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# Numerical Results of the Field Experiments 1968

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## Classical Experiments

### Rothamsted Research

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68/A/1.1

WHEAT AND THREE-COURSE ROTATION BROADBALK 1968

(BK)

The 125th year, 1st year of revised scheme

For history, treatments etc. see 'Details' 1967, Station Report for 1966, pp. 229-231 and Station Report for 1968, Part II.

Plots and sections:

The five sections created in 1926 are now all subdivided and renumbered (for details see below). Headlands adequate for turning tractors etc. separate all the new sections.

In 1968 a new plot was made, north of plot 2A. This is called plot 1 and runs the length of old sections II, III, IV only.

Cropping:

The cropping for 1968 - 1971 is as follows:-

Old section	IA	IB	II	III	IV	VA	VB
Last fallow	1951	1966	1967	1965	1964	1963	1958
New section	0	1	2	3	4	5	6
Crop in:							
1968	W	W	Be W	W W	F P	W	W
1969	W	W	W W	P F	W Be	W	W
1970	W	W	P F	Be W	W W	W	W
1971	W	W	Be W	W W	F P	W	W

(W = winter wheat, Be = spring beans, F = fallow, P = potatoes)

Sections 0, 1, 8, 9 will carry continuous wheat except when perennial weeds make a fallow necessary, but all four will not be fallowed in the same year. Sections 2, 4, 7 will continue in the 3-course rotation:

potatoes, spring beans, wheat.

Sections 3, 5, 6 will be cropped in a 3-year cycle:  
fallow, wheat, wheat.

All sections carrying wheat will be sprayed as necessary to control weeds, except section 8 which (as hitherto) will receive no weedkiller sprays.

Section 00, soil fumigation to continuous winter wheat: In autumn 1967 a 10 ft length at the West end of every plot of section 0 was fumigated with methyl bromide at 870 lb. Resulting yields were compared with those from an adjoining 10 ft length which received normal treatments only. Both series of plots were harvested by small combine harvester.

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In 1968 simazine was applied to beans, no weedkiller was applied to potatoes.

Varieties in 1968:

Wheat: Cappelle Desprez  
Beans: Maris Bead (inoculated seed)  
Potatoes: Majestic.

Manuring:

- (a) Plot 1. The new plot 1, which has received no organic or mineral manures for many years, now receives farmyard manure plus N2PK (see below for details) each year, applied to all crops including fallow (no N to fallow).
- (b) Nitrogen fertilisers. Sulphate of ammonia and nitrate of soda are discontinued, 'Nitro-Chalk' 21 being used instead. It is all applied at one time in spring.

For wheat it is applied as a top-dressing, for potatoes before rotary cultivation, for beans to the seedbed. No 'Nitro-Chalk' to fallow.

Rates of N are unchanged except on plots 2A, 9, 15 (for details see below).

The rates and symbols are (lb N), 43 (N1), 86 (N2), 129 (N3) and 172 (N4).

- (c) Organic manures. Farmyard manure (FYM) and castor bean meal are applied as hitherto, except that organics are now applied to the fallow section.

Symbol:

D: 14 tons FYM.  
R: Castor meal supplying 86 lb N.

- (d) Mineral manures. Except on plots 17 and 18 (which now receive PKNaMg at half the standard rates each year) and plot 14 which now receives K in addition to PMg, rates and materials are unchanged:-

Symbol:

P: Superphosphate supplying 30 lb P.  
K: Sulphate of potash supplying 80 lb K.  
Na: Sulphate of soda supplying 14 lb Na (except plot 12, 51 lb Na).  
Mg: Sulphate of magnesia supplying 10 lb Mg (except plot 14, 28 lb Mg).

All these are applied in autumn before ploughing. They are applied for all crops and fallow.

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Plot	Treatment till 1967	Treatment from 1968
1	-	DN2PK
2A	D	DN2
2B	D	D
3	None	None
5	PKNaMg	PKNaMg
6	N1PKNaMg	N1PKNaMg
7	N2PKNaMg	N2PKNaMg
8	N3PKNaMg	N3PKNaMg
9	N*1PKNaMg	N4PKNaMg
10	N2	N2
11	N2P	N2P
12	N2PNa	N2PNa
13	N2PK	N2PK
14	N2PMg	N2PKMg
15	N2**PKNaMg	N3PKNaMg
16	N*2PKNaMg	N2PKNaMg
17	N2	N2+1/2(PKNaMg)
18	PKNaMg alternating	N2+1/2(PKNaMg)
19	R	R
20	N2KNaMg	N2KNaMg

\*\* Formerly N in autumn.

NOTE: Plot 20 does not run the full length and is not included in the rotation scheme.

#### Liming:

Ground chalk was applied under the old scheme in autumn 1967, the following additional applications were made: (cwt chalk)

Plot	7	8	11	13	14	15
Section						
1	-	23	-	-	-	-
6,7	-	69	23	23	-	-
8	23	23	-	23	23	23
9	23	23	-	-	-	-

(remainder : none).

New scheme: Ground chalk will be applied in every third year, starting autumn 1970.

#### Drilling and planting:

Wheat: Because of the use of a new 15 row drill the plot widths for wheat have been reduced from 36 rows (21 ft) to 30 rows (17 ft 6 ins). Plot 1 has 30 rows. Plots 2A and 2B, originally 20 rows (11 ft 8 ins) each, now have 22 rows (12 ft 10 ins) each.

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Beans: 12 rows drilled (plot width 21 ft). Plot 1 has 12 rows.

Plots 2A and 2B each have 7 rows (12 ft 3 ins).

Potatoes: 8 rows are planted (plot width 18 ft 8 ins). Plot 1 has 8 rows. Plots 2A and 2B each have 5 rows (11 ft 8 ins).

The manures (with the exception of 'Nitro-Chalk') continue to be applied to the full 21 ft width for all crops. This applies also to plot 1. Dung is applied to plots 2A and 2B as though they were one plot, width 26 ft 3 ins. 'Nitro-Chalk' is applied to the drilled area for wheat, and to the full 21 ft width (13 ft on plot 2A) for beans and potatoes.

	Area of each plot:		Area harvested:
	2A and 2B	Remainder	All plots
Wheat: Section: 0	0.0147	0.0201	0.0107
1	0.0271	0.0370	0.0197
3, 4 and 5	0.0224	0.0305	0.0163
8 and 9	0.0236	0.0321	0.0171
Potatoes: Section: 7	0.0204	0.0326	0.0163
Beans: Section: 2	0.0214	0.0367	0.0153

#### Cultivations, etc.:

ALL SECTIONS: Ground chalk applied (including extra chalking):

11 Sept, 1967. FYM applied: 18 Sept. Plots 1 - 3 ploughed, all autumn fertiliser applied: 19 Sept. Remaining plots ploughed: 20 Sept.

#### CROPPED SECTIONS:

Winter wheat: Seed drilled at 180 lb: 7 Dec, 1967. 'Nitro-Chalk' applied (plot 20 omitted in error): 10 Apr, 1968. All sections except 8 and 9 sprayed with ioxynil at 9 oz and mecoprop at 27 oz in 20 gals: 4 May. Section 9 sprayed with ioxynil at 9 oz and mecoprop at 27 oz in 20 gals, section 5 resprayed with ioxynil at 7.5 oz and mecoprop at 22.5 oz in 20 gals and sections 0, 1, 3 and 4 resprayed with ioxynil at 6 oz and mecoprop at 18 oz in 20 gals: 6 May. The second spray was applied because of rain during spraying on 4th May. 'Nitro-Chalk' applied to plot 20: 17 June. Combine harvested: 26 Aug.

Potatoes: 'Nitro-Chalk' applied: 26 Mar, 1968. All plots rotary cultivated - first time: 28 Apr, second time: 29 Apr.

Potatoes machine planted: 29 Apr. Grubbed: 20 May. Rotary ridged: 28 May. Grubbed and then rotary ridged: 19 June. Sprayed with mancozeb at 1.2 lb in 37 gals: 4 July.

Sprayed with mancozeb at 1.2 lb and demeton-s-methyl at 3.5 oz in 37 gals: 19 July. Sprayed with mancozeb

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at 1.2 lb in 37 gals: 5 Aug. Sprayed with undiluted BOV  
at 20 gals: 31 Aug. Haulm destroyed mechanically: 13 Sept.  
Lifted: 19 Sept.

Spring beans: Seed drilled at 200 lb: 4 Mar, 1968. Sprayed  
with simazine at 1 lb in 33 gals: 5 Mar. 'Nitro-Chalk'  
applied: 26 Mar. 1.04 lb phorate applied in granules:  
22 June. Combine harvested: 6 Sept.

FALLOW SECTION: Ploughed second time: 28 May, 1968, third  
time: 5 Aug.

Area of each sub plot:	Area harvested: 0.0018
(Plots 2A and 2B):	0.0031
(Remainder):	0.0046

Cultivations to section OO: As section O except:- Rotary cultivated:  
21 Sept, 1967. Methyl bromide applied: 27 Sept. Combine harvested:  
25 Aug, 1968.

BROADBALK WILDERNESS: Cultivations, etc.:-

Ungrazed meadow (north): Topped with rotary grass cutter: 23 Jan, 1968.  
Grazed meadow (centre): Grazed by sheep: 2 - 10 May, 1968,  
27 - 31 May, 10 - 17 June, 8 - 17 July, 16 - 23 Aug,  
18 - 24 Sept, 10 - 16 Oct. Grass topped: 10 May, 18 June,  
18 July, 24 Aug, 18 Oct.

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SUMMARY OF RESULTS

Section Years after fallow	WHEAT							Mean
	3	4	5	1	8	9	0	
	1	3	3	2	5*	10	17	
Plot								
1	37.8	30.5	29.7					
2A	34.3	38.1	35.3	33.0	35.2	36.4	37.8	35.3
2B	38.8	29.0	30.1	25.2	32.8	34.9	31.3	32.2
3	15.0	10.2	10.4	8.3	17.0	11.6	11.5	12.3
5	22.9	12.8	13.8	8.5	17.5	13.9	14.4	15.2
6	28.6	22.8	21.3	15.9	31.7	24.9	21.0	23.9
7	31.3	29.2	29.6	24.3	27.3	31.1	29.5	28.8
8	22.8	31.5	28.8	27.9	30.4	31.7	29.4	28.5
9	27.2	33.2	31.9	30.4	33.1	30.6	30.1	30.6
10	8.3	18.7	17.6	16.1	21.2	16.2	9.4	14.8
11	6.1	19.6	15.4	21.3	13.8	14.9	16.8	14.7
12	4.4	20.0	19.1	23.5	12.6	13.0	22.4	15.8
13	13.7	27.1	26.2	26.4	16.1	27.7	26.1	22.7
14	15.2	27.9	24.0	26.7	24.9	30.1	25.4	24.4
15	20.7	30.3	31.4	28.1	31.4	32.3	25.3	28.2
16	21.3	25.8	24.5	23.7	29.6	30.4	20.2	24.9
17	27.4	29.9	20.3	22.2	37.9	32.7	27.1	29.6
18	25.9	25.9	23.1	23.2	39.8	32.4	23.5	28.0
19	22.7	20.0	19.0	15.3	24.6	15.9	18.3	19.3
20					8.1		9.6	8.8

Mean D.M. %: 83.6

\* No herbicide

% weed seeds plus rubbish

Plot 5, section 1: 8

Plot 8, section 0: 1

Plot 14, section 8: 3

Plot 16, section 0: 1

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WHEAT

STRAW

Section Years after fallow	3	4	5	1	8	9	0	Mean
	1	3	3	2	5*	10	17	
<b>Plot</b>								
1	52.3	22.0	33.9					
2A	50.8	50.2	42.8	48.0	60.9	39.0	42.1	47.3
2B	38.5	30.1	31.1	24.1	43.0	34.2	27.8	33.1
3	9.3	7.0	10.3	5.1	10.9	7.3	7.0	8.3
5	18.3	11.5	9.3	6.8	23.0	11.2	11.2	13.3
6	21.4	19.4	18.1	16.2	35.1	23.8	18.5	22.2
7	30.8	31.0	33.0	27.3	45.1	36.4	33.4	34.3
8	31.4	36.0	29.0	34.0	48.1	39.5	31.1	35.5
9	32.7	34.2	28.2	31.7	44.2	35.8	28.8	33.6
10	6.4	14.9	17.2	11.2	17.9	12.4	8.3	12.2
11	12.9	13.9	11.4	19.6	24.3	16.9	14.8	16.6
12	24.5	15.4	15.3	21.1	25.0	14.8	20.7	20.2
13	24.5	26.6	25.3	30.5	42.3	31.2	27.5	30.2
14	16.9	22.3	20.0	24.9	35.7	27.3	22.9	24.6
15	28.8	27.7	25.4	29.1	46.6	32.6	27.2	31.6
16	19.1	20.6	27.2	21.5	39.0	36.2	26.9	28.3
17	25.1	29.2	28.4	22.5	42.1	30.9	25.9	29.1
18	26.6	24.6	25.9	22.1	50.3	38.3	26.2	31.6
19	18.8	17.4	14.3	11.6	31.4	18.5	15.4	18.3
20					5.9		6.7	6.3

Mean D.M. %: 69.5

\* No herbicide

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WHEAT

GRAIN

SECTION OO. FUMIGATED STRIPS

Plots	O	MB	Mean
2A	17.7	17.9	17.8
2B	23.8	18.6	21.2
3	11.8	16.4	14.1
5	12.1	16.2	14.1
6	21.1	24.2	22.6
7	28.0	27.9	27.9
8	23.9	20.8	22.3
9	22.3	21.9	22.1
10	12.7	9.9	11.3
11	19.3	20.7	20.0
12	22.9	20.6	21.7
13	21.3	20.6	20.9
14	21.0	23.0	22.0
15	23.5	22.4	22.9
16	13.9	19.3	16.6
17	23.1	23.5	23.3
18	20.3	25.5	22.9
19	14.2	19.1	16.7
Mean	19.6	20.5	20.0

Mean D.M. %: 81.6

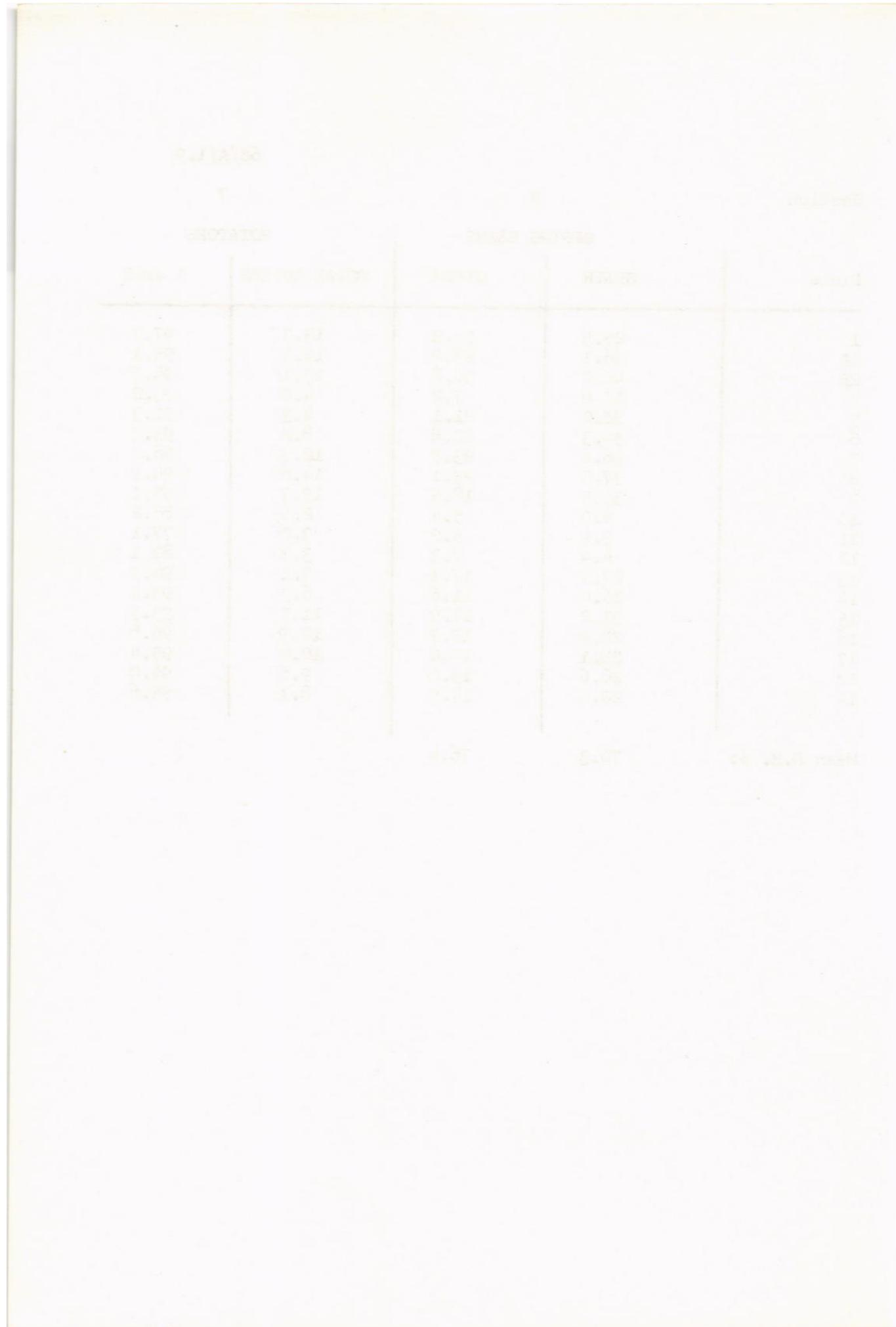
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Section

2

7

Plots	SPRING BEANS		POTATOES	
	GRAIN	STRAW	TOTAL TUBERS	% WARE
1	25.5	11.2	13.77	97.7
2A	36.1	23.2	15.73	95.1
2B	42.0	30.8	13.16	94.7
3	10.6	7.2	4.05	93.2
5	32.0	21.1	4.35	91.3
6	34.3	22.8	8.26	93.7
7	36.8	23.5	12.38	96.2
8	37.0	23.1	14.68	94.9
9	35.5	18.5	13.75	97.1
10	6.0	5.4	2.95	88.2
11	3.9	5.2	3.06	77.1
12	4.4	7.3	3.33	82.1
13	27.7	17.1	9.15	94.2
14	16.0	11.6	6.38	93.5
15	31.2	17.9	11.53	93.5
16	28.9	19.7	10.99	95.8
17	28.1	14.6	10.05	95.4
18	26.6	13.0	9.67	96.0
19	20.0	14.5	8.19	95.6
Mean D.M. %:		70.3	76.4	



68/A/2.1

HODSFIELD: BARLEY AND THREE-COURSE ROTATION 1968

(HB)

The 117th year, 1st year of revised scheme

For history, treatments, etc., see 'Details 1967' and Station Report for 1966.

Cropping and treatments:

A three-course rotation (potatoes, spring beans, spring barley) is now followed on parts of the old series AA, AAS and C. The remainder of these series, the old series O and A and old plots 1N, 2N, 5-O, 5A, 6-1, 6-2, 7-1, 7-2, carry continuous barley.

The arrangement is indicated below:-

Old Series	O	A	AA	AAS	C	1N, 2N 5-O, 5-A	(West)
(East): 1968	B	B	B	P	P B	B B P Be	B
1969	B	B	B	Be	Be B	B P Be B	B
1970	B	B	B	B	B B	B Be B P	B
1971	B	B	B	P	P B	B B P Be	B

(B = Barley, Be = Beans, P = Potatoes)

Varieties in 1968:

Barley - Maris Badger, Beans - Maris Bead (seed inoculated with Rhizobium), Potatoes - Majestic.

The strip manures:

- Strip 1 - None
- 2 - P
- 3 - KNaMg
- 4 - PKNaMg

continue to be applied at the same rates, but are now applied in autumn before ploughing. Farmyard manure (D) at 14 tons is applied to plot 7-2 as hitherto and silicate of soda is applied as hitherto (old series AAS). The rate is unchanged but it too is applied before ploughing. Castor meal is no longer applied. All plots (except 1N, 2N, 5-O, 5A) are split into 4 sub plots and (except on plot 7-2) a test is made of none (N0), 43(N1), 86(N2), 129 (N3) lb N as 'Nitro-Chalk 21' applied to the barley seed bed. Potatoes receive basal 'Nitro-Chalk' at 129 lb N before rotary cultivation in spring, beans receive no N. The levels of N to barley are cumulative and are randomized. Plot 7-2 in 1968 had a test on duplicate sub plots of N0 and N1\*\*. Plots

68/A/2.2

1N (now numbered 581), 2N (571), 5A (551), receive N2, plot 5-0 (561) NO. Plots 5-0, and 5A receive PK, at rates as before but applied before ploughing in autumn.

\* NOTE: In 1968 sub plots on the old plots 6-1, 6-2, 7-1 and 7-2 received nitrogen at rates 57 (N1) 115 (N2) and 172 (N3) lb N in error.

Symbols:

- D - 14 tons farmyard manure
- P - Superphosphate supplying 30 lb P
- K - Sulphate of potash supplying 80 lb K
- Na - Sulphate of soda supplying 14 lb Na
- Mg - Sulphate of magnesia supplying 10 lb Mg
- Si - 400 lb silicate of soda.

Standard applications 1968:

- To Barley: (weedkiller) dicamba/mecoprop/MCPA ('Banlene Plus' at 4 pints in 33 gals).
- To Beans: (weedkiller) simazine at 1 lb in 33 gals, (insecticide) phorate at 1.04 lb (in granules).
- To Potatoes: (no weedkiller) (fungicide) mancozeb at 1.2 lb in 37 gals, on 3 occasions, (insecticide) demeton-s-methyl at 3.5 oz applied with fungicide on 2nd occasion, (haulm killer) undiluted BCV at 20 gals.

Liming:

Under the new scheme ground chalk will be applied every third year, starting Autumn 1970.

Area of each sub plot:-

	Area	Area harvested
Old series 0 and A	0.0317	0.0086
Old plots 6-1, 6-2, 7-1 and 7-2	0.0238	0.0064
Old series AA, AAS and C		
Barley	0.0087	0.0024
Potatoes	0.0087	0.0047
Beans	0.0087	0.0044**
Old plots 1N, 2N, 5-0, 5A (whole plots)	0.0661	0.0101

Barley is harvested by small combine harvester on the old series AA, AAS and C, by large combine on the remainder.

\*\* Plots harvested in pairs.

All crop-rows now run north-south, not east-west as previously.

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Cultivations, etc.:-

P, K, Na, Mg applied : 5 Oct, 1967. Silicate of soda and FYM applied, all plots ploughed: 6 Oct.

Barley: Seed drilled at 140 lb: 4 Mar, 1968. 'Nitro-Chalk' applied: 25 Mar. Weedkiller applied: 14 May. Combine harvested: 22 Aug.  
Potatoes: 'Nitro-Chalk' applied: 26 Mar, 1968. Plots rotary cultivated, potatoes machine planted: 1 Apr. Grubbed: 20 May. Rotary ridged: 28 May. Fungicide applied, the second time including insecticide: 3 July, 19 July, 5 Aug. BOV applied: 30 Aug. Haulm destroyed mechanically: 13 Sept. Lifted: 23 Sept.  
Spring beans: Seed drilled at 200 lb: 4 Mar, 1968. Weedkiller applied: 5 Mar. Insecticide applied: 21 June. Combine harvested: 13 Sept.

68/A/2.4

SUMMARY OF RESULTS

BARLEY

N 1968

Treatment**		0	1	2	3	Mean
GRAIN						
1852-1968	1852-1968					
-	-	12.5	12.0	13.3	14.7	13.1
-	N	10.5	11.9	9.9	12.5	11.2
P	-	18.9	26.7	32.3	33.6	27.9
P	N	21.0	28.1	30.2	27.3	26.6
K Na Mg	-	8.6	15.4	22.3	23.8	17.5
K Na Mg	N	12.1	12.4	12.8	11.8	12.3
PK Na Mg	-	13.1	28.3	38.6	38.1	29.5
PK Na Mg	N	16.1	31.3	37.3	34.2	29.7
D	-	19.4	37.7	-	-	28.6
-	(D)	10.5	28.6	39.1	36.9	28.8
-	(Ashes)	15.8	29.3	27.3	26.9	24.9
-	-	11.9	18.1	19.5	24.1	18.4
STRAW						
-	-	0.8	10.4	13.9	17.0	10.5
-	N	4.1	9.0	6.4	10.1	7.4
P	-	10.7	19.0	25.6	24.0	19.8
P	N	12.9	21.2	23.2	23.5	20.2
K Na Mg	-	5.9	10.9	17.9	25.2	15.0
K Na Mg	N	10.7	11.8	16.4	16.2	13.8
PK Na Mg	-	10.9	27.9	34.0	38.3	27.8
PK Na Mg	N	8.5	25.1	34.7	27.8	24.0
D	-	28.4	40.3	-	-	34.3
-	(D)	7.9	21.7	36.6	31.2	24.4
-	(Ashes)	11.0	18.5	19.2	18.8	16.9
-	-	5.4	12.9	13.0	18.9	12.6

\*\* For explanation of symbols see 'Details 1967'

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BARLEY

N 1968

Treatment**		0	1	2	3	Mean
GRAIN						
1852-1968	1852-1966					
-	N*	10.1	10.0	11.9	10.6	10.6
Si	N*	19.0	24.4	28.9	24.0	24.1
P	N*	23.7	32.8	33.3	30.0	29.9
P Si	N*	20.9	31.7	35.5	34.3	30.6
K Na Mg	N*	10.7	11.7	14.4	12.8	12.4
K Na Mg Si	N*	22.2	26.8	28.5	33.5	27.7
PK Na Mg	N*	12.7	28.8	33.0	36.6	27.8
PK Na Mg Si	N*	18.8	34.2	40.0	34.6	31.9
-	R(c)	21.9	38.4	33.1	36.1	32.4
-	R(r)	32.0	36.0	34.5	32.5	33.7
P	R(c)	21.3	32.8	35.9	33.3	30.8
P	R(r)	17.6	29.9	36.1	33.1	29.2
K Na Mg	R(c)	26.2	36.0	33.3	35.0	32.6
K Na Mg	R(r)	23.2	33.7	34.4	36.0	31.8
PK Na Mg	R(c)	28.2	34.3	37.4	35.0	33.7
PK Na Mg	R(r)	30.9	33.7	38.1	29.7	33.1
STRAW						
-	N*	13.8	11.1	13.7	13.7	13.1
Si	N*	20.2	21.6	28.9	27.9	24.7
P	N*	23.1	29.6	35.7	30.3	29.7
P Si	N*	16.0	30.5	37.6	36.1	30.1
K Na Mg	N*	18.1	15.0	22.2	21.3	19.1
K Na Mg Si	N*	17.6	26.3	31.8	36.0	27.9
PK Na Mg	N*	10.2	27.1	34.7	43.0	28.7
PK Na Mg Si	N*	14.8	34.9	41.3	40.1	32.8
-	R(c)	13.8	34.7	28.8	34.4	27.9
-	R(r)	24.5	28.2	26.4	28.9	27.0
P	R(c)	16.3	25.9	32.5	29.6	26.1
P	R(r)	14.5	27.4	29.8	26.3	24.5
K Na Mg	R(c)	19.2	33.7	32.8	32.9	29.7
K Na Mg	R(r)	19.7	30.7	29.4	34.7	28.7
PK Na Mg	R(c)	24.3	30.4	38.0	36.4	32.3
PK Na Mg	R(r)	23.4	29.3	38.8	38.5	32.5

NOTE: (c) = continuous, (r) = rotation. (These treatments were identical in 1968.)

\*\* For explanation of symbols see 'Details 1967'

68/A/2.6

Plots	Treatment**		BARLEY	
			GRAIN	STRAW
1852-1968 1852-1966				
551	N2PK	N	32.5	30.6
561	PK	-	11.0	10.1
571	N2	N*	26.1	18.0
581	N2	N*	14.8	11.1

\*\* For explanation of symbols see 'Details 1967'

Mean D.M. %: Grain: 80.9  
Straw: 82.3

68/A/2.7

POTATOES

Treatments**		TOTAL TUBERS	% WARE
1852-1968	1852-1966		
-	N*	2.20	80.7
Si	N*	2.66	86.8
P	N*	3.67	79.6
P Si	N*	3.30	77.9
K Na Mg	N*	5.78	94.6
K Na Mg Si	N*	6.84	95.6
PK Na Mg	N*	14.66	95.2
PK Na Mg Si	N*	15.04	95.9
-	R	8.98	94.8
P	R	8.41	92.8
K Na Mg	R	12.03	97.5
PK Na Mg	R	14.95	95.3

\*\* For explanation of symbols see 'Details 1967'

68/A/2.8

BEANS

Treatment**		GRAIN	STRAW
1852-1968	1852-1966		
-	R	24.8	16.9
P	R	22.5	15.5
K Na Mg	R	30.2	21.4
PK Na Mg	R	36.3	28.8

\*\* For explanation of symbols see 'Details 1967'

Mean D.M. %: Grain: 75.9  
Straw: 57.2

68/A/3

WHEAT AFTER FALLOW - HODSFIELD 1968

(HWF)

For history, treatments, etc. see 'Details' 1967.

Area of each plot: 0.1237. Area harvested: 0.0366.

The seed is now treated with a seed-dressing (dieldrin 1967 and 1968) to control wheat bulb fly (*Leptohylemyia coarctata*).

Cultivations, etc.:

Cropped plots: Ploughed: 5 Sept, 1967. Seed drilled at 180 lb: 19 Oct. Sprayed with ioxynil at 9 oz and mecoprop at 27 oz in 20 gals: 14 May, 1968. Combine harvested: 26 Aug.

Fallow plots: Ploughed 3 times: 5 Sept, 1967, 27 May and 5 Aug, 1968.

SUMMARY OF RESULTS

Plot No.	A1	A4	A2
No. of years of fallow	1	1	3
GRAIN			
	14.7	13.4	17.4
STRAW			
	14.4	12.0	13.8

Mean D.M. %: Grain: 84.1  
Straw: 70.5

the first time in the history of the world, the  
whole of the human race has been gathered  
together in one place, and that is the  
present meeting of the World's Fair.  
The great nations of the world have  
gathered here to exhibit their products,  
and to show the progress they have made  
in the arts and sciences. The United States  
is represented by a large number of  
exhibits, and the people of the United  
States are here to witness the progress  
of the world, and to learn from the  
experience of other nations. The  
World's Fair is a great success, and  
will be remembered as one of the  
greatest events in the history of the  
world.

68/A/4.1

GRASS - AGDELL 1968

(AG)

For history, treatments, etc. see 'Details' 1962 and 'Results'  
63/A/4, 64/A/4, 65/A/4, 66/A/4 and 67/A/4.

Area of each microplot: Plots 1 - 4 - 0.0180. Plots 5 - 6 - 0.0162.

Area harvested: 1st cut: Plots 1 - 4 - 0.0046. Plots 5 - 6 -  
0.0040. 2nd cut: Plots 1 - 4 - 0.0023. Plots 5 - 6 - 0.0020.

P (as triple superphosphate) and K (as muriate of potash) were applied  
in March 1968 to balance removals by grass in 1967 to all sub plots  
except P0, which continues to receive no P, and K0, which continues  
to receive no K.

Rates in cwt P205

Plot no.	Sub plots testing P:-				Sub plots testing K:-			
	P0	P1	P2	P4	K0	K1	K2	K4
1	0	0.36	0.32	0.35	0.23	0.36	0.40	0.35
2	0	0.36	0.40	0.31	0.22	0.38	0.39	0.40
3	0	0.39	0.32	0.42	0.18	0.32	0.31	0.32
4	0	0.28	0.27	0.33	0.31	0.36	0.34	0.31
5	0	0.30	0.31	0.30	0.33	0.38	0.38	0.35
6	0	0.30	0.31	0.33	0.22	0.33	0.34	0.33

Rates in cwt K20

Plot no.	Sub plots testing P:-				Sub plots testing K:-			
	P0	P1	P2	P4	K0	K1	K2	K4
1	1.33	1.80	1.56	1.65	0	1.48	1.80	1.66
2	0.86	1.63	1.99	1.48	0	1.62	1.68	1.84
3	0.99	2.00	1.57	1.99	0	1.38	1.35	1.52
4	0.48	1.68	1.67	1.75	0	1.50	1.67	1.54
5	0.38	1.84	2.04	1.86	0	1.96	1.94	2.00
6	0.18	1.68	1.57	1.72	0	1.53	1.54	1.64

Basal dressing: 'Nitro-Chalk' applied at 0.8 cwt N on 8 Sept, 1967  
and 15 Mar, 1968, 30 May, 15 July.

Cultivations, etc.:

Grass: Ground chalk applied at 46 cwt to plots 1 and 2 and to the  
southern half of plots 3 and 4: 6 June, 1967. Ploughed: 14 June.  
Rotary cultivated 4 times: 5 July, 21 July, 8 Aug, 24 Aug. Seed

68/A/4.2

drilled at 30 lb: 7 Sept. P and K applied: 15 Mar, 1968.  
PO sub plots on plots 4, 5 and 6 resown at 30 lb: 10 Apr.  
Sprayed with ioxynil at 7.5 oz and mecoprop at 22.5 oz in  
32 gals: 11 Apr. Cut 3 times for silage: 27 May, 10 July,  
22 Oct. Variety: Timothy S51.  
Fallow: Ploughed: 14 June, 1967.

Soil type - 3 - 2 sand 1 silt loam 1 clay loam 1 loamy sand 1 loamy  
sand 1 - 2 sand 1 silt loam 1 clay loam 1 loamy sand 1 clay loam  
1 loamy sand 1 - 2 sand 1 silt loam 1 - 1 sand 1 silt loam 1 clay loam

Bulldozed over limestone to shallow soil & then harrowed again after  
a heavy rain. No tillage or manure or lime applied except as topdressing  
of fertilizers early. All plots were cut 3 times during course of experiment.

1968 yield analysis

Plot	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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and we have a fair amount of data on the bullock trials from 1964 onwards. These trials, I think, are the best ones to go by in this situation because, as far as I can see, it's difficult to have a representative sample

68/A/4.3

SUMMARY OF RESULTS

DRY MATTER

Plot

P K	5	6	3	4	1	2	Mean
1ST CUT							
0 4	0.0	0.0	3.0	0.0	17.9	5.9	4.5
1 4	20.8	27.6	37.9	31.3	38.1	34.6	31.7
2 4	28.8	27.5	33.0	30.7	33.6	38.6	32.0
4 4	29.8	29.4	36.5	30.7	35.8	40.5	33.8
4 0	17.1	26.0	29.1	29.3	26.5	22.8	25.1
4 1	26.7	31.5	40.3	33.5	35.6	35.7	33.9
4 2	30.5	34.8	31.2	35.6	39.4	35.0	34.4
4 4	31.1	30.8	37.1	39.4	37.7	38.5	35.8
Mean	23.1	25.9	31.0	28.8	33.1	31.5	28.9

Mean D.M. %: 15.0

2ND CUT

0 4	3.7	4.8	15.5	8.0	23.7	18.7	12.4
1 4	17.7	16.8	16.2	17.0	22.6	20.3	18.4
2 4	17.9	16.9	19.5	13.1	21.1	22.1	18.4
4 4	17.4	16.8	16.0	20.1	22.0	19.7	18.7
4 0	21.1	15.8	17.8	21.4	17.1	17.1	18.4
4 1	19.0	17.1	13.5	25.8	21.2	23.9	20.1
4 2	20.6	18.2	14.7	15.2	18.6	22.8	18.4
4 4	23.2	15.0	16.0	17.3	20.3	20.1	18.6
Mean	17.6	15.2	16.2	17.2	20.8	20.6	17.9

Mean D.M. %: 15.6

68/A/4.4

DRY MATTER

Plot

P K	5	6	3	4	1	2	Mean
3RD CUT							
0 4	19.6	21.3	26.2	24.8	23.1	21.4	22.7
1 4	30.7	28.5	24.4	35.2	26.1	27.8	28.8
2 4	25.3	37.0	28.2	31.8	20.5	27.8	28.4
4 4	25.8	27.0	25.6	24.6	26.2	25.4	25.8
4 0	18.2	23.4	20.2	21.0	14.2	13.1	18.3
4 1	25.8	26.1	22.4	28.2	23.7	24.6	25.1
4 2	24.5	29.5	25.4	27.8	27.9	28.8	25.1
4 4	26.1	26.7	23.2	29.3	24.3	25.7	25.9
Mean	24.5	27.4	24.4	27.8	23.2	24.3	25.3

Mean D.M. %: 20.7

TOTAL OF 3 CUTS

0 4	23.3	26.2	44.6	32.8	64.7	46.0	39.6
1 4	69.3	72.9	78.5	83.4	86.8	82.7	78.9
2 4	72.0	81.4	80.7	75.6	75.2	88.4	78.9
4 4	73.0	73.2	78.1	75.3	84.0	85.6	78.2
4 0	56.4	65.3	67.1	71.6	57.8	53.0	61.9
4 1	71.5	74.6	76.2	87.5	80.5	84.2	79.1
4 2	75.7	82.5	71.3	78.6	85.9	86.7	80.1
4 4	80.3	72.4	76.3	86.1	82.4	84.3	80.3
Mean	65.2	68.6	71.6	73.9	77.1	76.4	72.1

Mean D.M. %: 17.1

68/A/5.1

BARNFIELD: FOUR-COURSE ROTATION AND SPRING BEANS AFTER LONG TERM

EXPERIMENTS ON ROOT CROPS

(BN)

First year of new scheme, 1968

For history, treatments, etc., see 'Details 1967' and 'Results'  
62/A/5.

Cropping and design:

Series O (now Section 1): Continuous spring beans started 1967. Plots are split lengthways into two for a test (unrandomised) of inter-row cultivation none (O) v.l (H) 1 lb simazine 1 lb simazine for weed control.

The valley (now Section 2), excluding a 30 ft headland between the valley and section 3: As section 1. The remainder of each strip (1, 2, 4, 5, 6, 7, 8,) is split lengthways into two to carry two crops of a four course rotation of potatoes, spring barley, sugar beet and spring wheat, with two crops present each year (barley and wheat in 1968, with barley on the east side, both following beans 1967). Each half is further split breadthways into two for the 4 N rates, which are applied cumulatively (for rates of N see below). Each whole plot has the four rates, NO and N2 on one crop, N1 and N3 on the other.

In each crop on any one strip Series N and C have the same two rates of N, Series A and AC the other two. In each crop, too, on any one series, strips 1, 4, and 5 have the same two rates of N and strips 2, 6, 7, and 8, the other two. Series N, A, AC, and C are now called Sections 3, 4, 5 and 6 respectively.

Plot 9: Carries a four course rotation as above with one crop present each year (barley in 1968). It is similarly divided into quarter plots to which the 4 rates of N are applied for each crop.

Manuring:

Nitrogen is now applied as 'Nitro-Chalk' only. The rates in lb N are none (NO), 43 (N1), 86 (N2), 129 (N3) to barley and wheat and none (NO), 64 (N1), 129 (N2) and 193 (N3) to potatoes and sugar beet. No N is applied to beans. The mineral fertilisers and FYM to strips continue to be applied. Section 2 (the valley) now receives the strip manures. Application of castor bean meal is discontinued.

68/A/5.2

Varieties in 1968: Barley: Maris Badger, spring wheat: Kolibri, spring beans: Maris Bead (uninoculated).

Plot areas:

Wheat and barley (quarter plot):

0.0362 (Strip 1: 0.0238). Area harvested: 0.0193.

Beans Section 1 (half plot): 0.0723

(Strips 1 and 8: 0.0475). Area harvested: 0.0362.

Section 2 (half plot): 0.0241.

(Strips 1 and 8: 0.0158). Area harvested: 0.0129.

Cultivations, etc.: P, K, Na and Mg applied: 22 Sept, 1967. Sub-soiled: 10 Oct. FYM applied, all plots ploughed: 9 Nov.

Spring wheat: Seed drilled at 160 lb: 4 Mar, 1968. 'Nitro-Chalk' applied: 18 Mar. Combine harvested: 7 Sept.

Barley: Seed drilled at 140 lb: 4 Mar, 1968. 'Nitro-Chalk' applied: 18 Mar. Combine harvested: 22 Aug.

Spring beans: Seed drilled at 200 lb: 4 Mar, 1968. Half plots sprayed with simazine at 1 lb in 33 gals: 5 Mar. 1.04 lb phorate applied in granules: 21 June. Combine harvested: 9 Sept.

NOTE: Birds took much of the grain from the plots of strip 1.

1.04 lb phorate applied in granules to half plots sprayed with simazine at 1 lb in 33 gals. This was done to reduce bird damage. The birds were very bad in 1967 and 1968. They ate most of the grain and seed. It has been suggested that they may have been attracted by the taste of heritage oil in the seeds. This is not true. The birds were not attracted by the taste of heritage oil. They were attracted by the taste of the grain itself. They were not attracted by the taste of the seeds.

68/A/5.3

SUMMARY OF RESULTS

SPRING WHEAT

GRAIN

SERIES

Strip	N 1968	N	A	AC	C
1	0	-	18.0	22.3	-
	1	11.1	-	-	27.3
	2	-	20.9	21.5	-
	3	19.7	-	-	17.8
2	0	18.0	-	-	18.5
	1	-	28.7	31.5	-
	2	25.7	-	-	29.3
	3	-	25.0	27.2	-
4	0	-	16.2	18.3	-
	1	22.3	-	-	28.8
	2	-	34.5	33.7	-
	3	28.3	-	-	23.1
5	0	-	18.1	21.0	-
	1	22.0	-	-	27.6
	2	-	36.4	37.3	-
	3	33.1	-	-	35.8
6	0	11.2	-	-	17.4
	1	-	25.0	31.5	-
	2	24.0	-	-	33.4
	3	-	38.0	40.8	-
7	0	9.5	-	-	19.1
	1	-	30.9	33.0	-
	2	21.9	-	-	34.9
	3	-	33.7	41.9	-
8	0	7.6	-	-	20.0
	1	-	21.4	32.7	-
	2	23.5	-	-	38.4
	3	-	39.9	43.2	-

Mean D.M. %: 77.0

68/A/5.4

SPRING WHEAT

STRAW

SERIES

Strip	N 1968	N	A	AC	C
1	0	-	55.2	28.0	-
	1	40.3	-	-	44.1
	2	-	40.9	54.2	-
	3	60.4	-	-	63.4
2	0	40.0	-	-	31.8
	1	-	56.9	52.8	-
	2	58.1	-	-	57.6
	3	-	69.3	68.5	-
4	0	-	14.8	20.0	-
	1	28.2	-	-	30.8
	2	-	44.2	45.4	-
	3	55.1	-	-	51.9
5	0	-	19.2	22.7	-
	1	35.8	-	-	37.3
	2	-	44.5	48.9	-
	3	51.0	-	-	50.2
6	0	14.0	-	-	19.2
	1	-	33.7	37.9	-
	2	41.4	-	-	46.7
	3	-	56.7	51.6	-
7	0	10.6	-	-	18.5
	1	-	34.1	37.0	-
	2	36.2	-	-	39.9
	3	-	58.7	56.9	-
8	0	12.2	-	-	18.1
	1	-	26.8	35.1	-
	2	36.7	-	-	41.1
	3	-	45.8	48.2	-

Mean D.M. %: 80.4

68/A/5.5

BARLEY

GRAIN

SERIES

Strip	N 1968	N	A	AC	C
1	0	34.5	-	-	32.7
	1	-	30.0	40.6	-
	2	30.1	-	-	28.4
	3	-	26.2	27.3	-
2	0	-	33.3	31.0	-
	1	37.2	-	-	34.2
	2	-	28.4	30.6	-
	3	24.7	-	-	28.2
4	0	16.8	-	-	20.7
	1	-	23.3	35.5	-
	2	33.9	-	-	34.3
	3	-	29.6	26.6	-
5	0	13.5	-	-	21.7
	1	-	36.1	38.4	-
	2	36.6	-	-	35.9
	3	-	36.5	33.7	-
6	0	-	19.0	22.5	-
	1	25.6	-	-	30.1
	2	-	35.9	33.1	-
	3	31.8	-	-	28.3
7	0	-	14.3	20.7	-
	1	25.2	-	-	30.3
	2	-	39.4	36.7	-
	3	30.3	-	-	22.4
8	0	-	19.7	22.8	-
	1	24.9	-	-	33.3
	2	-	36.8	36.1	-
	3	30.4	-	-	24.4
9	0	13.2			
	1	31.4			
	2	29.8			
	3	33.4			

Mean D.M. %: 82.8

68/A/5.6

BARLEY

STRAW

SERIES

Strip	N 1968	N	A	AC	C
1	0	38.3	-	-	38.7
	1	-	60.0	59.5	-
	2	66.8	-	-	70.5
	3	-	57.1	52.4	-
2	0	-	35.1	35.2	-
	1	55.9	-	-	55.9
	2	-	58.5	59.6	-
	3	59.5	-	-	60.1
4	0	15.8	-	-	16.7
	1	-	26.7	36.7	-
	2	48.2	-	-	42.4
	3	-	48.9	51.6	-
5	0	12.0	-	-	19.9
	1	-	32.4	35.5	-
	2	46.3	-	-	44.7
	3	-	42.6	45.6	-
6	0	-	16.8	22.3	-
	1	26.4	-	-	27.5
	2	-	43.4	44.8	-
	3	42.5	-	-	45.0
7	0	-	11.8	19.2	-
	1	25.5	-	-	29.9
	2	-	44.2	47.3	-
	3	41.8	-	-	47.9
8	0	-	29.0	19.1	-
	1	28.9	-	-	29.7
	2	-	36.0	25.2	-
	3	34.9	-	-	40.2
9	0	11.8			
	1	29.4			
	2	38.1			
	3	46.2			

Mean D.M. %: 79.7

68/A/5.7

SPRING BEANS

SERIES

Strip	O	H	Mean
GRAIN			
1	19.2	26.7	23.0
2	31.9	29.6	30.7
4	30.8	16.7	23.7
5	32.7	11.8	22.2
6	32.1	15.8	23.9
7	32.5	11.9	22.2
8	25.7	7.6	16.7
Mean	29.3	17.2	23.2
STRAW			
1	5.1	17.8	11.5
2	26.8	16.0	21.4
4	15.2	8.1	11.6
5	17.3	4.0	10.7
6	16.8	5.4	11.1
7	13.7	5.3	9.5
8	10.9	1.7	6.3
Mean	15.1	8.3	11.7

Mean D.M. %: Grain: 79.2  
Straw: 82.2

SILVER OXIDE			
COPPER		ZINC	
IRON	MANGANESE	CHROMIUM	MOLYBDENUM
0.00	0.00	0.00	0.00
0.01	0.01	0.01	0.01
0.02	0.02	0.02	0.02
0.03	0.03	0.03	0.03
0.04	0.04	0.04	0.04
0.05	0.05	0.05	0.05
0.06	0.06	0.06	0.06
0.07	0.07	0.07	0.07
0.08	0.08	0.08	0.08
0.09	0.09	0.09	0.09
0.10	0.10	0.10	0.10
0.11	0.11	0.11	0.11
0.12	0.12	0.12	0.12
0.13	0.13	0.13	0.13
0.14	0.14	0.14	0.14
0.15	0.15	0.15	0.15
0.16	0.16	0.16	0.16
0.17	0.17	0.17	0.17
0.18	0.18	0.18	0.18
0.19	0.19	0.19	0.19
0.20	0.20	0.20	0.20
0.21	0.21	0.21	0.21
0.22	0.22	0.22	0.22
0.23	0.23	0.23	0.23
0.24	0.24	0.24	0.24
0.25	0.25	0.25	0.25
0.26	0.26	0.26	0.26
0.27	0.27	0.27	0.27
0.28	0.28	0.28	0.28
0.29	0.29	0.29	0.29
0.30	0.30	0.30	0.30
0.31	0.31	0.31	0.31
0.32	0.32	0.32	0.32
0.33	0.33	0.33	0.33
0.34	0.34	0.34	0.34
0.35	0.35	0.35	0.35
0.36	0.36	0.36	0.36
0.37	0.37	0.37	0.37
0.38	0.38	0.38	0.38
0.39	0.39	0.39	0.39
0.40	0.40	0.40	0.40
0.41	0.41	0.41	0.41
0.42	0.42	0.42	0.42
0.43	0.43	0.43	0.43
0.44	0.44	0.44	0.44
0.45	0.45	0.45	0.45
0.46	0.46	0.46	0.46
0.47	0.47	0.47	0.47
0.48	0.48	0.48	0.48
0.49	0.49	0.49	0.49
0.50	0.50	0.50	0.50
0.51	0.51	0.51	0.51
0.52	0.52	0.52	0.52
0.53	0.53	0.53	0.53
0.54	0.54	0.54	0.54
0.55	0.55	0.55	0.55
0.56	0.56	0.56	0.56
0.57	0.57	0.57	0.57
0.58	0.58	0.58	0.58
0.59	0.59	0.59	0.59
0.60	0.60	0.60	0.60
0.61	0.61	0.61	0.61
0.62	0.62	0.62	0.62
0.63	0.63	0.63	0.63
0.64	0.64	0.64	0.64
0.65	0.65	0.65	0.65
0.66	0.66	0.66	0.66
0.67	0.67	0.67	0.67
0.68	0.68	0.68	0.68
0.69	0.69	0.69	0.69
0.70	0.70	0.70	0.70
0.71	0.71	0.71	0.71
0.72	0.72	0.72	0.72
0.73	0.73	0.73	0.73
0.74	0.74	0.74	0.74
0.75	0.75	0.75	0.75
0.76	0.76	0.76	0.76
0.77	0.77	0.77	0.77
0.78	0.78	0.78	0.78
0.79	0.79	0.79	0.79
0.80	0.80	0.80	0.80
0.81	0.81	0.81	0.81
0.82	0.82	0.82	0.82
0.83	0.83	0.83	0.83
0.84	0.84	0.84	0.84
0.85	0.85	0.85	0.85
0.86	0.86	0.86	0.86
0.87	0.87	0.87	0.87
0.88	0.88	0.88	0.88
0.89	0.89	0.89	0.89
0.90	0.90	0.90	0.90
0.91	0.91	0.91	0.91
0.92	0.92	0.92	0.92
0.93	0.93	0.93	0.93
0.94	0.94	0.94	0.94
0.95	0.95	0.95	0.95
0.96	0.96	0.96	0.96
0.97	0.97	0.97	0.97
0.98	0.98	0.98	0.98
0.99	0.99	0.99	0.99
1.00	1.00	1.00	1.00

Q.97 calculated by H.A.G. and  
Q.98 measured

68/A/6.1

HAY - THE PARK GRASS PLOTS

(PG)

For history, treatments etc. see 'Details' 1967 and 'Results'  
65/A/6.

Ground chalk was applied as follows (lb CaCO<sub>3</sub>) :-

Plot	Sub-plot		
	a	b	c
1	1786	-	2800
2,3,4/1	1786	-	-
4/2	1786	1120	5040
7,8	1786	-	-
9	1786	2240	3920
10	1786	1120	4480
11/1	3572	5600	4480
11/2	3572	3360	4480
13	1786	-	1120
14,16,17	1786	-	-
18	1020	-	2240

Whole plots:-

5/1*	5490
5/2*	4930
6*	6720
18/2,19,20	1020
12	-
15	-

\* Plots at present used for microplot experiments.

Cultivations, etc.: Mineral fertilisers applied: 21 Nov, 1967.

Ground chalk applied to sub-plots: 13 Dec. Ground chalk applied

to whole plots: 28 Dec. Nitrogenous fertilisers applied:

1st dressing - 27 Mar, 1968, 2nd dressing - 22 Apr.

Cut twice: 11 June, 5 Nov.

SUMMARY OF RESULTS

Plot No	1st cut				2nd cut				Mean	Total of 2 cuts			
	a	b	c	d	a	b	c	d		a	b	c	d
1	14.3	10.8	9.8	6.2	10.3	15.5	13.6	6.6	10.4	29.8	24.4	16.4	12.6
2	11.0	14.9	10.6	10.2	11.7	16.5	15.8	16.5	16.5	27.5	30.6	27.1	27.6
3	13.8	15.4	11.1	12.1	13.1	14.1	14.9	16.6	16.1	27.9	30.4	27.7	30.8
4-1	14.6	16.9	16.1	16.1	15.9	18.9	17.6	22.2	23.3	33.5	34.5	38.3	39.4
4-2	27.9	28.0	26.0	18.4	25.1	14.0	12.1	10.9	12.3	41.9	40.1	38.0	29.3
7	47.9	42.9	20.0	21.4	33.1	24.2	22.9	27.7	26.8	72.1	65.9	47.8	48.2
8	13.8	14.2	16.1	15.9	15.0	17.5	19.5	24.1	23.6	21.2	31.3	33.7	40.2
9	53.1	49.8	38.0	39.6	45.1	25.9	21.6	25.7	21.7	79.0	71.4	63.7	52.3
10	33.6	33.6	27.4	22.1	29.1	16.0	14.5	16.8	10.0	14.3	49.6	48.0	44.2
11-1	50.3	47.3	60.4	14.9	43.2	25.9	21.5	26.9	25.7	76.0	68.8	87.3	40.6
11-2	55.5	57.7	62.8	24.1	50.0	37.2	39.0	38.1	28.0	35.6	92.7	96.8	100.9
12	10.7	10.2	10.5	10.5	10.5	30.0	30.0	30.1	30.1	40.7	40.3	40.3	40.5
13	34.0	34.2	32.5	25.3	31.5	39.0	33.6	38.9	30.5	73.0	67.9	71.4	55.8
14	49.4	43.2	49.3	45.7	46.9	21.6	28.2	24.6	25.7	25.0	71.0	71.4	73.9
15	37.7	48.8	48.8	16.8	27.2	21.0	21.0	21.2	21.1	58.6	38.0	48.0	48.3
16	42.3	18.3	38.3	39.6	42.3	21.8	21.6	27.2	22.4	23.2	64.2	70.4	65.4
17	17.9	18.3	22.7	19.7	19.7	14.5	14.9	21.8	18.0	17.3	32.4	33.2	44.5
18-1	15.5	11.2	13.4	11.2	20.0	28.7	23.5	26.1	26.1	23.1	44.1	34.8	37.0
18-2	21.9	23.3	22.6	22.6	25.4	23.5	22.6	24.5	24.5	24.5	47.3	46.8	43.2
19-1											46.9		47.1
19-2											29.0		65.2
19-3											38.1		59.0
20-1											38.4		64.7
20-2											33.6		74.6
20-3											36.3		71.0

Mean D.M. %: 1st cut: 22.8

2nd cut: 21.5

Total of 2 cuts: 22.2

68/A/6.2

68/A/7

EXHAUSTION LAND, HOOSFIELD 1968

(EX)

For history, treatments, etc. see 'Details' 1967.

Area harvested: 0.0741.

Cultivations, etc.: Ploughed: 5 Sept, 1967. Seed combine drilled at 140 lb: 28 Feb, 1968. Sprayed with dicamba, mecoprop and MCPA (Banlene Plus at 4 pints in 32 gals): 17 May. Combine harvested: 21 Aug. Variety: Maris Badger.

SUMMARY OF RESULTS

Plot		Grain	Straw
1	-	9.8	9.2
2	-	12.5	11.7
3	D	29.2	27.2
4	D	34.3	29.8
5	N2	9.2	9.9
6	N*2	9.5	9.6
7	N2PKNaMg	19.1	21.7
8	N*2PKNaMg	24.5	24.9
9	P	20.5	22.3
10	PK	27.0	27.1
Mean		19.6	19.3
Mean D.M. %:		76.2	87.4

Table 1 Effect of different organic acids on the growth of <i>Aspergillus niger</i> and penicillium chrysogenum	
Organic acid concentration (%)	
0.00	100
0.05	100
0.10	100
0.15	100
0.20	100
0.25	100
0.30	100
0.35	100
0.40	100
0.45	100
0.50	100
0.55	100
0.60	100
0.65	100
0.70	100
0.75	100
0.80	100
0.85	100
0.90	100
0.95	100
1.00	100
1.05	100
1.10	100
1.15	100
1.20	100
1.25	100
1.30	100
1.35	100
1.40	100
1.45	100
1.50	100
1.55	100
1.60	100
1.65	100
1.70	100
1.75	100
1.80	100
1.85	100
1.90	100
1.95	100
2.00	100
2.05	100
2.10	100
2.15	100
2.20	100
2.25	100
2.30	100
2.35	100
2.40	100
2.45	100
2.50	100
2.55	100
2.60	100
2.65	100
2.70	100
2.75	100
2.80	100
2.85	100
2.90	100
2.95	100
3.00	100
3.05	100
3.10	100
3.15	100
3.20	100
3.25	100
3.30	100
3.35	100
3.40	100
3.45	100
3.50	100
3.55	100
3.60	100
3.65	100
3.70	100
3.75	100
3.80	100
3.85	100
3.90	100
3.95	100
4.00	100
4.05	100
4.10	100
4.15	100
4.20	100
4.25	100
4.30	100
4.35	100
4.40	100
4.45	100
4.50	100
4.55	100
4.60	100
4.65	100
4.70	100
4.75	100
4.80	100
4.85	100
4.90	100
4.95	100
5.00	100
5.05	100
5.10	100
5.15	100
5.20	100
5.25	100
5.30	100
5.35	100
5.40	100
5.45	100
5.50	100
5.55	100
5.60	100
5.65	100
5.70	100
5.75	100
5.80	100
5.85	100
5.90	100
5.95	100
6.00	100
6.05	100
6.10	100
6.15	100
6.20	100
6.25	100
6.30	100
6.35	100
6.40	100
6.45	100
6.50	100
6.55	100
6.60	100
6.65	100
6.70	100
6.75	100
6.80	100
6.85	100
6.90	100
6.95	100
7.00	100
7.05	100
7.10	100
7.15	100
7.20	100
7.25	100
7.30	100
7.35	100
7.40	100
7.45	100
7.50	100
7.55	100
7.60	100
7.65	100
7.70	100
7.75	100
7.80	100
7.85	100
7.90	100
7.95	100
8.00	100
8.05	100
8.10	100
8.15	100
8.20	100
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68/A/8.1

CLOVER - ROTHAMSTED GARDEN

(EGC)

The 115th year

(Revised 1968)

For history etc., see 'Details' 1967.

Basal applications: 0.6 cwt P2O5, 1.2 cwt K2O applied as (0:14:28) in winter 0.6 cwt K2O as muriate of potash after each cut except the last.

Test of N x Mg: The test of 0 (NO) v 1.0 (N1) cwt N per cut introduced in 1967 is continued. A further test of 0 (MgO) v 100 (Mg1) lb Mg as sulphate of magnesia ( $MgSO_4 \cdot 7H_2O$ ) is applied to quarter plots (50 lb Mg in winter and 50 lb after the 1st cut).

Variety: S123.

Cultivations, etc.: Basal PK and test Mg applied: 24 Jan, 1968. Area hand weeded: 27 Feb. All plants removed and carted, area hand hoed: 12 Mar. Area raked down to seedbed, seed sown at 30 lb, 'Nitro-Chalk' applied: 29 Mar. Cut, basal potash, test Mg and 'Nitro-Chalk' applied: 12 Aug. Cut second time: 17 Oct.

NOTE: Yields were not recorded from NOMgO and N1MgO plots for the 1st cut because of rabbit damage.

68/A/8.2

SUMMARY OF RESULTS

DRY MATTER

	NOMgO	N1MgO	NOMgl	N1Mgl
1st cut			17.0	15.8
2nd cut	10.6	13.7	17.7	15.7
Total of 2 cuts			34.7	31.5
Mean D.M. %:	1st cut:	16.1		
	2nd cut:	15.8		
	Total of 2 cuts:	16.0		

Mean D.M. %:  
1st cut: 16.1  
2nd cut: 15.8  
Total of 2 cuts: 16.0

68/A/9.1

SAXMUNDHAM

ROTATION I 1968

(SA)

For history, treatments, rotations etc. see Rothamsted Report for 1964, pp. 228 - 232 and 'Results' 66/A/10. For previous years' results see 'Results' 64/A/10, 65/A/10, 66/A/10, 67/A/9.

Area harvested:

New treatments, Sugar beet: 0.0072

Barley: 0.0257

Beans and

wheat: 0.0230

Old treatments, Sugar beet: 0.0017

Barley, beans

and wheat: 0.0014

In 1968 nitrogen was applied to sugar beet, barley and wheat at 1.0 cwt N in spring to all fertiliser plots receiving N. On the N2 plots this dressing was followed by a top-dressing of 0.5 cwt N (based on the needs of the crops as indicated by tissue-analysis). Nitrogen applications to beans and to FYM plots were unaltered.

Cultivations, etc.:

Sugar beet: FYM applied: 7 Sept, 1967. Ploughed: 7 and 18 Sept.

Bonemeal applied: 5 Mar, 1968. P and K applied: 14 Mar. 'Nitro-Chalk' applied: 20 Mar. Seed drilled: 27 Mar. Sprayed with pyramin at 2.2 lb in 33 gals: 2 Apr. Singled: 20 May.

Sprayed with DDT at 9 oz in 18 gals: 23 May. Additional 'Nitro-Chalk' applied to N2 plots: 25 July. Lifted: 24 Sept - 1 Oct. Variety: Klein E.

Barley: FYM applied, all plots ploughed: 7 Sept, 1967. Bonemeal applied: 5 Mar, 1968. P and K applied: 6 Mar. Seed drilled: 12 Mar. 'Nitro-Chalk' applied: 20 Mar. Sprayed with mecoprop at 27 oz and 2,4-D at 6.75 oz in 18 gals: 3 May. Additional 'Nitro-Chalk' applied to N2 plots: 28 May. Combine harvested: 22 Aug. Variety: Zephyr.

Spring beans: FYM applied: 7 Sept, 1967. Ploughed: 7 - 11 Sept. Bonemeal applied: 5 Mar, 1968. P and K applied: 6 Mar. Seed drilled: 8 Mar. 'Nitro-Chalk' applied: 20 Mar. Sprayed with simazine at 1 lb in 33 gals: 21 Mar. Combine harvested: 9 Sept. Variety: Maris Bead.

68/A/9.2

Winter wheat: FYM applied: 7 Sept, 1967. Ploughed: 7 - 9 Sept.  
Bonemeal applied: 16 Sept. P and K applied: 5 Oct. Seed drilled:  
9 Oct. 'Nitro-Chalk' applied: 20 Mar, 1968. Sprayed with  
mecoprop at 32.5 oz and 2,4-D at 8 oz in 18 gals: 18 Apr.  
Additional 'Nitro-Chalk' applied to N2 plots: 15 May.  
Combine harvested: 22 Aug. Variety: Cappelle.

68/A/10

SAXMUNDHAM

ROTATION II 1968

(SB)

For history, treatments, rotations, etc. see Rothamsted Report for 1964, pp. 228 - 232 and 'Results' 66/A/11. For previous years' results see 'Results' 64/A/11, 65/A/11, 66/A/11, 67/A/10.

Area of each plot: 0.0273. Area harvested: 0.0149.

Barley was grown over the whole area. No treatments (phosphate or FYM) were applied.

Basal manuring: 3 cwt (25:0:16).

Cultivations, etc.: Ploughed: 16 - 23 Oct, 1967. Basal NK compound applied: 6 Mar, 1968. Seed drilled: 11 Mar. Sprayed with mecoprop at 36 oz and 2,4-D at 9 oz in 32 gals: 3 May. Combine harvested: 14 Aug. Variety: Zephyr.

SUMMARY OF RESULTS

BARLEY

Plot	Treatment 1966 and 67	GRAIN	STRAW
1	P0	24.2	12.3
2	P0	29.7	15.8
3	P0	34.3	24.2
4	D	32.0	22.2
5	DP1	31.1	23.7
6	P1	31.4	21.5
7	P2	32.7	21.2
8	P0	32.2	21.9
Mean		31.0	20.4

Mean D.M. %: Grain: 84.6  
Straw: 84.6



SUMMARY OF RESULTS

NEW TREATMENTS

Treatment 1899 - 1965	Treatment from 1966	SUGAR BEET			BARLEY			SPRING BEANS			WINTER WHEAT		
		Roots	Sugar %	Total sugar	Tops	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
D	DNL	19.66	16.2	63.7	13.59	30.7	32.2	27.6	48.4	40.0	40.0	40.0	40.0
B	B	7.95	15.8	25.1	3.93	10.5	6.1	23.6	27.8	20.5	20.5	20.5	20.5
N	N2P2	16.95	15.6	52.8	15.71	31.3	19.4	24.5	40.0	28.5	28.5	28.5	28.5
P	NPL1	15.27	16.2	49.5	10.32	34.3	20.0	25.4	41.8	31.0	31.0	31.0	31.0
K	NLP2K	15.36	16.6	51.1	9.32	31.8	18.8	25.6	42.6	38.9	38.9	38.9	38.9
-	NLP2	15.40	16.3	50.0	9.57	28.7	20.0	25.8	45.9	37.5	37.5	37.5	37.5
PK	NPL1K	16.17	16.4	53.2	11.03	27.6	20.6	28.4	42.5	28.7	28.7	28.7	28.7
NK	N2P2K	15.80	15.7	49.6	14.58	26.5	18.6	27.5	47.6	30.9	30.9	30.9	30.9
NP	N2P1	16.74	15.3	51.1	16.21	38.0	23.8	22.0	43.5	26.7	26.7	26.7	26.7
NPK	N2P1K	16.77	15.5	51.9	15.99	33.5	19.7	30.5	42.7	30.6	30.6	30.6	30.6
	Mean	15.61	16.0	49.8	12.02	29.3	19.9	26.1	42.3	31.3	31.3	31.3	31.3
	Mean D.M. %:				85.0	82.7	80.4	79.7	72.6	72.6	72.6	72.6	72.6

68/A/9.3