N3	N4	Mean
TOTAL TUBERS				
12.91	13.91	13.95	13.88	13.66
% WARE				
97.4	96.6	96.5	96.5	96.8

Table 1. Summary of the results of the 2010-2011 survey of the status of the world's coral reefs. The table is organized into two main sections: 'Global' and 'Regional'. Each section contains a table with columns for 'Region', 'Number of Reefs', 'Area (km<sup>2</sup>)', 'Number of Species', and 'Number of Genera'. The 'Global' section includes data for the Pacific, Indian, Atlantic, and Caribbean regions. The 'Regional' section includes data for the Pacific, Indian, Atlantic, and Caribbean regions. The data is summarized in the following table:

Region	Number of Reefs	Area (km <sup>2</sup> )	Number of Species	Number of Genera
Global	1,000	1,000,000	1,000	100
Pacific	500	500,000	500	50
Indian	200	200,000	200	20
Atlantic	100	100,000	100	10
Caribbean	200	200,000	200	20

68/B/8.1

## LONG TERM PHOSPHATE

(WLP)

To assess the residual and cumulative effects of superphosphate -  
Woburn Stackyard III 1968, 1st year.

Design: 6 blocks of 6 plots, split into two. Half plots received  
uniform treatment in 1968 but later there will be a test of  
phosphate.

Area of each sub plot: 0.0167. Area harvested: 0.0111.

Treatments: Superphosphate: None (R0) (2 plots per block), 1.5 (R1),  
3.0 (R2), 6.0 (R4), 9.0 (R6) cwt P<sub>2</sub>O<sub>5</sub> as superphosphate.

Basal applications: Both crops: 5 cwt K<sub>2</sub>O as sulphate of potash,  
2.0 cwt MgO as Epsom salts in August 1967.

Potatoes: 2.0 cwt N as 'Nitro-Chalk' and 1.5 cwt K<sub>2</sub>O as sulphate  
of potash in spring. Weedkiller: Linuron at 0.5 lb plus  
paraquat at 0.37 lb ion in 50 gals. Fungicide: Mancozeb at  
1.2 lb in 38 gals. Insecticide: Demeton-s-methyl at 3.5 oz  
in 38 gals.

Barley: 23 cwt ground chalk. 1.2 cwt N as 'Nitro-Chalk' and 0.5  
cwt K<sub>2</sub>O as muriate of potash in spring. Weedkiller:  
Ioxynil/mecoprop (Actril C at 5 pints in 25 gals).

Cultivations, etc.: Both crops: Rotary cultivated: 13 June, 1967.

Subsoiled: 20 - 21 June, 30 June - 3 July, 3 - 4 July (3  
directions). Deep-tine cultivated: 6 July. Basal K and Mg  
applied: 9 Aug. Phosphate treatments applied: 15 - 16 Aug.  
Fallow since 1963 (the site was part of the site of the Woburn  
Classical Experiments).

Potatoes: 'Nitro-Chalk' applied: 18 Mar, 1968. Sulphate of  
potash applied: 19 Mar. Rotary cultivated, potatoes planted:  
27 Mar. Weedkiller applied: 3 May. Rotary ridged: 13 June.  
Fungicide and insecticide applied: 12 July, 24 July.  
Fungicide applied: 30 July. Sprayed with undiluted BOV at  
15 gals: 4 Sept. Lifted: 25 Sept. Variety: Majestic.

68/B/8.2

Barley: Ground chalk applied: 11 Dec, 1967. 'Nitro-Chalk'  
applied, spring-tine cultivated: 4 Mar, 1968. Muriate  
of potash applied, seed drilled at 140 lb: 6 Mar. Weedkiller  
applied: 3 May. Combine harvested: 20 Aug. Variety: Maris  
Badger.

Standard errors per plot.

Potatoes: Total tubers: Whole plot: 0.478 or 3.8% (10 d.f.)

Barley: Grain: Whole plot: 0.49 or 1.5% (10 d.f.)

68/B/8.3

SUMMARY OF RESULTS

RO	R1	R2	R4	R6	Mean
POTATOES					
TOTAL TUBERS					
(±0.195) 10.65	12.22	(±0.276) 12.29	14.76	13.81	12.40
% WARE					
95.8	96.3	96.3	97.0	96.6	96.3
BARLEY					
GRAIN					
(±0.20) 32.6	33.9	(±0.29) 34.1	34.7	34.2	33.7
STRAW					
31.3	35.7	35.8	36.8	36.5	34.5

Mean D.M. %: Grain: 81.6  
Straw: 85.4