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ROTHAMSTED RESEARCH

Numerical Results of the Field Experiments 1970



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Rothamsted Experimental Station

Harpenden

Lawes Agricultural Trust

NUMERICAL RESULTS

of the

FIELD

EXPERIMENTS

1970

This report includes only experiments conducted at Rothamsted, Woburn and Saxmundham. The design and supervision of these experiments are the responsibility of the Field Plots Committee (present members: D.J. Watson (Chairman), G.V. Dyke (Secretary), J. McEwen (Deputy Secretary), F.C. Bawden, G.W. Cooke, J.M. Hirst, F.G.W. Jones, J.R. Moffatt, R. Moffitt, J.A. Nelder).

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R = Rothamsted W = Woburn S = Saxmundham

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CONVENTIONS 1970

In this report the following conventions are observed unless otherwise stated.

All areas are in acres.

All seed rates, rates of application of fertilisers, sprays etc. are per acre.

All yields and plant numbers are per acre.

The following conventions are used in variate headings:

Wheat, barley, oats, rye, beans etc.

Grain:	Grain (at 85% dry matter)
Straw:	Straw (at 85% dry matter)

Potatoes

% ware:	Percentage ware (1.5 inch riddle)

Sugar beet

Roots:	Roots (washed)
Sugar %:	Sugar percentage

Oilseed rape

Grain:	Grain (at 90% dry matter)
% fixed oil:	Percentage fixed oil

All crops

Mean D.M. %:	Mean dry matter % as harvested

For any other crop, details of abbreviations are given as necessary.

The following abbreviated forms of reference are used:

'Results'	(Numerical) Results of the Field Experiments, with year of harvest given.
'Details'	Details of the Classical and Long Term Experiments up to 1967.

Compound fertilisers indicated thus - (20:10:10) = compound fertiliser (20% N, 10% P_2O_5, 10% K_2O), granular unless otherwise stated.

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Treatment symbols are used in all summaries of results, and for annual experiments the key is given with the treatment descriptions.

For the classical and long term experiments the full description of the treatments is given in the 'Details': where necessary the key to the symbols is given in the 1968 'Results'.

For crop sequence experiments in progress in 1970 the key is given in the first year of the experiment with modifications as they arise.

Harvest Areas for Cereals

On most of those cereal experiments at Rothamsted and Woburn (but not Saxmundham) which are harvested by combine the 'blank-row' technique is used to distinguish the areas taken for yield from the discard areas. When seed is drilled in rows 7 in. apart (the most common arrangement), appropriate coulters are prevented from sowing and 8 or 16 rows are left for yield according to the cutter-bar width of the combine to be used. If the row-spacing is other than 7 in. a similar arrangement is used but with a different number of rows.

The ends of plots are separated from each other or from headlands by 3 ft. fallow paths made after the crop has established.

The 'Area harvested' in the 'Results', when the blank-row technique is used, is the product:-

number of rows harvested x distance between rows x length of rows.

A series of experiments by Widdowson at Rothamsted (68/Da/9, 68/Db/1, 69/R/W/13, 69/R/B/5, 70/R/WW/3 showed that on average the yield of 16 rows (50 ft. long) was 7.8% greater with blank rows than without.

If no rows are left blank and the plot is wider than the combine harvester so that discards are left uncut, the 'Area harvested' is the product:-

width of cutter bar x length of rows.

If the plot is narrower than the combine so that the whole area between paths is cut, the 'Area harvested' is the product:-

number of rows x distance between rows x length of rows.

We do not apply the adjustment used by some workers who take the harvested area as width x length where each is measured to the centre of 'paths' up to a maximum of 18 in.

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BROADBALK

(70/R/BK/1)

The 127th year, 3rd year of revised scheme.

Wheat, beans and potatoes 1970. For history, treatments etc. see 'Details' 1967, Station Report for 1966, pp. 229 - 231, Station Report for 1968, Part II and 'Results' 68/A/1 and 69/R/BK/1.

Areas harvested:

Wheat	Section 0	0.0107
	Section 1	0.0197
	Sections 5, 6 and 7	0.0163
	Sections 8 and 9	0.0171
Potatoes:	Section 2	0.0163
Beans:	Section 4	0.0183

Standard applications:-

Winter wheat: Weedkillers: Terbutryne and related triazines ('Prebane' at 4 lb in 20 gals) to all sections except 8 (no weedkillers). MCPA, mecoprop and dicamba ('Banlene Plus' at 4 pints in 20 gals) to all sections except 8.

Potatoes: Weedkillers: Paraquat at 0.375 lb ion plus linuron at 1 lb in 20 gals.
Fungicide: Mancozeb at 1.2 lb in 40 gals on 2 occasions.
Insecticide: Demeton-s-methyl at 3.5 oz with the first application of mancozeb.

Spring beans: Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.

Section 00: Methyl bromide sub-plots: No yields were taken. This investigation has now ceased.

Cultivations, etc.:-

ALL SECTIONS: Autumn fertilisers applied: 29 Sept, 1969. Plot 01 shallow rotary cultivated to incorporate fertiliser, FYM applied: 1 Oct. Ploughed: 2 - 4 Oct.

CROPPED SECTIONS:

Winter wheat: Rotary cultivated: 12 Sept, 1969. All plots rotary cultivated second time, plots 15 - 19, sections 0 and 1 rotary cultivated third time: 13 Oct. Seed drilled at 180 lb: 15 Oct. 'Prebane' applied: 17 Oct. N applied: 30 Apr, 1970. MCPA/mecoprop/dicamba applied: 6 May. Combine harvested: 27 Aug.

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Potatoes: Rotary cultivated: 12 Sept, 1969. N applied: 17 Apr, 1970. Plots rotary cultivated, potatoes machine planted: 30 Apr. Weedkiller applied: 20 May. All plots except 1, 21, 22, 7, 8, 9, 13, 15 grubbed and rotary ridged: 30 June. Fungicide and insecticide applied: 29 July. Fungicide applied: 14 Aug. Sprayed with undiluted BOV at 15 gals: 3 Sept. Lifted: 15 Sept.

Spring beans: Seed drilled at 200 lb: 21 Mar, 1970. N applied: 17 Apr. Insecticide applied: 19 June. Combine harvested: 2 Sept.

FALLOW SECTION: Rotary cultivated: 12 Sept, 1969. Ploughed second time: 20 May, 1970, third time: 9 July.

BROADBALK WILDERNESS:-

Ungrazed meadow (north): Topped with rotary grass cutter: 27 Oct, 1969.

Grazed meadow (centre): Grazed by sheep: 29 Apr, 1970 - 11 May, 27 May - 3 June, 29 June - 3 July, 3 - 14 Aug, 15 - 26 Sept, 14 - 19 Oct. Grass topped: 11 May, 3 June, 6 July, 20 Aug, 26 Sept.

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70/R/BK/1

SUMMARY OF RESULTS

WHEAT

GRAIN: CWT

Section	5	6	7	1	8	9	0	
Years after fallow	1	2	**	4	7*	12	19	Mean
Plot								
01	39.9	47.4	46.8					44.7
21	45.6	45.4	45.2	50.3	34.7	41.2	36.3	42.7
22	49.7	40.1	46.7	47.0	35.7	41.2	42.3	43.2
03	23.5	11.6	18.0	14.2	14.1	12.5	17.2	15.9
05	31.5	15.0	20.0	15.6	18.9	16.6	21.3	19.8
06	36.1	27.3	37.4	28.7	26.8	28.6	32.6	31.1
07	36.8	38.3	42.4	38.4	31.5	39.8	41.0	38.3
08	38.0	42.6	39.4	40.6	38.7	44.4	46.4	41.5
09	36.8	46.3	41.0	45.9	41.3	46.9	44.1	43.2
10	34.4	21.2	34.6	18.3	20.9	14.2	15.2	22.7
11	30.2	31.7	36.3	24.2	22.3	20.0	29.3	27.7
12	36.6	40.1	46.4	34.5	28.7	32.6	38.1	36.7
13	38.9	39.0	44.4	36.8	28.9	36.3	40.7	37.8
14	36.1	40.9	48.1	36.5	29.6	32.3	38.0	37.4
15	36.5	41.2	44.2	38.6	35.5	34.6	41.5	38.9
16	36.7	36.8	41.2	36.5	27.4	31.4	36.2	35.2
17	38.5	36.2	43.0	33.6	29.8	31.2	34.3	35.2
18	36.1	38.9	43.1	33.9	33.4	33.6	32.2	35.9
19	36.7	28.4	38.9	29.3	24.6	22.7	29.2	30.0
20				17.8			20.0	18.9

Mean D.M. %: 84.2

* No herbicide
** After beans

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70/R/BK/1

WHEAT

STRAW: CWT

Section	5	6	7	1	8	9	0	
Years after fallow	1	2	**	4	7*	12	19	Mean
Plot								
01	22.1	23.3	29.2					24.9
21	32.0	31.7	32.7	37.1	23.8	25.3	31.4	30.6
22	35.9	23.9	29.9	34.6	22.4	26.8	27.7	28.7
03	12.1	6.3	10.5	7.8	6.5	6.0	9.3	8.3
05	16.1	6.9	13.6	9.1	11.5	7.5	11.7	10.9
06	17.7	13.6	23.5	14.4	15.3	14.4	18.5	16.8
07	20.2	17.0	23.0	18.8	19.1	19.4	22.7	20.0
08	18.4	21.9	25.1	18.6	23.5	22.9	24.7	22.2
09	18.7	20.9	22.2	23.8	20.2	21.4	23.8	21.6
10	13.9	8.8	15.2	10.1	9.6	6.1	9.7	10.5
11	12.8	12.6	15.2	10.7	12.1	8.3	14.6	12.3
12	17.3	17.2	22.5	15.8	13.0	13.3	19.7	17.0
13	18.4	18.4	21.8	19.3	19.5	17.3	22.6	19.6
14	15.5	20.0	25.4	17.3	17.4	12.7	20.6	18.4
15	18.1	16.7	21.5	20.6	23.6	16.1	24.4	20.1
16	18.9	17.1	21.7	18.3	17.3	15.7	24.9	19.1
17	20.7	17.2	26.6	14.4	19.2	14.2	16.0	18.3
18	19.3	20.2	23.9	15.5	20.4	15.6	16.4	18.8
19	19.7	14.2	19.5	15.3	14.5	12.8	16.3	16.0
20				9.2			10.7	10.0

Mean D.M. %: 89.3

* No herbicide
** After beans

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70/R/BK/1

Section	4		2	
	SPRING BEANS		POTATOES	
Plot	GRAIN: CWT	STRAW: CWT	TOTAL TUBERS: TONS	% WARE 1.5 INCH
01	9.1	10.4	11.92	90.2
21	7.9	16.9	19.60	93.2
22	10.9	14.3	17.51	93.9
03	2.6	3.8	4.99	81.9
05	3.1	6.6	7.56	81.5
06	5.1	7.6	10.36	81.0
07	7.3	9.7	13.73	87.6
08	8.8	14.1	15.86	89.3
09	8.9	16.5	16.68	93.6
10	4.7	1.9	4.25	75.3
11	4.9	6.4	3.41	43.4
12	8.8	9.6	7.97	81.0
13	10.1	10.9	7.71	79.5
14	8.3	9.3	8.36	87.0
15	9.5	12.5	14.15	91.1
16	10.9	14.5	11.18	93.7
17	10.5	10.7	10.15	90.6
18	11.3	10.6	10.41	91.0
19	7.7	7.1	8.06	87.2
Mean D.M. %:	77.1	46.8		

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HOOSFIELD

(70/R/HB/2)

The 119th year, 3rd year of revised scheme.

Barley, beans and potatoes 1970. For history, treatments etc., see 'Details' 1967, Station Report for 1966, 'Results' 68/A/2 and 69/R/HB/2.

The barley variety for the period 1970 - 1972 will be Julia.

Standard applications:
Barley: Weedkillers: Paraquat at 0.75 lb ion in 20 gals. MCPA, mecoprop and dicamba ('Banlene Plus' at 4 pints in 20 gals).
Spring beans: Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.
Potatoes: Weedkillers: Paraquat at 0.75 lb ion in 20 gals. Linuron at 1 lb in 39 gals. Fungicide: Mancozeb at 1.2 lb in 40 gals on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 oz with the first application of mancozeb.

Cultivations, etc.: Fertilisers applied: 22 Oct, 1969. FYM applied: 10 Nov. Ploughed: 11 - 12 Nov.
Barley: Paraquat applied: 17 Sept, 1969. Seed drilled at 140 lb: 20 Mar, 1970. N applied: 9 Apr. MCPA/mecoprop/dicamba applied: 26 May. Combine harvested small combine plots: 18 Aug, large combine plots: 25 Aug. Variety: Julia.
Spring beans: Seed drilled at 200 lb: 21 Mar, 1970. Insecticide applied: 18 June. Combine harvested: 2 Sept.
Potatoes: Paraquat applied: 17 Sept, 1969. N applied: 29 Apr, 1970. Plots rotary cultivated, potatoes machine planted: 30 Apr. Linuron applied: 23 May. Grubbed and rotary ridged: 30 June. Fungicide and insecticide applied: 29 July. Fungicide applied: 14 Aug. Sprayed with undiluted BOV at 15 gals: 3 Sept. Lifted: 15 Sept.

Errata to 'Results' 1969 page 16. Row P K Na Mg Si N* column N1. Insert + against the figures 29.8 for grain and 27.0 for straw. In the note replace * by +.

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70/R/HB/2

SUMMARY OF RESULTS

BARLEY

Treatment**		N 0	1	2	3	Mean
1852-1970	1852-1966					
		GRAIN: CWT				
-	-	6.5	15.9	19.5	20.2	15.5
-	N	8.6	15.5	14.7	15.6	13.6
P	-	9.5	22.3	29.9	28.4	22.5
P	N	10.5	16.5	16.0	16.7	14.9
K Na Mg	-	2.2	17.7	25.4	30.9	19.0
K Na Mg	N	10.3	16.4	19.7	20.7	16.8
P K Na Mg	-	9.4	25.2	36.2	45.4	29.0
P K Na Mg	N	15.5	23.8	34.2	37.5	27.8
	D	34.7	44.8	45.8	46.1	42.8
	(D)	7.6	20.7	38.8	33.6	25.2
	(Ashes)	2.9	22.1	22.5	25.1	18.1
	-	9.3	18.0	19.1	23.3	17.4
		STRAW: CWT				
-	-	2.2	5.4	8.7	7.7	6.0
-	N	3.3	5.5	5.5	6.6	5.2
P	-	3.3	7.7	10.9	7.8	7.4
P	N	3.4	5.7	5.6	6.8	5.4
K Na Mg	-	1.1	8.6	10.6	12.2	8.1
K Na Mg	N	3.3	8.3	8.5	8.5	7.2
P K Na Mg	-	4.1	10.6	18.4	23.9	14.3
P K Na Mg	N	6.3	12.2	16.9	20.0	13.9
	D	14.6	26.0	30.0	31.1	25.4
	(D)	4.3	7.4	17.2	14.1	10.7
	(Ashes)	15.8	10.2	8.7	10.0	11.2
	-	2.9	5.9	7.3	8.5	6.1

** For explanation of symbols see 'Details' 1967

Mean D.M. % (all plots): Grain: 84.0
Straw: 85.1

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70/R/HB/2

BARLEY

Treatment**			N 0	1	2	3	Mean
				GRAIN: CWT			
1852-1970		1852-1966					
-		N*	13.6	21.7	20.8	22.2	19.6
	Si	N*	14.2	27.9	31.0	30.7	26.0
P		N*	19.0	30.9	37.6	36.1	30.9
P	Si	N*	19.8	33.6	37.0	36.3	31.7
K Na Mg		N*	15.9	25.9	27.0	28.1	24.2
K Na Mg	Si	N*	20.5	28.8	33.4	37.4	30.0
P K Na Mg		N*	16.4	30.8	39.2	41.0	31.9
P K Na Mg	Si	N*	17.9	34.0	40.5	44.2	34.1
-		R(c)	13.4	28.2	34.0	37.5	28.3
-		R(r)	20.6	32.4	35.0	36.0	31.0
P		R(c)	15.9	28.2	38.4	39.9	30.6
P		R(r)	21.7	32.8	36.9	40.6	33.0
K Na Mg		R(c)	12.1	24.5	34.8	33.5	26.2
K Na Mg		R(r)	17.5	28.0	34.1	34.3	28.5
P K Na Mg		R(c)	16.1	26.7	36.2	36.8	29.0
P K Na Mg		R(r)	28.7	35.8	40.2	42.1	36.7
				STRAW: CWT			
-		N*	5.7	7.7	7.8	9.5	7.7
	Si	N*	5.8	11.7	11.4	13.6	10.6
P		N*	5.8	9.7	14.6	13.5	10.9
P	Si	N*	7.7	15.5	13.5	15.6	13.1
K Na Mg		N*	7.2	11.1	14.1	16.4	12.2
K Na Mg	Si	N*	9.0	13.3	20.1	21.4	16.0
P K Na Mg		N*	7.3	13.6	20.1	25.2	16.5
P K Na Mg	Si	N*	9.2	16.9	23.8	26.4	19.1
-		R(c)	3.8	7.8	15.8	15.3	10.7
-		R(r)	7.8	11.8	11.7	15.3	11.7
P		R(c)	7.7	11.7	11.6	14.3	11.3
P		R(r)	7.4	11.5	11.9	15.7	11.6
K Na Mg		R(c)	3.8	7.8	19.3	18.5	12.4
K Na Mg		R(r)	7.3	11.7	15.3	20.3	13.6
P K Na Mg		R(c)	7.6	11.5	18.0	21.0	14.5
P K Na Mg		R(r)	14.5	15.5	25.6	21.1	19.2

** For explanation of symbols see 'Details' 1967

NOTE: (c) = continuous (i.e. barley after barley)
(r) = rotational (i.e. barley after beans)

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70/R/HB/2

BARLEY

Plots	Treatment**			GRAIN: CWT	STRAW: CWT
	1852-1970		1852-1966		
551	N2	PK	N	36.5	20.6
561	-	PK	-	8.9	2.8
571	N2	-	N*	27.3	10.3
581	N2	-	N*	19.7	9.3

** For explanation of symbols see 'Details' 1967

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70/R/HB/2

BEANS

GRAIN: CWT

1968

Treatment**		N0	N1	N2	N3	Mean
1852-1970 1852-1966						
-	R	9.9	9.0	7.9	9.5	9.1
P	R	5.5	6.6	6.3	5.5	6.0
K Na Mg	R	8.6	6.2	6.6	8.5	7.5
P K Na Mg	R	11.1	11.0	11.7	11.2	11.3
Mean		8.8	8.2	8.1	8.7	8.5

Mean D.M. %: 79.6

** For explanation of symbols see 'Details' 1967

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70/R/HB/2

POTATOES

1969

Treatment**		N0	N1	N2	N3	Mean
		TOTAL TUBERS: TONS				
1852-1970	1852-1966					
-	R	8.62	6.83	5.87	9.02	7.58
P	R	8.44	5.12	5.18	6.64	6.34
K Na Mg	R	9.42	10.65	10.23	11.05	10.34
P K Na Mg	R	13.34	13.47	13.18	13.72	13.43
Mean		9.95	9.02	8.61	10.11	9.42
		% WARE: 1.5 INCH				
1852-1970	1852-1966					
-	R	92.3	88.4	89.0	92.4	90.5
P	R	86.4	73.9	66.1	85.8	78.1
K Na Mg	R	89.8	89.6	91.6	89.2	90.1
P K Na Mg	R	92.3	92.2	89.4	91.7	91.4
Mean		90.2	86.0	84.0	89.8	87.5

** For explanation of symbols see 'Details' 1967

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WHEAT AND FALLOW - HOOSFIELD 1970

(70/R/WF/3)

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

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

Cultivations, etc.:

Cropped plots: Ploughed: 22 Sept, 1969. Rotary cultivated: 14 Oct. Seed drilled at 180 lb: 15 Oct. Sprayed with ioxynil at 7.5 oz and mecoprop at 22.5 oz in 20 gals: 14 May, 1970. Combine harvested: 26 Aug.

Fallow plots: Plot 07 (2nd year fallow) rotary cultivated: 14 Oct, 1969. Ploughed (all fallow plots) 3 times: 22 Sept, 1969, 21 May, 1970, 9 July.

SUMMARY OF RESULTS

Plot No.	1	3	5
No. of years of fallow	1	1	3
	GRAIN: CWT		
	13.4	14.5	13.0
	STRAW: CWT		
	13.9	13.3	11.8

Mean D.M. %: Grain: 83.7
Straw: 88.1

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EXHAUSTION LAND HOOSFIELD 1970

(70/R/EX/4)

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

Variety changed to: Julia.

Area harvested: 0.0741.

Cultivations, etc.: Sprayed with paraquat at 0.5 lb ion in 20 gals: 18 Sept, 1969. Ploughed: 16 Oct. Seed combine drilled at 140 lb: 20 Mar, 1970. Sprayed with MCPA, mecoprop and dicamba ('Banlene Plus' at 4 pints in 20 gals): 26 May. Combine harvested: 15 Aug.

SUMMARY OF RESULTS

Plot	1876 - 1901	GRAIN: CWT	STRAW: CWT
1	-	9.1	2.0
2	-	13.8	3.5
3	D	32.7	10.7
4	D	35.4	11.3
5	N	13.1	7.4
6	N*	12.6	4.2
7	N PKNa Mg	29.9	11.9
8	N* PKNa Mg	30.9	8.0
9	P	26.3	8.7
10	PKNa Mg	30.7	14.0
Mean		23.5	8.2
Mean D.M. %:		85.3	88.0

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PARK GRASS

(70/R/PG/5)

HAY

For history, treatments etc. see 'Details' 1967 and 'Results' 68/A/6 and 69/R/PG/5.

Cultivations, etc.: Mineral fertilisers applied: 5 Nov, 1969. N applied: 1st dressing - 18 Mar, 1970, 2nd dressing - 28 Apr. Cut twice: 15 June, 2 Oct.

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SUMMARY OF RESULTS

DRY MATTER: CWT

Plot No	1st cut a	b	c	d	Mean	2nd cut a	b	c	d	Mean	Total of 2 cuts a	b	c	d	Mean
1	13.9	14.0	8.0	4.4	10.1	10.6	6.9	4.7	1.9	6.0	24.6	20.9	12.7	6.4	16.1
2	8.9	12.0	11.3	9.7	10.5	7.6	8.5	9.4	9.8	8.8	16.5	20.5	20.6	19.6	19.3
3	8.9	10.5	10.0	9.2	9.6	4.7	5.2	6.7	8.1	6.2	13.6	15.7	16.7	17.3	15.8
4-1	9.0	9.5	12.4	13.1	11.0	6.4	6.3	8.6	10.0	7.8	15.4	15.9	21.0	23.1	18.8
4-2	22.4	20.9	21.8	13.9	19.7	7.8	7.6	6.4	12.3	8.5	30.2	28.5	28.2	26.2	28.3
7	37.9	43.8	19.1	22.8	30.9	19.0	17.2	8.3	7.3	12.9	56.9	61.1	27.4	30.1	43.9
8	10.1	8.3	15.4	15.4	12.3	7.9	6.8	10.9	9.2	8.7	18.1	15.0	26.3	24.6	21.0
9	51.9	52.5	39.2	32.0	43.9	17.6	16.1	10.8	6.2	12.7	69.5	68.6	50.0	38.2	56.6
10	29.2	29.6	27.0	16.8	25.7	15.5	14.8	6.8	12.5	12.4	44.6	44.4	33.9	29.3	38.0
11-1	52.3	54.0	50.6	33.8	47.7	20.1	16.9	11.7	22.2	17.7	72.4	71.0	62.3	56.0	65.4
11-2	60.4	66.5	58.4	49.6	58.7	30.6	32.2	16.0	25.1	26.0	91.0	98.8	74.4	74.8	84.7
12	14.8		12.0		13.4	12.9		10.0		11.4	27.7		22.0		24.9
13	33.1	33.8	34.9	27.5	32.3	40.8	37.0	23.2	15.1	29.0	73.9	70.8	58.1	42.6	61.4
14	47.3	47.1	48.7	49.2	48.1	12.1	14.1	19.5	22.5	17.1	59.4	61.3	68.2	71.8	65.2
15	37.4		16.0		26.7	16.0		8.0		12.0	53.5		23.9		38.7
16	45.7	47.4	36.0	38.5	41.9	14.6	13.7	15.1	12.3	13.9	60.3	61.1	51.1	50.9	55.8
17	15.4	14.9	23.7	19.8	18.4	9.0	9.2	12.5	15.5	11.6	24.4	24.1	36.2	35.3	30.0
18-1			14.1	3.6	8.8			6.9	2.8	4.9			21.0	6.4	13.7
18-2					17.1					12.1					29.2
18-3	16.1	17.7			16.9	8.3	9.1			8.7	24.5	26.9			25.7
19-1					32.2					17.2					49.4
19-2					33.7					21.6					55.3
19-3					36.1					21.4					57.5
20-1					42.4					19.2					61.6
20-2					43.4					17.1					60.5
20-3					47.7					23.4					71.0

Mean D.M. %: 1st cut: 31.0 2nd cut: 32.0 Total of 2 cuts: 31.5

70/R/Pg/5

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AGDELL

(70/R/AG/6)

Grass, sugar beet and barley 1970.

First year of revised scheme testing fresh P on two phases per annum of a three course rotation - sugar beet, barley, potatoes. Crops in 1970 sugar beet and barley.

For history, past treatments etc. and for previous years' results see 'Details' 1967 and 'Results' 68/A/4 and 69/R/AG/6.

Area of each sub-plot:
Grass and fallow: Plots 1, 2, 3, 4 - 0.0180. Plots 5, 6 - 0.0162.
Area harvested: Plots 1, 2, 3, 4 - 0.0023. Plots 5, 6 - 0.0020.
Sugar beet and barley: Plots 1, 2, 3, 4 - 0.0045. Plots 5, 6 - 0.0040.
Area harvested: Sugar beet: Plots 1, 2, 3, 4 - 0.0019. Plots 5, 6 - 0.0017. Barley: Plots 1, 2, 3, 4 - 0.0017. Plots 5, 6 - 0.0015.

New superphosphate treatments:
Sugar beet: None (P0), 1.0 cwt (P2) P_2O_5
Barley: None (P0), 0.5 cwt (P1) P_2O_5
(P as single superphosphate).

Only the sub-plots formerly testing P have been brought into the new scheme. Pairs of these sub-plots were split in a North-South direction for crops. Each original sub-plot was further split in an East-West direction for the test of fresh superphosphate.

Treatments and cropping on sub-plots testing K were unaltered.

Balancing P and K: P (as triple superphosphate) and K (as muriate of potash) were applied on 18 Nov, 1969, to balance removals by grass in 1969, to all sub-plots except P0, which continues to receive no P, and K0, which continues to receive no K.

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Rates in cwt P_2O_5

Plot No	Sub-plots testing P:- P0	P1	P2	P4	Sub-plots testing K:- K0	K1	K2	K4
1	0	0.41	0.44	0.47	0.35	0.45	0.46	0.49
2	0	0.36	0.43	0.47	0.31	0.44	0.52	0.47
3	0	0.35	0.39	0.39	0.34	0.39	0.39	0.39
4	0	0.40	0.36	0.45	0.42	0.44	0.40	0.46
5	0	0.29	0.34	0.39	0.29	0.36	0.36	0.35
6	0	0.31	0.36	0.36	0.22	0.42	0.41	0.44

Rates in cwt K_2O

	Sub-plots testing P:- P0	P1	P2	P4	Sub-plots testing K:- K0	K1	K2	K4
1	2.59	3.00	3.13	2.92	0	2.36	2.60	3.08
2	2.24	2.67	2.93	2.99	0	2.20	2.90	2.81
3	1.99	2.47	2.75	2.44	0	2.38	2.18	2.53
4	1.30	2.80	2.36	2.84	0	2.46	2.19	2.77
5	0.99	2.25	2.26	2.48	0	1.96	2.10	2.23
6	0.81	2.20	2.26	2.21	0	2.26	2.20	2.45

Basal applications: Manures:-
Sugar beet: 1.5 cwt N as 'Nitro-Chalk', 2.5 cwt K_2O as muriate of potash, 0.8 cwt MgO as kieserite.
Barley: 0.75 cwt N, 0.48 cwt K_2O as (25:0:16).
Grass: as previously.
Insecticide to sugar beet: Menazon ('Saphicol' at 0.5 pints in 40 gals) on 2 occasions.

Cultivations, etc.: Ground chalk applied at 25 cwt to main plots 1 and 2 and to South half of 3 and 4: 31 Oct, 1969.
Grass: Basal N applied: 18 Mar, 1970 and 15 June. Cut twice for silage: 4 June and 3 Aug. Ploughed: 4 Sept.
Fallow: Ploughed: 5 Dec, 1969. Rotary cultivated twice: 10 June, 1970 and 22 July.
Sugar beet: Ploughed: 5 Dec, 1969. Test P and basal NK Mg applied: 30 Apr, 1970. Seed drilled at 8 lb: 4 May. Singled: 8 June. Insecticide applied: 25 June, 15 July. Lifted: 19 Oct. Variety: Klein E.
Barley: Ploughed: 5 Dec, 1969. Test P applied, seed drilled at 150 lb, basal N and K applied: 24 Apr, 1970. Combine harvested: 18 Aug. Variety: Julia.

Errata to 'Results' 1969: Delete table on p.24 of 'Rates in cwt K_2O' and replace by:

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Rates in cwt K20

Plot No	Sub-plots testing P:- P0	P1	P2	P4	Sub-plots testing K:- K0	K1	K2	K4
1	2.23	3.31	2.72	3.23	0	2.64	3.02	3.06
2	1.40	2.85	3.25	3.08	0	2.66	2.89	2.88
3	1.32	2.66	2.77	2.97	0	2.54	2.38	2.72
4	0.89	2.88	2.66	2.67	0	2.85	2.76	3.09
5	0.65	2.26	2.46	2.67	0	2.19	2.54	2.80
6	0.68	2.42	2.56	2.61	0	2.42	2.52	2.49

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70/R/AG/6

SUMMARY OF RESULTS

GRASS

DRY MATTER: CWT

Plot

K	5	6	3	4	1	2	Mean
			1ST CUT				
0	14.5	16.2	25.0	22.8	27.5	17.4	20.6
1	36.2	40.6	36.9	39.2	40.8	42.7	39.4
2	36.4	45.2	40.5	41.9	39.1	44.5	41.3
4	38.6	40.7	41.4	42.0	39.2	45.1	41.2
Mean	31.4	35.7	36.0	36.5	36.7	37.4	35.6
			2ND CUT				
0	3.6	2.6	3.1	3.6	4.4	1.6	3.2
1	10.9	13.2	8.9	14.1	11.1	11.9	11.7
2	9.5	10.7	9.2	11.3	12.3	22.1	12.5
4	8.6	10.3	8.9	13.6	10.6	14.3	11.0
Mean	8.2	9.2	7.5	10.6	9.6	12.5	9.6
			TOTAL OF 2 CUTS				
0	18.1	18.8	28.1	26.4	31.8	19.1	23.7
1	47.0	53.8	45.8	53.3	52.0	54.6	51.1
2	45.9	55.9	49.7	53.2	51.4	66.5	53.8
4	47.2	51.0	50.3	55.5	49.8	59.4	52.2
Mean	39.6	44.9	43.5	47.1	46.3	49.9	45.2

Mean D.M. %: 1st cut: 27.1
2nd cut: 28.9
Total of 2 cuts: 28.0

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70/R/AG/6

SUGAR BEET

ROOTS (WASHED): TONS

Treatment 1848-1957		Plot 5	6	3	4	1	2	Mean
		None		PK		NPK		
P		Previous cropping 1958-69, Arable or fallow						
1964-69	1970							
0	0	8.15	13.63	15.90	11.22	12.51	13.21	12.44
1	0	11.09	13.36	14.03	11.34	15.90	11.46	12.86
2	0	13.76	13.50	16.37	13.68	12.39	16.72	14.40
4	0	15.23	14.83	12.98	16.49	16.14	15.78	15.24
0	2	12.03	14.83	16.84	15.90	15.78	12.98	14.73
1	2	13.50	9.49	13.91	10.99	15.55	12.51	12.66
2	2	16.97	11.49	17.89	14.62	14.97	16.49	15.40
4	2	11.76	13.63	11.81	14.50	17.89	12.74	13.72
Mean		12.81	13.10	14.97	13.59	15.14	13.99	13.93
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	6.81	1.07	4.79	8.54	12.74	12.28	7.71
1	0	14.57	16.17	16.84	16.95	17.54	16.72	16.46
2	0	18.04	13.76	15.67	16.60	13.68	19.06	16.14
4	0	10.56	17.77	16.60	12.39	16.49	17.77	15.26
0	2	14.03	11.22	11.46	12.16	15.55	15.08	13.25
1	2	13.50	15.90	16.95	15.32	17.77	17.42	16.14
2	2	18.57	13.63	16.02	13.68	13.33	16.14	15.23
4	2	15.63	17.50	14.97	13.91	14.26	16.49	15.46
Mean		13.96	13.38	14.16	13.69	15.17	16.37	14.46

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70/R/AG/6

SUGAR BEET

SUGAR %

Treatment 1848-1957		Plot 5 None	6 None	3 PK	4 PK	1 NPK	2 NPK	Mean
P		Previous cropping 1958-69, Arable or fallow						
1964-69	1970							
0	0	16.3	16.7	17.6	14.8	16.9	16.1	16.4
1	0	17.1	16.6	17.2	15.2	17.2	16.0	16.5
2	0	16.0	16.4	16.7	16.8	16.4	16.7	16.5
4	0	17.2	17.2	17.0	15.9	17.0	17.2	16.9
0	2	15.3	17.0	16.9	16.0	16.5	16.0	16.3
1	2	16.3	16.3	16.8	16.2	16.7	15.9	16.4
2	2	16.5	16.1	16.8	16.6	16.6	16.6	16.5
4	2	15.6	16.8	17.1	16.6	16.2	16.4	16.5
Mean		16.3	16.6	17.0	16.0	16.7	16.3	16.5
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	16.0	16.6	14.9	15.2	16.3	16.0	15.8
1	0	17.2	16.7	17.4	16.3	16.8	16.4	16.8
2	0	16.5	17.0	17.4	16.3	16.7	16.8	16.8
4	0	17.0	16.5	17.0	16.4	16.8	17.1	16.8
0	2	16.4	15.9	16.1	15.7	16.4	16.6	16.2
1	2	16.5	16.5	17.3	16.8	16.7	17.3	16.9
2	2	17.3	16.9	17.2	16.5	16.1	16.7	16.8
4	2	16.9	17.0	17.7	16.4	16.8	17.1	17.0
Mean		16.7	16.7	16.9	16.2	16.6	16.8	16.6

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SUGAR BEET

TOTAL SUGAR: CWT

Treatment 1848-1957		Plot 5 None	6 None	3 PK	4 PK	1 NPK	2 NPK	Mean
P		Previous cropping 1958-69, Arable or fallow						
1964-69	1970							
0	0	26.5	45.5	56.1	33.2	42.3	42.6	41.0
1	0	37.8	44.3	48.3	34.5	54.8	36.6	42.7
2	0	44.1	44.3	54.7	45.9	40.7	55.8	47.6
4	0	52.3	50.9	44.1	52.5	54.7	54.2	51.5
0	2	36.7	50.4	56.8	50.7	52.1	41.5	48.1
1	2	43.9	30.9	46.8	35.5	52.0	39.7	41.5
2	2	56.1	36.9	60.1	48.4	49.7	54.6	51.0
4	2	36.7	45.8	40.5	48.1	58.0	41.8	45.1
Mean		41.8	43.6	50.9	43.6	50.5	45.9	46.1
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	21.9	3.5	14.3	26.0	41.5	39.3	24.4
1	0	50.2	54.1	58.6	55.3	59.1	54.9	55.4
2	0	59.7	46.9	54.7	54.0	45.7	64.2	54.2
4	0	36.0	58.8	56.3	40.6	55.3	60.9	51.3
0	2	46.0	35.7	36.9	38.1	51.1	50.1	43.0
1	2	44.5	52.6	58.8	51.4	59.3	60.4	54.5
2	2	64.2	46.0	55.0	45.0	42.9	53.8	51.1
4	2	52.9	59.6	52.9	45.7	48.0	56.4	52.6
Mean		46.9	44.7	48.4	44.5	50.3	55.0	48.3

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70/R/AG/6

SUGAR BEET

TOPS: TONS

Treatment 1848-1957		Plot 5	6	3	4	1	2	Mean
		None		PK		NPK		
P		Previous cropping 1958-69, Arable or fallow						
1964-69	1970							
0	0	12.98	18.24	21.75	15.90	19.18	19.41	17.91
1	0	11.34	17.07	19.64	16.84	21.28	16.37	17.09
2	0	13.45	18.94	19.18	16.37	17.77	21.28	17.83
4	0	18.82	17.19	16.60	18.01	21.51	18.94	18.51
0	2	16.25	18.47	21.28	23.38	22.68	23.38	20.91
1	2	14.73	16.14	20.11	16.84	23.62	19.64	18.51
2	2	16.25	16.60	21.98	22.68	19.18	21.51	19.70
4	2	15.55	17.19	19.41	20.11	22.45	18.47	18.86
Mean		14.92	17.48	19.99	18.77	20.96	19.88	18.67
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	7.02	1.14	6.78	9.59	18.24	15.90	9.78
1	0	17.54	19.99	25.72	20.11	24.09	24.09	21.92
2	0	18.59	17.77	20.81	20.58	22.45	26.42	21.10
4	0	11.93	20.23	22.68	16.60	23.62	27.36	20.40
0	2	19.29	16.02	21.28	16.60	24.32	23.85	20.23
1	2	13.33	22.22	23.62	20.11	25.49	23.38	21.36
2	2	19.41	14.26	22.22	18.47	20.11	25.49	19.99
4	2	17.77	20.93	18.24	16.37	21.98	23.62	19.82
Mean		15.61	16.57	20.17	17.30	22.54	23.76	19.33

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70/R/AG/6

SUGAR BEET

PLANT NUMBER: THOUSANDS

Treatment 1848-1957		Plot 5 None	6	3 PK	4	1 NPK	2	Mean
P		Previous cropping 1958-69, Arable or fallow						
1964-69	1970							
0	0	16.8	19.4	26.2	17.8	30.9	25.1	22.7
1	0	15.2	22.5	27.2	16.2	31.4	23.0	22.6
2	0	14.1	18.3	24.6	18.9	25.7	25.1	21.1
4	0	22.5	19.4	23.6	15.7	27.8	24.6	22.3
0	2	18.3	17.8	25.7	28.3	33.0	24.1	24.5
1	2	18.3	17.3	21.0	16.8	30.9	24.1	21.4
2	2	15.2	15.2	24.6	20.4	29.3	24.6	21.6
4	2	14.1	14.1	23.0	19.9	26.7	22.5	20.1
Mean		16.8	18.0	24.5	19.3	29.5	24.2	22.0
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	22.5	18.6	23.6	18.3	28.3	26.7	23.0
1	0	16.8	21.0	32.0	21.0	23.0	26.2	23.3
2	0	21.0	16.2	22.5	22.0	28.3	26.7	22.8
4	0	13.1	20.4	21.0	16.8	29.3	29.9	21.7
0	2	24.1	18.9	21.5	17.8	29.3	27.8	23.2
1	2	13.1	21.0	23.6	20.4	28.3	27.8	22.3
2	2	25.1	17.3	23.0	16.8	28.8	24.6	22.6
4	2	17.3	20.4	19.9	19.4	24.6	30.4	22.0
Mean		19.1	19.2	23.4	19.1	27.5	27.5	22.6

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70/R/AG/6

BARLEY

GRAIN: CWT

Plot

Treatment 1848-1957	5 None	6	3 PK	4	1 NPK	2	Mean
P	Previous cropping 1958-69, Arable or fallow						
1964-69 1970							
0 0	9.1	13.8	34.3	14.9	14.7	19.9	17.8
1 0	23.1	21.5	36.7	25.3	21.8	11.1	23.3
2 0	29.4	37.8	37.5	40.0	20.7	24.6	31.7
4 0	29.6	39.3	34.8	43.0	25.7	21.7	32.4
0 1	8.0	25.1	33.4	14.7	18.2	15.0	19.1
1 1	28.2	27.1	36.9	30.5	14.9	14.3	25.3
2 1	36.3	36.2	35.3	41.0	21.1	31.0	33.5
4 1	32.0	38.5	39.3	37.7	29.6	23.3	33.4
Mean	24.5	29.9	36.0	30.9	20.8	20.1	27.0
P	Previous cropping 1958-69, Grass						
1964-69 1970							
0 0	18.8	16.6	28.4	18.2	26.9	24.5	22.2
1 0	33.2	36.0	36.3	29.2	35.1	30.5	33.4
2 0	32.5	41.5	35.7	26.0	25.7	29.2	31.8
4 0	34.7	37.6	37.6	42.6	30.1	34.6	36.2
0 1	17.9	17.1	30.0	19.0	29.5	29.3	23.8
1 1	28.4	38.8	37.5	31.6	28.5	30.0	32.5
2 1	32.1	37.6	35.4	32.8	26.8	32.1	32.8
4 1	38.3	38.3	39.7	25.8	34.3	34.7	35.2
Mean	29.5	32.9	35.1	28.2	29.6	30.6	31.0

Mean D.M. %: 84.7

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70/R/AG/6

BARLEY

STRAW: CWT

Treatment 1848-1957		Plot 5 None	6 None	3 PK	4 PK	1 NPK	2 NPK	Mean
P		Previous cropping 1958-69, Arable or fallow						
1964-69	1970							
0	0	4.3	10.4	19.2	9.8	10.8	14.5	11.5
1	0	13.9	13.4	24.5	15.8	13.8	7.0	14.7
2	0	16.1	21.8	21.2	23.3	13.7	16.0	18.7
4	0	14.5	20.7	19.6	24.2	16.2	12.9	18.0
0	1	3.1	12.6	19.0	8.6	16.8	11.0	11.9
1	1	16.5	16.0	24.2	19.7	18.1	8.9	17.2
2	1	21.7	20.6	19.0	23.0	13.1	20.3	19.6
4	1	14.9	20.4	23.8	23.8	16.4	11.3	18.4
Mean		13.1	17.0	21.3	18.5	14.9	12.7	16.3
P		Previous cropping 1958-69, Grass						
1964-69	1970							
0	0	7.6	9.3	15.1	8.8	17.7	14.3	12.1
1	0	16.2	17.7	19.2	16.9	19.5	20.5	18.3
2	0	16.2	19.9	20.4	14.9	22.5	20.1	19.0
4	0	18.6	20.1	23.2	24.1	20.4	22.5	21.5
0	1	8.6	8.2	14.8	11.0	17.6	16.6	12.8
1	1	14.8	19.7	21.9	18.6	17.2	23.5	19.3
2	1	14.5	19.0	19.6	19.7	20.1	20.7	18.9
4	1	19.8	19.6	22.4	22.8	22.2	20.6	21.2
Mean		14.5	16.7	19.6	17.1	19.6	19.9	17.9

Mean D.M. %: 54.0

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BARNFIELD

(70/R/BN/7)

Third year of new scheme, 1970. Beans, spring wheat and barley.

For history, treatments, etc. see 'Details' 1967 and 'Results' 68/A/5 and 69/R/BN/7.

Varieties in 1970: Spring wheat: Kolibri, barley: Julia, spring beans: Maris Bead.

Continuous spring beans: The half plots on Section 1 which have now received simazine in each of the 3 years 1967 - 69 were divided into 2 for a test of continued simazine application v residual effects of previous application.

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: 0.0217.
Section 2 (half plot): 0.0241.
(Strips 1 and 8: 0.0158). Area harvested: 0.0217.

Standard applications: Spring beans: Weedkiller: Paraquat at 0.5 lb ion in 20 gals to strips 1 and 2 only. Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.

Cultivations, etc.: FYM applied: 10 Nov, 1969. P,K,Na and Mg applied: 10 - 27 Nov. All plots ploughed: 28 Nov.
Spring beans: Paraquat applied: 8 Oct, 1969. Seed drilled at 200 lb: 20 Apr, 1970. Simazine applied to half plots at 1 lb in 20 gals: 24 Apr. Insecticide applied: 17 June. Combine harvested: 4 Sept.
Spring wheat: Seed drilled at 170 lb: 20 Apr, 1970. N applied: 24 Apr. Combine harvested: 29 Aug.
Barley: Seed drilled at 140 lb: 20 Apr, 1970. N applied: 24 Apr. Combine harvested: 25 Aug.

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70/R/BN/7

SUMMARY OF RESULTS

SPRING WHEAT

GRAIN: CWT

Strip	N	N	A	AC	C
1	0	10.4	-	-	23.0
	1	-	21.4	30.4	-
	2	15.6	-	-	26.3
	3	-	25.0	22.8	-
2	0	-	20.0	18.1	-
	1	20.3	-	-	24.7
	2	-	21.3	27.8	-
	3	10.6	-	-	28.2
4	0	11.0	-	-	12.4
	1	-	19.8	24.2	-
	2	16.7	-	-	25.7
	3	-	29.4	31.4	-
5	0	8.6	-	-	12.2
	1	-	22.9	26.8	-
	2	16.4	-	-	21.2
	3	-	25.7	32.2	-
6	0	-	10.1	12.6	-
	1	18.3	-	-	22.2
	2	-	25.1	31.4	-
	3	17.9	-	-	31.8
7	0	-	10.5	14.3	-
	1	17.7	-	-	24.8
	2	-	26.8	29.6	-
	3	11.9	-	-	23.8
8	0	-	22.5	12.4	-
	1	17.3	-	-	20.0
	2	-	23.6	13.7	-
	3	12.3	-	-	25.5
9	0		15.0		
	1		18.8		
	2		20.7		
	3		22.4		

Mean D.M. %: 83.0

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70/R/BN/7

SPRING WHEAT

STRAW: CWT

Strip	N	N	A	AC	C
1	0	19.0	-	-	20.9
	1	-	28.8	26.7	-
	2	26.6	-	-	29.3
	3	-	26.6	28.3	-
2	0	-	15.3	17.3	-
	1	22.6	-	-	24.0
	2	-	28.0	22.1	-
	3	28.3	-	-	32.0
4	0	8.9	-	-	8.8
	1	-	14.6	16.8	-
	2	19.5	-	-	21.6
	3	-	22.6	22.1	-
5	0	7.8	-	-	8.4
	1	-	14.2	16.7	-
	2	17.2	-	-	15.8
	3	-	16.6	19.0	-
6	0	-	7.7	9.2	-
	1	16.1	-	-	17.3
	2	-	21.9	23.6	-
	3	17.8	-	-	27.1
7	0	-	6.1	9.8	-
	1	12.6	-	-	17.8
	2	-	16.7	19.1	-
	3	12.1	-	-	17.5
8	0	-	6.7	8.2	-
	1	11.3	-	-	12.2
	2	-	13.0	14.9	-
	3	13.9	-	-	13.7
9	0		7.7		
	1		13.4		
	2		16.6		
	3		18.3		

Mean D.M. %: 71.2

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70/R/BN/7

BARLEY

GRAIN: CWT

Strip	N	N	A	AC	C
1	0	-	32.6	29.7	-
	1	36.6	-	-	40.6
	2	-	42.3	44.5	-
	3	40.7	-	-	44.6
2	0	33.7	-	-	26.8
	1	-	38.8	39.5	-
	2	38.6	-	-	44.0
	3	-	43.1	44.2	-
4	0	-	8.9	9.1	-
	1	22.6	-	-	22.3
	2	-	28.9	30.4	-
	3	32.1	-	-	37.3
5	0	-	8.7	10.1	-
	1	22.4	-	-	27.1
	2	-	31.5	37.2	-
	3	28.7	-	-	39.8
6	0	7.6	-	-	11.4
	1	-	23.7	27.4	-
	2	26.9	-	-	33.3
	3	-	35.5	39.7	-
7	0	7.4	-	-	11.6
	1	-	22.9	26.4	-
	2	23.1	-	-	32.5
	3	-	36.9	39.0	-
8	0	6.5	-	-	15.4
	1	-	21.2	28.4	-
	2	25.0	-	-	33.1
	3	-	30.0	33.9	-

Mean D.M. %: 82.7

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70/R/BN/7

BARLEY

STRAW: CWT

Strip	N	N	A	AC	C
1	0	-	18.0	17.7	-
	1	19.1	-	-	22.3
	2	-	23.3	25.1	-
	3	25.6	-	-	24.4
2	0	18.6	-	-	15.5
	1	-	23.7	22.4	-
	2	22.4	-	-	23.1
	3	-	25.3	21.8	-
4	0	-	3.2	3.4	-
	1	11.9	-	-	12.1
	2	-	13.0	17.2	-
	3	18.2	-	-	20.0
5	0	-	2.7	4.4	-
	1	11.3	-	-	13.6
	2	-	14.3	18.5	-
	3	15.4	-	-	18.6
6	0	2.5	-	-	5.0
	1	-	12.2	14.6	-
	2	15.1	-	-	18.3
	3	-	17.9	21.8	-
7	0	3.2	-	-	4.8
	1	-	11.3	12.9	-
	2	11.7	-	-	16.7
	3	-	18.4	18.3	-
8	0	1.7	-	-	6.9
	1	-	10.3	12.8	-
	2	11.1	-	-	16.9
	3	-	14.2	13.8	-

Mean D.M. %: 78.0

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70/R/BN/7

BEANS

SIMAZINE

Strip	1967*	1967-69	1967-70	Mean
		GRAIN: CWT		
1	16.4	12.6	12.6	14.5
2	13.0	16.6	13.3	14.0
4	8.2	7.5	6.4	7.6
5	11.6	9.0	7.2	9.8
6	7.2	8.4	6.4	7.3
7	8.6	5.3	4.3	6.7
8	6.5	1.6	1.7	4.1
Mean	10.2	8.7	7.4	9.1
		STRAW: CWT		
1	7.3	6.6	8.2	7.4
2	12.7	10.7	5.8	10.5
4	3.4	3.1	2.5	3.1
5	3.4	2.6	1.8	2.8
6	3.0	3.5	2.7	3.1
7	3.4	2.2	1.8	2.7
8	2.6	1.1	0.6	1.7
Mean	5.1	4.2	3.4	4.4

Mean D.M. %: Grain: 79.2
Straw: 66.5

* Duplicated treatment

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GARDEN CLOVER

(70/R/GC/8)

The 117th year

For history etc., see 'Details' 1967 and 'Results' 68/A/8 and 69/R/GC/8.

Area harvested: 0.0002.

Cultivations, etc.: All plants removed and carted, area hand dug: 14 Oct, 1969. Basal PK and test Mg applied: 2 Apr, 1970. Area raked down to seedbed, seed sown at 30 lb, test N applied: 20 Apr. Hand-hoed: 27 May. Irrigated (0.25 inches per acre): 28 May. Hand-hoed: 19 June. Cut, area hand-hoed, basal K, test N and test Mg applied: 30 July. Cut second time, hand-hoed, basal K and test N applied: 18 Sept. Cut third time: 13 Oct.

NOTE: Samples of herbage were taken for determinations of N, P, K, Ca, Na and Mg.

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70/R/GC/8

SUMMARY OF RESULTS

DRY MATTER: CWT

	N0Mg0	N1Mg0	N0Mg1	N1Mg1	Mean
1st cut	9.2	7.5	11.3	12.7	10.2
2nd cut	16.9	15.7	19.9	22.4	18.7
3rd cut	5.7	5.1	7.5	8.5	6.7
Total of 3 cuts	31.8	28.4	38.8	43.6	35.6

Mean D.M. %: 1st cut: 19.0
2nd cut: 15.1
3rd cut: 15.5
Total of 3 cuts: 16.5

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SAXMUNDHAM

ROTATION I 1970

(70/S/RN/1)

For history, treatments, rotations and results etc. see 'Details' 1967, 'Results' 68/A/9 and 69/S/RN/1. Grass and lucerne 1970.

Area of each new plot: 0.0236. Area harvested: Lucerne: 0.0034.

The rotation cropping is now discontinued and all blocks are sown to leys.

Treatments:

Plots with new treatments from 1966 (large plots):

Each main plot is split into two. Lucerne is grown on the northern half and grass on the southern. Manuring is unchanged except for FYM* and nitrogen. Lucerne does not receive nitrogen to any plots. Grass receives basal nitrogen at 0.8 cwt N for each cut as 'Nitro-Chalk'.

Plots continuing old treatments (small plots):

Each plot is sown to grass. Classical manuring is maintained except for FYM*.

* FYM was applied at 24 tons in autumn 1969. No further FYM will be applied before ploughing up grass and lucerne.

NOTE: Grass established poorly and all plots were re-sown in autumn without further cultivations. All small plots received basal nitrogen at 0.3 cwt N as 'Nitro-Chalk' to aid establishment. No cuts were taken from the grass plots.

Cultivations, etc.:-

FYM applied: (1) After beans and barley: 22 Sept, 1969. (2) After wheat: 6 Oct. (3) After sugar beet: 29 Oct. Ploughed: (1) 22 Sept. (2) 7 Oct. (3) 31 Oct.

Grass: Bonemeal applied: 25 Mar, 1970. P and K applied to large and small plots, test N applied to small plots: 5 May. Seed drilled at 30 lb and basal N applied to large plots: 6 May. Sprayed with 2,4-D ester at 21 oz a.e. in 20 gals: 26 Aug. Basal N applied to small plots, all grass redrilled into the partially established sward: 8 Sept. Varieties: Timothy (S.352) and Meadow Fescue (S.215) in equal proportions by weight.

Lucerne: Bonemeal applied: 25 Mar, 1970. P and K applied: 5 May. Seed drilled at 50 lb: 6 May. Cut once: 26 Aug. Variety: Europe.

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70/S/RH/1

SUMMARY OF RESULTS

LUCERNE. DRY MATTER: CWT

Treatment 1899-1965	Treatment from 1966	1st and only cut
D	DN1	25.3
B	B	10.7
N	N2P2	13.6
P	N1P1	10.6
K	N1P2K	10.3
-	N1P2	10.5
PK	N1P1K	13.7
NK	N2P2K	12.8
NP	N2P1	14.4
NPK	N2P1K	15.7
Mean		13.8

Mean D.M. %: 32.1

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SAXMUNDHAM

ROTATION II 1970

(70/S/RN/2)

For history, treatments, rotations and results see 'Details' 1967 and 'Results' 68/A/10 and 69/S/RN/2.

	Area of each sub plot:	Area harvested:
Potatoes:	0.0048	0.0019
Sugar beet:	0.0050	0.0025
Barley:	0.0273	0.0015

Basal applications: Manures as 1969.

Potatoes: Weedkiller: Linuron at 1.5 lb in 40 gals. Insecticide: Menazon ('Saphicol' at 0.5 pints in 40 gals) alone and with fungicide. Fungicide: Captafol at 1.5 lb in 40 gals alone and with insecticide.

Sugar beet: Weedkiller: Pyrazon at 2.4 lb in 20 gals. Insecticide: Menazon ('Saphicol' at 0.5 pints in 40 gals on four occasions).

Barley: Weedkiller: Mecoprop at 36 oz and 2,4-D at 9 oz in 20 gals.

Cultivations, etc.:

Potatoes: Ploughed: 10 Oct, 1969. Fertilisers applied: 29 Apr, 1970. Potatoes planted: 30 Apr. Weedkiller applied: 28 May. Insecticide applied: 24 June. Insecticide plus fungicide applied: 14 July, 6 Aug. Fungicide applied: 26 Aug. Lifted: 22 Sept. Variety: King Edward.

Barley: Ploughed: 10 Oct, 1969. Fertilisers applied, seed drilled: 20 Apr, 1970. Weedkiller applied: 28 May. Combine harvested: 11 Aug. Variety: Julia.

Sugar beet: Ploughed: 10 Oct, 1969. Fertilisers applied: 29 Apr, 1970. Seed drilled: 30 Apr. Weedkiller applied: 1 May. Insecticide applied: 24 June, 22 July, 6 Aug and 26 Aug. Lifted: 13 Oct. Variety: Klein E.

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70/S/RN/2

SUMMARY OF RESULTS

POTATOES

TOTAL TUBERS: TONS

Plot	Treatment 1966 and 1967	1970 P0*	P1	P2	P3	Mean
1	P0	3.59	3.94	4.51	6.02	4.33
2	P0	5.44	4.17	7.99	6.48	5.90
3	P0	9.72	9.03	8.91	9.38	9.35
4	D	10.88	11.46	9.84	11.81	10.97
5	DP1	11.58	12.39	12.04	11.11	11.74
6	P1	11.81	10.42	10.65	12.96	11.53
7	P2	10.88	11.46	12.73	11.58	11.51
8	P0	9.67	10.07	11.11	8.57	9.82
Mean		9.20	9.12	9.72	9.74	9.39

SUGAR BEET

ROOTS (WASHED): TONS

1	P0	2.12	2.61	2.70	12.78	4.47
2	P0	4.95	6.75	7.20	7.20	6.21
3	P0	9.36	11.52	9.00	13.77	10.61
4	D	9.41	6.66	7.09	6.48	7.81
5	DP1	10.14	10.08	11.25	9.99	10.32
6	P1	9.99	12.69	11.16	8.01	10.37
7	P2	10.49	14.49	10.80	14.85	12.23
8	P0	13.05	13.14	10.53	9.90	11.94
Mean		8.69	9.75	8.72	10.38	9.24

* Duplicated treatment

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SUGAR BEET

Plot	Treatment 1966 and 1967	1970 PO*	P1	P2	P3	Mean
		SUGAR %				
1	PO	13.9	13.0	13.2	15.2	13.8
2	PO	14.3	13.8	14.8	14.3	14.3
3	PO	14.5	15.6	14.6	15.4	14.9
4	D	15.2	14.3	14.3	14.5	14.7
5	DP1	14.5	15.2	15.0	14.3	14.7
6	P1	14.6	15.4	16.0	14.6	15.0
7	P2	15.7	15.5	15.1	15.7	15.5
8	PO	15.5	15.2	15.5	15.5	15.5
Mean		14.8	14.8	14.8	15.0	14.8
		TOTAL SUGAR: CWT				
1	PO	5.9	6.8	7.1	39.0	12.9
2	PO	14.2	18.6	21.3	20.6	17.8
3	PO	27.2	36.0	26.2	42.3	31.8
4	D	28.6	19.1	20.2	18.8	23.1
5	DP1	29.3	30.7	33.9	28.6	30.3
6	P1	30.0	39.2	35.6	23.5	31.7
7	P2	32.9	44.8	32.6	46.6	38.0
8	PO	40.5	39.9	32.7	30.8	36.9
Mean		26.1	29.4	26.2	31.3	27.8

* Duplicated treatment

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70/S/RN/2

SUGAR BEET

Plot	Treatment 1966 and 1967	1970 P0*	P1	P2	P3	Mean
		TOPS: TONS				
1	P0	3.06	4.01	4.10	8.33	4.51
2	P0	5.38	8.96	8.64	8.60	7.39
3	P0	8.71	13.19	9.14	13.28	10.61
4	D	10.22	7.88	9.23	7.43	8.99
5	DP1	10.69	9.59	14.54	9.14	10.93
6	P1	12.40	11.93	12.83	9.99	11.91
7	P2	11.57	13.46	11.39	13.28	12.25
8	P0	12.58	11.48	10.04	12.02	11.74
Mean		9.33	10.06	9.99	10.26	9.79
		PLANT NUMBER: THOUSANDS				
1	P0	8.9	11.7	9.3	13.7	10.5
2	P0	11.5	15.3	14.1	14.5	13.4
3	P0	16.3	18.6	13.7	22.2	17.4
4	D	15.9	13.3	8.5	14.1	13.6
5	DP1	14.5	14.9	15.7	10.9	14.1
6	P1	22.4	18.1	21.8	13.3	19.6
7	P2	21.2	27.8	16.9	30.7	23.6
8	P0	21.8	22.6	21.0	20.2	21.5
Mean		16.6	17.8	15.1	17.4	16.7

* Duplicated treatment

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70/S/RN/2

BARLEY AFTER POTATOES

Plot	Treatment 1966 and 1967	1969 P0*	P1	P2	P3	Mean
		GRAIN: CWT				
1	P0	22.9	25.4	33.9	31.7	27.4
2	P0	30.3	32.1	35.5	36.5	33.0
3	P0	35.3	35.3	34.3	36.5	35.3
4	D	37.1	35.5	38.7	38.0	37.3
5	DP1	37.0	35.9	40.2	36.0	37.2
6	P1	38.1	37.2	33.2	39.5	37.2
7	P2	38.3	34.4	33.5	36.9	36.3
8	P0	37.8	35.0	32.3	36.2	35.8
Mean		34.6	33.9	35.2	36.4	34.9
		STRAW: CWT				
1	P0	20.4	23.6	28.1	30.8	24.7
2	P0	27.7	29.3	34.6	32.6	30.4
3	P0	36.5	35.9	32.9	33.7	35.1
4	D	38.6	40.7	41.6	40.3	39.9
5	DP1	40.2	38.4	39.1	38.2	39.2
6	P1	39.5	35.9	39.9	37.6	38.5
7	P2	36.2	37.3	41.9	40.0	38.3
8	P0	37.2	33.3	34.2	39.9	36.4
Mean		34.5	34.3	36.6	36.6	35.3

Mean D.M. %: Grain: 84.2
Straw: 74.6

* Duplicated treatment

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70/S/RH/2

BARLEY AFTER SUGAR BEET

Plot	Treatment 1966 and 1967	1969 P0*	P1	P2	P3	Mean
		GRAIN: CWT				
1	P0	18.1	20.6	25.8	29.5	22.4
2	P0	24.9	28.5	29.5	28.2	27.2
3	P0	32.1	30.7	30.7	31.7	31.5
4	D	32.6	37.5	36.5	33.2	34.5
5	DP1	36.9	36.1	32.1	34.6	35.3
6	P1	34.6	39.2	34.2	37.5	36.0
7	P2	36.2	35.2	39.3	39.9	37.4
8	P0	32.7	35.4	36.8	34.9	34.5
Mean		31.0	32.9	33.1	33.7	32.3
		STRAW: CWT				
1	P0	16.5	17.3	22.5	23.9	19.3
2	P0	23.1	23.4	28.3	27.9	25.2
3	P0	31.2	33.9	34.7	33.1	32.8
4	D	35.5	40.2	37.2	35.1	36.7
5	DP1	36.7	40.7	37.7	36.8	37.7
6	P1	37.0	41.0	35.7	38.1	37.8
7	P2	39.7	38.7	37.3	42.6	39.6
8	P0	43.4	38.1	42.2	37.4	40.9
Mean		32.9	34.2	34.5	34.3	33.8

Mean D.M. %: Grain: 83.4
Straw: 72.9

* Duplicated treatment

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LEY/ARABLE

(70/R/RN/1 & 70/R/RN/2)

Highfield and Fosters 1970, the 22nd year.

For details of treatments, rotations etc. see 'Details' 1967, 'Results' 68/B/1 and 69/R/RN/1&2.

Revised cropping on blocks 1-4 on both fields (blocks reserved for continuation of the original Ley/Arable contrasts): From 1970 the treatment period is increased to 4 years:-

Treatments	1970	1971	1972	1973
Lucerne (LU)	LU	LU	LU	LU
Clover-grass (LC)	LC	LC	LC	LC
Grass (LN)	LN	LN	LN	LN
Arable with hay (AH)	Barley (undersown)	Seeds hay	Sugar beet	Oats

The basal manuring to the treatment barley crop was 0.4 cwt N, 0.3 cwt P2O5, 0.6 cwt K2O as 'Nitro-Chalk' broadcast, and compound (0:14:28) combine drilled.

Corrective K dressings, as muriate of potash, to 1st test crop potatoes, were applied before ploughing in Autumn 1969 as follows (in cwt K2O):-

Rotation	Highfield	Fosters
AH	5.3	4.4
LU	3.7	2.9
LC	0.2	0.0
LN	3.6	1.5
R	4.4	3.9

The variety of barley is now Julia.

Revised nitrogen levels to 3rd test crop, barley (both fields):- Cwt N to 1/8th plots: None (N0), 0.4 (N1), 0.7 (N2), 1.0 (N3) as 'Nitro-Chalk'.

Revised manuring to permanent (GC,GN) and reseeded (RC,RN) grass and to leys (LC, LN), in cwt:-

RN,GN: 0.6 N and 0.38 K2O as (25:0:16) for each cut, (previously 0.6 N and 0.6 K2O for each cut).

LN: 0.6 N as 'Nitro-Chalk' in spring and NK revised as above after each cut except the last, (previously 0.6 N and 0.6 K2O for each cut).

LC,RC,GC: K2O for each cut is now 0.38 as muriate of potash, (previously 0.6 K2O for each cut).

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PK dressing for all the above is unchanged at 0.6 P_2O_5 and 1.2 K_2O as (0:14:28) applied in winter (seedbed for 1st year leys).

HIGHFIELD

1st year Treatment Crops:

All-grass ley: Ploughed: 9 Oct, 1969. N and basal PK compound applied: 28 Apr, 1970. Seed drilled at 33 lb: 29 Apr. Sprayed with MCPB at 2.5 lb a.e. in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. NK compound applied after first cut.

Clover-grass ley: Ploughed: 9 Oct, 1969. Basal PK compound applied: 28 Apr, 1970. Seed drilled at 34 lb: 29 Apr. Sprayed with MCPB at 2.5 lb a.e. in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. Muriate of potash applied after first cut.

Lucerne: Ploughed: 9 Oct, 1969. Basal PK compound applied: 28 Apr, 1970. Seed drilled at 25 lb: 29 Apr. Cut twice: 4 Aug, 1 Oct.

Barley: Ploughed: 9 Oct, 1969. Seed combine drilled at 140 lb: 20 Mar, 1970. N applied: 2 Apr. Undersown: 7 May. Sprayed with MCPB/MCPA ('Tropotox Plus' at 5 pints in 20 gals): 26 May. Combine harvested: 13 Aug.

1st Test Crop. Potatoes:-

Corrective K applied, plots ploughed: 21 Oct, 1969. N, P and K fertiliser applied: 6 May, 1970. FYM applied, all plots rotary cultivated, potatoes machine planted: 7 May. Sprayed with linuron at 1 lb and paraquat at 0.375 lb ion in 39 gals: 23 May. Grubbed and rotary ridged: 17 June. Sprayed with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5 oz in 40 gals: 29 July. Sprayed with mancozeb at 1.2 lb in 40 gals: 14 Aug. Sprayed with undiluted BOV at 15 gals: 15 Sept. Lifted: 21 Sept.

2nd Test Crop. Wheat:-

Basal PK compound applied: 14 Oct, 1969. Deep-tine cultivated: 15 Oct. Seed combine drilled at 180 lb: 16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 8 May, 1970. N applied: 12 May. Combine harvested: 17 Aug.

3rd Test Crop. Barley:-

Ground chalk applied: 6 Oct, 1969. Ploughed: 9 Oct. Seed combine drilled at 140 lb: 20 Mar, 1970. N applied: 2 Apr. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 26 May. Combine harvested: 13 Aug.

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5th and 6th Test Crops. Wheat:-
Basal PK compound applied: 30 Sept, 1969. Ploughed: 9 Oct. Rotary cultivated: 15 Oct. Seed combine drilled at 180 lb: 16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 8 May, 1970. N applied: 14 May. Combine harvested: 17 Aug.

Permanent grasses:-
The 22nd experimental year permanent (old) grass, blocks 1, 2 and 4, the 22nd year reseeded grass, blocks 1 and 4. Basal PK compound applied: 18 Nov, 1969. NK compound applied to 'all-grass' half plots, muriate of potash to 'clover-grass' half plots: 18 Mar, 1970. Cut three times: 2 June, 3 Aug, 29 Sept. NK compound applied to 'all-grass' half plots and muriate of potash to 'clover-grass' half plots after each cut except the last.

FOSTERS

1st year Treatment Crops:
All-grass ley: Ploughed: 7 Oct, 1969. N and basal PK compound applied: 28 Apr, 1970. Seed drilled at 33 lb: 29 Apr. A few bare patches reseeded: 1 June. Sprayed with MCPB at 2.5 lb a.e. in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. NK compound applied after first cut.
Clover-grass ley: Ploughed: 7 Oct, 1969. Basal PK compound applied: 28 Apr, 1970. Seed drilled at 34 lb: 29 Apr. A few bare patches reseeded: 1 June. Sprayed with MCPB at 2.5 lb a.e. in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. Muriate of potash applied after first cut.
Lucerne: Ploughed: 7 Oct, 1969. Basal PK compound applied: 28 Apr, 1970. Seed drilled at 25 lb: 29 Apr. Cut twice: 4 Aug, 1 Oct.
Barley: Ploughed: 7 Oct, 1969. Seed combine drilled at 140 lb: 20 Mar, 1970. N applied: 2 Apr. Undersown: 7 May. Sprayed with MCPB/MCPA ('Tropotox Plus' at 5 pints in 20 gals): 26 May. Combine harvested: 13 Aug.

1st Test Crop. Potatoes:-
Corrective K applied: 20 Oct, 1969. Ploughed: 21 Oct. N, P and K fertilisers applied: 28 Apr, 1970 - 6 May. FYM applied: 6 May. All plots rotary cultivated, potatoes machine planted: 7 May. Sprayed with linuron at 1 lb and paraquat at 0.375 lb ion in 39 gals: 23 May. Grubbed and rotary ridged: 17 June. Sprayed with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5 oz in 40 gals: 29 July. Sprayed with mancozeb at 1.2 lb in 40 gals: 14 Aug. Sprayed with undiluted BOV at 15 gals: 15 Sept. Lifted: 21 Sept.

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2nd Test Crop. Wheat:-
Basal PK compound applied: 14 Oct, 1969. Deep-tine cultivated 3 times: 15 Oct. Seed combine drilled at 180 lb: 16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 8 May, 1970. N applied: 13 May. Combine harvested: 18 Aug.

3rd Test Crop. Barley:-
Ploughed: 8 Oct, 1969. Seed combine drilled at 140 lb: 20 Mar, 1970. N applied: 2 Apr. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 26 May. Combine harvested: 13 Aug.

5th and 6th Test Crops. Wheat:-
Basal PK compound applied: 30 Sept, 1969. Ploughed: 7 Oct. Rotary cultivated: 14 Oct. Seed combine drilled at 180 lb: 16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 8 May, 1970. N applied: 14 May. Combine harvested: 18 Aug.

Permanent grasses:-
The 22nd year reseeded grass, Blocks 1 and 3. Basal PK compound applied: 18 Nov, 1969. NK compound applied to 'all-grass' half plots, and muriate of potash to 'clover-grass' half plots: 18 Mar, 1970. Cut three times: 2 June, 3 Aug, 29 Sept. NK compound applied to 'all-grass' half plots and muriate of potash to 'clover-grass' half plots after each cut except the last.

NOTE: LU, LC and LN are now cut by half plots (ignoring F v D residues). Yields are taken from alternate half plots on successive cutting occasions.

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70/R/RN/1&2

SUMMARY OF RESULTS

POTATOES 1ST TEST CROP

TOTAL TUBERS: TONS

HIGHFIELD

1967 - 69

	LU	LC	LN	AH	R*	Mean
Mean	21.25	21.63	20.40	19.54	21.02	20.77
F	21.17	21.85	19.99	18.26	20.70	20.39
D	21.34	21.42	20.81	20.82	21.34	21.15
N0	19.61	18.61	17.75	16.09	18.59	18.13
N1	21.58	22.82	21.14	20.56	20.82	21.38
N2	21.46	22.70	20.89	20.03	21.72	21.36
N3	22.37	22.40	21.81	21.49	22.96	22.21
P0	21.05	21.20	20.44	19.38	20.56	20.53
P1	21.46	22.07	20.36	19.70	21.48	21.01
K0	20.95	21.14	19.87	18.71	20.98	20.33
K1	21.56	22.13	20.93	20.37	21.06	21.21

* R 1949 - 63 then AH

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70/R/RN/1&2

POTATOES 1ST TEST CROP

% WARE: 1.5 INCH

HIGHFIELD

1967 - 69

	LU	LC	LN	AH	R*	Mean
Mean	93.2	94.0	94.1	92.8	92.2	93.3
F	93.3	94.3	93.4	92.4	92.4	93.2
D	93.2	93.8	94.7	93.2	92.0	93.4
N0	92.4	92.8	93.1	89.2	91.3	91.8
N1	93.4	94.9	94.6	93.4	91.6	93.6
N2	93.9	94.4	94.4	94.0	92.6	93.9
N3	93.3	94.1	94.2	94.7	93.2	93.9
P0	93.3	93.8	94.1	93.2	92.1	93.3
P1	93.1	94.3	94.1	92.5	92.2	93.2
K0	93.4	94.2	93.9	93.0	91.9	93.3
K1	93.1	93.9	94.3	92.7	92.4	93.3

* R 1949 - 63 then AH

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70/R/RN/1&2

POTATOES 1ST TEST CROP

TOTAL TUBERS: TONS

FOSTERS

1967 - 69

	LU	LC	LN	AH	R*	Mean
Mean	14.68	14.46	15.41	13.35	15.32	14.64
F	13.72	13.83	14.28	12.29	14.73	13.77
D	15.65	15.09	16.55	14.40	15.91	15.52
N0	13.02	14.38	13.81	10.31	12.72	12.85
N1	15.39	14.69	15.55	13.22	15.17	14.80
N2	15.05	14.64	16.28	14.35	16.62	15.39
N3	15.27	14.12	16.02	15.51	16.77	15.54
P0	14.49	14.00	15.30	13.05	15.33	14.43
P1	14.88	14.91	15.53	13.64	15.31	14.85
K0	14.71	14.24	15.37	12.96	15.17	14.49
K1	14.66	14.68	15.46	13.73	15.46	14.80

* R 1949 - 63 then AH

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70/R/RN/1&2

POTATOES 1ST TEST CROP

% WARE: 1.5 INCH

FOSTERS

1967 - 69

	LU	LC	LN	AH	R*	Mean
Mean	90.7	90.2	91.5	87.5	90.1	90.0
F	89.8	89.9	91.3	86.5	89.6	89.4
D	91.6	90.4	91.7	88.6	90.7	90.6
N0	89.7	88.1	88.4	80.2	87.5	86.8
N1	89.3	90.0	91.2	88.8	90.0	89.9
N2	91.4	91.8	93.2	89.5	91.3	91.4
N3	92.4	90.7	93.2	91.6	91.5	91.9
P0	90.7	89.1	91.9	87.7	90.2	89.9
P1	90.7	91.3	91.0	87.3	90.0	90.1
K0	91.5	90.2	91.7	87.3	90.1	90.2
K1	89.9	90.1	91.2	87.8	90.1	89.8

* R 1949 - 63 then AH

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WHEAT 2ND TEST CROP

GRAIN: CWT

HIGHFIELD

	1966 - 68				1951 - 62		1951 - 68		
	LU	LC	LN	AH	Mean	R*	GC	GN	Mean
Mean	56.5	60.0	55.4	53.4	56.3	57.0	57.9	59.5	57.4
1970									
N0	47.8	51.9	45.4	43.9	47.3	49.0	52.6	53.5	51.0
N1	58.4	60.7	55.6	53.7	57.1	54.9	52.2	60.3	55.6
N2	59.1	62.9	60.4	58.1	60.1	59.2	60.2	60.1	59.6
N3	60.7	64.4	60.4	58.1	60.9	64.8	59.2	64.2	63.3
1969									
F	56.3	59.2	54.1	51.4	55.3	56.1			
D	56.8	60.8	56.7	55.5	57.4	57.9			
1969									
N0	56.2	58.6	52.3	51.7	54.7	55.8	57.7	54.5	55.9
N1	57.3	60.0	55.5	50.0	55.7	54.7	54.3	62.8	56.6
N2	55.6	59.9	56.4	55.4	56.8	58.6	57.4	59.1	58.4
N3	57.0	61.6	57.5	56.7	58.2	58.9	54.7	61.8	58.6

Mean D.M. % (All plots): 84.8

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70/R/RN/1&2

WHEAT 2ND TEST CROP

GRAIN: CWT

FOSTERS

	1966 - 68					1951 - 62
	LU	LC	LN	AH	Mean	R*
Mean	52.5	50.6	47.7	46.0	49.2	51.1
1970						
N0	46.7	46.3	42.6	37.9	43.4	45.8
N1	52.4	50.3	48.3	45.3	49.1	49.7
N2	54.9	52.2	49.7	49.4	51.5	53.8
N3	56.0	53.6	50.1	51.3	52.8	55.2
1969						
F	50.6	48.6	46.2	44.4	47.5	49.3
D	54.5	52.5	49.1	47.5	50.9	53.0
1969						
N0	51.2	49.2	47.0	45.4	48.2	49.1
N1	52.1	49.6	46.5	44.3	48.1	49.9
N2	52.6	51.1	47.8	45.9	49.4	52.0
N3	54.1	52.4	49.5	48.3	51.1	53.4

Mean D.M. % (All plots): 85.2

* AH since 1963

https://doi.org/10.23637/ERADOC-1-59 *pp 59*

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70/R/RN/1&2

BARLEY 3RD TEST CROP

GRAIN: CWT

HIGHFIELD

	1965 - 67					1950 - 67				
	LU	LC	LN	AH	Mean	RC	RN	GC	GN	Mean
Mean	44.8	44.3	43.7	42.0	43.7	49.7	50.1	49.9	49.8	49.9
1970										
NO	37.3	36.9	35.0	29.4	34.7	45.9	46.3	48.0	48.7	47.2
N1	46.7	47.6	45.5	44.6	46.1	50.9	51.8	49.4	50.7	50.7
N2	47.1	46.4	47.2	46.3	46.7	53.0	52.4	52.1	51.3	52.2
N3	48.2	46.2	46.9	47.8	47.3	49.1	49.7	50.2	48.6	49.4
1969										
NO	43.4	43.9	44.0	42.7	43.5	52.6	49.0	47.0	51.2	50.0
N1	45.8	43.9	43.0	40.8	43.4	48.2	53.2	49.2	46.6	49.3
N2	45.5	43.4	43.4	42.0	43.6	46.8	51.0	52.2	50.6	50.2
N3	44.6	45.9	44.3	42.6	44.3	51.3	47.0	51.2	50.8	50.1
1968										
F	44.9	44.3	43.6	42.0	43.7					
D	44.7	44.2	43.7	42.0	43.7					

Mean D.M. % (All plots): 85.4

https://doi.org/10.23637/ERADOC-1-59

https://doi.org/10.23637/ERADOC-1-59

BARLEY 3RD TEST CROP

GRAIN: CWT

FOSTERS

	1965 - 67					1950 - 67		
	LU	LC	LN	AH	Mean	RC	RN	Mean
Mean	36.0	34.3	34.4	33.5	34.6	35.0	35.9	35.4
1970								
N0	26.4	26.7	28.8	22.7	26.2	27.4	30.7	29.1
N1	37.8	35.9	35.3	35.5	36.1	38.0	36.0	37.0
N2	40.3	38.5	37.1	37.4	38.3	37.2	37.0	37.1
N3	39.7	36.2	36.6	38.2	37.7	37.2	39.9	38.6
1969								
N0	34.6	35.1	33.9	33.1	34.2	36.2	35.0	35.6
N1	36.9	34.3	32.8	31.8	33.9	32.4	36.6	34.5
N2	36.5	33.6	35.6	33.7	34.8	32.2	36.3	34.2
N3	36.2	34.3	35.5	35.3	35.3	39.0	35.6	37.3
1968								
F	35.3	33.4	34.3	33.1	34.1			
D	36.7	35.2	34.5	33.9	35.1			

Mean D.M.% (All plots): 83.5

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https://doi.org/10.23637/ERADOC-1-59

WHEAT 5TH TEST CROP

GRAIN: CWT

HIGHFIELD

	1963 - 65					1951 - 68				
	LU	LC	LN	AH	Mean	RC	RN	GC	GN	Mean
N1	29.4	26.9	20.8	28.8	26.5	51.5	44.3	50.5	54.3	50.2
N2	35.5	31.9	22.8	31.4	30.4	42.9	53.5	55.1	51.8	50.8
N3	32.7	30.3	27.8	31.4	30.5	49.8	56.2	39.0	50.8	49.0
N4	30.1	34.8	32.0	34.0	32.7	54.8	55.6	51.3	41.0	50.7
Mean	31.9	31.0	25.8	31.4	30.0	49.7	52.4	49.0	49.5	50.2

Mean D.M. % (All plots): 85.9

70/R/RN/1&2

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WHEAT 5TH TEST CROP

GRAIN: CWT

FOSTERS

	1963 - 65					1951 - 68		
	LU	LC	LN	AH	Mean	RC	RN	Mean
N1	25.2	37.1	32.0	31.0	31.3	44.7	42.6	43.6
N2	26.7	37.3	37.2	32.4	33.4	42.0	47.6	44.8
N3	31.7	39.1	40.4	34.2	36.4	45.5	46.9	46.2
N4	32.1	43.0	42.2	37.4	38.7	44.5	47.9	46.2
Mean	28.9	39.1	38.0	33.8	34.9	44.2	46.2	45.2

Mean D.M. % (All plots): 86.3

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70/R/RN/1&2

WHEAT 6TH TEST CROP

GRAIN: CWT

HIGHFIELD

	1962-64				1950-64		1950-67		
	LU	LC	LN	AH	R	Mean	GC	GN	Mean
N1	24.2	26.8	23.1	27.4	25.2	25.3	39.8	33.3	36.6
N2	24.0	29.8	27.4	25.5	25.6	26.5	32.3	46.2	39.3
N3	26.9	33.5	31.8	25.0	29.7	29.3	51.7	37.9	44.8
N4	30.7	32.7	28.3	30.8	31.1	30.7	41.4	44.2	42.8
Mean	26.4	30.7	27.6	27.2	27.9	28.0	41.3	40.4	40.9

Mean D.M. % (All plots): 85.4

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70/R/RN/1&2

WHEAT 6TH TEST CROP

GRAIN: CWT

FOSTERS

	1962 - 64				1950 - 64	
	LU	LC	LN	AH	R	Mean
N1	37.7	39.0	35.3	32.3	34.8	35.8
N2	33.3	40.4	43.0	34.8	41.1	38.5
N3	38.0	40.8	43.3	37.7	43.8	40.7
N4	43.7	42.8	46.3	40.5	44.5	43.5
Mean	38.2	40.7	42.0	36.3	41.0	39.6

Mean D.M. %: 86.2

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	HIGHFIELD Mean	FOSTERS Mean
LUCERNE, DRY MATTER: CWT		
TOTAL OF 2 CUTS		
1st year	29.5	28.0
ALL-GRASS LEY, DRY MATTER: CWT		
TOTAL OF 2 CUTS		
1st year	53.4	37.4
CLOVER-GRASS LEY, DRY MATTER: CWT		
TOTAL OF 2 CUTS		
1st year	31.2	24.0

RESEEDED GRASS, DRY MATTER: CWT

TOTAL OF 3 CUTS

	HIGHFIELD			FOSTERS		
	Blocks	RC	RN	Blocks	RC	RN
22nd Exptl year	1 & 4	22.5	70.0	1 & 3	29.4	43.2

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70/R/RN/1&2

PERMANENT GRASS, DRY MATTER: CWT

TOTAL OF 3 CUTS

	GC	GN
	HIGHFIELD	
22nd Exptl year		
Blocks 1 & 4	16.0	67.6
Block 2	14.3	67.8

(C) Clover-grass management
(N) All-grass management

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LEY/ARABLE

(70/W/RN/3)

Woburn Stackyard, 1970 - 33rd year.

For history, treatments, etc., see 'Details' 1967 and 'Results' 68/B/2 and 69/W/RN/3.

Corrective K dressings (in cwt K2O) as muriate of potash applied to first test crop barley:-

	No FYM half plots	FYM half plots
Continuous rotations		
Ley	1.6	0.0
Sainfoin	3.5	3.0
Arable with hay	5.0	5.0
Arable	3.0	2.0
Alternating rotations (last two rotations, in order)		
Arable with hay/ley	2.0	0.5
Arable/sainfoin	3.5	2.5
Ley/arable with hay	4.0	4.0
Lucerne/arable	3.5	3.5

Treatments to potatoes:

1. Fumigant on quarter plots: None (O), 400 lb (F) chloropicrin.
2. Nitrogen on twelfth plots: 1.0 (N2), 1.5 (N3), 2.0 (N4) cwt N as 'Nitro-Chalk'.
3. Nematicide on twenty fourth plots: None (O), 10 lb (T) aldicarb (as 'Temik' 10% granules).

Treatments to rye:

1. Residues of fumigant applied to potatoes in 1969 on quarter plots: None (O), 400 lb (F) chloropicrin.

Treatments to carrots:

1. Residues of fumigant applied to potatoes in 1968 on quarter plots: None (O), 400 lb (F) chloropicrin.

Management of leys:

1. All leys are now cut and carted off.

Cultivations, etc.:

Treatment crops.

Ley 1st year: Ploughed: 27 Aug, 1969. Mg applied: 16 Apr, 1970. NPK applied: 22 Apr. Seed sown at 40 lb: 24 Apr. NK applied: 18 June, 5 Aug. Cut twice: 3 Aug, 29 Sept.

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Ley 2nd year: NK applied: 16 Mar, 1970, 16 June, 5 Aug. Cut three times: 10 June, 3 Aug, 29 Sept.
Ley 3rd year: NK applied: 16 Mar, 1970, 16 June, 5 Aug. Cut three times: 10 June, 3 Aug, 28 Sept.
Sainfoin 1st year: Ploughed: 27 Aug, 1969. Mg applied: 16 Apr, 1970. NPK applied: 22 Apr. Seed drilled at 40 lb: 24 Apr. Cut twice: 3 Aug, 29 Sept.
Sainfoin 2nd year: N and K applied: 16 Mar, 1970. Sprayed between rows with paraquat at 0.6 lb ion in 24 gals: 19 June. Cut three times: 2 June, 3 Aug, 29 Sept.
Sainfoin 3rd year: N and K applied: 16 Mar, 1970. Sprayed with paraquat at 0.3 lb ion in 25 gals: 24 Mar. Rotary cultivated: 22 Apr. Power harrowed: 23 Apr. Redrilled at 40 lb: 24 Apr. Sprayed between rows with paraquat at 0.6 lb ion in 24 gals: 28 May. Cut twice: 3 Aug, 28 Sept.

Potatoes: Ploughed: 27 Aug, 1969. Rotary cultivated: 16 Oct. Chloropicrin applied: 26 Nov. PK and Mg applied: 16 Apr, 1970. 'Temik' applied, rotary cultivated: 20 Apr. N applied: 21 Apr. Potatoes planted: 22 Apr. Sprayed with linuron at 1.0 lb plus paraquat at 0.37 lb ion in 33 gals: 13 May. Grubbed: 3 June. Rotary ridged: 5 June. Sprayed with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5 fl oz in 37 gals: 31 July. Sprayed with mancozeb at 1.2 lb in 37 gals: 18 Aug. Sprayed with undiluted BCV at 15 gals: 18 Sept. Haulm destroyed mechanically: 23 Sept. Lifted: 25 Sept.
Rye: Deep-tine cultivated twice: 8 - 9 Oct, 1969. Seed combine drilled at 170 lb: 20 Oct. N applied: 23 Apr, 1970. Seeds hay undersown at 30 lb (AH plots): 24 Apr. Combine harvested: 18 Aug.
Seeds hay: Seeds undersown in rye at 30 lb: 16 Apr, 1969. NPK applied: 16 Mar, 1970. NK applied: 16 June. Cut three times: 2 June, 3 Aug, 28 Sept.
Carrots: Ploughed: 12 Sept, 1969. NPK applied, power harrowed: 23 Apr, 1970. Seed drilled at 3 lb: 24 Apr. Hand hoed: 20 - 21 May. Lifted: 7 - 8 Sept.

Test crops
Barley, 1st test crop: Half corrective K applied: 31 Oct, 1969. Ploughed: 14 - 18 Nov. Remaining corrective K applied: 20 Mar, 1970. Power harrowed, seed combine drilled at 140 lb: 25 Mar. N applied: 2 Apr. Sprayed with ioxynil at 7.5 oz plus mecoprop at 22.5 oz in 25 gals: 18 May. Combine harvested: 12 Aug.

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Barley, 2nd test crop: Chalk applied at 40 cwt: 2 Oct, 1969. Ploughed: 3 Oct. Power harrowed, seed combine drilled at 140 lb: 25 Mar, 1970. Sprayed with ioxynil at 7.5 oz plus mecoprop at 22.5 oz in 25 gals: 18 May. Combine harvested: 12 Aug.

NOTE: Soil samples were taken from the potato plots monthly throughout the growing season for counts of nematodes.

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70/W/RN/3

SUMMARY OF RESULTS

1ST TEST CROP

BARLEY

		N0	N1	N2	N3	N4
			GRAIN: CWT			
0	LE	16.8	23.7	18.4	21.0	
	SA	24.3	30.6	30.8	28.5	
	AH		24.7	28.8	24.9	26.9
	AR		24.5	27.7	28.8	24.4
D*	LE	20.6	23.2	23.9	22.6	
	SA	22.4	27.3	25.3	26.8	
	AH		23.7	22.9	25.7	22.5
	AR		25.3	28.4	27.3	27.8
			STRAW: CWT			
0	LE	7.5	11.1	7.6	9.4	
	SA	10.2	12.7	21.3	15.7	
	AH		13.9	17.2	12.9	18.1
	AR		11.6	15.4	17.2	13.7
D*	LE	10.3	11.2	11.9	10.4	
	SA	10.7	15.7	12.8	13.7	
	AH		11.2	12.5	11.6	12.9
	AR		13.5	16.1	14.0	16.7

Mean: Grain: 25.0
Straw: 13.1
Mean D.M. %: Grain: 83.8
Straw: 77.6

* Last applied to test crop sugar beet 1965

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70/W/RN/3

RYE

GRAIN: CWT

	LE	SA	AH	AR	Mean
O	31.9	33.8	33.9	31.7	32.8
D*	30.5	33.8	33.4	31.4	32.3
O	31.2	30.7	30.8	30.7	30.8
F	31.2	36.9	36.5	32.4	34.3
Mean	31.2	33.8	33.6	31.5	32.5

Mean D.M. %: 85.4

* Last applied to test crop sugar beet 1967

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70/W/RN/3

POTATOES

TOTAL TUBERS: TONS

	LE	SA	AH	AR	Mean
0	14.60	15.34	15.04	12.30	14.32
D*	20.40	15.10	12.91	15.45	15.96
0	14.98	14.14	11.58	11.98	13.17
F	20.03	16.29	16.37	15.77	17.11
N2	16.99	14.27	13.07	11.98	14.07
N3	16.26	15.60	13.66	13.69	14.80
N4	19.26	15.79	15.19	15.96	16.55
0	17.46	13.49	12.77	12.96	14.17
T	17.55	16.95	15.17	14.79	16.11
Mean	17.50	15.22	13.97	13.88	15.14

* Last applied to test crop sugar beet 1967

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70/W/RN/3

POTATOES

% WARE: 1.5 INCH

	LE	SA	AH	AR	Mean
0	96.1	96.0	97.2	96.8	96.5
D*	96.5	96.4	96.2	96.5	96.4
0	96.1	96.0	96.8	95.9	96.2
F	96.5	96.4	96.6	97.4	96.7
N2	95.9	95.9	96.4	96.7	96.2
N3	96.1	96.1	96.8	96.4	96.4
N4	96.9	96.6	96.9	96.8	96.8
0	96.5	96.1	96.6	96.3	96.4
T	96.1	96.3	96.8	96.9	96.6
Mean	96.3	96.2	96.7	96.6	96.5

* Last applied to test crop sugar beet 1963

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70/W/RN/3

CARROTS

ROOTS: TONS

	O	D*	O	F	Mean
AH	18.64	18.26	18.26	18.64	18.45
AR	14.58	14.45	14.58	14.45	14.52
Mean	16.61	16.36	16.42	16.54	16.48

* Last applied to test crop sugar beet 1966

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Replacement for 'Results' 1969 pp. 70 and 71

SUMMARY OF RESULTS

1ST TEST CROP

BARLEY

	N0	N1	N2	N3	N4
		GRAIN: CWT			
D0 LE	34.9	39.1	37.1	34.9	
SA	21.8	38.7	38.2	37.8	
AH		31.3	35.0	32.7	30.5
AR		33.2	39.6	37.9	37.9
D1 LE	35.6	39.7	36.4	33.9	
SA	24.7	42.1	39.3	36.7	
AH		32.9	33.7	34.8	33.0
AR		38.3	41.7	34.8	35.9
		STRAW: CWT			
D0 LE	31.2	43.0	41.5	40.7	
SA	14.8	34.5	40.4	37.8	
AH		25.7	33.6	34.4	29.3
AR		30.1	40.1	39.4	38.4
D1 LE	34.8	43.6	43.0	40.8	
SA	18.2	36.8	39.1	39.1	
AH		27.2	38.1	32.9	37.0
AR		31.1	37.9	35.5	41.0

Mean: Grain: 35.4
Straw: 35.3

Mean D.M. %: Grain: 84.4
Straw: 79.4

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MARKET GARDEN

(70/W/RN/4)

Residues of organic manures, P and K and effect of fresh P - Lansome I 1970.

First year of revised scheme testing fresh P on two phases per annum of a three course rotation - Sugar beet, barley, potatoes - crops in 1970 sugar beet and barley.

For history, past treatments, etc., see 'Details' 1967 and 'Results' 68/B/4 and 69/W/RN/4.

Area of each plot for sugar beet: 0.0109. Area harvested:
Roots (washed): 0.0040.
Tops: 0.0016.
sub-plot for barley: 0.0055. Area harvested: 0.0018.

Superphosphate treatments (applied to whole plots with confounding of certain two and three factor interactions):-
Series A: Sugar beet: None (0), 1.0 cwt P2O5 (P)
Series B: Barley: None (0), 0.5 cwt P2O5 (P).

Standard applications:-
Series A: Sugar beet: Manures: 20 cwt ground chalk. 480 lb muriate of potash (60% K2O), 550 lb Epsom salts (16% MgO). 810 lb 'Nitro-Chalk' 21. Weedkiller: Phenmedipham ('Betanal' at 5 pints in 20 gals). Insecticide: Demeton-s-methyl at 3.5 fl oz in 25 gals.
Series B: Barley: Manures: 20 cwt ground chalk, 95 lb muriate of potash (60% K2O), 265 lb 'Nitro-Chalk' 21. Weedkiller: Ioxynil at 7.5 oz and mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.:
Series A: Sugar beet: Ground chalk applied: 29 Sept, 1969. Ploughed: 13 Oct. K, Mg and N applied: 4 Apr, 1970. P applied: 7 Apr. Power harrowed, seed drilled at 5 lb: 20 Apr. Weedkiller applied: 15 May. Singled: 27 May. Insecticide applied: 22 June. Lifted: 22 Oct. Variety: Klein E.
Series B: Barley: Ground chalk applied: 29 Sept, 1969. Ploughed: 13 Oct. K, N and P applied, power harrowed, seed drilled at 135 lb: 26 Mar, 1970. Weedkiller applied: 16 May. Combine harvested: 13 Aug. Variety: Julia.

NOTE: Soil samples were taken in early spring, before applying fresh P.

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70/W/RN/4

SUMMARY OF RESULTS

SERIES A

SUGAR BEET

Organic 1942-61*	Organic 1962-67	P0K0 0	P0K0 P	P1K1 0	P1K1 P	P2K2 0	P2K2 P
ROOTS (WASHED): TONS							
0	0			17.81	16.28	10.89	18.12
S1	0					17.35**	17.82**
S2	0					18.60**	17.32**
T1	0					17.50**	18.56**
T2	0					17.39**	18.06**
D1	D1	17.32	18.28	17.14	17.50		
D2	D2	19.28	19.53	19.28	20.10		
C1	D1	17.50	20.15	17.83	19.64		
C2	D2	19.75	21.44	18.48	21.00		
SUGAR %							
0	0			17.1	17.1	16.7	17.4
S1	0					17.7**	16.6**
S2	0					16.8**	17.4**
T1	0					17.4**	17.5**
T2	0					16.8**	17.3**
D1	D1	17.3	17.1	17.9	17.3		
D2	D2	17.5	17.4	18.0	17.1		
C1	D1	17.5	17.6	17.7	17.3		
C2	D2	17.1	17.3	17.8	17.2		

General mean: Roots (washed): 17.89
Sugar %: 17.3

* Last applied to Leeks 1961/62
** P1K1 1962-65

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70/W/RN/4

SERIES A

SUGAR BEET

Organic 1942-61*	Organic 1962-67	P0K0 0	P0K0 P	P1K1 0	P1K1 P	P2K2 0	P2K2 P
			TOTAL SUGAR: CWT				
0	0			61.0	55.8	36.4	63.3
S1	0					61.3**	59.3**
S2	0					62.4**	60.2**
T1	0					61.2**	64.8**
T2	0					58.6**	62.6**
D1	D1	59.8	62.4	61.5	60.4		
D2	D2	67.4	68.1	69.3	68.8		
C1	D1	61.3	70.9	62.9	67.9		
C2	D2	67.5	74.4	65.6	72.0		
			TOPS: TONS				
0	0			13.80	12.31	9.39	10.75
S1	0					15.61**	17.31**
S2	0					18.70**	15.75**
T1	0					15.24**	17.12**
T2	0					17.26**	16.22**
D1	D1	11.04	15.42	12.29	13.47		
D2	D2	12.64	12.57	12.64	14.38		
C1	D1	13.47	15.49	13.47	14.24		
C2	D2	15.35	14.86	13.54	12.92		

General mean: Total sugar: 61.8
Tops: 14.41

* Last applied to Leeks 1961/62
** P1K1 1962-65

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70/W/RN/4

SERIES B

BARLEY

Organic 1942-61	Organic 1962-64	Organic 1966-67	P0K0		P1K1		P2K2	
				0	P	0	P	0
GRAIN: CWT								
0	0	0			37.0	37.1	40.0	37.6
0	0	PT				34.3	30.8	37.3
S1	0	0	36.3*	37.1*				
S2	0	0	32.1*	37.5*				
T1	0	0	42.2*	39.8*				
T2	0	0	30.0*	38.1*				
D1	D1	D1		35.0	36.9	41.3	31.0	
D1	D1	0	36.0	36.7	38.3	37.3		
D2	D2	D2		40.2	38.0	41.1	41.0	
D2	D2	0	45.5	36.4	39.3	42.1		
C1	D1	D1		38.3	42.3	43.1	44.8	
C2	D2	D2		35.0	36.6	37.4	41.4	
STRAW: CWT								
0	0	0			20.2	16.1	20.7	18.2
0	0	PT				18.4	20.2	19.5
S1	0	0	20.4*	17.1*				
S2	0	0	15.2*	18.3*				
T1	0	0	22.9*	18.6*				
T2	0	0	18.0*	20.1*				
D1	D1	D1		18.7	17.7	18.9	16.3	
D1	D1	0	14.3	16.7	25.5	16.3		
D2	D2	D2		13.1	15.7	18.8	18.8	
D2	D2	0	27.2	12.7	19.7	21.0		
C1	D1	D1		18.6	20.5	23.1	22.7	
C2	D2	D2		18.2	17.9	20.4	22.3	

General mean: Grain: 37.9
Straw: 19.1
Mean D.M. %: Grain: 84.0
Straw: 78.4

* P1K1 1962-64

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ARABLE REFERENCE PLOTS

(70/R/RN/5)

Great Field IV 1970. **Winter wheat, kale, barley, ley, potatoes and permanent grass.**

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, 67/B/2, 68/B/3 and 69/R/RN/5.

Cultivations, etc.:-

Winter wheat: Balancing Mg applied to half plots, plots dug by hand: 24 Sept, 1969. P, K, Mg, Ca and S applied: 25 Sept. Seed drilled: 14 Oct, additional plots: 17 Oct. First half N dressing applied (excluding additional plots): 2 Apr, 1970. All N applied to additional plots, all plots sprayed with ioxynil at 7.5 oz and mecoprop at 22.5 oz in 80 gals, second half N dressing applied: 14 May. Trace element spray applied: 5 June. Harvested: 14 Aug.

Kale: FYM applied, plots dug by hand: 19 Nov, 1969. Ca applied: 27 Jan, 1970. P, K, Mg and S applied: 23 Feb. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, seed drilled: 29 Apr. Sprayed with dimethoate at 4.8 oz in 40 gals: 17 June. Trace element spray applied: 18 June. Second half N dressing applied to additional plots: 25 June. Sprayed with menazon ('Saphicol' at 0.5 pints in 40 gals): 7 and 30 July. Harvested: 30 Oct.

Barley: Dug by hand: 6 Nov, 1969. Ca applied: 22 Jan, 1970. P, K, Mg and S applied: 23 Feb. N applied, plots rotary cultivated, seed drilled: 17 Apr. Trace element spray applied: 11 June. Harvested: 13 Aug.

Grass - clover ley: Seed drilled in barley stubble (additional plots): 15 Aug, 1969, remainder: 20 Aug. Mg applied: 12 Dec. P, K, Ca and S applied: 15 Dec. N applied: 16 Mar, 1970. Trace element spray applied: 14 May. Cut three times: 27 May, 27 July, 5 Oct.

Potatoes: FYM applied, plots dug by hand: 20 Nov, 1969. Ca applied: 27 Jan, 1970. P, K, Mg and S applied: 23 Feb. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, Mg applied to half plots, potatoes planted: 29 Apr. Sprayed with dimethoate at 4.8 oz in 40 gals: 17 June. Trace element spray applied: 18 June. Potatoes earthed up: 20 June. Second half N dressing applied to additional plots:

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25 June. Sprayed on 2 occasions with menazon ('Saphicol' at 0.5 pints) plus captafol at 1.5 lb in 40 gals: 7 and 30 July. Lifted: Plots of main experiment with neither K nor FYM and no fertiliser plots of additional plots: 1 Sept, remainder: 21 Sept.

Permanent grass: P and K applied: 15 Dec, 1969. FYM applied: 3 Mar, 1970. N applied: 16 Mar, 1 June, 20 Aug. Cut three times: 27 May, 20 Aug, 27 Oct.

NOTES: (1) On the additional plots 5 cwt CaO per acre as ground chalk was applied to each plot of each crop to correct low soil pH.
(2) Yields of dry matter were obtained for each crop.
(3) The percentages of N, P and K were measured for each crop.
(4) The percentage of Mg was measured in potato tubers on the main experiment.
(5) The percentage of K in potato leaves was measured on the main experiment.
(6) pH of soil was measured.

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SUMMARY OF RESULTS

ORIGINAL PLOTS

Treatment	WINTER WHEAT: GRAIN CWT	WINTER WHEAT: STRAW CWT	KALE: FRESH WEIGHT TONS	BARLEY: GRAIN CWT	BARLEY: STRAW CWT	LEY: DRY MATTER: CWT 1st cut	2nd cut	3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS TONS	PERMANENT GRASS: DRY MATTER: CWT 1st cut	2nd cut	3rd cut	Total of 3 cuts
0	21.1	22.5	6.60	14.4	11.5	2.8	6.3	5.8	14.9	3.60	2.6	7.1	3.1	12.8
N1	26.6	33.5	8.51	18.6	15.1	3.5	6.8	4.2	14.5	3.29	12.0	10.5	10.4	32.9
P	31.5	36.4	9.55	17.8	14.4	9.7	8.2	8.5	26.4	4.46	2.8	5.0	3.9	11.7
N1P	23.5	28.6	19.27	21.2	17.4	11.7	9.2	4.0	24.9	3.06	14.3	13.0	14.1	41.4
K	27.1	31.8	6.60	15.6	14.8	7.3	10.5	17.1	34.9	11.80	4.2	6.2	4.3	14.7
N1K	33.2	37.1	6.08	20.4	18.5	9.6	11.2	14.3	35.1	15.02	16.2	12.5	12.0	40.7
PK	29.2	35.8	9.20	19.4	16.5	13.1	14.1	30.7	57.9	13.80	4.8	8.9	3.9	17.6
N1PK	39.8	50.4	19.80	32.5	28.7	20.8	10.3	23.7	54.8	17.97	18.7	10.4	11.6	40.7
N2PK	42.7	53.5	22.57	35.6	30.1	23.2	11.2	20.0	54.4	19.18	33.2	15.7	17.1	66.0
D	32.9	46.1	16.50	30.1	24.8	10.5	13.9	20.5	44.9	18.14	19.8	9.0	8.4	37.2
N1PKD	43.3	53.4	23.44	37.4	34.7	21.6	13.3	22.5	57.4	22.57	36.0	13.5	16.0	65.5
N2PKD	46.4	59.1	29.00	39.5	34.7	26.8	13.0	21.6	61.4	23.35	37.9	14.8	19.9	72.6
Mean D.M.%	86.1	86.8		84.9	75.6	25.2	32.2	24.6	27.3		28.0	23.9	20.5	24.1

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ADDITIONAL PLOTS

Treatment	WINTER WHEAT: GRAIN CWT	WINTER WHEAT: STRAW CWT	KALE: FRESH WEIGHT TONS	BARLEY: GRAIN CWT	BARLEY: STRAW CWT	LEY: DRY MATTER: CWT 1st cut	2nd cut	3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS TONS
None	24.5	27.5	9.90	14.5	12.6	9.9	7.5	4.9	22.3	4.65
N2 PK	41.0	46.8	26.91	36.3	29.8	26.4	11.0	15.4	52.8	17.54
N2 PK Mg Ca	39.1	47.4	25.87	31.8	30.2	29.4	11.6	23.8	64.8	17.97
N2 PK Mg S	39.0	47.5	22.57	33.9	28.0	31.9	11.4	25.4	68.7	18.32
N2 PK Ca S	38.3	48.5	23.27	31.9	29.9	23.3	10.4	14.3	48.0	18.66
N2 PK Mg Ca S	39.9	47.4	22.05	35.2	32.4	32.3	11.9	20.7	64.9	16.84
N2 PK Mg Ca S TE	40.8	49.8	23.44	34.3	25.7	30.8	11.3	23.3	65.4	17.80
Mean D.M. %:	86.1	88.2		86.5	87.8	24.0	31.3	24.0	26.4	

70/A/RN/5

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ARABLE REFERENCE PLOTS

(70/W/RN/6)

Woburn Stackyard Series C 1970.

For details of previous years' results and for rates of fertiliser etc., see 'Results' 61/B/2 to 67/B/2 inclusive, 68/B/3 and 69/W/RN/6.

NOTE: The rates of nitrogen to potatoes and sugar beet are now 1.0 (N1), 2.0 (N2) cwt N as ammonium nitrate. The variety of barley is now Julia, and the variety of potatoes is Desiree.

Cultivations, etc.:-

Winter oats: Balancing Mg applied to half plots: 29 Sept, 1969. Plots dug by hand, P and K applied: 6 Oct. Seed drilled: 16 Oct. First N applied: 17 Mar, 1970. Second N applied: 15 May. Harvested: 3 Aug.

Sugar beet: FYM applied, plots dug by hand: 9 Dec, 1969. Ground chalk applied at 25 cwt: 20 Jan, 1970. P and K applied: 25 Feb. First N applied, plots rotary cultivated, Mg applied to half plots, seed drilled: 7 Apr. Singled, second N applied: 26 May. Sprayed with dimethoate at 4.8 fl oz in 40 gals: 17 June. Sprayed twice with menazon at 0.25 lb in 40 gals: 6 July, 29 July. Harvested: 7 Oct.

Barley: Balancing Mg applied to half plots: 2 Oct, 1969. Plots dug by hand: 8 Dec. Ground chalk applied at 25 cwt: 20 Jan, 1970. P and K applied: 25 Feb. First N applied, rotary cultivated, seed drilled: 7 Apr. Second N applied: 15 May. Harvested: 14 Aug.

Grass - clover ley: Seed drilled in barley stubble: 13 Aug, 1969. P and K applied: 8 Dec. N applied: 17 Mar, 1970. Cut three times: 29 May, 23 July, 6 Oct.

Potatoes: FYM applied, plots dug by hand: 9 Dec, 1969. P and K applied: 25 Feb, 1970. First N applied, rotary cultivated, Mg applied to half plots, potatoes planted: 28 Apr. Second N applied, earthed up: 26 May. Sprayed with dimethoate at 4.8 fl oz in 40 gals: 17 June. Sprayed twice with menazon at 0.25 lb plus captafol at 1.5 lb in 40 gals: 6 July, 29 July. Lifted all plots except 40 and 47 (DN1PK, DN2PK): 14 Sept. Lifted plots 40 and 47: 29 Sept.

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Permanent grass: P and K fertiliser applied: 8 Dec, 1969. Ground chalk applied: 20 Jan, 1970. FYM applied: 25 Feb. N applied: 17 Mar, 29 May, 27 Aug. Cut three times: 29 May, 27 Aug, 29 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 sugar beet tops and potato tubers was determined.
(3) The percentage of K in potato leaves was determined.
(4) Surface soil samples were taken from each block for determination of soil pH and N, P and K in the soil.

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SUMMARY OF RESULTS

Treatment	OATS GRAIN cwt	OATS STRAW cwt	SUGAR BEET ROOTS tons	SUGAR BEET TOPS tons	BARLEY GRAIN cwt	BARLEY STRAW cwt
None	11.1	9.6	6.79	4.32	12.1	8.6
N1	17.9	12.8	7.10	9.10	15.6	13.4
P	11.3	8.4	6.64	4.32	10.5	9.0
N1P	21.0	15.5	6.17	7.95	14.0	11.5
K	10.9	8.3	7.41	4.01	11.9	13.3
N1K	18.5	14.1	13.89	8.72	23.1	17.0
PK	9.6	8.3	7.10	3.93	14.0	11.0
N1PK	27.0	20.2	10.80	7.56	26.5	21.5
N2PK	27.8	22.6	14.35	14.89	28.1	27.7
D	18.8	14.2	13.89	7.10	18.6	15.1
N1PKD	29.4	25.6	16.51	11.27	27.6	26.1
N2PKD	32.8	28.8	17.29	15.36	32.1	23.8
Mean D.M. %:	82.6	62.2			85.0	85.6

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Treatment	LEY: DRY MATTER: CWT 1st cut	2nd cut	3rd cut	Total of 3 cuts	POTATOES TOTAL TUBERS TONS	PERMANENT GRASS: DRY MATTER: CWT 1st cut	2nd cut	3rd cut	Total of 3 cuts
None	7.6	4.2	6.5	18.3	3.48	8.0	2.9	3.1	14.0
N1	20.7	5.3	4.3	30.3	4.52	15.2	12.6	7.8	35.6
P	7.3	5.0	4.7	17.0	4.91	6.8	2.5	2.5	11.8
N1P	19.0	5.2	3.3	27.5	2.77	11.6	11.7	7.2	30.5
K	11.3	9.3	20.6	41.2	5.15	8.4	4.1	2.7	15.2
N1K	24.1	7.2	12.3	43.6	6.51	20.7	16.2	8.9	45.8
PK	13.5	8.9	20.2	42.6	5.68	8.8	3.3	2.5	14.6
N1PK	26.6	7.2	14.7	48.5	8.92	26.0	15.0	9.6	50.6
N2PK	33.2	8.8	12.6	54.6	7.52	26.7	20.4	12.3	59.4
D	15.0	10.4	20.2	45.6	6.91	17.4	6.9	4.1	28.4
N1PKD	28.8	8.0	16.2	53.0	13.89	29.9	18.7	12.3	60.9
N2PKD	38.6	8.7	12.3	59.6	19.44	31.7	19.8	13.9	65.4
Mean D.M. %:	32.6	33.0	20.0	28.5		33.5	29.2	24.5	29.1

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RESIDUAL PHOSPHATE

(70/R/RN/7)

Potatoes, barley and swedes, Great Field IV and Sawyers I the 11th year. For treatments and previous years' results see 'Details' 1967 and 'Results' 67/B/6, 68/B/5 and 69/R/RN/7.

Area of each plot:-
Great Field IV: 0.0193. Area harvested: Potatoes and barley - 0.0129. Turnips - 0.0096.
Sawyers I: 0.0212. Area harvested: Potatoes and barley - 0.0141.

Revised manuring on both fields:

	cwt N	cwt K2O
Potatoes	2.0	2.0 as 'Nitro-Chalk' and sulphate of potash
Barley	0.8	0.5 as (25:0:16) combine drilled
Swedes	0.5	1.0 as 'Nitro-Chalk' and sulphate of potash

The barley variety is now Julia.

NOTE: Because of dry weather, swedes failed on both fields and turnips were sown (without further manuring). On Sawyers I the turnips were seriously affected by Phoma and yields were not taken.

Standard applications:
Potatoes: Weedkiller: Linuron at 1 lb plus paraquat at 0.375 lb ion in 39 gals. Fungicide: Mancozeb at 1.2 lb in 40 gals on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 oz with first mancozeb spray.
Barley: Ground chalk at 25 cwt. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc. (both fields):- Ploughed: 24 Nov, 1969.
Potatoes: Fertilisers applied: 5 May, 1970. Plots rotary cultivated, potatoes machine planted: 6 May. Weedkiller applied: 23 May. Grubbed and rotary ridged: 18 June. Fungicide and insecticide applied: 29 July. Fungicide applied: 14 Aug. Sprayed with undiluted BOV at 15 gals: 15 Sept. Lifted: 25 Sept.
Barley: Ground chalk applied: 6 Oct, 1969. Treatment P fertilisers applied: 26 Mar, 1970. Seed combine drilled at 140 lb: 28 Mar. Weedkiller applied 18 May. Combine harvested: 14 Aug. Variety: Julia.

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Swedes: Fertilisers applied: 14 May, 1970. Seed drilled at 1.5 lb: 15 May. Power harrowed for turnips: 23 June. Rotary cultivated: 24 June. Turnips drilled at 1.5 lb: 25 June. Singled: 23 July - 7 Aug. Lifted: 12 Oct. Variety of turnips: Imperial Green Globe.

Standard errors per plot.

Sawyers I:

Potatoes, total tubers, tons:	1.016 or 9.5%	(11 d.f.)
Barley, grain, cwt:	1.57 or 5.1%	(11 d.f.)

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SUMMARY OF RESULTS

POTATOES

Treatment	TOTAL TUBERS: TONS Great Field IV Mean	Sawyers I Mean	% WARE: 1.5 INCH Great Field IV Mean	Sawyers I Mean
		(±0.719)		
0	11.68	9.25	98.0	98.2
A1	12.87	8.54	98.5	96.4
A2	15.32	10.12	98.2	98.1
A3	16.80	11.86	98.5	96.9
A4	17.32	13.44	98.1	97.9
T1	12.18	8.43	98.4	97.3
T2	14.17	9.89	97.5	97.1
R2	15.21	12.50	98.3	98.3
R3	14.37	11.51	97.4	97.8
R4	15.53	13.70	97.3	97.5
G1	12.62	7.60	97.6	98.0
S1	13.55	11.00	98.3	98.1
Mean	14.30	10.65	98.0	97.6

BARLEY

	GRAIN: CWT		STRAW: CWT	
		(±1.11)		
0	23.9	24.1	16.9	8.6
A1	36.6	30.5	17.7	10.5
A2	37.8	31.9	18.9	11.5
A3	33.9	33.2	19.7	10.8
A4	33.7	34.3	24.7	14.3
T1	42.0	28.0	17.3	9.4
T2	36.4	30.9	16.3	11.2
R2	32.1	31.7	14.4	8.9
R3	32.8	33.0	19.8	11.5
R4	33.1	33.7	19.5	13.2
G1	36.5	28.6	18.1	9.5
S1	32.3	27.6	15.1	9.8
Mean	34.3	30.6	18.2	10.8
Mean D.M.%:	86.5	86.7	88.2	88.1

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70/R/RN/7

TURNIPS, ROOTS: TONS

Treatment	Great Field IV Mean
O	0.37
A1	4.40
A2	6.76
A3	8.47
A4	6.95
T1	3.15
T2	3.38
R2	3.98
R3	4.82
R4	5.37
G1	2.69
S1	2.32
Mean	4.39

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CULTIVATION/WEEDKILLER

(70/R/RN/8)

Beans, wheat, potatoes and barley, Great Harpenden I 1970, the 10th year. For previous history, rotations, treatments etc. see 'Details' 1967 and 'Results' 68/B/6 and 69/R/RN/8.

The barley variety is now Julia.

Area of each plot: 0.0482. Area harvested: Beans: 0.0121. Wheat, potatoes and barley: 0.0107.

Cultivations, etc.:-

Spring beans: Barley straw burned on B plots: 29 Aug, 1969. Paraquat applied to G sub-plots and to half of each B plot: 17 Sept. Paraquat applied to remaining B half-plots, T plots deep-tine cultivated twice: 6 Oct. B plots deep-tine cultivated: 7 Oct. P and C plots ploughed: 20 Oct. R plots rotary cultivated: 24 Nov. P, R, T, B and C plots power-harrowed: 20 Mar, 1970. A plots rotary-cultivated, all plots placement drilled at 200 lb: 21 Mar. S plots sprayed: 31 Mar. M plots tractor-hoed twice: 14 May, 5 June. Sprayed with demeton-s-methyl at 3.5 oz in 40 gals: 18 June. Combine harvested: 3 Sept.

Winter wheat: Bean straw raked off B plots (insufficient to burn): 7 Sept, 1969. Paraquat applied to G sub-plots and to half of each B plot: 17 Sept. Paraquat applied to remaining B half-plots, T plots deep-tine cultivated twice: 6 Oct. B plots deep-tine cultivated: 7 Oct. P, C and A plots ploughed: 10 Oct. T plots deep-tine cultivated: 11 Oct. P, T, A, B and C plots power-harrowed, R plots rotary cultivated: 13 Oct. P, C and A plots rolled: 14 Oct. P, C and A plots disced: 15 Oct. Seed combine drilled at 180 lb: 17 Oct. N applied: 28 Apr, 1970. All plots rolled: 3 May. H sub-plots and B plots sprayed with mecoprop/2,4-D ('Methoxone 4X' at 4.5 pints in 20 gals): 14 May. Combine harvested: 27 Aug.

Potatoes: Wheat straw burned on B plots: 3 Sept, 1969. Paraquat applied to G sub-plots and to half of each B plot: 17 Sept. Paraquat applied to remaining B half-plots, T plots deep-tine cultivated twice: 6 Oct. P and C plots ploughed: 20 Oct. R plots rotary cultivated: 24 Nov. Basal NPK applied: 17 Apr, 1970. R, A, B and C plots rotary cultivated, P and T plots power-harrowed, potatoes machine planted: 1 May. All ridges rolled:

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14 May. S plots sprayed: 23 May. M plots mechanically weeded and grubbed: 30 May. M and Y plots grubbed and rotary ridged: 17 June. Sprayed with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5 oz in 40 gals: 29 July. Sprayed with mancozeb at 1.2 lb in 40 gals: 14 Aug. Sprayed with undiluted BCV at 15 gals: 14 Sept. Lifted: 16 Sept.

Barley: T and C plots deep-tine cultivated twice, B plots spring-tine cultivated: 8 Oct, 1969. P plots ploughed: 20 Oct. R plots rotary cultivated: 24 Nov. P, R, T, B and C plots power-harrowed: 20 Mar, 1970. A plots rotary cultivated, seed combine drilled at 140 lb: 21 Mar. H sub-plots and B plots sprayed with mecoprop/2,4-D ('Methoxone 4X' at 4 pints in 20 gals): 18 May. Combine harvested: 15 Aug.

Standard errors per plot.

Spring beans: Grain, cwt:	Whole plot:	1.34 or 24.3% (8 d.f.)
	Sub plot:	1.04 or 18.9% (8 d.f.)
Winter wheat: Grain, cwt:	Whole plot:	3.47 or 7.8% (8 d.f.)
	Sub plot:	2.26 or 5.1% (8 d.f.)
Potatoes: Total tubers, tons:	Whole plot:	2.054 or 15.2% (8 d.f.)
	Sub plot:	0.673 or 5.0% (8 d.f.)
Barley: Grain, cwt:	Whole plot:	5.07 or 13.4% (8 d.f.)
	Sub plot:	1.73 or 4.6% (8 d.f.)

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70/R/RN/8

SUMMARY OF RESULTS

SPRING BEANS

GRAIN: CWT

	P	R	T	Mean
Mean (±0.39)	7.6	4.3	4.6	5.5
M (±0.67)	7.0	4.5	5.0	5.5 (±0.39)
S (±0.48)	7.9	4.1	4.4	5.5 (±0.27)
		(1) and (2)		(±0.24)
O	7.5	3.9	4.1	5.2
G	7.7	4.6	5.1	5.8

A	AG	BG	C	CG
4.1	2.7	7.6	5.8	7.4

General mean: 5.6

Mean D.M. %: 75.6

(1) (±0.49) For use in horizontal and diagonal comparisons only
(2) (±0.42) For use in vertical and interaction comparisons only

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70/R/RN/8

WINTER WHEAT

GRAIN: CWT

	P	R	T	Mean
Mean (±1.00)	44.6	44.1	45.2	44.6
M* (±1.73)	45.7	45.0	45.8	45.5 (±1.00)
S* (±1.22)	44.1	43.6	44.8	44.2 (±0.71)
		(1) and (2)		(±0.53)
O	45.0	43.0	44.3	44.1
G	44.3	45.2	46.1	45.2
		(1) and (2)		(±0.53)
O	44.6	42.3	43.1	43.3
H	44.6	45.8	47.3	45.9

A	AG	AH	AGH	BGH	CH	CGH
40.8	39.2	37.9	47.7	41.5	41.2	47.5

General mean: 44.1
Mean D.M. %: 84.1

* Applied 1969

(1) (±1.19) For use in horizontal and diagonal comparisons only
(2) (±0.92) For use in vertical and interaction comparisons only

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70/R/RN/8

POTATOES

TOTAL TUBERS: TONS

	P	R	T	Mean
Mean (±0.593)	12.99	12.99	14.56	13.51
		(±1.027)		(±0.593)
M	12.83	13.63	14.96	13.81
S	12.94	12.45	15.19	13.52
SY	13.21	12.88	13.54	13.21
		(1) and (2)		(±0.159)
O	12.38	13.23	14.47	13.36
G	13.61	12.74	14.66	13.67

A	AG	BG	C	CG
12.20	12.82	13.38	13.70	12.23

(1) (±0.624) For use in horizontal and diagonal comparisons only
(2) (±0.275) For use in vertical and interaction comparisons only

General mean: 13.37

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70/R/RN/8

POTATOES

% WARE: 1.5 INCH

	P	R	T	Mean
Mean	96.3	96.6	96.4	96.4
M	97.4	97.0	96.5	97.0
S	95.5	96.6	96.4	96.2
SY	95.9	96.1	96.4	96.1
O	96.0	96.3	96.5	96.3
G	96.5	96.8	96.4	96.6

A	AG	BG	C	CG
96.8	97.0	94.4	96.9	94.8

General mean: 96.2

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70/R/RN/8

BARLEY

GRAIN: CWT

	P	R	T	Mean
Mean (±1.46)	39.5	37.1	37.3	38.0
		(±2.54)		(±1.46)
M*	39.7	37.6	37.5	38.3
S*	41.7	38.0	35.1	38.3
SY*	37.0	35.6	39.4	37.4
		(1) and (2)		(±0.41)
O	39.7	36.5	36.3	37.5
H	39.3	37.6	38.3	38.4

A	AH	BH	CH
42.3	44.1	41.2	39.4

(1) (±1.55) For use in horizontal and diagonal comparisons only
(2) (±0.71) For use in vertical and interaction comparisons only

General mean: 38.8
Mean D.M. %: 85.4

* Applied 1969

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CEREAL DISEASE REFERENCE PLOTS

(70/R/RN/9)

Pennells Piece 1970, the eighth year, winter and spring wheat.
For treatments etc., see 'Results' 63/C/10 (W = Wheat, O = Oats, BE = Spring beans).

Area of each plot: 0.0180. Area harvested: 0.0118.

Cultivations, etc.: Sprayed with paraquat at 0.5 lb ion in 20 gals: 18 Sept, 1969. Ploughed: 19 Sept.
Winter wheat: Rotary cultivated: 15 Oct, 1969. Seed combine drilled at 180 lb, plots sprayed with terbutryne and related triazines ('Prebane' at 4 lb in 20 gals): 17 Oct. N applied: 25 Mar, 1970. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 13 May. Combine harvested: 26 Aug.
Spring wheat: Seed combine drilled at 170 lb: 22 Apr, 1970. N applied: 24 Apr; Sprayed with ioxynil at 7.5 oz and mecoprop at 22.5 oz in 20 gals: 27 May. Combine harvested: 28 Aug.
Oats: Seed combine drilled at 170 lb: 17 Apr, 1970. N applied: 24 April. Combine harvested: 15 Aug.
Spring beans: Seed placement drilled at 200 lb: 21 Mar, 1970. Phorate at 17 oz in granules applied: 16 June. Combine harvested: 4 Sept.

NOTES: (1) Yields were taken for winter and spring wheat only- (Crop sequences 1, 4, 5 and 6).
(2) Estimates were made in spring and summer of the incidence of take-all (Ophiobolus graminis) and eyespot (Cercosporella herpotrichoides).
(3) For previous years' results see 'Results' 63/C/10, 64/C/9, 65/C/9, 66/C/7, 67/C/5, 68/C/5 and 69/R/RN/9.

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SUMMARY OF RESULTS

GRAIN: CWT

Crop in	C1	C4	C5	C6	
1963	W	BE	O	W	
1964	W	O	W	W	
1965	W	W	W	W	
1966	BE	W	W	W	
1967	O	W	BE	W	
1968	W	BE	O	W	
1969	W	O	W	W	Mean
WINTER WHEAT					
	42.0	43.7	44.4	39.8	42.5
SPRING WHEAT					
	16.7	23.8	22.1	19.2	20.4

Mean D.M. %: Winter wheat: 83.9
Spring wheat: 84.2

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IRRIGATION

(70/R/RN/11)

The effect of irrigation on spring beans and barley, Great Field I and II 1970.

Design: Spring beans: 2 randomised blocks of 4 plots.
Barley: 2 randomised blocks of 4 plots, split into 3.

Area of each plot:-
Spring beans: 0.2571. Area harvested: 0.0222.
Barley (sub-plot): 0.0322. Area harvested: 0.0171.

Treatments:-
Spring beans: Irrigation: None (O), early (A), late (B), full (C).
Barley: All combinations of:-
Whole plots: 1. Irrigation: None (O), early (A), late (B), full (C).
Sub plots: 2. Nitrogen (in cwt N): 0.2 (N1), 0.4 (N2), 0.6 (N3). N1 applied in basal compound, remaining N as 'Nitro-Chalk'.

Basal applications:
Spring beans: 5 tons ground chalk. 360 lb (0:14:28) placement drilled. Weedkillers: Paraquat at 0.5 lb ion in 20 gals. Simazine at 1 lb in 20 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.
Barley: 3 tons ground chalk. 280 lb (8:20:16) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.:
Spring beans: Paraquat applied: 18 Sept, 1969. Subsoiled 28 ins. apart, 15 ins. deep: 3 Oct. Ground chalk applied: 10 Oct. Ploughed: 20 Dec. Seed placement drilled at 200 lb: 27 Mar, 1970. Simazine applied: 31 Mar. Insecticides applied: 22 June. Combine harvested: 4 Sept. Variety: Maris Bead.
Barley: Subsoiled 28 ins. apart 15 ins. deep: 7 Oct, 1969. Ground chalk applied: 10 Oct. Ploughed: 2 - 19 Dec. 'Nitro-Chalk' applied: 31 Mar, 1970. Seed combine drilled at 140 lb: 1 Apr. Weedkiller applied: 18 May. Combine harvested: 12 Aug. Variety: Zephyr.

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70/R/RN/11

RAINFALL AND IRRIGATION: INCHES

Week-ending	Rainfall	IRRIGATION Barley A	Barley B	Barley C	Beans A	Beans B	Beans C
Apr 29	0.98						
May 6	0.06						
May 13	0.55						
May 20	0.02						
May 27	0.06	1.00		1.00	1.00		1.00
June 3	0.21	1.00		1.00	0.50		0.50
June 10	0.00	1.00		1.00	1.00		1.00
June 17	0.05						
June 24	0.49		1.00	1.00		1.00	1.00
July 1	0.33		0.75	0.75		0.75	0.75
July 8	0.48		0.50	0.50		1.00	1.00
July 15	0.53						
July 22	0.29						
July 29	0.62						
Aug 5	0.09					1.00	1.00
Aug 12	0.90						
Aug 19	1.15						
Aug 26	0.37						
Sept 2	0.08						
Sept 9	0.37						
Sept 16	1.44						
Sept 23	0.01						
Sept 30	0.09						
Total	9.17	3.00	2.25	5.25	2.50	3.75	6.25

Standard error per sub plot.
Barley, grain, cwt: 0.91 or 2.2% (8 d.f.)

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SUMMARY OF RESULTS

GRAIN: CWT

	0	A	B	C	Mean
	SPRING BEANS				
	11.7	20.7	17.4	19.9	17.4
	BARLEY				
		(±0.64)*			(±0.32)
N1	36.4	40.3	37.9	37.2	37.9
N2	40.9	45.2	39.5	44.0	42.4
N3	44.2	46.2	42.5	46.5	44.9
Mean	40.5	43.9	39.9	42.5	41.7

* For use in vertical and interaction comparisons only

Mean D.M. %: Spring beans: 79.2
Barley: 83.6

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ORGANIC MANURING EXPERIMENT

(70/W/RN/12)

The cumulative effects of organic matter on light land - Woburn Stackyard B 1970, 6th year.

For previous history, rotation, treatments etc., see 'Results' 66/C/31, 67/C/24, 68/C/18 and 69/W/RN/12. All plots except those under leys (LC and LN) carried beans. No nitrogen was applied to beans, residual effects of nitrogen applied to sugar beet in 1969 were measured.

Area of each sub plot: 0.0156. Area harvested: Leys: 0.0129, Beans: 0.0097.

Fertilisers applied Autumn 1969 (cwt)

Treatment	P_2O_5	K_2O	MgO
DG	-	-	-
ST	0.4	-	0.2
PT	0.5	1.0	-
GM	0.5	1.0	0.3
FD	1.0	4.0	0.3
FS	0.5	1.0	0.3
LC	0.5	1.0	0.3
LN	0.5	1.0	0.3

Fertilisers applied Spring 1970 (cwt)

Treatment	P_2O_5	K_2O	MgO
FD	-	0.3	-
ST	-	0.3	-
LC	-	0.4	-
LN	-	0.8	-

Basal and standard applications: 400 lb (0:14:28) to all bean plots. Weedkiller: Simazine at 0.5 lb in 25 gals. Insecticide: Demeton-s-methyl at 3.5 fl oz in 25 gals.

Cultivations, etc.:

Leys: P, K, and Mg applied: 20 Nov, 1969. K applied, N applied to LN plots only: 17 Mar, 1970. N applied to LN plots: 16 June. Cut: 11 June, 28 Sept.

Beans: Sugar beet tops spread: 7 - 11 Nov, 1969. PK and Mg applied: 12 - 14 Nov. Peat, straw and FYM applied: 19 Nov. Ploughed: 20 Nov. Additional K applied to FD and ST plots, power harrowed, PK applied, seed drilled at 200 lb: 20 Mar, 1970. Weedkiller applied: 21 Mar. Insecticide applied: 18 June. Combine harvested: 1 Sept. Variety: Maris Bead.

Standard errors per plot. Beans: Grain, cwt:

Whole plot: 0.99 or 15.1% (15 d.f.)

Sub plot: 1.54 or 23.4% (54 d.f.)

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70/W/RN/12

SUMMARY OF RESULTS

BEANS

1969

	N1	N3	N5	N7	Mean
		GRAIN: CWT			
		(1) and (2)			(±0.50)
DG	9.4	8.7	9.4	8.8	9.1
ST	7.1	8.3	5.7	7.7	7.2
PT	5.0	5.8	4.9	6.4	5.5
GM	6.4	7.3	7.8	7.2	7.2
FD	4.5	5.1	4.0	4.4	4.5
FS	5.6	5.7	7.4	5.7	6.1
Mean (±0.32)	6.3	6.8	6.5	6.7	6.6

(1) (±0.83) For use in vertical and diagonal comparisons only
(2) (±0.77) For use in horizontal and interaction comparisons only

STRAW: CWT

DG	6.2	6.9	6.2	6.3	6.4
ST	4.1	5.6	3.6	4.5	4.5
PT	3.8	5.1	4.4	5.4	4.7
GM	5.3	5.4	6.5	6.2	5.8
FD	4.6	4.5	4.4	4.3	4.5
FS	4.3	4.5	4.9	4.6	4.6
Mean	4.7	5.3	5.0	5.2	5.1

Mean D.M. %: Grain: 83.2
Straw: 53.0

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70/W/RN/12

LEYS: DRY MATTER

LC	LN
1ST CUT	
4.3	17.2
2ND CUT	
3.3	20.5
TOTAL OF 2 CUTS	
7.6	37.7

Mean D.M. %: 1st cut: 45.8
2nd cut: 33.4
Total of 2 cuts: 39.6

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INTENSIVE CEREALS

(70/W/RN/13)

Woburn Stackyard I 1970 - the fifth year.

For treatments and previous years' results, see 'Results' 66/B/9, 67/B/9, 68/B/7 and 69/W/RN/13.

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

NOTE: The magnesium test was amended to compare residual (MR) with equivalent fresh dressing (MM) to sub-plots previously untreated. The fresh dressings were 1980 lb Epsom salts (half before ploughing, half after) on the wheat blocks and 990 lb Epsom salts (all before ploughing) on the barley blocks.

The ley is now ryegrass only. The barley variety is now Julia.

Basal and standard applications:

All crops: 1.0 cwt P_2O_5, 2.0 cwt K_2O as (0:14:28), half ploughed in, half applied to plough furrow.

Ley: 1.0 cwt N in spring, 0.75 cwt N after the first two cuts, as 'Nitro-Chalk'. Weedkiller: Paraquat at 0.5 lb ion in 37 gals.

Potatoes: 1.2 cwt N as 'Nitro-Chalk'. Weedkiller: Linuron at 1.0 lb plus paraquat at 0.37 lb ion in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals applied on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz applied on one occasion with fungicide.

Wheat: Weedkillers: Paraquat at 0.5 lb ion in 37 gals, Ioxynil at 9 oz plus mecoprop at 27 oz in 25 gals.

Barley: Weedkillers: Paraquat at 0.5 lb ion in 37 gals, Ioxynil at 6.5 oz plus mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.:

All plots: Mg and half PK applied: 25 Sept, 1969. Ploughed: 26 Sept. Remaining PK applied: 29 Sept.

Ley: Paraquat applied: 10 Sept, 1969. Seed sown at 28 lb: 30 Sept. N applied: 16 Mar, 1970, 16 June, 24 July. Cut three times: 11 June, 23 July*, 3 Sept*.

Potatoes: Remaining Mg applied on wheat block: 30 Sept, 1969. N applied: 17 Apr, 1970. Rotary cultivated, potatoes planted: 22 Apr. Weedkiller applied: 13 May. Grubbed, rotary ridged: 6 June. Fungicide plus insecticide applied: 31 July. Fungicide applied: 18 Aug. Sprayed with undiluted BUV at 20 gals: 7 Sept. Lifted: 15 Sept.

* Topping cuts. No yields recorded.

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Wheat: Paraquat applied: 10 Sept, 1969. Remaining Mg applied: 30 Sept. Rotary cultivated, seed drilled at 170 lb: 23 Oct. N applied: 24 Apr, 1970. Ioxynil plus mecoprop applied: 7 May. Combine harvested: 14 Aug.

Barley: Paraquat applied: 10 Sept, 1969. Power harrowed, seed drilled at 135 lb: 25 Mar, 1970. N applied: 31 Mar. Ioxynil plus mecoprop applied: 18 May. Combine harvested: 11 Aug.

NOTE: Estimates of eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis) were made on both cereal crops.

Standard errors per plot.

Ley: dry matter, cwt:	
Wheat blocks 1/4 plot: 1st cut:	2.02 or 10.3% (4 d.f.)
Barley blocks 1/4 plot: 1st cut:	1.27 or 4.7% (4 d.f.)
Potatoes, total tubers, tons:	
Wheat blocks 1/4 plot:	0.910 or 7.2% (4 d.f.)
Barley blocks 1/4 plot:	1.957 or 14.5% (4 d.f.)
Wheat, grain, cwt:	
1/4 plot:	2.70 or 12.9% (12 d.f.)
1/8 plot:	1.54 or 7.4% (16 d.f.)
Barley, grain, cwt:	
1/4 plot:	2.47 or 8.6% (12 d.f.)
1/8 plot:	2.18 or 7.6% (16 d.f.)

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70/W/RN/13

SUMMARY OF RESULTS

LEY

PERMANENT WHEAT BLOCKS

1ST AND ONLY CUT, DRY MATTER: CWT

1969

	N1	N2	N3	N4	Mean
		(±1.43)*			(±0.72)
MR	21.3	20.2	18.7	20.3	20.1
MM	18.2	19.8	20.0	19.0	19.2
Mean	19.7	20.0	19.4	19.7	19.7

* For use in vertical and interaction comparisons only

Mean D.M. %: 43.8

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70/W/RN/13

LEY

PERMANENT BARLEY BLOCKS

1ST AND ONLY CUT, DRY MATTER: CWT

1969

	N1	N2	N3	N4	Mean
		(±0.90)*			(±0.45)
MR	25.5	28.2	29.0	28.9	27.9
MM	27.8	25.4	23.8	26.3	25.8
Mean	26.7	26.8	26.4	27.6	26.9

* For use in vertical and interaction comparisons only

Mean D.M. %: 37.1

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70/W/RN/13

POTATOES

PERMANENT WHEAT BLOCKS

1968

	N1	N2	N3	N4	Mean
	TOTAL TUBERS: TONS				
	(±0.644)*				(±0.322)
MR	12.92	12.42	13.62	12.09	12.77
MM	13.56	12.68	11.75	12.45	12.61
Mean	13.24	12.55	12.69	12.27	12.69

* For use in vertical and interaction comparisons only

% WARE: 1.5 INCH

MR	95.2	94.9	95.1	94.3	94.9
MM	94.4	95.9	95.1	93.7	94.8
Mean	94.8	95.4	95.1	94.0	94.8

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70/W/RN/13

POTATOES

PERMANENT BARLEY BLOCKS

1968

	N1	N2	N3	N4	Mean
	TOTAL TUBERS: TONS				
	(±1.384)*				(±0.692)
MR	14.21	13.69	11.31	13.28	13.12
MM	13.46	14.93	13.69	13.43	13.88
Mean	13.84	14.31	12.50	13.36	13.50

* For use in vertical and interaction comparisons only

% WARE: 1.5 INCH

MR	96.0	97.1	96.0	96.8	96.5
MM	96.4	96.8	96.4	96.0	96.4
Mean	96.2	97.0	96.2	96.4	96.4

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70/W/RN/13

WINTER WHEAT

GRAIN: CWT

Crop in 1966	1967	1968	1969	N1	N2	N3	N4	MR	MM	Mean
				(1) and (2)				(3) and (4)		(±1.12)
L	P	W	W	17.2	18.7	17.9	17.9	18.8	17.1	17.9
W	W	L	P	21.2	23.1	25.1	24.8	23.6	23.6	23.6
W	L	P	W	21.6	24.3	26.8	23.6	24.2	24.0	24.1
W	W	W	W	17.4	18.5	20.5	16.8	18.5	18.1	18.3
								(5) and (6)		(±0.96)
						N1		19.7	19.0	19.3
						N2		21.5	20.8	21.2
						N3		22.5	22.6	22.6
						N4		21.2	20.3	20.8
						Mean (±0.27)		21.2	20.7	21.0

(1) (±2.00) (3) (±1.18) (5) (±1.03) For use in vertical and diagonal comparisons only

(2) (±1.91) (4) (±0.54) (6) (±0.54) For use in horizontal and interaction comparisons only

Mean D.M. %: 82.7

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70/W/RN/13

WINTER WHEAT

STRAW: CWT

Crop in 1966	1967	1968	1969	N1	N2	N3	N4	MR	MM	Mean
L	P	W	W	10.4	10.1	11.1	10.7	10.5	10.7	10.6
W	W	L	P	12.6	13.1	15.8	15.6	14.5	14.0	14.3
W	L	P	W	12.9	13.4	14.8	14.6	14.0	13.9	13.9
W	W	W	W	11.0	10.6	12.2	10.7	11.4	10.8	11.1
						N1		11.8	11.7	11.7
						N2		11.9	11.7	11.8
						N3		13.5	13.4	13.5
						N4		13.3	12.5	12.9
						Mean		12.6	12.3	12.5

Mean D.M. %: 92.3

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70/W/RN/13

BARLEY

GRAIN: CWT

Crop in 1966	1967	1968	1969	N1	N2	N3	N4	MR	MM	Mean
				(1) and (2)				(3) and (4)		(±2.76)
L	P	B	B	22.4	31.2	27.4	30.3	28.4	27.3	27.9
B	B	L	P	29.0	34.3	37.2	35.7	33.5	34.6	34.1
B	L	P	B	19.3	33.0	30.4	30.9	28.3	28.5	28.4
B	B	B	B	12.9	21.1	29.8	32.8	23.8	24.5	24.1
								(5) and (6)		(±0.87)
						N1		20.6	21.2	20.9
						N2		29.5	30.3	29.9
						N3		30.4	32.0	31.2
						N4		33.5	31.4	32.4
						Mean (±0.38)		28.5	28.7	28.6

(1) (±3.14) (3) (±2.81) (5) (±1.03) For use in vertical and diagonal comparisons only

(2) (±1.75) (4) (±0.77) (6) (±0.77) For use in horizontal and interaction comparisons only

Mean D.M. %: 79.0

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70/W/RW/13

BARLEY

STRAW: CWT

Crop in 1966	1967	1968	1969	N1	N2	N3	N4	MR	MM	Mean
L	P	B	B	12.9	16.5	16.4	18.8	17.1	15.2	16.1
B	B	L	P	15.5	19.4	18.5	19.4	17.3	19.1	18.2
B	L	P	B	12.6	19.3	18.8	21.7	18.5	17.6	18.1
B	B	B	B	8.6	12.7	18.8	19.2	14.6	15.0	14.8
						N1		12.3	12.5	12.4
						N2		17.3	16.6	17.0
						N3		17.7	18.5	18.1
						N4		20.2	19.4	19.8
						Mean		16.9	16.7	16.8

Mean D.M. %: 86.7

https://doi.org/10.23637/ERADOC-1-59 *pp 117*

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LONG TERM PHOSPHATE

(70/W/RN/14)

Residual and cumulative effects of superphosphate - Woburn Stackyard III 1970.

First year of revised scheme testing fresh P on two phases per annum of a three course rotation - sugar beet, barley, potatoes. Crops in 1970, sugar beet and barley.

For previous years' results, design, treatments etc., see 'Results' 68/B/8 and 69/W/RN/14.

Area of each sub-plot: 0.0167. Area harvested: Barley: 0.0111, sugar beet: Roots: 0.0051, tops: 0.0026.

Superphosphate treatments, to sub-plots:-
Sugar beet: None (0), 1.0 cwt P_2O_5 (P)
Barley: None (0), 0.5 cwt P_2O_5 (P).

Standard applications:-
Sugar beet: Manures: 465 lb muriate of potash (60% K_2O), 335 lb Epsom salts (16% MgO), 805 lb 'Nitro-Chalk' 21. Weedkiller: Phenmedipham (Betanal at 5 pts in 20 gals). Insecticide: Demeton-s-methyl at 3.5 fl oz in 25 gals.
Barley: Manures: 95 lb muriate of potash (60% K_2O), 640 lb 'Nitro-Chalk' 21. Weedkiller: Ioxynil at 7.5 oz and mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.:
Sugar beet: Ploughed: 3 Sept, 1969. Reploughed: 14 Nov. P applied: 7 Apr, 1970. K and N applied: 15 Apr. Mg applied: 16 Apr. Power harrowed, seed drilled at 5 lb: 20 Apr. Weedkiller applied: 15 May. Partly redrilled because of poor germination: 22 May. Singled: 27 May, 2 June. Insecticide applied: 22 June. Lifted: 23 Oct. Variety: Klein E.
Barley: Ploughed: 13 Nov, 1969. K and N applied: 25 Mar, 1970. Power harrowed, seed drilled at 135 lb, P applied: 26 Mar. Weedkiller applied: 18 May. Combine harvested: 25 Aug. Variety: Julia.

NOTE: Soil samples were taken for P analyses before applying fresh P.

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Standard errors per plot:

Sugar beet: Roots (washed) tons:	Whole plot:	1.099 or 8.5%	(10 d.f.)
	Sub plot:	1.091 or 8.4%	(12 d.f.)
Total sugar, cwt:	Whole plot:	4.30 or 9.4%	(10 d.f.)
	Sub plot:	4.32 or 9.5%	(12 d.f.)
Tops, tons:	Whole plot:	1.569 or 11.4%	(10 d.f.)
	Sub plot:	1.685 or 12.2%	(12 d.f.)
Barley: Grain, cwt:	Whole plot:	5.12 or 21.8%	(10 d.f.)
	Sub plot:	2.77 or 11.8%	(12 d.f.)

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70/W/RN/14

SUMMARY OF RESULTS

SUGAR BEET

	R0*	R1	R2	R4	R6	Mean
		ROOTS (WASHED): TONS				
	(1) and (2)		(3) and (4)			(±0.257)
O	11.97	11.78	13.75	13.82	12.94	12.70
P	13.13	12.78	12.50	15.03	12.17	13.12
Mean	12.55 (±0.449)	12.28	13.12	14.43 (±0.635)	12.55	12.91

(1) (±0.548) (3) (±0.775) For use in horizontal and diagonal comparisons only

(2) (±0.445) (4) (±0.630) For use in vertical and interaction comparisons only

SUGAR %

O	17.5	17.4	17.9	17.8	17.6	17.6
P	17.6	17.6	17.5	17.7	17.4	17.5
Mean	17.5	17.5	17.7	17.8	17.5	17.6

* Duplicated treatment

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70/W/RN/14

SUGAR BEET

	R0*	R1	R2	R4	R6	Mean
		TOTAL SUGAR: CWT				
	(1) and (2)		(3) and (4)			(±1.02)
O	41.8	40.9	49.2	49.2	45.7	44.8
P	46.3	45.0	43.7	53.3	42.4	46.1
Mean	44.0 (±1.76)	42.9	46.4 (±2.48)	51.2	44.0	45.4

(1) (±2.15) (3) (±3.04) For use in horizontal and diagonal comparisons only

(2) (±1.76) (4) (±2.49) For use in vertical and interaction comparisons only

TOPS: TONS

	(1) and (2)		(3) and (4)			(±0.397)
O	12.39	13.31	13.83	13.37	13.54	13.14
P	13.95	15.57	14.87	14.82	13.66	14.47
Mean	13.17 (±0.641)	14.44	14.35 (±0.906)	14.09	13.60	13.80

(1) (±0.804) (3) (±1.137) For use in horizontal and diagonal comparisons only

(2) (±0.688) (4) (±0.973) For use in vertical and interaction comparisons only

*** Duplicated treatment**

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70/W/RN/14

BARLEY

	R0*	F1	R2	R4	R6	Mean
			GRAIN: CWT			
	(1) and (2)			(3) and (4)		(±0.65)
O	22.8	24.7	23.9	27.3	25.8	24.5
P	21.7	24.7	23.2	21.7	21.9	22.5
Mean	22.3 (±2.09)	24.7	23.5 (±2.95)	24.5	23.8	23.5

(1) (±2.24) (3) (±3.16) For use in horizontal and diagonal comparisons only

(2) (±1.13) (4) (±1.60) For use in vertical and interaction comparisons only

STRAW: CWT

O	7.9	10.5	8.4	12.1	10.9	9.6
P	7.4	11.9	9.0	11.4	9.1	9.4
Mean	7.7	11.2	8.7	11.7	10.0	9.5

Mean D.M. %: Grain: 78.9
Straw: 78.8

* Duplicated treatment

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ROTATION AND FUMIGATION

(70/W/RN/15)

The effects of soil fumigants on a rotation of crops - Woburn Butt Close 1970, 2nd year.

For design, treatments and previous year's results see 'Results' 69/W/RN/15.

Area of each sub-plot: 0.0048. Area harvested: Barley, potatoes: 0.0013, sugar beet: 0.0038.

NOTE: One of the sub-plots of each plot, untreated in 1969, is now used to test dazomet at 200 lb before all crops (AZ).

Standard applications:

Barley: Manures: 280 lb (0:20:20). Weedkiller: Ioxynil at 7.5 oz plus mecoprop at 22.5 oz in 25 gals.

Potatoes: Manures: 940 lb (0:14:28). Weedkiller: Linuron at 1.0 lb plus paraquat at 0.37 lb ion in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz in 37 gals on one occasion with fungicide.

Sugar beet: Manures: 940 lb (0:14:28). Weedkiller: Phenmedipham ('Betanal' at 5 pts in 20 gals). Insecticide: Demeton-s-methyl at 3.5 fl oz in 25 gals.

Cultivations, etc.:

Barley: Ploughed: 12 Nov, 1969. Dazomet applied and rotary cultivated in: 14 Nov. DD injected: 24 Nov. Reploughed: 3 Mar, 1970. N applied, power harrowed, seed combine drilled at 140 lb: 27 Mar. Weedkiller applied: 16 May. Combine harvested: 26 Aug. Variety: Julia.

Potatoes: Ploughed: 12 Nov, 1969. Dazomet applied and rotary cultivated in: 14 Nov. DD injected: 24 Nov. Reploughed: 3 Mar, 1970. N applied: 3 Apr. PK applied: 14 Apr. Rotary cultivated, potatoes planted: 22 Apr. Weedkiller applied: 13 May. Grubbed: 3 June. Rotary ridged: 5 June. Fungicide plus insecticide applied: 31 July. Fungicide applied: 18 Aug. Sprayed with undiluted BOV at 15 gals: 19 Sept. Haulm destroyed mechanically: 23 Sept. Lifted: 30 Sept. Variety: Pentland Crown.

Sugar beet: Rotary cultivated twice: 11 Sept, 1969 and 30 Sept. Dazomet applied and rotary cultivated in: 14 Nov. DD injected: 24 Nov. Ploughed: 3 Mar, 1970. N applied: 3 Apr. PK applied: 14 Apr. Power harrowed, seed drilled at 5 lb: 20 Apr. Weedkiller applied: 15 May. Singled: 26 May. Insecticide applied: 22 June. Lifted: 26 Oct. Variety: Klein E.

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NOTES: (1) Soil samples were taken from all N2 plots for eelworm counts, (Heterodera rostochiensis, H.avenae) in late November.

(2) The yields of barley grain and straw have been adjusted for a linear trend down the whole plots.

Standard errors per sub-plot.

Barley, grain, cwt:	3.33 or 25.8% (17 d.f.)
Sugar beet, roots tons:	1.252 or 9.1% (18 d.f.)
Total sugar, cwt:	4.60 or 9.4% (18 d.f.)
Potatoes, total tubers, tons:	2.012 or 11.2% (18 d.f.)

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70/W/RN/15

SUMMARY OF RESULTS

BARLEY

	O,S&R	P	B	A	AZ	Mean
		GRAIN: CWT				
	(±1.36)		(±2.36)*			
N1	7.2	12.2	8.9	10.1	16.9	9.9
N2	10.6	15.7	15.9	18.4	16.7	14.1
N3	12.5	18.0	15.7	14.0	17.7	14.7
Mean	10.1 (±0.78)	15.3	13.5 (±1.36)	14.2	17.1	12.9

* For use in horizontal and interaction comparisons only

		STRAW: CWT				
N1	8.7	10.5	11.2	11.1	14.0	10.4
N2	12.3	15.6	15.2	16.5	16.0	14.3
N3	11.4	14.2	14.5	12.6	16.5	13.1
Mean	10.8	13.4	13.6	13.4	15.5	12.6

Mean D.M. %: Grain: 80.1
Straw: 71.8

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70/[illegible]/RN/15

POTATOES

	O,B&R	P	S	A	AZ	Mean
			TOTAL TUBERS: TONS			
	(±0.821)			(±1.423)*		
N1	14.79	15.15	17.23	16.23	17.02	15.71
N2	18.07	19.79	19.36	20.75	19.71	19.12
N3	16.83	19.40	20.31	22.14	20.01	18.91
Mean	16.56 (±0.474)	18.12	18.97	19.71 (±0.822)	18.91	17.91

* For use in horizontal and interaction comparisons only

% WARE: 1.5 INCH

N1	98.2	98.8	98.4	98.1	98.5	98.4
N2	98.4	98.1	98.7	98.1	98.7	98.4
N3	98.0	98.2	98.3	98.4	98.3	98.2
Mean	98.2	98.4	98.5	98.2	98.5	98.3

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70/W/RN/15

SUGAR BEET

	O,P&R	S	B	A	AZ	Mean
			ROOTS (WASHED): TONS			
	(±0.511)			(±0.885)*		
N1	10.85	10.46	11.41	10.66	15.73	11.54
N2	14.34	14.92	13.58	16.07	15.52	14.73
N3	14.02	14.90	17.01	15.74	16.70	15.20
Mean	13.07 (±0.295)	13.43	14.00	14.16 (±0.511)	15.99	13.82
			SUGAR %			
N1	18.4	17.9	18.0	18.0	18.2	18.2
N2	17.7	17.7	17.5	17.1	18.0	17.6
N3	17.3	16.9	17.3	16.5	17.1	17.1
Mean	17.8	17.5	17.6	17.2	17.8	17.7
			TOTAL SUGAR: CWT			
	(±1.88)			(±3.25)*		
N1	40.0	37.5	40.9	38.3	57.6	42.0
N2	50.9	52.7	47.6	54.9	55.9	52.0
N3	48.6	50.4	58.9	51.9	57.3	52.0
Mean	46.5 (±1.08)	46.9	49.2	48.4 (±1.88)	56.9	48.7

* For use in horizontal and interaction comparisons only

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LEVELS OF N & K

(70/R/CS/1)

Residues of N, P and K to grass, Harwoods Piece 1970 - the 13th year, spring wheat.

For treatments, etc. see 'Results' 63/C/7.1, 65/C/6.2 and 69/R/CS/1.1 and for previous years' results see 58/Cg/2, 59/Cg/2, 60/Ci/1, 61/Dg/1, 62/C/11, 63/C/7, 64/C/6, 65/C/6, 66/C/5, 67/C/4, 68/C/4 and 69/R/CS/1.

The 1969 test of K to half plots was repeated.

Basal applications: 0.6 cwt N as 'Nitro-Chalk' broadcast. Weedkiller: Tri-allate at 1.25 lb in 20 gals.

Area of each sub plot: 0.0043. Area harvested: 0.0024.

Cultivations, etc.: Deep-tine cultivated twice: 30 Oct, 1969. Weedkiller applied: 19 Apr, 1970. K applied, seed drilled at 185 lb, N applied: 23 Apr. Combine harvested: 28 Aug. Variety: Kolibri.

NOTE: Green crop samples were taken on the 7th July. The percentage of K in the green wheat, and grain, was determined.

Standard errors per plot. Grain, cwt:
Whole plot: 2.13 or 9.3% (33 d.f.)
Sub plot: 1.77 or 7.7% (36 d.f.)

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70/R/CS/1

SUMMARY OF RESULTS

GRAIN: CWT

1969 - 70

1958 - 67	KD	KK	Mean
	(1) and (2)		(±1.06)
N P K			
0 1 0	21.8	25.1	23.5
1 1 0	21.0	25.8	23.4
1 1 1	22.6	25.9	24.3
1 1 2	21.3	22.7	22.0
2 1 0	18.0	23.6	20.8
2 1 1	20.3	25.9	23.1
2 1 2	21.2	26.5	23.9
3 1 0	20.1	24.5	22.3
3 1 1	23.3	27.2	25.2
3 1 2	19.8	23.0	21.4
3 0 2	20.6	24.0	22.3
3 2 2	19.7	25.8	22.7
Mean (±0.26)	20.8	25.0	22.9

Mean D.M. %: 84.2

(1) (±1.23) For use in vertical and diagonal comparisons only
(2) (±0.88) For use in horizontal and interaction comparison only

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GRAZED REFERENCE PLOTS

(70/R/CS/2)

Highfield IX, old grass 1970, the 12th year

For details of previous years' results see 'Results' 65/B/2, 66/B/2, 67/B/2, 68/B/3, 69/R/CS/2.

Area harvested: 0.0002.

Cultivations, etc.: P and K fertilisers applied, ground chalk applied to appropriate plots: 3 Dec, 1969. First N dressing applied: 16 Mar, 1970. Sample cuts taken: 8 May, 25 June, 3 Sept, 27 Oct. Sampling cages moved after each cut. N dressings applied to all blocks after each cut except the last.

NOTES: (1) Only two blocks were cut on each occasion, the other two were grazed.
(2) The percentages of N, P and K in the dry grass were measured.
(3) Visual estimates were made of the percentage surface area covered by clover leaves.

Standard errors per plot. Dry matter, cwt:
1st cut: 3.30 or 17.1% (13 d.f.)
2nd cut: 4.05 or 11.1% (13 d.f.)
3rd cut: 2.69 or 8.6% (13 d.f.)
4th cut: 2.22 or 14.5% (13 d.f.)

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70/R/CS/2

SUMMARY OF RESULTS

GRASS: DRY MATTER: CWT

Blocks	1st cut 1 & 3	2nd cut 2 & 4	3rd cut 1 & 3	4th cut 2 & 4	Total of 4 cuts
PK	(±2.33)	(±2.86)	(±1.90)	(±1.57)	
N0 00	11.7	30.0	15.5	10.1	67.3
N1 00	19.8	33.8	31.5	14.0	99.1
A1 00	12.1	37.5	32.3	14.9	96.8
N0 10	16.6	29.0	21.3	8.9	75.8
N1 10	20.5	42.0	35.5	20.7	118.7
A1 10	20.7	35.1	32.1	15.9	103.8
N0 01	10.9	33.1	27.9	11.3	83.2
N1 01	24.5	37.9	32.5	12.2	107.1
A1 01	20.1	35.5	31.0	18.9	105.5
N0 11	11.1	35.0	26.2	14.9	87.2
N1 11	22.6	43.4	33.3	17.2	116.5
A1 11	27.4	35.4	35.1	18.4	116.3
N2 11	24.4	47.9	40.4	19.5	132.2
A2 11	26.8	33.9	42.9	17.2	120.8
Mean	19.2	36.4	31.2	15.3	102.2

Mean D.M. %: 1st cut: 20.0
2nd cut: 25.2
3rd cut: 19.8
4th cut: 18.4
Total of 4 cuts: 20.9

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WHEAT AFTER INTENSIVE BARLEY

(70/R/CS/6)

The tenth year of the 'Intensive Barley Growing Experiment', Little Knott I. For design, treatments etc. see 'Results' 61/C/8 and 69/R/CS/6.

Area of each plot: 0.0212. Area harvested: 0.0140.

Cropping: Winter wheat was grown over the whole experiment, with the exception of sequence 1 (winter wheat 1969, preceded by 6 years of continuous barley), which was fallowed.

Basal applications: 780 lb (0:14:28) ploughed in, 220 lb (0:14:28) combine drilled. Weedkillers: Paraquat at 0.75 lb ion in 20 gals. Terbutryne and related triazines ('Prebane' at 4 lb in 20 gals). 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: First basal PK applied: 16 Sept, 1969. Paraquat applied: 17 Sept. Ploughed: 23 Sept. All plots rotary cultivated: 10 Nov. Seed combine drilled at 160 lb: 11 Nov. 'Prebane' applied: 14 Nov. 2,4-D/dichlorprop applied: 5 May, 1970. 'Nitro-Chalk' applied: 13 May. Combine harvested: 26 Aug. Variety: Joss Cambier.

NOTES: (1) Yields were taken for all sequences except sequence 1 (fallow).
(2) Estimates of take-all (Ophiobolus graminis) were made in early July.
(3) For previous years' results see 'Results' 61/C/8, 62/C/7, 63/C/2, 64/C/2, 65/C/2, 66/C/2, 67/C/2, 68/C/2, 69/R/CS/6.

Standard error per plot.
Grain, cwt: 3.94 or 11.5% (35 d.f.)

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70/R/CS/6

SUMMARY OF RESULTS

GRAIN: CWT

Crop Sequences

Crop in 1961	2	3	4	5	6	7	8	9	10	
2	WS	O	BE	WS	WS	B	WS	WS	BE	
3	O	WS	O	BE	WS	B	WS	WW	WW	
4	BE	O	WS	O	BE	B	WS	WW	P	
5	B	BE	O	WS	O	B	WS	WW	B	
6	B	B	BE	O	WS	B	WS	WW	BE	
7	B	B	B	BE	O	B	WS	WW	WW	
8	B	B	B	B	BE	B	WS	WW	P	
9	B	B	B	B	B	B	WS	F	B	
	WW	WW	WW	WW	WW	WW	WW	WW	F	Mean
					(±2.79)					(±0.93)
N3	30.0	32.3	29.0	24.7	22.0	32.9	29.2	32.4	47.5	31.1
N5	28.5	30.8	33.0	32.5	25.7	34.2	32.0	34.9	49.4	33.4
N7	30.2	41.9	31.6	32.8	29.2	35.4	39.2	40.6	48.8	36.6
N9	36.1	33.4	26.9	33.8	31.7	39.2	34.8	38.9	53.8	36.5
Mean (±1.39)	31.2	34.6	30.1	30.9	27.2	35.4	33.8	36.7	49.9	34.4

Mean D.M. %: 83.4

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LONG TERM LIMING

(70/R/CS/10 and 70/W/CS/10)

Rothamsted Sawyers I (R) and Woburn Stackyard Series C (W) - the ninth year, barley.

For treatments and previous years' results see 'Details' 1967 and 'Results' 67/C/3, 68/C/3 and 69/R&W/CS/10.

Design: 2 randomised blocks of 16 plots.

Area of each plot: 0.0289. Area harvested: Sawyers I (R): 0.0127. Stackyard Series C (W): 0.0128.

Treatments: All combinations of:-

1. Ground chalk (tons) applied 1962 - 3

	Sawyers I (R)	Stackyard Series C (W)
CA0	0	0
CA2	2	2
CA4	4	4.75
CA8	8	7.5

2. P: None (P0), 0.5 (P1) cwt P_2O_5 as superphosphate.
3. K: None (K0), 1.0 (K1) cwt K_2O as muriate of potash.

Basal applications:

Sawyers I (R): 0.75 cwt N as 'Nitro-Chalk' combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Stackyard Series C (W): 1.0 cwt N as 'Nitro-Chalk' broadcast before planting. Weedkiller: Ioxynil at 7.5 oz and mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.:

Sawyers I (R): Ploughed: 30 Dec, 1969. P and K applied: 26 Mar, 1970. Seed combine drilled at 140 lb: 28 Mar. Weedkiller applied: 18 May. Combine harvested: 15 Aug. Variety: Julia.

Stackyard Series C (W): Ploughed: 30 Oct - 8 Nov, 1969. N applied: 25 Mar, 1970. Seed drilled at 135 lb, P and K applied: 26 Mar. Weedkiller applied: 18 May. Combine harvested: 12 Aug. Variety: Julia.

NOTE: On Sawyers I (R) the yields on the CA0 plots were very small and have been omitted from the analysis.

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Standard errors per plot. Grain, cwt:
Sawyers I (R): 4.62 or 17.2% (11 d.f.)
Stackyard C (W): 2.09 or 7.7% (15 d.f.)

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70/R&W/CS/10

SUMMARY OF RESULTS

SAWYERS I (R)

GRAIN: CWT

	CA2	CA4	CA8	Mean
Mean (±1.63)	22.8	29.0	28.6	26.8
		(±2.31)		(±1.33)
P0	20.1	26.9	27.3	24.7
P1	25.6	31.1	29.8	28.8
K0	20.6	27.3	28.2	25.4
K1	25.1	30.7	28.9	28.2

	P0	P1
	(±1.88)	
K0	23.6	27.2
K1	25.9	30.5

	CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1
	(±3.27)					
P0	20.1	20.1	24.3	29.5	26.3	28.3
P1	21.2	30.1	30.4	31.9	30.1	29.5

	CA0 Plots		
	P0	P1	Mean
K0	2.1	2.2	2.1
K1	0.3	5.2	2.7
Mean	1.2	3.7	2.4

General mean: 20.7
Mean D.M. % (all plots): 83.2

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70/R&W/CS/10

SAWYERS I (R)

STRAW: CWT

	CA2	CA4	CA8	Mean
Mean	9.2	11.4	12.1	10.9
P0	7.7	10.1	10.8	9.5
P1	10.8	12.7	13.4	12.3
K0	7.6	10.1	11.3	9.7
K1	10.9	12.7	13.0	12.2

	P0	P1
K0	8.6	10.7
K1	10.4	13.9

	CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1
P0	7.3	8.0	8.9	11.3	9.6	12.1
P1	7.9	13.7	11.3	14.1	13.0	13.8

CA0 Plots

	P0	P1	Mean
K0	1.3	0.6	1.0
K1	0.4	2.3	1.4
Mean	0.8	1.5	1.2

General mean: 9.0
Mean D.M. % (all plots): 81.4

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70/R&W/CS/10

STACKYARD SERIES C (W)

GRAIN: CWT

	CA0	CA2	CA4	CA8	Mean
Mean (±0.74)	12.1	30.0	32.6	33.8	27.1
		(±1.04)			(±0.52)
P0	7.4	28.5	30.8	34.3	25.2
P1	16.9	31.6	34.4	33.3	29.0
K0	11.8	27.9	32.0	31.6	25.8
K1	12.5	32.2	33.2	35.9	28.4

	P0	P1
	(±0.74)	
K0	24.9	26.8
K1	25.6	31.3

	CA0		CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1	K0	K1
				(±1.48)				
P0	10.1	4.6	27.5	29.5	30.3	31.3	31.6	36.9
P1	13.4	20.3	28.3	34.9	33.8	35.1	31.7	34.9

Mean D.M. %: 81.9

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70/R&W/CS/10

STACKYARD SERIES C (W)

STRAW: CWT

	CA0	CA2	CA4	CA8	Mean
Mean	6.9	12.6	14.9	13.3	11.9
P0	3.3	10.3	12.4	12.2	9.6
P1	10.6	14.8	17.3	14.4	14.3
K0	5.4	8.9	12.9	12.8	10.0
K1	8.5	16.2	16.8	13.8	13.8

	P0	P1
K0	8.7	11.3
K1	10.4	17.2

	CA0		CA2		CA4		CA8	
	K0	K1	K0	K1	K0	K1	K0	K1
P0	4.8	1.8	6.6	14.0	11.0	13.9	12.6	11.9
P1	6.0	15.1	11.2	18.4	14.9	19.6	13.0	15.8

Mean D.M. %: 83.6

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SOIL STRUCTURE 2

(70/W/CS/11)

Effect of peat (annual applications 1963 - 1968) Woburn, Stackyard II, plot 6 of the Continuous Barley site, the eighth year, Spring beans.

Design: 4 randomised blocks of 5 plots with weedkiller treatments to blocks.

Area of each plot: 0.0016. Area harvested: 0.0016.

Treatments: All combinations of:-

Blocks: 1. Weedkiller: No spray (S0), simazine at 0.84 lb in 100 gals 1969 and 0.75 lb in 60 gals 1970 (SA), 1.68 lb in 200 gals 1969 and none in 1970 (SB), 0.42 lb in 50 gals 1969 and 1.50 lb in 120 gals 1970 (SC).

Whole plots: 2. Residues of Peat: None (0), peat at 62.5 cwt dry matter applied in 1965 only (Sb65). Annual dressings of peat repeated 1963 - 1968 at 62.5 (DG1), 125 (DG2), 187.5 cwt dry matter (DG3) dug in to a depth of 8 inches.

Basal applications: 20 cwt ground chalk. Triple superphosphate, potassium bicarbonate, and magnesium sulphate to supply 75 lb P, 250 lb K, 50 lb Mg applied to the seedbed before drilling. Insecticide: Dimethoate at 4.8 fl oz in 40 gals on one occasion, menazon 0.25 lb in 40 gals on two occasions.

Cultivations, etc.: Ground chalk, P, K, Mg applied, plots dug: 16 Dec, 1969. Seed drilled at 200 lb, weedkiller treatments applied: 28 Apr, 1970. Dimethoate applied: 17 June. Menazon applied: 6 July, 29 July. Harvested by hand: 10 Sept. Variety: Tarvin.

NOTES: (1) For previous years' results see 'Results' 64/C/20, 65/C/19, 66/C/11, 67/C/8, 68/C/31 and 69/W/CS/11.
(2) Soil samples for PK analysis were taken after harvest.

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SUMMARY OF RESULTS

	0	Sb65	DG1	DG2	DG3	Mean
			GRAIN: CWT			
SO	11.1	10.7	13.9	17.8	18.3	14.4
SA	4.7	6.1	11.7	14.4	16.6	10.7
SB	7.4	7.3	13.7	15.5	13.2	11.4
SC	10.4	10.2	15.9	15.8	14.3	13.3
Mean	8.4	8.6	13.8	15.9	15.6	12.4
			STRAW: CWT			
SO	24.0	21.2	18.9	22.6	23.4	22.0
SA	16.5	16.2	19.0	22.1	20.7	18.9
SB	19.2	20.5	19.9	19.2	18.5	19.5
SC	19.6	20.0	20.8	21.8	22.5	20.9
Mean	19.8	19.5	19.7	21.4	21.3	20.3

Mean D.M. %: Grain: 82.4
Straw: 78.0

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N AND Mg LEVELS TO OLD GRASS

(70/R/CS/13)

Old grass, Park Grass plot 6, 1970, the sixth year.

For previous years' results see 'Results' 65/C/33, 66/C/14, 67/C/10, 68/C/8 and 69/R/CS/13.

Area of each plot: 0.0045. Area harvested: 0.0021.

Additional treatments: A test of 25 (M1) v 50 lb (M2) Mg as magnesium sulphate applied in spring has been added in combination with the other residual treatments. A certain high order interaction is confounded with block differences. All plots are now cut 4 times a year and the 'Nitro-Chalk' is applied in equal dressings for each cut. Total N rates per year are unchanged. Basal applications of sodium and magnesium have been discontinued.

Basal application: 23 cwt ground chalk.

Cultivations, etc.: Basal PK applied: 20 Feb, 1970. Test Mg applied: 23 Feb. N applied: 16 Mar. Ground chalk applied: 16 Apr. S plots sprayed with mecoprop at 45 oz a.e. in 40 gals: 1 May. S plots spot-sprayed with mecoprop at the same rate: 1 Sept. Plots cut: 20 May, 16 July, 4 Sept, 23 Oct. N applied after each cut except the last.

Standard errors per plot. Dry matter, cwt:

1st cut:	1.78 or 7.8% (14 d.f.)
2nd cut:	2.10 or 19.6% (14 d.f.)
3rd cut:	1.71 or 10.7% (14 d.f.)
4th cut:	1.16 or 13.9% (14 d.f.)
Total of all 4 cuts:	3.81 or 6.6% (14 d.f.)

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70/R/CS/13

SUMMARY OF RESULTS

DRY MATTER: CWT

	N0	N1	N2	N3	Mean	SN0
			1ST CUT			
1969			(±0.89)		(±0.45)	
C3	10.4	15.7	29.6	35.7	22.8	1.9
C6	9.4	16.6	30.1	35.7	22.9	1.7
1970						
M1	9.7	15.9	29.8	35.7	22.8	1.8
M2	10.1	16.3	29.8	35.7	23.0	1.8
Mean (±0.63)	9.9	16.1	29.8	35.7	22.9	1.8
			2ND CUT			
1969			(±1.05)		(±0.53)	
C3	12.7	11.6	12.1	7.5	11.0	3.9
C6	11.4	11.6	11.3	7.5	10.4	3.5
1970						
M1	12.7	11.6	12.4	8.0	11.2	3.7
M2	11.4	11.6	11.0	6.9	10.2	3.7
Mean (±0.74)	12.0	11.6	11.7	7.5	10.7	3.7

	General mean:	Mean D.M. %:
1st cut:	18.7	19.6
2nd cut:	9.3	28.0

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70/R/CS/13

DRY MATTER: CWT

	N0	N1	N2	N3	Mean	SN0
			3RD CUT			
1969			(±0.85)		(±0.43)	
C3	11.1	12.2	20.2	19.9	15.9	3.2
C6	9.9	12.9	19.5	21.6	16.0	3.8
1970						
M1	10.5	13.0	20.4	21.1	16.3	3.2
M2	10.4	12.1	19.3	20.4	15.6	3.8
Mean (±0.60)	10.5	12.6	19.9	20.8	15.9	3.5
			4TH CUT			
1969			(±0.58)		(±0.29)	
C3	4.1	6.7	11.6	10.7	8.3	3.0
C6	4.1	6.5	11.0	12.0	8.4	2.2
1970						
M1	4.4	7.2	11.4	11.5	8.6	2.7
M2	3.8	6.0	11.3	11.2	8.1	2.4
Mean (±0.41)	4.1	6.6	11.3	11.4	8.4	2.6

	General mean:	Mean D.M. %:
3rd cut:	13.4	22.8
4th cut:	7.2	25.0

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70/R/CS/13

DRY MATTER: CWT

	N0	N1	N2	N3	Mean	SN0
			TOTAL OF 4 CUTS			
1969			(±1.90)		(±0.95)	
C3	38.2	46.3	73.6	73.8	58.0	12.0
C6	34.8	47.6	71.9	76.9	57.8	11.1
1970						
M1	37.3	47.8	74.1	76.4	58.9	11.5
M2	35.7	46.1	71.5	74.3	56.9	11.7
Mean (±1.35)	36.5	47.0	72.8	75.3	57.9	11.6

General mean: 48.6

Mean D.M. %: 23.8

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NPK TO OLD GRASS

(70/R/CS/14)

Park Grass Old Plots 5/1 and 5/2, 1970, the sixth year.

For details of treatments etc. see 'Results' 65/C/22, 66/C/13, 67/C/9, 68/C/7 and 69/R/CS/14.

Area of each plot: 0.0045. Area harvested: 0.0021.

Treatments K1P2 and K6P2 were applied in 1965 only. In each season these plots received N at current rates.

Basal application: 70 cwt ground chalk.

Cultivations, etc.: P and K applied: 15 Jan, 1970. N applied: 16 Mar. Ground chalk applied: 16 Apr. Cut twice: 5 June and 9 Oct. N applied after first cut.

Standard errors per plot. Dry matter, cwt:

Plot 5/1:	1st cut:	2.47 or 13.6% (11 d.f.)
	2nd cut:	2.21 or 10.4% (11 d.f.)
	Total of 2 cuts:	4.07 or 10.4% (11 d.f.)
Plot 5/2:	1st cut:	3.18 or 10.7% (11 d.f.)
	2nd cut:	1.50 or 7.8% (11 d.f.)
	Total of 2 cuts:	3.48 or 7.1% (11 d.f.)

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70/R/CS/14

SUMMARY OF RESULTS

PLOT 5/1: DRY MATTER, CWT

1ST CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.87)	10.0	23.1	26.2	23.1	20.6
		(±1.74)			(±0.87)
K0	8.5	16.5	19.4	14.1	14.6
K2	11.4	24.9	27.5	23.6	21.8
K4	9.9	25.2	28.3	27.5	22.7
K8	10.1	25.9	29.6	27.1	23.2
		(±1.23)			(±0.62)
N1	9.0	18.8	18.6	18.7	16.3
N2	11.0	27.5	33.8	27.4	24.9

	K0	K2	K4	K8
		(±1.23)		
N1	13.9	17.5	15.1	18.5
N2	15.3	26.1	30.4	27.8

K1 and K6 plots

	K1P2*	K6P2*	Mean
	(±1.74)		(±1.23)
N1	8.1	4.9	6.5
N2	10.9	9.0	9.9
Mean (±1.23)	9.5	7.0	8.2

* Applied 1965

General mean: 18.1
Mean D.M. %: 25.5

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70/R/CS/14

PLOT 5/1: DRY MATTER, CWT

2ND CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.78)	19.0	20.4	23.2	23.8	21.6
			(±1.56)		(±0.78)
K0	20.6	19.6	19.6	21.0	20.2
K2	18.1	21.2	28.1	22.5	22.5
K4	19.1	21.1	23.0	25.3	22.1
K8	18.1	19.7	22.0	26.5	21.6
			(±1.10)		(±0.55)
N1	16.6	16.8	19.3	22.5	18.8
N2	21.4	24.1	27.0	25.2	24.4

	K0	K2	K4	K8
			(±1.10)	
N1	18.1	18.5	19.2	19.5
N2	22.3	26.4	25.1	23.7

K1 and K6 plots

	K1P2*	K6P2*	Mean
	(±1.56)		(±1.10)
N1	20.2	17.2	18.7
N2	20.5	21.0	20.7
Mean (±1.10)	20.3	19.1	19.7

* Applied 1965

General mean: 21.2
Mean D.M. %: 29.4

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70/R/CS/14

PLOT 5/1: DRY MATTER, CWT

TOTAL OF 2 CUTS

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±1.44)	29.0	43.6	49.4	46.9	42.2
			(±2.88)		(±1.44)
K0	29.1	36.1	38.9	35.1	34.8
K2	29.5	46.1	55.6	46.1	44.3
K4	29.0	46.4	51.3	52.7	44.9
K8	28.2	45.7	51.7	53.6	44.8
			(±2.04)		(±1.02)
N1	25.6	35.6	37.9	41.2	35.1
N2	32.3	51.5	60.8	52.6	49.3

	K0	K2	K4	K8
			(±2.04)	
N1	32.0	36.1	34.2	38.0
N2	37.6	52.6	55.5	51.6

K1 and K6 plots

	K1P2*	K6P2*	Mean
	(±2.88)		(±2.04)
N1	28.3	22.1	25.2
N2	31.4	30.0	30.7
Mean (±2.04)	29.8	26.1	27.9

* Applied 1965

General mean: 39.3
Mean D.M. %: 27.4

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70/R/CS/14

PLOT 5/2: DRY MATTER, CWT

1ST CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±1.13)	30.6	30.4	29.7	27.7	29.6
			(±2.25)		(±1.13)
K0	28.0	28.6	28.6	26.2	27.8
K2	32.0	33.1	30.6	27.7	30.8
K4	31.4	29.9	30.7	27.3	29.8
K8	31.1	30.0	29.0	29.6	29.9
			(±1.59)		(±0.80)
N1	18.9	18.2	18.0	15.0	17.5
N2	42.3	42.6	41.5	40.4	41.7

	K0	K2	K4	K8
			(±1.59)	
N1	16.8	18.6	17.5	17.2
N2	38.9	43.1	42.1	42.7

K1 and K6 plots

	K1P2*	K6P2*	Mean
	(±2.25)		(±1.59)
N1	19.6	20.3	19.9
N2	37.4	42.6	40.0
Mean (±1.59)	28.5	31.4	30.0

* Applied 1965

General mean: 29.7
Mean D.M. %: 27.4

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70/R/CS/14

PLOT 5/2: DRY MATTER, CWT

2ND CUT

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±0.53)	19.3	18.6	18.7	20.2	19.2
			(±1.06)		(±0.53)
K0	20.4	19.0	20.5	20.1	20.0
K2	18.8	17.8	19.0	20.2	18.9
K4	19.0	19.8	18.4	19.4	19.2
K8	19.0	18.0	16.8	21.0	18.7
			(±0.75)		(±0.38)
N1	17.1	16.4	17.1	17.2	16.9
N2	21.5	20.8	20.3	23.2	21.4

	K0	K2	K4	K8
			(±0.75)	
N1	18.1	18.2	15.7	15.7
N2	21.9	19.6	22.6	21.7

K1 and K6 plots

	K1P2*	K6P2*	Mean
	(±1.06)		(±0.75)
N1	20.0	18.6	19.3
N2	19.3	21.3	20.3
Mean (±0.75)	19.6	19.9	19.8

* Applied 1965

General mean: 19.3
Mean D.M. %: 33.9

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70/R/CS/14

PLOT 5/2: DRY MATTER, CWT

TOTAL OF 2 CUTS

Excluding K1 and K6 plots

	P0	P1	P2	P4	Mean
Mean (±1.23)	49.9	49.0	48.4	47.9	48.8
			(±2.46)		(±1.23)
K0	48.3	47.5	49.1	46.4	47.8
K2	50.7	50.9	49.6	47.9	49.8
K4	50.4	49.8	49.1	46.7	49.0
K8	50.2	48.0	45.7	50.6	48.6
			(±1.74)		(±0.87)
N1	36.0	34.7	35.0	32.2	34.5
N2	63.8	63.4	61.7	63.6	63.1

	K0	K2	K4	K8
			(±1.74)	
N1	34.9	36.8	33.2	32.9
N2	60.8	62.7	64.8	64.3

K1 and K6 plots

	K1P2*	K6P2*	Mean
	(±2.46)		(±1.74)
N1	39.6	38.8	39.2
N2	56.7	63.9	60.3
Mean (±1.74)	48.1	51.4	49.7

* Applied 1965

General mean: 49.0
Mean D.M. %: 30.6

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DIRECT SEEDING

(70/W/CS/15)

Direct seeding, Woburn White Horse Field 1970, the fifth year - Winter wheat.

Design: 4 randomised blocks of 4 plots, split into 2.

Area of each sub plot: 0.0149. Area harvested: 0.0071.

Treatments: All combinations of:-

Whole plots: 1. Seedbed preparations: Direct seeding after paraquat at 1.0 lb ion in 33 gals (SP), normal cultivations (M).

2. Seed dressing: No insecticide, fungicide only (SO), combined insecticide fungicide (SI).

Sub plots: 3. Insecticide: None (DO), phorate at 10 lb a.i. applied in autumn (DD).

NOTE: Treatments 1966 - 1970 inclusive are cumulative.

Basal applications: 530 lb (0:14:28) combine drilled. 1.0 cwt N as 'Nitro-Chalk' top dressed. Weedkiller: Aminotriazole at 2.0 lb plus ammonium thiocyanate at 1.85 lb in 37 gals. Ioxynil at 7.5 oz plus mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.: Aminotriazole and ammonium thiocyanate applied: 2 Sept, 1969. M plots ploughed: 3 Oct. SP plots paraquat applied: 6 Oct. Insecticide applied, seed combine drilled at 190 lb: 21 Oct. 'Nitro-Chalk' applied: 28 Apr, 1970. Ioxynil and mecoprop applied: 7 May. Combine harvested: 13 Aug.

NOTES: (1) For the previous years' results see 'Results' 66/C/33, 67/C/26, 68/C/20 and 69/W/CS/15.

(2) A germination count was made in March, and plant samples were taken then and in July for counts of damage to tillers. Counts of soil fauna were made in March and after harvest when earthworm counts were also made.

(3) Observations were made on the apparent effects of phorate on weeds.

(4) Samples were taken for estimates of take-all (Ophiobolus graminis).

(5) Samples were taken for nematode counts in October, January, May and August.

Standard errors per plot:

Grain, cwt: Whole plot: 1.54 or 13.2% (9 d.f.)

Sub plot: 3.54 or 30.0% (12 d.f.)

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70/W/CS/15

SUMMARY OF RESULTS

GRAIN: CWT

	SO	SI	DO	DD	Mean
	(±0.77)		(1) and (2)		(±0.54)
SP	10.3	11.3	13.0	8.6	10.8
M	12.7	12.3	13.6	11.5	12.5
			(1) and (2)		(±0.54)
		SO	13.8	9.2	11.5
		SI	12.8	10.9	11.8
Mean (±0.88)			13.3	10.1	11.7

Mean D.M. %: 81.2

(1) (±1.04) For use in vertical and diagonal comparisons only
(2) (±1.25) For use in horizontal and interaction comparisons only

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IRRIGATION AND EELWORMS

(70/W/CS/16)

Butt Close Woburn, the fifth year - potatoes 1970.

Effects on yield and cyst nematode of soil fumigant, irrigation and sequences of resistant and susceptible varieties of potatoes.

For details of treatments etc. and previous years' results see 'Results' 66/C/32, 67/C/25, 68/C/19 and 69/W/CS/16. Irrigation and fumigant treatments are cumulative.

Area of each sub-plot: 0.0114. Area harvested: 0.0046.

Irrigation to C plots 1970 (inches water):

	Series I		Series IV
10 June	1.0	9 - 10 June	1.0
12 June	1.0	11 - 12 June	1.0
17 - 18 June	1.0	16 - 17 June	1.0
23 June	0.5	22 June	0.5
24 June	0.5	24 June	0.5
15 - 16 July	1.0	13 - 14 July	1.0
5 - 6 Aug	1.0	7 - 10 Aug	1.0
Total	6.0		6.0

Basal applications: 9 cwt (13:13:20). Weedkiller: Linuron at 1.0 lb plus paraquat at 0.37 lb ion in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz in 37 gals on one occasion with mancozeb.

Cultivations, etc.: Rotary cultivated: 4 Oct, 1969. Fumigated, rotary cultivated: 29 Oct. Ploughed: 11 Feb, 1970. Fertiliser applied: 2 Apr. Rotary cultivated, potatoes planted, (Series I): 29 Apr, (Series IV): 4 May. Weedkiller applied, (Series I): 13 May, (Series IV): 14 May. Rotary ridged: 5 June. Fungicide with insecticide applied: 31 July. Fungicide applied: 18 Aug. Sprayed with undiluted BOV at 20 gal: 7 Sept. Lifted: 14 Sept.

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NOTE: Soil samples were taken from each plot before planting, and after lifting for cyst-nematode counts. Root invasion tests by cyst-nematode were made in pots of soil from samples taken at planting.

Standard errors per plot. Total tubers, tons:

Series I

Strip:	1.438	or 17.9% (6 d.f.)
1/2 plots:	1.342	or 16.7% (8 d.f.)
1/4 plots:	1.269	or 15.8% (16 d.f.)
Pooled (used for calculation of standard errors in summary):	1.324	or 16.5% (30 d.f.)

Series IV

Strip:	3.126	or 32.7% (6 d.f.)
1/2 plots:	1.391	or 14.6% (8 d.f.)
1/4 plots:	1.564	or 16.4% (16 d.f.)
Pooled (used for calculation of standard errors in summary):	1.943	or 20.3% (30 d.f.)

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70/W/CS/16

SUMMARY OF RESULTS

SERIES I

1966 1967 1968 1969 1970	MP MP MP MP MP	MP PD MP PD MP	PD PD PD PD PD	PD MP PD MP PD	Mean
	TOTAL TUBERS: TONS				
		(±0.541)			(±0.270)
O	10.48	7.95	2.01	7.32	6.94
C	15.00	9.79	1.74	10.04	9.14
O	10.95	7.36	0.70	2.68	5.42
F	14.52	10.38	3.06	14.68	10.66
Mean (±0.382)	12.74	8.87	1.88	8.68	8.04
	% WARE: 1.5 INCH				
O	89.6	93.8	64.2	75.1	80.7
C	94.9	94.5	48.1	86.5	81.0
O	90.3	94.8	42.2	66.0	73.3
F	94.2	93.5	70.0	95.6	88.3
Mean	92.3	94.2	56.1	80.8	80.8

Varieties MP = Maris Piper
PD = Pentland Dell

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70/W/CS/16

SERIES IV

1966 1967 1968 1969 1970	MP MP MP MP MP	MP PD MP PD MP	PD PD PD PD PD	PD MP PD MP PD	Mean
		TOTAL TUBERS: TONS			
		(±0.793)			(±0.397)
O C	13.58 16.95	10.47 11.84	2.26 3.44	8.12 9.88	8.61 10.53
O F	14.23 16.30	8.33 13.97	1.02 4.68	3.10 14.91	6.67 12.46
Mean (±0.561)	15.26	11.15	2.85	9.00	9.57
		% WARE: 1.5 INCH			
O C	93.6 95.8	95.0 94.6	66.1 63.7	86.0 86.4	85.2 85.1
O F	94.0 95.5	94.1 95.5	47.8 82.0	76.4 95.9	78.1 92.2
Mean	94.7	94.8	64.9	86.2	85.2

Varieties MP = Maris Piper
PD = Pentland Dell

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PLACEMENT OF FUMIGANT

(70/W/CS/20)

Soil fumigation for control of potato cyst-nematode - Woburn Butt Furlong 1970 fourth year, potatoes.

For treatments etc., see 'Results' 68/C/27 and for previous years' results see 'Results' 67/C/34, 68/C/27 and 69/W/CS/20. In 1970 the fumigant was changed to dazomet applied at None (DZ0), 37.5 (DZ1), 75 (DZ2), 150 (DZ4) and 300 lb (DZ8) in the autumn and rotary cultivated into the top six inches of soil. These treatments were cumulative to 'D-D' treatments applied in 1967, 1968 and 1969 - (D0), (D1), (D2), (D4) and (D8) respectively.

Area of each plot: 0.0024. Area harvested: 0.0024.

Basal applications: 11 cwt (13:13:20). Weedkiller: Linuron at 1 lb in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz in 37 gals on one occasion with fungicide.

Cultivations, etc.: Ploughed: 14 Oct, 1969. Dazomet applied, rotary cultivated: 27 Oct. Deep-tine cultivated, NPK applied, potatoes planted, inter-row rotary cultivated and earthed up: 5 May, 1970. Weedkiller applied: 15 May. Fungicide applied: 31 July, 18 Aug. Insecticide applied: 31 July. Lifted by hand: 18 Sept.

NOTE: Soil samples were taken before planting and after harvest for cyst counts.

Standard error per plot.
Total tubers, tons: 1.407 or 15.6% (8 d.f.)

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70/W/CS/20

SUMMARY OF RESULTS

DZ0	DZ1	DZ2	DZ4	DZ8	Mean
		TOTAL TUBERS: TONS			
		(±0.812)			
6.45	7.28	8.24	9.78	13.30	9.01
		% WARE: 1.5 INCH			
70.8	72.5	82.2	76.1	77.7	75.9

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SIMULATED GRAZING

(70/R/CS/23)

Old grass, plot 6 Park Grass 1970 the fourth year. For treatments, etc., and for previous years' results see 'Results' 67/C/38, 68/C/29 and 69/R/CS/23.

Treatments G+H and HG+ were replaced by treatments G+ (cuttings returned after each cut) and G- (cuttings removed). The new treatments were allocated at random for each N level in each block.

Cultivations, etc.: Basal P, K, Na and Mg applied: 4 Dec, 1969.
The following treatments were cut on the dates shown:-

24 Apr, 1970:	G+	G-	G-H		
11 May:				HG-	H
12 May:	G+	G-	G-H		
1 June:	G+	G-		HG-	
18 June:	G+	G-		HG-	
30 June:	G+	G-	G-H	HG-	H
21 July:	G+	G-	G-H		
4 Aug:	G+	G-	G-H		
2 Sept:	G+	G-	G-H	HG-	H
16 Sept:	G+	G-		HG-	
5 Oct:	G+	G-		HG-	
26 Oct:	G+	G-	G-H	HG-	H

Calcium nitrate applied on 16 Mar, 12 May, 30 June, 2 Sept.

NOTES: (1) On the G+ plots some grass returned at previous cutting was recovered by the rotary mower. Therefore these yields were overestimated.

(2) The percentages of N, P and K in the dry grass were measured.

Standard errors per plot. Dry matter, cwt:

1st Period (cuts 1-2):	3.53 or 22.7% (28 d.f.)
2nd Period (cuts 3-5):	3.18 or 19.6% (28 d.f.)
3rd Period (cuts 6-8):	2.76 or 15.8% (28 d.f.)
4th Period (cuts 9-11):	1.26 or 14.8% (28 d.f.)
Total of all 4 Periods (cuts 1-11):	4.65 or 8.0% (28 d.f.)

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70/R/CS/23

SUMMARY OF RESULTS

DRY MATTER: CWT

1ST PERIOD

Treatment	H	H(G-)	G-(H)	G+	G-	Mean
Cut with	M	M	R	R	R	
			(±2.04)			(±0.91)
N0	3.3	2.3	5.4	6.0	6.7	4.7
N1	20.7	18.7	13.8	15.7	16.8	17.1
N2	29.8	29.6	20.6	23.3	20.4	24.7
Mean (±1.18)	18.0	16.9	13.3	15.0	14.6	15.5

R plots cut twice.

2ND PERIOD

Treatment	H	(H)G-	(G-)H	G+	G-	Mean
Cut with	M	R	M	R	R	
			(±1.84)			(±0.82)
N0	14.4	9.6	16.6	17.7	10.2	13.7
N1	17.5	11.6	18.5	28.8	11.7	17.6
N2	15.7	10.3	22.3	25.1	12.8	17.2
Mean (±1.06)	15.9	10.5	19.1	23.9	11.6	16.2

R plots cut three times.

M = Motor scythe
R = Rotary mower
()= Not applied in this period

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70/R/CS/23

DRY MATTER: CWT

3RD PERIOD

Treatment	H	H(G-)	G-(H)	G+	G-	Mean
Cut with	M	M	R	R	R	
			(±1.60)			(±0.71)
N0	11.9	12.3	11.8	7.9	7.4	10.3
N1	18.4	22.2	14.2	20.3	13.0	17.6
N2	26.4	31.9	20.6	22.7	21.5	24.6
Mean (±0.92)	18.9	22.1	15.5	17.0	14.0	17.5

R plots cut three times

4TH PERIOD

Treatment	H	(H)G-	(G-)H	G+	G-	Mean
Cut with	M	R	M	R	R	
			(±0.73)			(±0.32)
N0	4.9	6.4	5.4	6.6	4.9	5.7
N1	10.4	7.1	9.3	15.0	7.7	9.9
N2	9.3	6.7	12.4	13.4	7.7	9.9
Mean (±0.42)	8.2	6.7	9.0	11.7	6.8	8.5

R plots cut three times

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70/R/CS/23

DRY MATTER: CWT

TOTAL OVER ALL PERIODS

Treatment Cut with	H M	HG- M&R	G-H M&R	G+ R	G- R	Mean	Under same management H(G-) M	 G-(H) R
			(±2.68)			(±1.20)		
N0	34.6	30.6	39.2	38.2	29.2	34.4	36.6	33.2
N1	67.0	59.6	55.8	79.8	49.3	62.3	68.7	46.7
N2	81.2	78.6	75.9	84.5	62.4	76.5	96.2	58.2
Mean (±1.55)	60.9	56.2	57.0	67.5	47.0	57.7	67.1	46.0

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P, K AND TAKE-ALL

(70/R/CS/24)

P, K and take-all (Ophiobolus graminis), West Barnfield II 1970, the third year, barley. For treatments etc. and for the previous years' results see 'Results' 68/C/16 and 69/R/CS/24.

Design: 2 replicates of 5x2x4 in 4 blocks of 10 plots split into 2 for N.

Area of each sub plot: 0.0127. Area harvested: 0.0067.

N test: A test of 0.3 (N1), 0.6 (N2), 0.9 (N3), 1.2 (N4) cwt N as 'Nitro-Chalk' is now applied to half plots. The test is cumulative in successive years.

Basal applications: Manures: None. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Ploughed: 29 Sept, 1969. N, P and K applied: 25 Mar, 1970. Seed drilled at 140 lb: 31 Mar. Weedkiller applied: 18 May. Combine harvested: 15 Aug. Variety: Julia.

NOTE: Estimates of eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis) were made in early July.

Standard errors per plot.

Grain, cwt:	Whole plot:	1.91 or 5.7% (17 d.f.)
	Sub plot:	2.21 or 6.6% (20 d.f.)
	Pooled (used for calculation of standard errors in summary):	2.45 or 7.3% (37 d.f.)

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70/R/CS/24

SUMMARY OF RESULTS

GRAIN: CWT

	P0	P1	P4	P6*	P24*	Mean
			(±0.86)			(±0.39)
K1	24.4	33.0	38.0	31.7	37.7	33.0
K4	24.5	31.3	38.6	34.2	40.3	33.8
			(±1.22)			(±0.55)
N1	24.4	30.8	35.4	32.0	36.6	31.8
N2	23.0	32.3	40.2	31.9	39.7	33.4
N3	26.3	33.6	39.6	34.0	40.2	34.7
N4	24.2	32.2	37.9	33.9	39.5	33.5
Mean (±0.61)	24.5	32.2	38.3	33.0	39.0	33.4

	N1	N2	N3	N4
		(±0.77)		
K1	31.9	33.2	33.9	33.0
K4	31.8	33.7	35.6	34.0

* Applied 1968 only

Mean D.M. %: 86.1

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70/R/CS/24

GRAIN: CWT

	K1					K4				
	P0	P1	P4	P6	P24	P0	P1	P4	P6	P24
	(±1.73)									
N1	24.2	31.5	34.4	31.9	37.4	24.5	30.1	36.4	32.1	35.8
N2	25.1	32.9	40.5	30.1	37.2	20.9	31.6	39.9	33.7	42.3
N3	22.7	34.1	38.9	33.4	40.2	29.8	33.0	40.2	34.7	40.1
N4	25.6	33.8	38.1	31.5	36.1	22.7	30.6	37.7	36.3	42.8

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70/R/CS/24

STRAW: CWT

	P0	P1	P4	P6*	P24*	Mean
K1	9.2	11.7	14.8	11.8	13.9	12.3
K4	10.8	13.5	17.9	14.4	17.3	14.8
N1	9.4	11.4	12.7	12.0	13.7	11.8
N2	8.9	13.1	17.8	13.1	15.7	13.7
N3	11.5	14.1	16.7	13.1	15.9	14.3
N4	10.1	11.9	18.2	14.4	16.9	14.3
Mean	10.0	12.6	16.3	13.1	15.6	13.5

	N1	N2	N3	N4
K1	11.3	12.4	13.1	12.3
K4	12.3	15.1	15.4	16.3

* Applied 1968 only

Mean D.M. %: 88.8

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STRAW: CWT

	K1					K4				
	P0	P1	P4	P6	P24	P0	P1	P4	P6	P24
N1	9.8	11.3	11.2	11.2	13.0	8.9	11.4	14.2	12.7	14.4
N2	9.1	12.1	15.9	10.8	14.0	8.7	14.2	19.7	15.3	17.4
N3	8.9	12.7	16.2	12.4	15.1	14.2	15.4	17.2	13.7	16.7
N4	8.9	10.7	15.7	12.8	13.3	11.3	13.1	20.6	16.0	20.6

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INSECTICIDES AND MOLLUSCICIDES

(70/R/CS/25)

Old grass, Road Piece 1970, the third year.

For treatments and previous years' results see 'Results' 68/C/17 and 69/R/CS/25.

Area of each plot: 0.0209. Area harvested: 0.0054.

Basal applications: 448 lb (0:14:28) in winter, 390 lb (25:0:16) in spring and 200 lb (25:0:16) after each cut except the last.

Cultivations, etc.: PK applied: 23 Oct, 1969. NK applied: 17 Mar, 1970. Cut 3 times: 2 June, 3 Aug, 1 Oct. NK applied after first 2 cuts. Insecticides and molluscicides applied:
BHC: Not applied in 1970.
Chlorbenside, Metaldehyde, Menazon: Applied 27 Jan, 23 Mar, 20 Apr, 19 May, 17 June, 22 July, 17 Aug, 4 Sept.

NOTE: Samples were taken for botanical analysis. Samples for fauna were taken throughout the year.

Standard errors per plot. Dry matter, cwt:

1st cut:	2.30 or 5.9% (18 d.f.)
2nd cut:	1.47 or 26.1% (18 d.f.)
3rd cut:	1.91 or 13.7% (18 d.f.)
Total of 3 cuts:	4.63 or 7.9% (18 d.f.)

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70/R/CS/25

SUMMARY OF RESULTS

DRY MATTER: CWT

O	S	B*	C	M	P	BCMP	Mean
			1ST CUT				
			(±1.15)				
39.3	37.7	40.4	38.4	37.9	39.3	40.0	39.0
			2ND CUT				
			(±0.74)				
5.2	5.7	6.2	5.3	4.5	6.3	6.2	5.6
			3RD CUT				
			(±0.96)				
13.1	15.0	16.1	13.3	12.5	14.3	13.6	14.0
			TOTAL OF 3 CUTS				
			(±2.32)				
57.6	58.4	62.7	57.0	55.0	60.0	59.8	58.6

Mean D.M. %: 1st cut: 22.1
2nd cut: 28.4
3rd cut: 23.2
Total of 3 cuts: 24.6

* Applied 1969

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FUMIGANTS AND IRRIGATION

(70/W/CS/28)

The residual effects of fumigants for the control of Pratylenchus spp. in barley - Woburn Butt Close Series III, 3rd year. For design, treatments etc. and previous years' results see 'Results' 68/C/34 and 69/W/CS/28.

NOTE: Fumigant treatments are residual from 1968. Irrigation and nitrogen treatments are cumulative 1968, 1969 and 1970.

Area of each sub plot: 0.0050. Area harvested: 0.0020.

Basal applications: 280 lb (0:20:20). Weedkiller: Ioxynil at 7.5 oz and mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.: Ploughed: 27 Aug, 1969. Power harrowed: 1 Nov. Deep-tine cultivated: 3 Nov. Power harrowed: 26 Mar, 1970. Seed combine drilled at 140 lb: 27 Mar. 'Nitro-Chalk' applied: 3 Apr. Weedkiller applied: 16 May. Irrigation applied at 1.0 inch on five occasions: 9 June, 11 June, 16 June, 22 June, 7 July. Combine harvested: 26 Aug. Variety: Maris Badger.

NOTE: Crop and soil samples were taken at intervals through the growing season for nematode counts.

Standard errors per plot. Grain, cwt:

Whole plot:	1.81 or 7.1%	(6 d.f.)
Quarter plot:	2.26 or 8.9%	(24 d.f.)
Eighth plot:	2.80 or 11.0%	(32 d.f.)

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70/W/CS/28

SUMMARY OF RESULTS

GRAIN: CWT

1968

	O	C	D	T	Mean
1968 - 70		(1) and (2)			(±0.74)
O	15.6	21.9	23.5	17.6	19.7
I	30.3	30.4	32.9	30.8	31.1

1968 - 70

	NO	N1	N2	N3	
		(3) and (4)			
O	9.2	22.1	24.3	23.2	
I	12.9	34.1	42.3	35.3	
1968		(5) and (6)			(±0.65)
O	10.4	24.5	31.6	25.4	23.0
C	12.0	26.9	35.7	30.1	26.2
D	11.0	32.7	36.1	32.9	28.2
T	10.8	28.0	29.7	28.5	24.2
Mean (±0.57)	11.0	28.1	33.3	29.2	25.4

Mean D.M. %: 85.0

(1) (±1.09) (3) (±1.02) (5) (±1.19) For use in vertical and diagonal comparisons only

(2) (±0.92) (4) (±0.81) (6) (±1.14) For use in horizontal and interaction comparisons only

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70/W/CS/28

STRAW: CWT

1968

	O	C	D	T	Mean
1968 - 70					
O	10.9	13.9	15.2	12.0	13.0
I	24.9	24.0	27.1	24.7	25.2

1968 - 70

	NO	N1	N2	N3	
O	6.1	14.0	16.1	15.9	
I	8.8	24.5	34.6	32.8	
1968					
O	7.4	18.0	25.6	20.7	17.9
C	7.8	16.8	26.6	24.5	18.9
D	7.7	23.2	27.0	26.7	21.1
T	6.9	18.9	22.2	25.3	18.3
Mean	7.4	19.2	25.4	24.3	19.1

Mean D.M. %: 87.5

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FORMS OF MAGNESIUM

(70/W/CS/29)

Effect of forms of magnesium fertiliser on spring wheat - Woburn Stackyard C, 3rd year.

For details of treatments etc. and previous years' results see 'Results' 68/C/35 and 69/W/CS/29. Mg and limestone treatments are cumulative.

Area of each plot: 0.0072. Area harvested: 0.0032.

Basal applications: 540 lb (20:10:10). Weedkiller: Ioxynil at 7.5 oz and mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.:- Ploughed: 12 Nov, 1969. NPK applied: 26 Mar, 1970. Mg and limestone treatments applied: 31 Mar. Power harrowed, seed drilled at 175 lb: 1 Apr. Weedkiller applied: 18 May. Combine harvested: 14 Aug. Variety: Kolibri.

Standard error per plot.
Grain, cwt: 3.21 or 31.6% (21 d.f.)

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70/W/CS/29

SUMMARY OF RESULTS

O	D2	E	C1	C2	DL	L2	EL	Mean
				GRAIN: CWT				
				(±1.61)				
11.0	9.9	11.3	10.0	9.4	11.2	6.9	11.6	10.2
				STRAW: CWT				
6.6	6.5	7.7	6.2	6.6	6.8	5.0	6.2	6.4

Mean D.M. %: Grain: 82.0
Straw: 90.1

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RATES OF NEMATICIDES DOSAGE

(70/W/CS/33)

The effect of different rates of nematicides on a sequence of crops - Woburn Butt Close 1970. Second year, sugar beet after potatoes.

Design: 3 blocks of 14 plots, split for residual and cumulative nematicides.

Area of each sub plot: 0.0032. Area harvested: 0.0014.

Treatments:

Nematicides were repeated in 1970, applied cumulatively on half-plots of whole plots treated in 1969 (C). The half plots untreated in 1970 tested residues of nematicides applied in 1969 (R). Rates of nematicides:-

1969		1970		
None		None		(C)
780 lb methyl bromide to whole area in spring		780 lb methyl bromide to whole area in spring		(M)
80 lb DD	applied at	100 lb DD	applied to	(D1)
160 lb DD	base of ridges	200 lb DD	whole area	(D2)
320 lb DD	in spring	400 lb DD	in autumn	(D3)
400 lb DD injected and rotary cultivated in autumn		400 lb DD		(D4)
60 lb 'Telone'	applied at	75 lb 'Telone'	applied to	(T1)
120 lb 'Telone'	base of ridges	150 lb 'Telone'	whole area	(T2)
240 lb 'Telone'	in spring	300 lb 'Telone'	in autumn	(T3)
220 lb 'Telone'	applied in autumn	300 lb 'Telone'		(T4)
100 lb dazomet	applied in	100 lb dazomet	applied to	(Z1)
200 lb dazomet	rows in	200 lb dazomet	whole area	(Z2)
300 lb dazomet	spring	300 lb dazomet	in autumn	(Z3)
400 lb dazomet	broadcast in autumn	400 lb dazomet		(Z4)

Basal applications: 960 lb (13:13:20). Weedkiller: Phenmedipham ('Betanal' at 5 pts in 20 gals). Insecticide: Demeton-s-methyl at 3.5 oz in 25 gals.

Cultivations: Ploughed: 11 Oct, 1969. DD and 'Telone' applied, rotary cultivated in: 16 Oct. Dazomet applied, rotary cultivated in twice: 17 Oct. Methyl bromide applied under gas tight sheet: 19 Mar, 1970. Gas tight sheet removed: 3 Apr. Basal NPK applied: 14 Apr. Power

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harrowed, seed drilled at 5 lb: 20 Apr. Weedkiller applied: 15 May. Singled: 26 May. Insecticide applied: 22 June. Lifted: 17 - 18 Nov. Variety: Klein E.

NOTES: (1) For previous year's results see 'Results' 69/W/CS/33.
(2) Soil samples were taken before applying treatments, at planting and after harvest for cyst counts.

Standard errors per plot.

Roots (washed), tons:	Whole plot:	1.282 or 5.8% (26 d.f.)
	Sub plot:	1.692 or 7.6% (28 d.f.)
Total sugar, cwt:	Whole plot:	5.46 or 7.0% (26 d.f.)
	Sub plot:	6.68 or 8.6% (28 d.f.)

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70/W/CS/33

SUMMARY OF RESULTS

SUGAR BEET

	ROOTS (WASHED): TONS			SUGAR %			TOTAL SUGAR: CWT		
	R	C	Mean	R	C	Mean	R	C	Mean
	(1) and (2)		(±0.740)				(3) and (4)		(±3.15)
O			21.86			17.0			74.5
M	23.72	22.74	23.23	17.3	17.2	17.2	81.9	78.2	80.1
D1	22.48	21.76	22.12	17.5	17.6	17.5	78.7	76.6	77.6
D2	19.65	22.02	20.84	17.1	17.0	17.1	67.4	75.0	71.2
D3	21.56	21.30	21.43	17.6	17.1	17.3	75.8	73.1	74.4
D4	23.87	22.33	23.10	17.7	17.2	17.5	84.5	77.0	80.8
T1	21.50	21.56	21.53	17.3	17.3	17.3	74.5	74.5	74.5
T2	20.42	21.76	21.09	17.7	17.2	17.5	72.3	75.2	73.7
T3	21.45	21.45	21.45	17.6	17.4	17.5	75.7	74.7	75.2
T4	23.36	22.58	22.97	17.5	17.2	17.3	81.7	77.7	79.7
Z1	21.04	21.76	21.40	17.6	17.3	17.5	74.2	75.5	74.8
Z2	23.00	24.69	23.85	17.5	17.3	17.4	80.3	85.3	82.8
Z3	23.36	24.28	23.82	17.8	17.7	17.8	83.4	85.8	84.6
Z4	23.00	23.20	23.10	17.6	17.2	17.4	81.2	79.7	80.5
Mean	22.18 (±0.271)	22.42	22.27*	17.5	17.3	17.4*	77.8 (±1.07)	77.6	77.5*

(1) (±1.013) (3) (±4.17) For use in vertical and diagonal comparisons only

(2) (±0.977) (4) (±3.86) For use in horizontal and interaction comparisons only

* General mean

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CULTIVATIONS AND SOIL INVERTEBRATES

(70/R/CS/41)

Old and new grass, Road Piece 1970, the second year. For treatments and previous year's results see 'Results' 69/R/CS/41.

Design: 4 blocks of 8 plots, randomisation restricted.

Area of each plot: 0.0116. Area harvested: 0.0018.

Revised treatments:
One of the duplicate pairs of unploughed plots in each block was ploughed in autumn 1969. Both plots received M treatment (most cultivations necessary to produce the seedbed for newly sown ley in spring). On one plot (AM) treatments will not be repeated, on the other (AMR) treatments will be repeated annually. Treatment of other plots ploughed in spring (SF and SM) was unchanged.

Cultivations, etc.: Basal PK applied: 23 Oct, 1969. AM and AMR plots ploughed: 9 Dec. SMR and SFR plots ploughed: 16 Mar, 1970. Basal NK applied: 17 Mar. AM, AMR and SMR plots disced four times, SFR plots twice. Harrowed and rolled, seed drilled at 20 lb and covered in with weeder: 30 Apr. SFR, SMR, AM and AMR plots topped: 4 Aug. SFR, SMR, AM and AMR plots cut once: 1 Oct, other plots 3 times: 2 June, 3 Aug, 1 Oct. NK applied to all plots except SFR, SMR, AM and AMR: 9 June, 6 Aug. SFR, SMR, AM and AMR plots: 6 Aug only. Seeds mixture for 1970: 6 lb Meadow Fescue S215, 4 lb Marbury Fescue, 4 lb Oakmere Timothy, 1.5 lb Kersey uncertified white clover, 0.5 lb wild white clover English Old Pasture.

NOTE: Soil cores were taken for total fauna on 5 Jan, 18 Mar, 22 Apr, 2 July, 10 Aug, 26 Oct. Quadrats (2 feet square) were sampled on each plot for earthworms on 30 Apr and 18 Dec.

Standard errors per plot. Dry matter, cwt:

1st cut:	5.01 or 13.0% (9 d.f.)
2nd cut:	1.47 or 31.0% (9 d.f.)
3rd cut:	3.23 or 24.7% (9 d.f.)
Total of 3 cuts:	7.68 or 13.7% (9 d.f.)

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70/R/CS/41

SUMMARY OF RESULTS

DRY MATTER: CWT

	O*	SF	SM	Mean	SFR	SMR	AM	AMR	Mean
	(±1.77)	(±2.50)							
1st cut	42.2	34.1	35.0	38.4					
	(±0.52)	(±0.73)							
2nd cut	5.1	4.3	4.5	4.7					
	(±1.41)	(±2.00)				(±2.00)			
3rd cut	13.8	9.8	15.1	13.1	17.7	19.9	22.4	24.0	17.1**
Total of	(±2.72)	(±3.84)							
3 cuts	61.0	48.2	54.6	56.2					

Mean D.M. %: 1st cut: 22.8
2nd cut: 31.1
3rd cut: 25.3
Total of 3 cuts: 26.4

* Duplicated level
** General mean

NOTE: AM = AMR in 1970

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EFFECT OF INVERTEBRATES ON YIELD

(70/R/CS/42)

Old grass, Road Piece 1970, the second year. For treatments and previous year's results see 'Results' 69/R/CS/42.

Area of each plot: 0.0043. Area harvested: 0.0016.

Basal applications: 448 lb (0:14:28) in winter, 390 lb (25:0:16) in spring and 200 lb (25:0:16) after each cut except the last.

Cultivations, etc.: PK applied: 23 Oct, 1969. NK applied: 17 Mar, 1970. Cut 3 times: 2 June, 3 Aug, 1 Oct. NK applied after first two cuts. Chemical treatments applied:

Chlorbenside:	2 Jan, 10 Feb, 20 Mar, 30 Apr, 4 June, 8 July, 13 Aug, 15 Sept, 15 Oct, 8 Dec.
Menazon:	2 Jan, 5 Feb, 20 Mar, 29 Apr, 4 June, 7 July, 12 Aug, 14 Sept, 14 Oct, 8 Dec.
Dimethoate:	14 Jan, 6 Feb, 20 Mar, 29 Apr, 4 June, 7 July, 13 Aug, 14 Sept, 14 Oct, 7 Dec.
Parathion:	4 May, 4 June, 6 July, 14 Aug, 15 Sept, 7 Dec.
C 14421:	1 May.
Formalin:	6 May (40% solution at 60.5 gals in 9680 gals).
Metaldehyde:	2 Jan, 6 Feb, 19 Mar, 30 Apr, 29 May, 7 July, 13 Aug, 14 Sept, 14 Oct, 7 Dec.

NOTES: (1) Treatment F3 and S4 also received parathion and formalin in 1970.
(2) Samples were taken for botanical analysis. Samples for fauna were taken throughout the year.
(3) Aldrin and chlordane were not applied in 1970.

Standard errors per plot. Dry matter, cwt:

1st cut:	3.86 or 9.2% (33 d.f.)
2nd cut:	1.88 or 35.0% (33 d.f.)
3rd cut:	2.67 or 23.4% (33 d.f.)
Total of 3 cuts:	6.62 or 11.2% (33 d.f.)

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70/R/CS/42

SUMMARY OF RESULTS

DRY MATTER: CWT

	1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
O	42.4	4.2	12.2	58.8
B	40.0	3.0	8.8	51.8
FCB	40.9	5.5	9.9	56.3
FMZ	45.7	5.1	10.9	61.7
F3	43.6	7.5	13.9	64.9
SFO	37.4	3.0	8.4	48.9
SL	42.5 (±1.93)	4.9 (±0.94)	10.8 (±1.33)	58.1 (±3.31)
SN	40.5	3.5	11.5	55.5
SMT	43.4	4.1	9.6	57.2
S3	46.7	7.1	13.6	67.4
S4	43.1	7.9	12.0	63.0
F3+S4	38.6	8.7	15.1	62.4
Mean	42.1	5.4	11.4	58.8

Mean D.M. %: 1st cut: 23.5
2nd cut: 29.7
3rd cut: 24.5
Total of 3 cuts: 25.9

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AQUA AMMONIA

(70/R/CS/43)

Grazed grass, Highfield IX 1970, the second year. For treatments and previous year's results see 'Results' 69/R/CS/43.

Area of each plot: 0.0161. Area harvested: 0.0002.

Cultivations, etc.: Basal PK applied: 18 Nov, 1969. Aqueous ammonia injected: 19 Mar, 1970. 'Nitro-Chalk' applied: 20 Mar. Sample cages placed: 23 Mar. Sample cuts taken: 7 May, 2 June, 8 July, 21 Aug, 10 Sept, 28 Oct. 'Nitro-Chalk' applied and sample cage moved after each of first five cuts.

NOTES: (1) Visual estimates were made of the percentage surface area within each cage covered by clover leaves immediately before cutting.
(2) The percentage of N in the dry grass was calculated.

Standard errors per plot. Dry matter, cwt:

1st cut:	3.73	or 17.9% (21 d.f.)
2nd cut:	1.96	or 5.9% (21 d.f.)
3rd cut:	2.50	or 19.6% (20 d.f.)
4th cut:	2.43	or 10.7% (21 d.f.)
5th cut:	2.75	or 9.9% (21 d.f.)
6th cut:	2.87	or 14.8% (21 d.f.)
Total of 6 cuts:	7.34	or 5.4% (20 d.f.)

NOTE: 3rd cut. Part of the yield from 1 plot (B N4) was lost. An estimated value has been used in the analysis of the 3rd cut and total of 6 cuts.

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70/R/CS/43

SUMMARY OF RESULTS

DRY MATTER: CWT

	N1	N2	N3	N4	Mean
		1ST CUT			
		(±1.86)			(±0.93)
I	18.6	25.0	23.7	19.8	21.8
B	17.8	20.7	21.9	19.3	19.9
Mean (±1.32)	18.2	22.8	22.8	19.6	20.9

NO: 12.6
General mean: 19.9

2ND CUT

		(±0.98)			(±0.49)
I	32.2	33.4	34.9	34.6	33.8
B	27.0	32.8	37.2	34.7	32.9
Mean (±0.69)	29.6	33.1	36.1	34.7	33.3

NO: 20.3
General mean: 31.9

3RD CUT

		(±1.25)			(±0.62)
I	9.5	11.9	14.9	14.7	12.7
B	10.9	13.6	14.8	12.0	12.8
Mean (±0.88)	10.2	12.7	14.8	13.3	12.8

NO: 9.7
General mean: 12.4

Mean D.M. %: 1st cut: 19.2
2nd cut: 19.1
3rd cut: 27.8

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70/R/CS/43

DRY MATTER: CWT

	N1	N2	N3	N4	Mean
		4TH CUT			
		(±1.22)			(±0.61)
I	14.8	22.4	22.8	23.5	20.9
B	19.1	26.8	26.3	25.6	24.5
Mean (±0.86)	16.9	24.6	24.6	24.6	22.7
NO:	13.6				
General mean:	21.7				
		5TH CUT			
		(±1.38)			(±0.69)
I	25.2	26.6	29.4	28.2	27.4
B	26.1	27.4	29.9	29.9	28.3
Mean (±0.97)	25.6	27.0	29.6	29.1	27.8
NO:	22.1				
General mean:	27.2				
		6TH CUT			
		(±1.44)			(±0.72)
I	14.5	19.9	20.7	18.5	18.4
B	18.5	20.1	21.8	20.9	20.3
Mean (±1.02)	16.5	20.0	21.3	19.7	19.4
NO:	13.5				
General mean:	18.7				

Mean D.M. %: 4th cut: 14.7
5th cut: 27.0
6th cut: 21.1

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70/R/CS/43

DRY MATTER: CWT

TOTAL OF 6 CUTS

	N1	N2	N3	N4	Mean
		(±3.67)			(±1.83)
I	114.7	139.1	146.5	139.4	134.9
B	119.4	141.4	151.9	141.0	138.4
Mean (±2.59)	117.1	140.2	149.2	140.2	136.7

NO: 91.8
General mean: 131.4
Mean D.M. %: 21.5

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BREAK CROPS AND WHEAT

(70/R/CS/44)

Long Hoos III 1970, the second year, winter wheat.

Design: 3 randomised blocks of 12 plots, split into 4.

Area of each sub-plot: 0.0096. Area harvested: 0.0064.

Treatments: All combinations of:-
Whole plots: Crops and nitrogen 1969:-
Spring beans (2 plots per block) (BE), clover (2 plots per block) (CL) and all combinations of:-
1. Crops: Barley (B), oats (O).
2. Nitrogen: 0.4 (R1), 0.8 (R2) cwt as 'Nitro-Chalk' in the seedbed.
3. Undersowing: None (O), trefoil (T).
Sub-plots:
4. Nitrogen 1970: None (N0), 0.4 (N1), 0.8 (N2), 1.2 (N3) cwt as 'Nitro-Chalk'.

Basal and other applications: Corrective K to clover plots at 1.0 cwt K20 as muriate of potash. 280 lb (0:20:20) combine drilled.
Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc. Corrective K applied: 28 Oct, 1969. Ploughed: 13 Nov. Seed combine drilled at 180 lb: 21 Nov. Weedkiller applied: 8 May, 1970. N applied: 13 May. Combine harvested: 26 Aug.
Variety: Joss Cambier.

NOTES: (1) For previous year's results see 'Results' 69/R/CS/44.
(2) All plots were sampled in June for estimates of eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis).

Standard errors per plot. Grain, cwt:
Whole plot: 2.45 or 11.2% (14 d.f.)
Sub plot: 2.11 or 9.6% (48 d.f.)

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70/R/CS/44

SUMMARY OF RESULTS

GRAIN: CWT

1970

	N0	N1	N2	N3	Mean
		(1) and (2)			(±0.71)
B	12.1	14.0	17.0	17.2	15.1
O	22.9	28.3	30.8	33.1	28.8
		(1) and (2)			(±0.71)
R1	17.5	20.8	23.6	25.1	21.8
R2	17.5	21.5	24.3	25.2	22.1
		(1) and (2)			(±0.71)
O	16.0	20.3	22.7	24.7	20.9
T	19.0	22.0	25.1	25.6	22.9
Mean (±0.43)	17.5	21.1	23.9	25.2	21.9

(1) (±0.88) For use in vertical and diagonal comparisons only
(2) (±0.61) For use in horizontal and interaction comparisons only

	N0	N1	N2	N3	Mean
RE	28.1	33.5	34.2	37.2	33.2
CL	36.7	38.0	39.3	39.4	38.4

General mean: 26.6
Mean D.M. %: 83.3

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NEMATICIDES IN ROWS

(70/W/CS/45)

Residual effects of nematicides in rows and irrigation, applied to sugar beet 1969 - Woburn Butt Close II 1970, barley second year. For previous year's results see 'Results' 69/W/CS/45.

Design: 3 blocks of 2 plots split into 8.

Area of each sub plot: 0.0069. Area harvested: 0.0069.

Treatments: All combinations of:-
1. Whole plots: Residue of irrigation 1969: None (O), full (C).
2. Sub plots: Residues of nematicides 1969: None (DO), 56 (D2), 84 (D3), 112 lb (D4) 'D-D' placed in rows before drilling. 56 lb (T) 'Telone' placed in rows before drilling, 1.5 (K1), 3.0 (K2), 4.0 lb (K3) aldicarb placed in rows at drilling.

NOTE: The nitrogen test to beans in 1968 is now ignored.

Basal applications: 400 lb (20:10:10). Weedkiller: Ioxynil at 7.5 oz plus mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.: Ploughed: 29 Dec, 1969. Power harrowed: 26 Mar, 1970. Seed combine drilled at 140 lb: 27 Mar. Weedkiller applied: 16 May. Combine harvested: 25 Aug. Variety: Julia.

Standard error per sub plot.
Grain, cwt: 2.18 or 8.1% (28 d.f.)

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70/W/CS/45

SUMMARY OF RESULTS

GRAIN: CWT

	D0	D2	D3	D4	T	K1	K2	K4	Mean
				(±1.26)*					
O	27.4	29.2	24.2	27.5	29.7	25.9	28.6	25.7	27.3
C	25.5	26.6	26.3	24.5	26.9	27.7	24.4	29.4	26.4
Mean (±0.89)	26.4	27.9	25.3	26.0	28.3	26.8	26.5	27.6	26.9

Mean D.M. %: 83.6

* For use in horizontal and interaction comparisons only

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THIOUREA

(70/R/CS/47)

Fosters O and E I 1970 the second year, ryegrass.

Area of each plot: 0.0140. Area harvested: 0.0006.

Treatments: The residual effects of the 1969 treatments were measured.

Basal applications: 560 lb (0:14:28). Weedkiller: Ioxynil at 7.5 oz and mecoprop at 22.5 oz in 40 gals.

Cultivations, etc.: Ploughed: 3 Sept, 1969. Basal PK applied, seed drilled at 40 lb: 10 Sept. Seed resown at 20 lb: 26 Sept. Weedkiller applied: 1 May. 1970. Cut once: 8 June. Variety: S22 Perennial ryegrass.

NOTES: (1) N uptakes were measured.
(2) For treatments and previous year's results see 'Results' 69/R/CS/47.

Standard error per plot. Dry matter, cwt:
1st and only cut: 2.30 or 23.5% (42 d.f.)

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70/R/CS/47

SUMMARY OF RESULTS

FIRST AND ONLY CUT DRY MATTER: CWT

	(±1.15)
U0A0	8.9
U0A1	10.7
U0A2	11.3
U0A3	8.9
U0A4	9.4
U1A0	6.8
U1A1	9.0
U1A2	10.2
U1A3	8.3
U2A0	11.3
U2A1	10.6
U2A2	9.7
U3A0	9.2
U3A1	9.8
U4A0	13.1
Mean	9.8

Mean D.M. %: 29.5

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FUMIGANT AND N

(70/R&W/CS/49)

Winter and spring wheat, Rothamsted (R) Furzefield and Woburn (W) Butt Close 1970 the first year.

Design: 2 replicates of 4 x 4 x 2 in 4 blocks of 4 plots split into 4, certain 3 factor interactions confounded with blocks.

Area of each sub-plot: 0.0024. Area harvested: 0.0016.

Treatments: All combinations of:-

Whole plots: 1. Crops, sowing dates and times of application of formalin: Cappelle winter wheat sown in autumn, formalin applied early autumn (WwA), Cappelle sown in spring, formalin applied early autumn (WwS), Kolibri spring wheat sown in spring, formalin applied in early autumn (WsS) or in early spring (WsS*).

Sub-plots: 2. Nitrogen: 0.6 (N1), 1.0 (N2), 1.4 (N3), 1.8 (N4) cwt N as 'Nitro-Chalk'.

3. Formalin: None (0), formalin (F) at 266 gals of 38% formaldehyde in 4840 gals.**

** For the spring applications 3620 gals were used on Furzefield (R) and 2420 gals on Butt Close (W).

Standard applications: Autumn sowing, 290 lb (0:20:20), spring sowing, 320 lb (0:20:20) each broadcast. Weedkiller: 2,4-D at 0.5 lb plus dichlorprop at 2.0 lb in 35 gals.

Cultivations, etc.:-

Furzefield (R): Ploughed: 18 Sept, 1969. Formalin applied (WwA, WwS and WsS): 2 Oct. WwA plots rotary cultivated, winter wheat drilled at 180 lb, PK applied: 28 Oct. Formalin applied (WsS*): 5 Feb, 1970. Spring sown wheat drilled at 180 lb, PK applied: 22 Apr. N applied: 6 May. Weedkiller applied: Winter wheat, 19 May, spring wheat, 1 June. Combine harvested: 29 Aug. Previous crops: Winter wheat 1968 and 1969.

Butt Close (W): Ploughed: 11 Sept, 1969. Formalin applied (WwA, WwS and WsS): 23 Sept. Winter wheat drilled at 180 lb, PK applied: 29 Sept. Remaining plots ploughed second time: 11 Feb, 1970. Formalin applied (WsS*): 25 Feb. Spring sown wheat drilled at 168 lb, PK applied: 18 Apr. N applied: 7 May. Weedkiller applied: 29 May. Combine harvested: 27 Aug. Previous crops: Barley 1968, fallow 1969.

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NOTES: (1) Because of very late sowing the spring sown winter wheat (WwS) failed to come into ear properly. No yields were recorded from this treatment.
(2) Incidence of root pathogens was recorded in spring and at harvest.

Standard errors per plot. Grain, cwt:

Furzefield (R): Whole plot: 3.57 or 12.8% (5 d.f.)
Sub plot: 4.51 or 16.2% (18 d.f.)
Pooled (used for calculation of standard errors in the summary): 5.19 or 18.6% (23 d.f.)

Butt Close (W): Whole plot: 1.83 or 31.5% (5 d.f.)
Sub plot: 1.90 or 32.8% (18 d.f.)
Pooled (used for calculation of standard errors in the summary): 2.40 or 41.4% (23 d.f.)

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70/R&W/CS/49

SUMMARY OF RESULTS

FURZEFIELD (R)

GRAIN: CWT

	N1	N2	N3	N4	O	F	Mean
		(±2.60)			(±1.83)		(±0.92)
WwA	34.2	37.2	35.9	32.4	31.1	38.8	34.9
WsS	21.1	24.2	25.1	23.9	23.1	24.1	23.6
WsS*	24.2	22.7	25.7	28.0	24.7	25.6	25.1
					(±2.12)		(±1.50)
			N1		25.2	27.8	26.5
			N2		25.5	30.6	28.0
			N3		29.5	28.4	28.9
			N4		24.9	31.3	28.1
			Mean (±1.06)		26.3	29.5	27.9

Mean D.M. %: 83.7

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70/R&W/CS/49

BUTT CLOSE (W)

GRAIN: CWT

	N1	N2	N3	N4	O	F	Mean
		(±1.20)			(±0.85)		(±0.42)
WwA	3.4	6.0	4.5	4.5	3.1	6.1	4.6
WsS	6.5	4.8	5.2	4.0	4.0	6.2	5.1
WsS*	7.3	6.7	8.2	8.6	5.3	10.0	7.7
					(±0.98)		(±0.69)
			N1		3.9	7.5	5.7
			N2		3.9	7.7	5.8
			N3		4.6	7.3	6.0
			N4		4.2	7.2	5.7
			Mean (±0.49)		4.2	7.4	5.8

Mean D.M. %: 80.7

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AUTUMN AND SPRING FUMIGANTS

(70/W/CS/51)

Effects of autumn and spring application of fumigants on potatoes - Woburn Butt Close 1st year.

Design: 4 randomised blocks of 8 plots.

Area of each plot: 0.0043. Area harvested: 0.0021.

Treatments:-

Fumigants and placement

- No fumigant ridged in autumn, re-ridged at planting (OAR)
- No fumigant ridged at planting (OSF)
- 300 lb dazomet applied in autumn then ridged, re-ridged at planting (DAR)
- 300 lb dazomet applied in autumn, ridged at planting (DAF)
- 300 lb dazomet applied in spring then ridged, re-ridged at planting (DSR)
- 300 lb dazoment applied in spring, ridged at planting (DSF)
- 300 lb 'Telone' applied in autumn at base of ridges made in autumn, re-ridged at planting (TAR)
- 300 lb 'Telone' applied in spring at base of ridges made in spring, re-ridged at planting (TSR)

Basal applications: 12.5 cwt (13:13:20). Weedkiller: Linuron at 1.0 lb in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on one occasion with insecticide. Insecticide: Demeton-s-methyl at 3.5 fl oz in 37 gals on one occasion with fungicide.

Cultivations, etc.: Ploughed: 9 Oct, 1969. Dazomet applied to DAR and DAF plots and rotary cultivated: 15 Oct. OAR, DAR and TAR plots ridged up, 'Telone' applied to TAR plots: 17 Oct. Dazomet applied to DSR and DSF plots and rotary cultivated, DSR and TSR plots ridged up, 'Telone' applied to TSR plots: 20 Mar, 1970. All plots deep-tine cultivated and spring-tine cultivated with markers on: 4 May. Fertiliser placed and potatoes planted, all plots inter-row rotary cultivated and ridged up: 5 May. Weedkiller applied 15 May. Fungicide plus insecticide applied: 31 July. Potatoes lifted: 2 Oct. Variety: Majestic. Previous crops: Potatoes 1968 and 1969.

NOTE: Soil samples were taken in autumn before applying treatments in spring, at planting and after harvest from all plots. Deep samples were taken from some plots after harvest. Samples were used to estimate the effects of treatments on Heterodera rostochiensis.

Standard error per plot.

Total tubers, tons: 2.442 or 15.6% (21 d.f.)

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70/W/CS/51

SUMMARY OF RESULTS

OAR	OSF	DAR	DAF	DSR	DSF	TAR	TSR	Mean
TOTAL TUBERS: TONS (±1.221)								
8.78	8.18	18.02	19.90	21.98	20.37	15.03	12.92	15.65
% WARE: 1.5 INCH								
82.9	83.0	88.6	91.0	91.5	93.8	89.4	88.8	88.6

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SPRING BEANS

(70/W/CS/55)

Effects of fumigation and nitrogen - Woburn Butt Furlong 1970, second year. For previous year's results see 'Results' 69/W/BE/1.

Design: 3 blocks of 6 plots.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatments (cumulative 1969, 1970): All combinations of:-
1. Fumigant: None (O), dazomet at 400 lb (F).
2. Nitrogen: None (N0), 1.0 (N1), 2.0 (N2) cwt N as 'Nitro-Chalk' 21 half seedbed, half top dressed.

Basal applications: 400 lb (0:14:28). Insecticide: Demeton-s-methyl at 3.5 fl oz in 35 gals.

Cultivations, etc.: Ploughed: 9 Sept, 1969. Fumigant applied, rotary cultivated twice to 4 inches and 6 inches: 18 Sept. Ploughed second time: 11 Feb, 1970. Power harrowed, fertiliser placed, seed drilled at 200 lb: 20 Mar. First application of N: 3 Apr. Second application of N: 15 May. Insecticide applied: 22 June. Hand harvested: 28 Aug. Variety: Tarvin.

NOTES: (1) Soil samples were taken for counts of ectoparasitic nematodes.
(2) Plant samples were taken for observations of fungal pathogens.
(3) Counts were made of germination, number of stems, number of pods, 1000 grain weights and percentage nitrogen in grain.

Standard error per plot.
Grain, cwt: 0.72 or 7.3% (10 d.f.)

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70/W/CS/55

SUMMARY OF RESULTS

GRAIN: CWT

	N0	N1	N2	Mean
		(±0.41)		(±0.24)
0	9.6	9.5	5.5	8.2
F	9.7	11.5	12.9	11.4
Mean (±0.29)	9.6	10.5	9.2	9.8

Mean D.M. %: 83.0

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NEMATODES AND VERTICILLIUM

(70/W/CS/56)

Nematodes and verticillium - Woburn Broadmead I 1970, second year - potatoes.

Design: 4 randomised blocks of 6 plots.

Area of each plot: 0.0094. Area harvested: 0.0047.

Treatments:
Residues of chemicals and wheelmarks 1969: None (OO), methyl bromide at 870 lb, with wheelmarks on 3 occasions (MW), methyl bromide at 870 lb, without wheelmarks (MO), 'Temik' (aldicarb) at 60 lb a.i., without wheelmarks (TO), benomyl at 10 lb of 50% wettable powder per ton of seed, without wheelmarks (BO), wheelmarks on 3 occasions (OW).

Basal applications: 10 cwt (13:13:20), 4.5 cwt Epsom salts. Weedkiller: Linuron at 1.5 lb plus paraquat at 0.37 lb ion in 33 gals, paraquat at 0.025 lb ion in 28 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz in 37 gals on one occasion with mancozeb.

Cultivations: Rotary cultivated twice: 10 Sept, 1969, 10 Oct. Deep-tine cultivated: 2 Jan, 1970. NPK applied: 2 Apr. Mg applied: 8 Apr. Rotary cultivated, potatoes planted: 23 Apr. Linuron plus paraquat applied: 13 May. Paraquat applied between rows: 3 June. Grubbed, rotary ridged: 6 June. Fungicide with insecticide applied: 31 July. Fungicide applied: 18 Aug. Sprayed with undiluted BOV at 20 gals: 7 Sept. Lifted: 14 Sept. Variety: Pentland Crown.

NOTES: (1) For previous year's results see 'Results' 69/W/P/2.
(2) Soil samples were taken after lifting for Heterodera rostochiensis cyst counts.

Standard error per plot.
Total tubers, tons: 2.106 or 38.0% (15 d.f.)

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70/W/CS/56

SUMMARY OF RESULTS

OO	MW	MO	TO	BO	OW	Mean
			TOTAL TUBERS: TONS			
			(±1.053)			
3.49	7.59	8.09	7.48	3.30	3.30	5.54
			% WARE: 1.75 INCH			
72.2	90.2	91.1	88.6	69.5	64.9	79.4

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CROP SEQUENCES AND TAKE-ALL

(70/R/CS/58)

Harwoods Piece 1970, the first year, spring wheat, spring beans and fallow.

Design: 3 randomised blocks of 3 plots, split into 4.

Area of each plot: 0.0671. Area harvested (spring wheat only): 0.0107.

Treatments: All combinations of:-
Whole plots: 1. Crops: Spring wheat (WS), spring beans (BE), fallow (F).
Sub plots: 2. Sampling: None two sub-plots per plot (0), sampled two sub-plots per plot (S). 6 samples of 6 in. of row removed on each of eight occasions (May - August).

Basal applications: Weedkiller: Tri-allate at 1.25 lb in 20 gals.
Spring wheat: 390 lb (20:10:10) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.
Spring beans: 370 lb (0:14:28) placement drilled. Weedkiller: Simazine at 1 lb in 40 gals. Insecticide: Phorate at 28 oz in granules.

Cultivations, etc.: Ploughed: 27 Oct, 1969. Tri-allate applied: 19 Apr, 1970.
Spring wheat: Seed combine drilled at 170 lb: 22 Apr, 1970. 2,4-D/dichlorprop applied: 27 Apr. Combine harvested: 29 Aug. Variety: Kolibri.
Spring beans: Seed placement drilled at 200 lb: 20 Apr, 1970. Simazine applied: 18 May. Phorate applied: 18 June. Combine harvested: 4 Sept. Variety: Maris Bead.

Previous crops: Spring wheat 1968 and 1969.

NOTE: Soil and crop samples were taken throughout the season and the following observations made:-
Estimates of take-all (Ophiobolus graminis) in the soil, in wheat seedlings and in wheat plants.
Growth stages of wheat.
Height of beans at each sampling.
Dry weights of tops and roots of seedlings.

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70/R/CS/58

SUMMARY OF RESULTS

SPRING WHEAT

GRAIN: CWT

O	S	Mean
14.5	14.4	14.4

Mean D.M. %: 85.0

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BREAK CROPS AND WHEAT

(70/R/CS/59)

Geescroft 1970 the first year, barley, oats, beans, maize, clover and undersown trefoil.

Design: 3 randomised blocks of 14 plots.

Area of each plot: 0.0350. Area harvested: Barley: 0.0232. Oats: 0.0234. Beans: 0.0263. Clover: 0.0083.

Treatments: Crops:- Spring beans (2 plots per block), clover (2 plots per block) and all combinations of:-
1. Crops: Barley (B), oats (O)
2. Undersowing: None (O), Trefoil (T)
3. Nitrogen: 0.4 (N1), 0.8 (N2) cwt as 'Nitro-Chalk' in the seedbed.

Together with additional crop maize (MA), receiving N at 0.8 (N2) 1.6 (N4) cwt as 'Nitro-Chalk' in the seedbed.

Basal and standard applications: 3 tons ground chalk. 450 lb (0:20:20) across the plough furrow. Weedkillers: Paraquat at 0.5 lb ion in 20 gals. MCPB at 2.5 lb a.e. in 20 gals to oats, barley and clover. Insecticide: Phorate at 17 oz in granules to beans.

Cultivations, etc.: Paraquat applied: 3 Oct, 1969. Ground chalk applied: 30 Oct. Ploughed: 1 Dec. Basal PK compound applied: 1 Apr, 1970.
Barley: N applied, seed drilled at 140 lb: 17 Apr, 1970. Trefoil undersown at 20 lb: 7 May. MCPB applied: 5 June. Combine harvested: 14 Aug. Variety: Julia.
Oats: N applied, seed drilled at 170 lb: 17 Apr, 1970. Trefoil undersown at 20 lb: 7 May. MCPB applied: 5 June. Combine harvested: 14 - 24 Aug. Variety: Manod.
Spring beans: Seed drilled at 200 lb: 17 Apr, 1970. Insecticide applied: 16 June. Combine harvested: 4 Sept. Variety: Maris Bead.
Maize: N applied: 17 Apr, 1970. Seed drilled at 48 lb: 15 May. Singled: 16 June. Cut with mower: 14 Oct. Variety: Earliking (F1 Hybrid).
Clover: Seed sown at 32 lb: 28 Apr, 1970. MCPB applied: 5 June. Cut twice: 24 Aug, 29 Sept. Variety: Broad Red.
Previous crops: Spring wheat 1968, barley 1969. Variety of trefoil: English.

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NOTE: Barley plots were sampled in summer for eyespot (Cercosporella herpotrichoides) and take-all (Ophiobolus graminis). Maize plots were sampled for take-all in September. Trefoil and clover were sampled before ploughing in and estimates made of the dry matter and N per acre.

Standard errors per plot.

Barley:	Grain, cwt:	1.15	or 3.8% (6 d.f.)
Oats:	Grain, cwt:	1.32	or 11.0% (6 d.f.)

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70/R/CS/59

SUMMARY OF RESULTS

BARLEY

GRAIN: CWT

	O	T	Mean
	(±0.67)		(±0.47)
N1	28.6	28.1	28.3
N2	33.3	31.3	32.3
Mean (±0.47)	30.9	29.7	30.3

Mean D.M. %: 84.8

OATS

GRAIN: CWT

	O	T	Mean
	(±0.76)		(±0.54)
N1	13.0	10.0	11.5
N2	13.7	11.1	12.4
Mean (±0.54)	13.3	10.5	11.9

Mean D.M. %: 73.2

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70/R/CS/59

BEANS

GRAIN: CWT

	Mean
	12.4

CLOVER

DRY MATTER: CWT

	Mean
1st cut:	36.0
2nd cut:	14.9
Total of 2 cuts:	50.8

	Mean D.M. %:
Beans	73.5
Clover, 1st cut:	18.6
2nd cut:	14.9
Total of 2 cuts:	16.8

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GLYCOLURIL FOR GRASS

(70/W/CS/60)

The effects of glycoluril as a slow-N fertiliser for grass - Woburn Stackyard D 1970, first year - ryegrass.

Design: 3 randomised blocks of 16 plots.

Area of each plot: 0.0003. Area harvested: 0.0002.

Treatments: None (N0) (4 plots per block) and all combinations of:-

1. N fertiliser:-
   - Glycoluril powder (less than 1 mm) single application (GP)
   - Glycoluril granules (1.5 - 3.0 mm) single application (GG)
   - 'Nitro-Chalk' single application (NS)
   - 'Nitro-Chalk', three equal divided applications* (ND)
2. Levels of N: 100 lb (N1), 200 lb (N2), 300 lb (N3)

* The third application was not given in 1970, it will be given in spring 1971.

Basal application: 6 cwt (6:15:15).

Cultivations, etc.: Rotary cultivated: 10 Sept, 1969. Seed combine drilled at 50 lb: 11 Sept. Trimmed by rotary mower (yields not taken): 10 Apr, 1970. N applied: 17 Apr. Second N applied ND plots: 18 May. Cut twice: 18 May, 30 Sept. Variety: S24 Ryegrass. Previous crops: Fallow 1968, 1969.

NOTE: Grass samples were taken to determine dry matter and percentage N.

Standard errors per plot. Dry matter, cwt:

1st cut:	2.80 or 11.6% (30 d.f.)
2nd cut:	3.43 or 12.5% (30 d.f.)
Total of 2 cuts:	4.31 or 8.4% (30 d.f.)

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70/W/CS/60

SUMMARY OF RESULTS

DRY MATTER: CWT

	N0	N1	N2	N3	Mean
		1ST CUT			
			(±1.61)		(±0.93)
GP		17.2	15.8	19.3	17.4
GG		17.9	19.9	18.1	18.6
NS		36.2	36.8	38.5	37.2
ND		29.8	36.7	36.4	34.3
Mean (±0.81)	16.2	25.3	27.3	28.1	24.2*
		2ND CUT			
			(±1.98)		(±1.14)
GP		24.8	38.7	42.2	35.3
GG		26.4	34.9	37.8	33.0
NS		14.7	24.9	38.2	25.9
ND		25.2	37.3	43.4	35.3
Mean (±0.99)	12.5	22.8	34.0	40.4	27.4*
		TOTAL OF 2 CUTS			
			(±2.49)		(±1.44)
GP		42.1	54.5	61.5	52.7
GG		44.3	54.7	55.8	51.6
NS		51.0	61.7	76.6	63.1
ND		55.0	74.0	79.8	69.6
Mean (±1.24)	28.7	48.1	61.2	68.5	51.6*

Mean D.M. %: 1st cut: 20.9
2nd cut: 26.7
Total of 2 cuts: 23.8

* General mean

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INTENSIVE WHEAT

(70/S/CS/1)

Saxmundham, Oldershaw's and Garner's plots 1970, the fifth year (winter wheat only). For treatments, etc. and for previous years' results see 'Results' 66/C/30, 67/C/23, 68/C/39, 69/S/CS/1.

Area of each sub plot: 0.0182. Area harvested: 0.0116.

Basal applications: 560 lb (0:20:20) broadcast. Weedkiller: Mecoprop at 42 oz and 2,4-D at 10.5 oz in 20 gals.

Cultivations, etc.: Ploughed: 11 Sept, 1969. Basal PK applied: 30 Sept. Seed drilled: 5 Nov. N applied: 19 Mar, 1970. Weedkiller applied: 9 May. Combine harvested: 18 Aug. Variety: Cappelle.

NOTE: Estimates of the incidence of take-all (Ophiobolus graminis) eyespot (Cercosporella herpotrichoides) sharp eyespot (Rhizoctonia solani) and brown foot rot were made.

Standard errors per plot.
Grain, cwt: Whole plot: 1.70 or 6.1% (12 d.f.)
Sub plot: 1.65 or 5.9% (30 d.f.)

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70/S/CS/1

SUMMARY OF RESULTS

GRAIN: CWT

Crop 1966 / 1967 / 1968 / 1969	W / W / W / W	L / W / W / W	L / BE / W / W	W / L / BE / W	W / W / L / BE	Mean
	(1) and (2)					(±0.37)
N1	26.0	24.5	24.1	26.2	28.0	25.8
N2	28.6	28.0	28.2	29.8	29.8	28.9
N3	30.4	28.1	28.3	30.8	28.9	29.3
Mean (±0.85)	28.3	26.9	26.9	28.9	28.9	28.0

(1) (±1.09) For use in horizontal and diagonal comparisons only
(2) (±0.83) For use in vertical and interaction comparisons only

Mean D.M. %: 86.6

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WINTER WHEAT

(70/R/WW/1 and 70/W/WW/1)

Varieties x N, Rothamsted (R) Great Knott III (pathogen free) and West Barnfield II (pathogen infected), and Woburn (W) Great Hill Bottom I (pathogen free) 1970.

Design: Great Knott III (R) and West Barnfield II (R): 3 randomised blocks of 8 plots, split into 4.
Great Hill Bottom I (W): 4 randomised blocks of 8 plots, split into 4.

Area of each sub-plot: Great Knott III (R) and West Barnfield II (R): 0.0096. Area harvested: 0.0064.
Great Hill Bottom I (W): 0.0024. Area harvested: 0.0016.

Treatments: All combinations of:-
Whole plots: 1. Varieties: Champlein (CH), Cama (CM), Cappelle (CP), Joss Cambier (JC), Maris Beacon (MB), Maris Ranger (MR), Maris Widgeon (MW), West Desprez (WD).
Sub plots: 2. Nitrogen (in cwt N): 0.5 (N1), 1.0 (N2), 1.5 (N3) in spring, and 1.0 in spring plus 0.5 at flowering (N2 + 1). All N as 'Nitro-Chalk'.

Basal applications:
Great Knott III (R) and West Barnfield II (R): 280 lb (8:20:16) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.
Great Hill Bottom I (W): 280 lb (8:20:16). Weedkiller: Ioxynil at 9 oz and mecoprop at 27 oz in 25 gals.

Cultivations, etc.:-
Great Knott III (R): Deep-tine cultivated: 21 Oct,1969. Seed combine drilled at 180 lb: 23 Oct. Spring N applied: 8 May, 1970. Weedkiller applied: 13 May. Late N applied: 9 June. Combine harvested: 28 Aug. Previous crops: Spring beans 1968, potatoes 1969.
West Barnfield II (R): Ploughed: 29 Sept, 1969. Rotary cultivated, seed combine drilled at 180 lb: 10 Nov. Weedkiller applied: 8 May, 1970. Spring N applied: 13 May. Late N applied: 9 June. Combine harvested: 28 Aug. Previous crops: Barley 1968 and 1969.

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70/R&W/WW/1

Great Hill Bottom I (W): Spring-tine cultivated: 24 Oct, 1969. Seed drilled at 170 lb: 27 Oct. Basal NPK applied: 28 Oct. Spring N applied: 28 Apr, 1970. Weedkiller applied: 7 May. Late N applied: 8 June. Combine harvested: 14 Aug. Previous crops: Sugar beet and barley 1968, potatoes 1969.

Standard errors per plot.

Grain, cwt:	Great Knott III (R):	Whole plot:	1.74 or 3.7% (14 d.f.)
		Sub plot:	2.24 or 4.8% (48 d.f.)
	West Barnfield II (R):	Whole plot:	1.71 or 6.3% (14 d.f.)
		Sub plot:	3.63 or 13.4% (48 d.f.)
	Great Hill Bottom I (W):	Whole plot:	1.90 or 3.5% (21 d.f.)
		Sub plot:	3.48 or 6.4% (72 d.f.)

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SUMMARY OF RESULTS

GRAIN: CWT

	CH	CM	CP	JC	MB	MR	MW	WD	Mean
	GREAT KNOTT III (R)								
	(1) and (2)								(±0.46)
N1	45.0	45.4	38.4	47.0	50.0	45.1	38.9	45.0	44.3
N2	50.6	46.8	42.5	49.1	54.8	46.1	42.9	48.6	47.7
N3	51.7	44.3	42.8	51.7	53.3	44.2	43.8	47.2	47.4
N2+1	50.4	43.6	44.7	50.3	54.4	43.7	42.3	50.1	47.4
Mean (±1.01)	49.4	45.0	42.1	49.5	53.1	44.8	42.0	47.7	46.7

(1) (±1.51) For use in horizontal and diagonal comparisons only
(2) (±1.29) For use in vertical and interaction comparisons only

Mean D.M. %: 86.0

	WEST BARNFIELD II (R)								
	(1) and (2)								(±0.74)
N1	24.4	20.2	21.3	26.7	28.9	25.0	29.9	25.2	25.2
N2	30.3	22.6	26.4	31.8	29.0	30.3	29.6	22.3	27.8
N3	30.1	25.2	24.3	29.7	27.0	30.0	26.3	28.9	27.7
N2+1	26.9	22.8	27.1	31.0	33.1	26.4	27.5	25.0	27.5
Mean (±0.99)	27.9	22.7	24.8	29.8	29.5	27.9	28.3	25.4	27.0

(1) (±2.06) For use in horizontal and diagonal comparisons only
(2) (±2.09) For use in vertical and interaction comparisons only

Mean D.M. %: 85.0

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70/R&W/WW/1

GRAIN: CWT

GREAT HILL BOTTOM I (W)

	CH	CM	CP	JC	MB	MR	MW	WD	Mean
				(1) and (2)					(±0.62)
N1	46.2	50.2	47.4	49.7	52.3	46.2	47.7	50.3	48.7
N2	52.6	56.8	56.5	53.4	61.2	54.8	49.7	55.2	55.0
N3	62.1	52.3	58.7	55.6	63.8	57.8	53.8	57.0	57.6
N2+1	56.0	54.3	58.2	57.0	59.2	52.8	49.3	52.8	55.0
Mean (±0.95)	54.2	53.4	55.2	53.9	59.1	52.9	50.1	53.8	54.1

(1) (±1.78) For use in horizontal and diagonal comparisons only
(2) (±1.74) For use in vertical and interaction comparisons only

Mean D.M. %: 83.1

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WINTER WHEAT

(70/R/WW/3)

Paths and blank rows - West Barnfield I 1970.

Design: 4 randomised blocks of 10 plots.

Area of each plot: 0.0161. Area harvested: 0.0107.

Treatments: All combinations of:-

1. Blank rows: None, central combine cut taken at harvest without blank rows (R0)
   None until just before harvest, when blanks cut and 16 middle rows harvested (R-)
   2 blank rows: 3(1) 16(1) 3 sown (R1)
   4 blank rows: 2(2) 16(2) 2 sown (R2)
   6 blank rows: 1(3) 16(3) 1 sown (R3)
2. N: 0.5 (N1), 1.0 (N2) cwt N as 'Nitro-Chalk'.

Plots were 24 row spaces wide, 16 (9'4'') being harvested.
(1) etc. indicate number and position of blank (unsown) rows.

For treatment R0 a central width of 10 ft was cut.

Basal applications: 280 lb (0:20:20) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.:- Ploughed: 2 Oct, 1969. Rotary cultivated, seed combine drilled at 180 lb per sown acre: 5 Nov. Weedkiller applied: 8 May, 1970. N applied: 15 May. Blank rows cut by sickle for treatment R-: 10 Aug. Combine harvested: 28 Aug. Variety: Joss Cambier. Previous crops: Barley 1968, spring oilseed rape 1969.

Standard error per plot.
Grain, cwt: 2.91 or 6.8% (27 d.f.)

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70/R/WW/3

SUMMARY OF RESULTS

GRAIN: CWT

	R0	R-	R1	R2	R3	Mean
			(±1.46)			(±0.65)
N1	39.6	40.3	43.9	41.4	43.7	41.8
N2	42.4	42.7	44.2	47.2	43.3	44.0
Mean (±1.03)	41.0	41.5	44.1	44.3	43.5	42.9

Mean D.M. %: 84.4

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WINTER WHEAT

(70/R/WW/5)

Cultivations and bulb fly (Leptohylemyia coarctata) - Stackyard 1970.

Design: 4 randomised blocks of 3 plots.

Area of each plot: 0.0362. Area harvested: 0.0129.

Treatments: Tine cultivation, no ploughing (C), normal ploughing (P), scraped and ploughed (SP).

NOTE: The SP treatment was done by a special plough, the top 2-3 inches of soil being scraped into the open furrow just ahead of the plough.

Basal applications: 280 lb (8:20:16) combine drilled, 0.84 cwt N as 'Nitro-Chalk' top dressed in spring. Weedkiller: Ioxynil at 9 oz and mecoprop at 27 oz in 20 gals.

Cultivations, etc.: Subsoiled 28 inches apart, 18 inches deep: 4 Aug, 1969. C plots deep-tine cultivated, P plots ploughed, SP plots scraped and ploughed: 11 Sept. All plots rotary cultivated: 11 Nov. Seed combine drilled at 180 lb: 14 Nov. 'Nitro-Chalk' applied: 28 Apr, 1970. Weedkiller applied: 6 May. Combine harvested: 27 Aug. Variety: Cappelle. Previous crops: Winter wheat 1968, Fallow 1969.

NOTE: Samples were taken for bulb fly eggs in February 1970.

Standard error per plot.
Grain, cwt: 3.15 or 10.6% (6 d.f.)

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70/R/WW/5

SUMMARY OF RESULTS

GRAIN: CWT

C	P	SP	Mean
	(±1.58)		
24.9	31.8	32.4	29.7

Mean D.M. %: 83.6

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WINTER WHEAT

(70/R/WW/6)

CCC* in grain, Great Knott III 1970.

*Chlormequat.

Design: 4 randomised blocks of 4 plots, split into 3.

Area of each sub-plot: 0.0096. Area harvested: 0.0064.

Treatments: All combinations of:-
Whole plots: 1. CCC in grain: None (GO), sprayed the previous year with 2 lb chlormequat in 40 gals, just after ear emergence (GG).
2. CCC spray in spring 1970: None (SO), 2 lb chlormequat in 39 gals on 14 May, 1970 (SS).
Sub-plots: 3. Nitrogen: 0.3 (N1), 0.6 (N2), 0.9 (N3) cwt N as 'Nitro-Chalk'.

Basal applications: 280 lb (0:20:20) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Deep-tine cultivated: 21 Oct, 1969. Seed combine drilled at 180 lb: 24 Oct. N applied: 8 May, 1970. Weedkiller applied: 13 May. Combine harvested: 28 Aug. Variety: Joss Cambier. Previous crops: Spring beans 1968, potatoes 1969.

NOTE: Crop samples were taken from 2 blocks on 14 Aug for measurements of height and components of yield.

Standard errors per plot. Grain, cwt:
Whole plot: 2.02 or 4.7% (9 d.f.)
Sub plot: 2.63 or 6.1% (24 d.f.)

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SUMMARY OF RESULTS

	SO	SS	N1	N2	N3	Mean
			GRAIN: CWT			
	(±1.01)			(1) and (2)		(±0.71)
GO	42.6	44.1	40.0	43.3	46.7	43.3
GG	42.5	44.0	38.7	43.9	47.0	43.2
				(1) and (2)		(±0.71)
		SO	38.7	44.0	44.9	42.5
		SS	40.0	43.2	48.8	44.0
Mean (±0.66)			39.3	43.6	46.9	43.3
			STRAW: CWT			
GO	21.6	19.2	18.3	20.4	22.6	20.4
GG	22.8	20.5	19.3	21.9	23.7	21.6
		SO	20.7	22.0	23.9	22.2
		SS	16.9	20.2	22.4	19.8
Mean			18.8	21.1	23.1	21.0

Mean D.M. %: Grain: 85.3
Straw: 92.2

(1) (±1.04) For use in vertical and diagonal comparisons only
(2) (±0.93) For use in horizontal and interaction comparisons only

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WINTER WHEAT

(70/R/WW/7)

Seed dressings and soil-borne diseases, Highfield Drive 1970.

Design: 4 randomised blocks of 8 plots.

Area of each plot: 0.0050. Area harvested: 0.0027.

Treatments: None (0) (2 plots per block) and all combinations of:-
1. Seed dressings (as wettable powders): 50% benomyl (B), 75% 'Plantvax' (P), 60% thiabendazole (T).
2. Rates of application per 63 lb of seed: 1 oz (1), 4 oz (2) of wettable powder.

Basal applications: 280 lb (8:20:16) combine drilled, 1.0 cwt N as 'Nitro-Chalk' top dressed in spring. Weedkillers: Paraquat at 0.75 lb ion in 20 gals, 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Paraquat applied: 17 Sept, 1969. Ploughed: 22 Sept. Rotary cultivated: 15 Oct. Seed combine drilled at 160 lb: 27 Oct. 'Nitro-Chalk' applied: 28 Apr, 1970. 2,4-D/dichlorprop applied: 8 May. Combine harvested: 27 Aug. Variety: Cappelle. Previous crops: Barley 1968, winter wheat 1969.

NOTE: Samples were taken for root and foot rot diseases.

Standard error per plot.
Grain, cwt: 2.47 or 6.6% (21 d.f.)

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70/B/WW/7

SUMMARY OF RESULTS

GRAIN: CWT

	O	B	P	T	Mean
			(±1.24)		(±0.71)
1		37.6	38.0	39.2	38.3
2		37.4	37.9	37.7	37.7
Mean (±0.87)	36.0	37.5	38.0	38.5	37.5*

* General mean

Mean D.M. %: 84.3

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WINTER WHEAT

(70/R/WW/8)

Gaines, seed rates, N and CCC, Great Knott III 1970.

Design: A single replicate of 4 x 4 x 4 in 4 blocks of 4 plots, each split into 4, certain 3 factor interactions being confounded with block differences.

Area of each sub plot: 0.0036. Area harvested: 0.0021.

Treatments: All combinations of:-

Whole plots: 1. Varieties and seed rates: Cappelle at 168 lb (CH), Gaines at 56 lb (GL), at 112 lb (GM), at 168 lb (GH). Row spacing: 5 inches for each variety.

Sub plots: 2. Nitrogen: 0.6 (N1), 1.2 (N2), 1.8 (N3), 2.4 (N4) cwt N as 'Nitro-Chalk'.

3. Chlormequat (CCC): None (C0), 1 (C1), 2 (C2), 3 (C3) lb chlormequat in 35 gals.

Basal applications: 290 lb (0:20:20) broadcast. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 35 gals.

Cultivations, etc.:- Deep-tine cultivated: 21 Oct, 1969. Seed drilled and basal PK broadcast: 27 Oct. N applied: 5 May, 1970. CCC applied: 7 May. Weedkiller applied: 13 May. Combine harvested: 25 Aug. Previous crops: Spring beans 1968, potatoes 1969.

NOTE: Shoot heights were measured and plant numbers counted. Samples were taken just before harvest for yield and dry matter.

Standard errors per plot. (estimated from unconfounded 3 factor interactions).

Grain, cwt: Whole plot: 1.37 or 3.1% (6 d.f.)
Sub plot: 3.10 or 6.9% (18 d.f.)

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70/R/WW/8

SUMMARY OF RESULTS

GRAIN: CWT

	N1	N2	N3	N4	C0	C1	C2	C3	Mean
	(1) and (2)				(1) and (2)				(±0.69)
CH	43.8	46.9	46.1	43.6	45.5	45.3	45.7	43.9	45.1
GL	40.0	42.7	42.5	42.4	42.2	42.1	40.8	42.4	41.9
GM	42.5	45.9	46.1	44.7	44.4	45.3	42.6	46.8	44.8
GH	44.3	49.2	47.8	46.6	46.0	46.5	48.0	47.3	47.0
					(±1.55)				(±0.77)
			N1		41.1	43.8	43.9	41.8	42.6
			N2		47.3	44.5	45.2	47.7	46.2
			N3		47.5	45.7	43.9	45.3	45.6
			N4		42.2	45.2	44.2	45.7	44.3
Mean (±0.77)					44.5	44.8	44.3	45.1	44.7

Mean D.M. %: 83.7

(1) (±1.51) For use in vertical and diagonal comparisons only
(2) (±1.55) For use in horizontal and interaction comparisons only

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WINTER WHEAT

(70/R/WW/9)

Growth regulators, Great Knott III 1970.

Design: 3 randomised blocks of 10 plots.

Area of each plot: 0.0029. Area harvested: 0.0016.

Treatments: None (2 plots per block) and all combinations of:-
1. Growth regulators: 'Ethrel'* at 0.5 lb a.i. in 30 gals. (E), 'Morphactin' at 0.08 lb a.i. in 30 gals (M).
2. Time of application: 6 May (e), 28 May (m), 11 June (l), together with
   Disbudders: 'JF 2197' (D1)
   'JF 2695' (D2)
   each applied at 1.35 lb a.i. in 27 gals on 30 Apr.

* 2-chloroethylphosphonic acid.

Basal applications: 290 lb (0:20:20) broadcast, 460 lb 'Nitro-Chalk' in spring. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 35 gals.

Cultivations, etc.: Deep-tine cultivated: 21 Oct, 1969. Seed drilled at 180 lb, basal PK broadcast: 27 Oct. Basal N applied: 6 May, 1970. Weedkiller applied: 13 May. Variety: Cappelle. Previous crops: Spring beans 1968, potatoes 1969.

NOTE: Samples were taken just before harvest for yields, dry weights and stem lengths.

Standard error per plot.
Grain, cwt: 3.45 or 7.7% (18 d.f.)

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70/R/WW/9

SUMMARY OF RESULTS

GRAIN: CWT

O*	Ee	Em	El	Me	Mm	Ml	Dl	D2	Mean
(±1.41)				(±1.99)					
46.7	46.3	46.1	47.1	40.2	46.7	43.1	44.7	39.3	44.7

Mean D.M. %: 85.4

* Duplicated treatment

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WINTER WHEAT

(70/R/WW/12)

Weedkiller and aqueous nitrogen, Great Knott III 1970.

Design: 4 randomised blocks of 28 plots.

Area of each plot: 0.0007. Area harvested: 0.0005.

Treatments: All combinations of:-

1. Weedkiller (dichlorprop/MCPA): None (H0), 20 (H1), 40 (H2), 60 (H3) oz total a.e.
2. Forms of nitrogen: Solid, as 'Nitro-Chalk' (21% N) applied immediately after the weedkiller (S), liquid as urea/ammonium nitrate (26% N) mixed with the weedkiller (L).
3. Rates of nitrogen: 0.3 (N1), 0.6 (N2), 0.9 (N3) cwt N,

together with 4 additional treatments

SN2 E H0, SN2 E H1, SN2 E H2, SN2 E H3

where 'Nitro-Chalk' was applied early (E) and the H0 plots were hand weeded.

NOTE: The weedkiller was applied in 28 gals where solid fertiliser was used. The liquid fertiliser (with or without weedkiller) was applied as a spray in 11, 22 and 33 gals for rates 1, 2 and 3 respectively.

Basal applications: 280 lb (0:20:20) combine drilled.

Cultivations, etc.: Deep-tine cultivated: 21 Oct, 1969. Seed combine drilled at 180 lb: 24 Oct. N applied to E plots: 27 Apr, 1970. Remaining N treatments and weedkiller applied: 8 May. Hand weed H0 plots: 4 June. Cut by sickle: 25 Aug. Variety: Cappelle. Previous crops: Spring beans 1968, potatoes 1969.

NOTE: Soil samples were taken for pH in May. Scores were made of weedkiller scorch growth and colour of crop and weed control. Weeds were identified on H0 plots and their dry matter determined. Plots were examined in July for bird damage and ear deformities from spraying. The percentage of N in grain and straw was determined.

Standard error per plot.
Grain, cwt: 3.78 or 8.7% (69 d.f.)

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70/R/WW/12

SUMMARY OF RESULTS

GRAIN: CWT

	H0	H1	H2	H3	Mean
		(±1.09)			(±0.55)
S	47.9	44.1	44.9	44.9	45.4
L	44.0	42.5	40.5	39.6	41.6
		(±1.34)			(±0.67)
N1	42.4	40.4	41.3	37.7	40.5
N2	46.7	42.5	42.0	42.7	43.5
N3	48.7	47.0	44.8	46.3	46.7
Mean (±0.77)	46.0	43.3	42.7	42.2	43.5

	N1	N2	N3
		(±0.95)	
S	43.2	45.2	47.9
L	37.7	41.8	45.5

SN2 E H0	48.0	
SN2 E H1	43.7	(±1.89)
SN2 E H2	45.2	
SN2 E H3	42.2	

General mean: 43.7
Mean D.M. %: 81.3

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SPRING WHEAT

(70/R/WS/2)

Systemic fungicides, Harwoods Piece 1970.

Design: 3 randomised blocks of 7 plots.

Area of each plot: 0.0060. Area harvested: 0.0031.

Treatments: Systemic fungicides (shown below in lb of active ingredient, except where described otherwise):

Fungicide	Seed dressing	Spray	Symbol
None	None	None	(O)
50% benomyl	0.25	1.00	(B)
80% ethirimol	1.00	1.00	(E)
50% furidazole	0.03	1.00	(F)
'E.L.273' (4 % a.i.)	0.03	0.08	(L)
50% thiophanate methyl	1.20	1.50	(T)
'W524' (83.4 % a.i.)	0.375	*2.85 fluid oz a.i.	(W)

Each applied as a seed dressing, and twice at above rates as a spray in 35 gals (except treatment W, which was in 70 gals), the first spray at growth stage 7, the second at growth stage 10.2.

*The formulation of 'W524' used for the spray contained 20% a.i.

Basal applications: 450 lb (20:10:10) combine drilled. Weedkiller: Tri-allate at 1.25 lb in 20 gals.

Cultivations, etc.: Ploughed: 27 Oct, 1969. Weedkiller applied: 19 Apr, 1970. Seed combine drilled at 170 lb: 22 Apr. Fungicide sprays applied: 8 June (GS7), 23 June (GS10.2). Combine harvested: 29 Aug. Variety: Rothwell Sprite. Previous crops: Spring wheat 1968 and 1969.

NOTE: Estimates were made of root diseases and mildew (Erysiphe graminis).

Standard error per plot.
Grain, cwts: 2.61 or 10.6% (12 d.f.)

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70/R/WS/2

SUMMARY OF RESULTS

GRAIN: CWT

O	B	E	F	L	T	W	Mean
			(±1.51)				
22.0	25.1	26.1	23.5	24.9	23.1	27.5	24.6

Mean D.M. %: 82.8

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SPRING WHEAT

(70/R/WS/3)

CCC* in grain, Long Hoos V 1970.

* Chlormequat.

Design: 4 randomised blocks of 4 plots, split into 3.

Area of each sub-plot: 0.0096. Area harvested: 0.0064.

Treatments: All combinations of:-
Whole plots: 1. CCC in grain: None (GO), sprayed the previous year with 2 lb chlormequat in 40 gals just after ear emergence (GG).
2. CCC spray in spring 1970: None (SO), 1.5 lb chlormequat in 35 gals on 28 May, 1970 (SS).
Sub-plots: 3. Nitrogen: 0.6 (N1), 1.2 (N2), 1.8 (N3) cwt N as 'Nitro-Chalk'.

Basal applications: 225 lb (0:20:20) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Deep-tine cultivated: 27 Oct, 1969. Seed combine drilled at 170 lb: 19 Apr, 1970. N applied: 28 Apr. Weedkiller applied: 27 May. Combine harvested: 28 Aug. Variety: Kolibri. Previous crops: Spring oilseed rape 1968, potatoes 1969.

NOTE: Crop samples were taken from 2 blocks on 14 Aug for measurements of height and components of yield.

Standard errors per plot. Grain, cwt:
Whole plot: 1.46 or 4.9% (9 d.f.)
Sub plot: 2.57 or 8.7% (24 d.f.)

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70/R/WS/3

SUMMARY OF RESULTS

GRAIN: CWT

	SO	SS	N1	N2	N3	Mean
	(±0.73)			(1) and (2)		(±0.51)
GO	29.8	29.5	29.3	29.0	30.8	29.7
GG	29.4	30.0	27.7	30.2	31.1	29.7
				(1) and (2)		(±0.51)
		SO	29.1	29.3	30.5	29.6
		SS	27.9	29.9	31.4	29.7
Mean (±0.64)			28.5	29.6	30.9	29.7

Mean D.M. %: 85.9

(1) (±0.90) For use in vertical and diagonal comparisons only
(2) (±0.91) For use in horizontal and interaction comparisons only

STRAW: CWT

	SO	SS	N1	N2	N3	Mean
GO	13.8	11.7	11.3	12.9	14.0	12.8
GG	12.7	11.8	12.1	12.1	12.5	12.2
		SO	12.8	12.7	14.1	13.2
		SS	10.6	12.3	12.3	11.8
Mean			11.7	12.5	13.2	12.5

Mean D.M. %: 82.6

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SPRING WHEAT

(70/R/WS/4)

Effect of gaps - Long Hoos V 1970.

Design: 5 randomised blocks of 6 plots.

Area of each plot: 0.0014. Area harvested: 0.0008.

Treatments: No rows missing, 12 rows harvested (G0), and gapping of full plant as described below (each plot 7 ft wide and 9 ft long, i.e. nominally 12 rows at 7 inch spacing, with no paths between plots - 10 rows x 6 ft were harvested for yield, the two outer rows being discarded.)

Quarter of plants removed by hand hoeing:-

1.5 inch gaps evenly spaced	(G1)
3 inch gaps evenly spaced	(G2)
6 inch gaps evenly spaced	(G4)

Quarter of plants removed by paraquat spray (concentration 0.5 lb ion in 20 gals):-

6 inch gaps evenly spaced	(GS4)

One eighth of plants removed by hand hoeing:

6 inch gaps evenly spaced in alternate rows	(G4A)

Basal applications: 390 lb (20:10:10) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Deep-tine cultivated: 27 Oct, 1969. Seed combine drilled at 160 lb: 19 Apr, 1970. Gapped by hand-hoeing: 21 and 22 May, by paraquat spray: 26 May. 2,4-D/dichlorprop applied: 27 May. Combine harvested: 28 Aug. Variety: Kolibri. Previous crops: Spring oilseed rape 1968, potatoes 1969.

Standard error per plot.
Grain, cwt: 2.59 or 11.3% (20 d.f.)

NOTE: More than quarter of plants were removed in GS4 because of faulty application of paraquat.

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70/R/WS/4

SUMMARY OF RESULTS

GRAIN: CWT

G0	G1	G2	G4	GS4	G4A	Mean
		(±1.16)				
25.6	23.5	23.2	24.8	15.1	25.0	22.9

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SPRING WHEAT

(70/R/WS/5)

Varieties x N and mildew control (Erysiphe graminis) Long Hoos I and II 1970.

Design: 4 randomised blocks of 12 plots, split into 4.

Area of each sub-plot: 0.0080. Area harvested: 0.0053.

Treatments: All combinations of:-

Whole plots: 1. Varieties and seed rate: Inia (semi-dwarf) at 170 lb (I), Kolibri at 200 lb (K), Maris Ensign at 200 lb (M), Rothwell Sprite at 200 lb (R), Sirius at 170 lb (S), Troll at 170 lb (T).

2. Fungicide: None (0), 1 lb ethirimol as a seed dressing (F).

Sub-plots: 3. Nitrogen (in cwt N): 0.5 (N1), 1.0 (N2), 1.5 (N3) in seedbed, 1.0 in seedbed plus 0.5 at flowering (N2+1). N1 applied in basal compound, remaining N as 'Nitro-Chalk'.

Basal applications: 370 lb (15:15:15) combine drilled. Weedkillers: Paraquat at 0.5 lb ion in 20 gals. 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Paraquat applied: 3 Oct, 1969. Ploughed: 14 Nov. Seed combine drilled: 22 Apr, 1970. 'Nitro-Chalk' applied: 27 Apr. 2,4-D/dichlorprop applied: 19 May. Late N applied: 16 June. Combine harvested: 28 Aug. Previous crops: Potatoes 1968, winter wheat and barley 1969.

NOTE: Samples were taken for assessment of mildew (Erysiphe graminis) and other foliar diseases.

Standard errors per plot. Grain, cwt:

Whole plot: 1.25 or 5.5% (33 d.f.)

Sub plot: 1.87 or 8.2% (108 d.f.)

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70/R/WS/5

SUMMARY OF RESULTS

GRAIN: CWT

	I	K	M	R	S	T	Mean
			(±0.63)				(±0.26)
O	13.9	26.1	24.4	25.6	22.2	20.1	22.0
F	15.3	25.9	25.0	28.2	24.9	22.2	23.6
			(1) and (2)				(±0.27)
N1	12.9	23.8	22.5	26.4	22.7	20.7	21.5
N2	16.3	26.0	25.1	27.1	23.3	21.7	23.2
N3	14.0	28.1	25.3	26.7	24.7	21.4	23.3
N2+1	15.3	26.0	25.9	27.5	23.5	20.8	23.2
Mean (±0.44)	14.6	26.0	24.7	26.9	23.5	21.2	22.8

	N1	N2	N3	N2+1
	(3) and (4)			
O	20.8	22.7	22.7	22.0
F	22.2	23.8	24.0	24.3

Mean D.M. %: 84.8

(1) (±0.72) For use in horizontal and diagonal comparisons only
(2) (±0.66) For use in vertical and interaction comparisons only
(3) (±0.42) For use in vertical and diagonal comparisons only
(4) (±0.38) For use in horizontal and interaction comparisons only

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SPRING WHEAT

(70/R/WS/6)

Growth regulators and N, Long Hoos V 1970.

Design: 3 randomised blocks of 18 plots.

Area of each plot: 0.0036. Area harvested: 0.0019.

Treatments: All combinations of:-
1. Growth regulators (active ingredient in 35 gals): None (0) 2 plots per block, chlormequat (CCC) at 1 lb (C1), at 2 lb (C2), 'Ethrel'* at 1 lb (E1), at 2 lb (E2).
2. Nitrogen: 0.6 (N1), 1.2 (N2), 1.8 (N3) cwt N as 'Nitro-Chalk'.

* 2-chloroethylphosphonic acid.

Basal applications: 320 lb (0:20:20) broadcast. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Deep-tine cultivated: 27 Oct, 1969. Seed drilled at 170 lb, basal PK broadcast: 22 Apr, 1970. N applied: 4 May. Weedkiller applied: 27 May. Growth regulators applied: Chlormequat - 28 May, 'Ethrel' - 11 June. Combine harvested: 29 Aug. Variety: Kolibri. Previous crops: Spring oilseed rape 1968, potatoes 1969.

NOTE: Samples were taken just before harvest for yields, dry weights and stem lengths.

Standard error per plot.
Grain, cwt: 3.18 or 14.2% (34 d.f.)

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70/R/WS/6

SUMMARY OF RESULTS

GRAIN: CWT

	O*	C1	C2	E1	E2	Mean
	(±1.30)		(±1.84)			(±0.75)
N1	24.6	21.6	22.2	20.7	18.6	22.1
N2	23.3	21.0	27.5	17.8	17.9	21.8
N3	20.9	24.9	30.3	21.9	19.8	23.1
Mean	22.9 (±0.75)	22.5	26.7 (±1.06)	20.1	18.8	22.3

Mean D.M. %: 83.1

* Duplicated level

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SPRING WHEAT

(70/R/WS/7)

Dwarf wheat, seed rates N and CCC, Long Hoos V 1970.

Design: A single replicate of 4 x 4 x 4 in 4 blocks of 4 plots, each split into 4 sub plots.

Area of each sub plot: 0.0036. Area harvested: 0.0020.

Treatments: All combinations of:-
Whole plots: 1. Varieties and seed rates: VR 6/57 (V), Benoist 257 (B), Inia (I), Kolibri (K).
2. Nitrogen: 0.6 (N1), 1.2 (N2), 1.8 (N3), 2.4 (N4) cwt N as 'Nitro-Chalk'.
Sub plots: 3. Chlormequat (CCC): None (C0), 1 (C1), 2 (C2), 3 (C3) lb in 35 gals.
Seed rate 112 lb (except Kolibri 168 lb). Row spacing: 5 inches for each variety.

Basal applications: 320 lb (0:20:20) broadcast. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Deep-tine cultivated: 27 Oct, 1969. Seed drilled, basal PK applied: 22 Apr, 1970. Weedkiller applied: 27 May. N applied: 4 May. CCC applied: 28 May. Combine harvested: 29 Aug. Previous crops: Spring oilseed rape 1968, potatoes 1969.

NOTE: Shoot heights were measured and plant numbers counted. Samples were taken just before harvest for yield and dry matter.

Standard errors per plot (Estimated from unconfounded 3 factor interactions). Grain, cwt:
Whole plot: 1.95 or 12.0% (6 d.f.)
Sub plot: 1.81 or 11.2% (18 d.f.)

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70/R/WS/7

SUMMARY OF RESULTS

GRAIN: CWT

	N1	N2	N3	N4	C0	C1	C2	C3	Mean
	(1) and (2)				(1) and (2)				(±0.97)
V	15.2	15.2	14.7	16.7	15.3	14.9	15.8	15.7	15.4
B	12.7	13.9	13.3	14.2	13.2	13.6	12.9	14.3	13.5
I	11.1	11.1	10.0	10.6	10.5	10.5	11.8	10.0	10.7
K	25.0	23.2	24.3	27.4	23.3	26.9	24.5	25.2	25.0
					(±0.91)				(±0.45)
			N1		15.5	14.9	17.1	16.5	16.0
			N2		16.7	16.4	14.2	16.1	15.9
			N3		12.4	17.0	15.6	17.2	15.5
			N4		17.7	17.7	18.1	15.3	17.2
Mean (±0.45)					15.6	16.5	16.3	16.3	16.2

Mean D.M. %: 84.5

(1) (±1.25) For use in vertical and diagonal comparisons only
(2) (±0.91) For use in horizontal and interaction comparisons only

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BARLEY

(70/R/B/1)

Systemic fungicides, Harwoods Piece 1970.

Design: 3 randomised blocks of 7 plots.

Area of each plot: 0.0060. Area harvested: 0.0021.

Treatments: Systemic fungicides (shown below in lb of active ingredient, except where described otherwise):

Fungicide	Seed dressing	Spray	Symbol
None	None	None	(O)
50% benomyl	0.25	1.00	(B)
80% ethirimol	1.00	1.00	(E)
50% furidazole	0.03	1.00	(F)
'E.L.273' (4 % a.i.)	0.03	0.08	(L)
50% thiophanate methyl	1.20	1.50	(T)
'W524' (83.4 % a.i.)	0.375	*2.85 fluid oz a.i.	(W)

Each applied as a seed dressing, and twice at above rates as a spray in 35 gals (except treatment W, which was in 70 gals), the first spray at growth stage 7, the second at growth stage 10.2.

*The formulation of 'W524' used for the spray contained 20% a.i.

Basal applications: 450 lb (20:10:10) combine drilled. Weedkiller: Tri-allate at 1.25 lb in 20 gals.

Cultivations, etc.: Ploughed: 27 Oct, 1969. Weedkiller applied: 19 Apr, 1970. Seed combine drilled at 140 lb: 22 Apr. Fungicide sprays applied: 8 June (GS7), 23 June (GS10.2). Combine harvested: 13 Aug. Variety: Zephyr. Previous crops: Spring wheat 1968 and 1969.

NOTE: Estimates were made of root diseases, mildew (Erysiphe graminis), brown rust (Puccinia anomala), and loose smut (Ustilago nuda).

Standard error per plot.
Grain, cwt: 3.09 or 8.3% (12 d.f.)

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70/R/B/1

SUMMARY OF RESULTS

GRAIN: CWT

O	B	E	F	L	T	W	Mean
			(±1.78)				
36.8	40.8	37.3	36.8	34.6	38.1	36.5	37.3

Mean D.M. %: 83.5

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BARLEY

(70/R/B/2 and 70/W/B/2)

Varieties x N and mildew control (Erysiphe graminis), Rothamsted (R) Great Knott I and Woburn (W) Great Hill III 1970.

Design: Great Knott I (R): 4 randomised blocks of 14 plots, split into 3.
Great Hill III (W): 4 randomised blocks of 16 plots, split into 3.

Area of each sub plot: Great Knott I (R): 0.0080. Area harvested: 0.0054.
Great Hill III (W): 0.0048. Area harvested: 0.0032.

Treatments: All combinations of:-
Whole plots: 1. Varieties: Akka (A), Bala - Great Hill III (W) only (B), Julia (J), Midas (M), Sultan (S), Vada (V), Zephyr (Z), Akka sown in late May (AL). Seed rates: Great Knott I (R) - A and AL plots 150 lb, remainder 140 lb. Great Hill III (W): All plots 140 lb.
2. Fungicide: None (0), 1 lb ethirimol as a seed dressing (F).
Sub plots: 3. Nitrogen: 0.3 (N1), 0.6 (N2), 0.9 (N3) cwt N (R) and 0.4 (N1), 0.8 (N2), 1.2 (N3) cwt N (W) as 'Nitro-Chalk'.

Basal applications: 220 lb (0:20:20) combine drilled. Weedkillers:-
Great Knott I (R): 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals. Great Hill III (W): Diquat at 0.34 lb and paraquat at 0.34 lb in 25 gals. Ioxynil at 9 oz and mecoprop at 27 oz in 25 gals.

Cultivations, etc.:-
Great Knott I (R): Ploughed: 17 - 31 Oct, 1969 and 3 Nov. Combine drilled (except AL plots): 2 Apr, 1970. N applied: 14 Apr. Weedkiller applied: 18 May. AL plots: N applied, seed combine drilled: 19 May. A plots combine harvested: 30 July. Remaining plots* combine harvested: 14 Aug. Previous crops: Fallow 1968, winter wheat 1969.
Great Hill III (W): Ploughed: 4 Sept, 1969. Rotary cultivated: 24 Oct. Diquat/paraquat applied: 17 Mar, 1970. Combine drilled (except AL plots): 27 Mar. All N applied: 9 Apr. Ioxynil/mecoprop applied: 15 May. AL plots combine drilled: 20 May. A plots combine harvested: 31 July. Remaining plots excluding AL combine harvested: 12 Aug. Previous crops: Potatoes 1968, fallow 1969.

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NOTES: (1) The weather after sowing AL plots was very dry, growth was very poor and yields were not taken.

(2) Samples were taken for assessment of mildew (Erysiphe graminis) and other foliar diseases.

(3) At Woburn the appearance of the crop in July caused doubt about the allocation of the N-rates to sub-plots within some of the whole plots of block 1: this block has been omitted from the tables involving N and from the corresponding analysis.

Standard errors per plot.	Grain, cwt:	
Great Knott I (R):	Whole plot:	1.58 or 5.4% (33 d.f.)
	Sub plot:	2.42 or 8.3% (72 d.f.)
Great Hill III (W)		
All 4 blocks:	Whole plot:	4.93 or 14.0% (39 d.f.)
Block 1 omitted:	Whole plot:	4.69 or 14.6% (26 d.f.)
	Sub plot:	5.08 or 15.9% (56 d.f.)

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70/R&W/B/2

SUMMARY OF RESULTS

GRAIN: CWT

GREAT KNOTT I (R)

	A	J	M	S	V	Z	Mean
			(±0.79)				(±0.32)
O	14.9	33.3	32.0	31.5	30.1	32.1	29.0
F	15.4	33.2	31.6	32.9	30.7	33.6	29.6
			(1) and (2)				(±0.35)
N1	13.8	29.3	27.2	28.6	27.8	28.4	25.9
N2	14.5	34.2	33.7	33.7	30.5	33.7	30.1
N3	17.0	36.3	34.3	34.2	32.9	36.6	31.9
Mean (±0.56)	15.1	33.3	31.8	32.2	30.4	32.9	29.3

	O	F
	(3) and (4)	
N1	25.2	26.5
N2	29.5	30.6
N3	32.2	31.6

Mean D.M. %: 85.2

(1) (±0.89) (3) (±0.52) For use in horizontal and diagonal comparisons only

(2) (±0.86) (4) (±0.49) For use in vertical and interaction comparisons only

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70/R&W/B/2

GRAIN: CWT

GREAT HILL III (W)

ALL 4 BLOCKS

	A	B	J	M	S	V	Z	Mean
				(±2.46)				(±0.93)
O	28.1	34.3	34.8	38.9	32.6	31.8	36.2	33.8
F	27.0	39.0	37.5	37.2	36.4	39.4	38.8	36.5
Mean (±1.74)	27.5	36.7	36.2	38.0	34.5	35.6	37.5	35.1

BLOCK 1 OMITTED

				(1) and (2)				(±0.78)
N1	21.1	32.1	27.0	34.2	30.0	31.3	28.2	29.1
N2	26.3	36.2	36.8	33.3	30.8	33.6	35.5	33.2
N3	25.6	30.0	31.9	35.4	38.3	37.4	38.0	33.8
Mean (±1.91)	24.3	32.8	31.9	34.3	33.0	34.1	33.9	32.0

	O	F
	(3) and (4)	
N1	28.4	29.8
N2	31.7	34.7
N3	31.9	35.7
Mean (±1.02)	30.7	33.4

Mean D.M. %: 82.6

(1) (±2.56) (3) (±1.37) For use in horizontal and diagonal comparisons only

(2) (±2.07) (4) (±1.11) For use in vertical and interaction comparisons only

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BARLEY

(70/R/B/3 and 70/W/B/3)

Deep drilled urea and 'Nitro-Chalk', Rothamsted (R) Great Knott I and Woburn (W) Great Hill III 1970.

Design: 4 blocks of 8 plots (randomisation restricted) plus 1 nil plot per block.

Area of each plot:
Great Knott I (R): 0.0161. Area harvested: 0.0103.
Great Hill III (W): 0.0154. Area harvested: 0.0099.

Treatments: No nitrogen (N0) and all combinations of:-
1. Forms of nitrogen: 'Nitro-Chalk' 21% N (C), urea 46% N (U).
2. Methods of application: Deeply drilled by 'Fiona' drill in 6 inch rows before drilling seed (D), broadcast by hand after drilling seed (B).
3. Rates of nitrogen: 0.5 (N1), 1.0 (N2) cwt N.

NOTE: (1) The seed was drilled on all plots by the 'Fiona' drill in rows 6 inches apart.

Basal applications: Manures: 280 lb (0:20:20). Broadcast by 'Fiona' drill.
Weedkillers: Great Knott I (R): 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.
Great Hill III (W): 0.34 lb diquat plus 0.34 lb paraquat in 25 gals, ioxynil at 7.5 oz plus mecoprop at 22.5 oz in 25 gals.

Cultivations, etc.:
Great Knott I (R): Ploughed: 17 - 31 Oct and 3 Nov, 1969. Seed drilled at 120 lb, basal PK, urea and 'Nitro-Chalk' applied: 2 Apr, 1970. Weedkiller applied: 18 May. Combine harvested: 12 Aug. Variety: Julia. Previous crops: Fallow 1968, winter wheat 1969.
Great Hill III (W): Ploughed: 4 - 10 Sept, 1969. Rotary cultivated: 24 Oct. Deep-tine cultivated: 1 Nov. Diquat/paraquat applied: 17 Mar, 1970. Seed drilled at 120 lb, basal PK, urea and 'Nitro-Chalk' applied: 31 Mar. Ioxynil/mecoprop applied: 15 May. Combine harvested: 11 Aug. Variety: Julia. Previous crops: Potatoes 1968, fallow 1969.

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NOTES: (2) The 'Fiona' drill was used on all plots to prepare the seedbed, being drawn idle through the B and NO plots.
(3) The percentage of N in the grain was determined.

Standard errors per plot. Grain, cwt:
Great Knott I (R): 1.23 or 3.5% (21 d.f.)
Great Hill III (W): 3.81 or 9.8% (21 d.f.)

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70/R&W/B/3

SUMMARY OF RESULTS

GRAIN: CWT

GREAT KNOTT I (R)

	D	B	N1	N2	Mean
	(±0.43)		(±0.43)		(±0.31)
C	35.7	35.1	34.3	36.5	35.4
U	34.8	34.7	33.8	35.8	34.8
			(±0.43)		(±0.31)
		D	34.2	36.4	35.3
		B	33.9	35.9	34.9
Mean (±0.31)			34.0	36.1	35.1

NO 18.6
General mean: 33.3

Mean D.M. %: 85.2

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70/R&W/B/3

GRAIN: CWT

GREAT HILL III (W)

	D	B	N1	N2	Mean
	(±1.35)		(±1.35)		(±0.95)
C	39.4	40.1	40.7	38.8	39.8
U	38.8	37.8	38.9	37.7	38.3
			(±1.35)		(±0.95)
		D	40.0	38.2	39.1
		B	39.6	38.3	39.0
Mean (±0.95)			39.8	38.2	39.0

NO 29.5
General mean: 38.0

Mean D.M. %: 80.2

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BARLEY

(70/R/B/4)

Early and late mildew (Erysiphe graminis), Long Hoos V 1970.

Design: 4 randomised blocks of 4 plots.

Area of each plot: 0.0257. Area harvested: 0.0129.

Treatments: Fungicide, ethirimol:-

None	(0)
0.25 lb as seed dressing	(1D)
2.0 lb as seed dressing plus 1 lb in 35 gals as a foliar spray on 2 occasions	(8D8S)
1.0 lb in 35 gals as a foliar spray on 2 occasions	(8S)

Basal applications: 360 lb (20:10:10) combine drilled. Weedkiller: 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals.

Cultivations, etc.: Deep-tine cultivated: 27 Oct, 1969. Seed combine drilled at 140 lb: 19 Apr, 1970. Weedkiller applied: 27 May. Fungicide sprays applied: 16 June and 8 July. Combine harvested: 12 Aug. Variety: Zephyr. Previous crops: Spring oilseed rape 1968, potatoes 1969.

NOTE: Samples were taken for assessment of mildew (Erysiphe graminis) and other foliar diseases and for assessment of tiller number, tiller length and ear sizes.

Standard error per plot.
Grain, cwt: 2.33 or 7.8% (9 d.f.)

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70/R/B/4

SUMMARY OF RESULTS

0	1D	8D8S	8S	Mean
		GRAIN: CWT		
		(±1.17)		
28.5	29.5	31.1	29.8	29.7
		STRAW: CWT		
15.0	15.5	17.0	15.3	15.7

Mean D.M. %: Grain: 82.0
Straw: 82.8

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BARLEY

(70/R/B/6)

Comparison of combines, Hoosfield (Series O and A of the Classical Barley Experiment) 1970.

For manurial treatments and original design see 'Details' 1967 and 'Results' 68/A/2.

Each row of N sub-plots running north - south across the Series was divided into 3 for a comparison of combines.

		Strips 1 - 4	Strips 6 and 7
Areas harvested:-	P plots:	0.0043	0.0032
	L plots:	0.0086	0.0064
	S plots:	0.0064	0.0048

Treatments:- Combine harvesters and number of rows cut between blank rows:

PAM 150S	8 rows (P)
Bamford Claeys	16 rows (L)
Sampo	12 rows (S)

Basal applications: Manure - none. Weedkillers: Paraquat at 0.75 lb ion in 20 gals, MCPA, mecoprop and dicamba ('Banlene Plus' at 4 pints in 20 gals).

Cultivations, etc.: Paraquat applied: 17 Sept, 1969. P, K, Na, Mg applied: 22 Oct. FYM applied: 10 Nov. Ploughed: 11 Nov. Seed drilled at 140 lb: 20 Mar, 1970. N applied: 9 Apr. MCPA/mecoprop/dicamba applied: 26 May. Combine harvested: 25 Aug. Variety: Julia.

NOTE: Plots 413 (N3), 414 (N1), 421 (N0), 422 (N1) - (all P K Na Mg) - were sampled, for all 3 combines, as follows:-
Shed grain was estimated from sample areas on 2 dates shortly before harvest, and just after the combine had passed.
During combining, the straw was sampled for unthreshed grains and loss of grain from sieves was estimated.

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70/R/B/6

SUMMARY OF RESULTS

GRAIN: CWT

GAUGE SERIES

	O	P	K	PK	Mean	D	(D) (Ashes)	-		Mean
L	14.6	18.7	17.9	28.4	19.9	42.8	25.2	18.1	17.4	25.9
P	13.6	18.7	18.0	27.5	19.4	43.5	24.3	18.5	16.3	25.6
S	15.8	19.8	18.7	27.9	20.5	43.2	26.2	20.5	17.0	26.7
Mean	14.6	19.1	18.2	27.9	20.0	43.2	25.2	19.0	16.9	26.1

EXCLUDING GAUGE SERIES

	NO	N1	N2	N3
L	9.1	19.2	24.4	26.9
P	9.3	18.3	23.5	26.6
S	10.6	19.6	24.6	27.3
Mean	9.7	19.0	24.2	26.9

Mean D.M. % all plots: 81.3

NOTE: K denotes K Na Mg

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BARLEY

(70/R/B/8)

Weedkiller and aqueous nitrogen, Great Knott I 1970.

Design: 4 randomised blocks of 28 plots.

Area of each plot: 0.0007. Area harvested: 0.0005.

Treatments: All combinations of:-

1. Weedkiller (dichlorprop/MCPA): None (H0), 20 (H1), 40 (H2), 60 (H3) oz total a.e.,
2. Forms of nitrogen: Solid, as 'Nitro-Chalk' (21% N) applied immediately after the weedkiller (S), liquid as urea/ammonium nitrate (26% N) mixed with the weedkiller (L),
3. Levels of nitrogen: 0.3 (N1), 0.6 (N2), 0.9 (N3) cwt N,

together with 4 additional treatments

SN2 E H0, SN2 E H1, SN2 E H2, SN2 E H3,

where 'Nitro-Chalk' was applied early (E) and the H0 plots were hand weeded.

NOTE: The weedkiller was applied in 28 gals where solid fertiliser was used. The liquid fertiliser (with or without weedkiller) was applied as a spray at 11, 22 and 33 gals for rates 1, 2 and 3 respectively.

Basal application: 280 lb (0:20:20) broadcast.

Cultivations, etc.: Ploughed: 17 Oct - 4 Nov, 1969. Seed drilled at 120 lb and basal PK applied: 2 Apr, 1970. N applied to E plots: 14 May. Remaining N treatments and weedkiller applied: 28 May. Hand weed H0 plots: 26 June. Cut by sickle: 24 Aug. Variety: Julia. Previous crops: Fallow 1968, winter wheat 1969.

NOTE: Soil samples were taken in May for pH and the site reviewed for weed species. Plots were scored for scorch and weed control and examined for bird damage and ear deformities. Weeds were identified on the H0 plots. At harvest weeds on certain plots were identified and their dry matter determined. The percentage of N in grain was determined.

Standard error per plot:
Grain, cwt: 2.76 or 12.0% (69 d.f.)

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70/R/B/8

SUMMARY OF RESULTS

GRAIN: CWT

	H0	H1	H2	H3	Mean
		(±0.80)			(±0.40)
S	24.3	22.1	23.7	22.4	23.1
L	21.9	22.5	23.3	23.5	22.8
		(±0.98)			(±0.49)
N1	20.3	20.7	22.2	19.9	20.8
N2	23.7	23.0	23.5	23.5	23.4
N3	25.4	23.2	24.8	25.4	24.7
Mean (±0.56)	23.1	22.3	23.5	22.9	23.0

	N1	N2	N3
		(±0.69)	
S	21.3	23.7	24.3
L	20.2	23.1	25.0

SN2 E H0	23.7	
SN2 E H1	24.3	(±1.38)
SN2 E H2	25.9	
SN2 E H3	25.4	

General mean: 23.2

Mean D.M. %: 81.6

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BARLEY

(70/S/B/1)

Varieties, N levels and times of application, Saxmundham, Grove Plot 1970.

Design: Two randomised blocks of 10 plots, split into 2 for fungicidal seed dressing.

Area of each sub plot: 0.0041. Area harvested: 0.0013.

Treatments: Untreated (2 plots per block, one for each variety split as above) and all combinations of:-

Whole plots: 1. Variety: Midas (M), Sultan (S).
2. Levels of N: 0.6 (N1), 1.2 (N2) cwt as 'Nitro-Chalk'.
3. Times of application of N: In the seedbed (E), as a top-dressing in May (L).

Sub plots: 4. Ethirimol as a seed dressing at 24 oz: None (O) seed dressed (P).

Basal applications: 560 lb (0:20:20) broadcast. Weedkiller: Mecoprop at 36 oz and 2,4-D at 9 oz in 45 gals.

Cultivations, etc.: Ploughed: 30 Oct, 1969. Seed drilled at 168 lb, seedbed N and basal PK applied: 23 Apr, 1970. Weedkiller and late N applied: 28 May. Harvested by sickle: 12 Aug. Previous crops: Sugar beet 1968, barley 1969.

Standard errors per plot.

Grain, cwt: Whole plot: 2.05 or 7.7% (7 d.f.)
Sub plot: 1.20 or 4.5% (8 d.f.)

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70/S/B/1

SUMMARY OF RESULTS

GRAIN: CWT

	E	L	M	S	O	P	Mean
	(±1.02)		(±1.02)		(1) and (2)		(±0.72)
N1	27.4	23.7	26.3	24.7	24.3	26.8	25.5
N2	29.6	25.7	27.6	27.7	26.2	29.0	27.6
			(±1.02)		(1) and (2)		(±0.72)
		E	28.3	28.7	27.3	29.7	28.5
		L	25.7	23.7	23.2	26.1	24.7
					(1) and (2)		(±0.72)
				M	27.2	26.7	27.0
				S	23.3	29.1	26.2
Mean (±0.30)					25.3	27.9	26.6

NO Plots

M	O	16.4
M	P	17.6
S	O	12.8
S	P	13.9

(1) (±0.78) For use in vertical and diagonal comparisons only
(2) (±0.43) For use in horizontal and interaction comparisons only

Mean D.M. %: 86.3

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70/S/B/1

STRAW: CWT

	E	L	M	S	O	P	Mean
N1	29.7	24.5	28.2	26.0	28.2	26.0	27.1
N2	33.8	24.7	31.0	27.6	27.4	31.2	29.3
		E	31.7	31.9	31.1	32.4	31.8
		L	27.5	21.7	24.4	24.8	24.6
				M	29.7	29.4	29.6
				S	25.9	27.7	26.8
Mean					27.8	28.6	28.2

NO Plots

M O 17.4
M P 16.0
S O 13.3
S P 14.8

Mean D.M. %: 83.8

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BARLEY

(70/S/B/2)

N rates to barley after grass, Saxmundham Grove Plot 1970.

Design: 2 randomised blocks of 8 plots.

Area of each plot: 0.0046. Area harvested: 0.0018.

Treatments:- Nitrogen: None (N0), 0.4 (N1), 0.8 (N2), 1.0 (N3), 1.2 (N4), 1.4 (N5), 1.6 (N6), 2.0 (N7) cwt N as 'Nitro-Chalk'.

Basal applications: 560 lb (0:20:20) broadcast. Weedkiller: Mecoprop at 36 oz and 2,4-D at 9 oz in 20 gals.

Cultivations, etc.: Ploughed: 30 Oct, 1969. N and PK applied, seed drilled: 23 Apr, 1970. Weedkiller applied: 28 May. Combine harvested: 18 Aug. Variety: Julia. Previous crops: 3 years grass.

Standard error per plot.
Grain, cwt: 1.47 or 5.5% (7 d.f.)

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70/S/B/2

SUMMARY OF RESULTS

N0	N1	N2	N3	N4	N5	N6	N7	Mean
				GRAIN: CWT				
				(±1.04)				
14.9	23.3	25.8	28.6	30.8	27.9	31.0	33.5	27.0
				STRAW: CWT				
15.5	21.8	25.9	30.0	30.2	32.2	35.1	38.3	28.6

Mean D.M. %: Grain: 86.0
Straw: 88.4

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SPRING BEANS

(70/R/BE/1 and 70/W/BE/1)

Row spacing, K, and methods of application, Rothamsted (R) Pastures and Woburn (W) Lansome III 1970.

Design: Pastures (R): 4 blocks of 8 plots, randomisation restricted. Lansome III (W): 3 blocks of 8 plots, randomisation restricted.

Area of each plot: 0.0193. Area harvested: Pastures (R): 0.0145, Lansome III (W): 0.0121.

Treatments: All combinations of:-

1. Spacing between rows of seed: 21 ins. (sown by 'Smythe' drill) (W), 5.5 ins. (sown by 'Tume' drill) (C). (Seed rate for all treatments:- 200 lb at Rothamsted (R), 195 lb at Woburn (W)).
2. Levels of K20 as muriate of potash:- 1.0 (K1) and 2.0 (K2) cwt (Rothamsted (R)), 1.3 (K1) and 2.0 (K2) cwt (Woburn (W)).
3. Methods of applying K20: Drilled 4 ins. deep across rows by 'Tume' drill (A), placed in rows (on C plots drilled 4 ins. deep by 'Tume' drill before sowing, on W plots placement drilled by'Smythe' drill at sowing) (R).

Basal applications:-

Pastures (R):- 3 tons ground chalk. Weedkillers: Paraquat at 0.5 lb ion in 20 gals. Simazine at 1 lb in 20 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.

Lansome III (W):- Weedkiller: Simazine at 1 lb in 25 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 25 gals.

Cultivations, etc.:-

Pastures (R): Paraquat applied: 2 Oct, 1969. Chalked: 1 Nov. Ploughed 2 - 10 Dec. K fertiliser applied to WA, CA and CR plots by 'Tume' drill with crumblers on, WR plots cultivated once by 'Tume' drill without fertiliser, with tines in and crumblers on: 26 Mar, 1970. Seed drilled on CA and CR plots by 'Tume' drill without fertiliser or crumblers. Seed drilled on WA plots by 'Smythe' drill without fertiliser. Seed placement drilled on WR plots by 'Smythe' drill: 27 Mar. Simazine applied: 19 Apr. Insecticide applied: 18 June. Combine harvested: 4 Sept. Variety: Maris Bead. Previous crops: Winter wheat and barley 1968, barley 1969.

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Lansome III (W): Rotary cultivated three times: 5 Sept., 1969, 29 Sept, 11 Oct. Deep-tine cultivated: 31 Dec. K fertiliser applied to WA, CA and CR plots by 'Tume' drill with crumblers on. WR plots cultivated once by 'Tume' drill without fertiliser, with tines in and crumblers on. Seed drilled on WA plots by 'Smythe' drill without fertiliser. Seed placement drilled on WR plots by 'Smythe' drill. Seed drilled on CA and CR plots by 'Tume' drill without fertiliser or crumblers: 19 Mar, 1970. Weedkiller applied: 21 Mar. Insecticide applied: 19 June. Combine harvested: 2 Aug. Variety: Maris Bead. Previous crops: Potatoes 1968, winter wheat 1969.

Standard errors per plot. Grain, cwt:
Pastures (R): 1.06 or 7.2% (21 d.f.)
Lansome III (W): 1.74 or 30.4% (14 d.f.)

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70/R&W/BE/1

SUMMARY OF RESULTS

GRAIN: CWT

	K1	K2	A	R	Mean
	PASTURES (R)				
	(±0.37)		(±0.37)		(±0.26)
W	13.5	13.7	13.8	13.4	13.6
C	16.0	15.5	15.5	16.0	15.8
			(±0.37)		
		K1	14.7	14.8	14.7
		K2	14.5	14.7	14.6
Mean (±0.26)			14.6	14.7	14.7
	LANSOME III (W)				
	(±0.71)		(±0.71)		(±0.50)
W	5.0	5.2	4.2	6.0	5.1
C	5.8	6.9	5.9	6.9	6.4
			(±0.71)		
		K1	4.5	6.4	5.4
		K2	5.6	6.5	6.0
Mean (±0.50)			5.0	6.4	5.7

Mean D.M. %: Pastures (R): 82.0
Lansome III (W): 84.3

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SPRING BEANS

(70/R/BE/2)

Effects of aphids, Pastures 1970.

Design: 5 randomised blocks of 6 plots.

Area of each plot: 0.0161. Area harvested: 0.0096.

Treatments: Insecticides:

None	(O)
Treated with 17 oz of phorate in granules:	
At start of flowering	(GE)
At start and again at end of flowering	(GEL)
Sprayed with demeton-s-methyl at 3.5 oz in 50 gals:	
At start of flowering	(SE)
At end of flowering	(SL)
At start and again at end of flowering	(SEL)

NOTE: Treatments O and SL were artificially infested with black aphids (Aphis fabae).

Basal applications: 360 lb (0:14:28) applied by 'Tume' drill across the plots: Ground chalk at 3 tons. Weedkillers: Paraquat at 0.5 lb ion in 20 gals. Simazine at 1 lb in 20 gals.

Cultivations, etc.: Paraquat applied: 2 Oct, 1969. Chalked: 1 Nov. Ploughed: 2 - 10 Dec. Basal PK applied: 22 Mar, 1970. Seed drilled at 200 lb: 26 Mar. Simazine applied: 19 Apr. 'Metasystox' applied to SE and SEL plots: 15 June, SL and SEL plots: 16 July. Phorate applied GE and GEL plots: 16 June, GEL plots: 7 July. Combine harvested: 4 Sept. Variety: Maris Bead. Previous crops: Winter wheat 1968, barley 1969.

NOTE: Aphid counts and estimates of plant growth were made once a week throughout the growing season.

Standard error per plot.
Grain, cwt: 0.91 or 8.2% (20 d.f.)

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70/R/BE/2

SUMMARY OF RESULTS

GRAIN: CWT

O	GE	GEL	SE	SL	SEL	Mean
		(±0.41)				
8.6	12.8	11.8	11.8	11.0	11.1	11.2

Mean D.M. %: 79.7

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SPRING BEANS

(70/W/BE/2)

Insecticide and Sitona - Woburn Lansome III 1970.

Design: 6 blocks of 3 plots.

Area of each plot: 0.0022. Area harvested: 0.0006.

Treatment:-
Insecticide: None (0), 2 lb (1), 4 lb BHC (2) cultivated in before sowing.

Basal applications: 400 lb (0:14:28). Weedkiller: Simazine at 1 lb in 25 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 35 gals.

Cultivations, etc.: Rotary cultivated twice: 8 Sept, 1969, 11 Oct. Deep-tine cultivated: 2 Jan, 1970. BHC applied, rotary cultivated, power harrowed across the plots, fertiliser placed, seed drilled at 200 lb: 18 Mar. Weedkiller applied: 21 Mar. Demeton-s-methyl applied: 22 June. Harvested by hand: 17 Aug. Variety: Maris Bead. Previous crops: Potatoes 1968, winter wheat 1969.

NOTES: (1) Sticky and water traps were placed in the crop from germination until ripening to catch Sitona.
(2) Plant samples were taken for counts of Sitona larvae and estimates of damage during the growing season.

Standard error per plot.
Grain, cwt: 0.69 or 11.5% (10 d.f.)

SUMMARY OF RESULTS

GRAIN: CWT

0	1	2	Mean
	(±0.28)		
5.0	6.6	6.4	6.0

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SPRING BEANS

(70/R/BE/3)

Pyrethroids, Pastures 1970.

Design: 3 randomised blocks of 4 plots.

Area of each plot: 0.0145. Area harvested: 0.0096.

Treatments:- Insecticides:

None	(O)
Pyrethroid NRDC 104, 25% emulsifiable concentrate at 4 oz a.i. in 50 gals	(A)
Pyrethroid NRDC 107, 25% emulsifiable concentrate at 4 oz a.i. in 50 gals	(B)
Dimethoate 40% emulsifiable concentrate at 6 oz a.i. in 50 gals	(D)

Basal applications: 360 lb (0:14:28) drilled 4 in. deep by 'Tume' drill. 3 tons of ground chalk. Weedkillers: Paraquat at 0.5 lb ion in 20 gals, simazine at 1 lb in 20 gals.

Cultivations, etc.: Paraquat applied: 2 Oct, 1969. Chalked: 1 Nov. Ploughed: 2 Dec. Basal PK applied: 22 Mar, 1970. Seed drilled at 200 lb: 17 Apr. Simazine applied: 19 Apr. Insecticides applied: 3 July. Combine harvested: 4 Sept. Variety: Maris Bead. Previous crops: Barley 1968 and 1969.

NOTE: Aphid counts were made.

Standard error per plot.
Grain, cwt: 1.42 or 20.0% (6 d.f.)

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70/R/BE/3

SUMMARY OF RESULTS

GRAIN: CWT

C	A	B	D	Mean
	(±0.82)			
5.0	6.5	6.4	10.6	7.1

Mean D.M. %: 81.5

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SPRING BEANS

(70/R/BE/5)

Photosynthetic zones, Fosters O and E III 1970.

Design: 3 blocks of 8 plots, randomisation restricted.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatments: All combinations of:-

1. Defoliation in Zone A: None (O), leaves removed when first flower buds formed (A).
2. Defoliation in Zone B: None (O), leaves removed when first flower buds formed on 9th flowering node (B).
3. Decapitation of Zone C: None (O), decapitation (C) on 7 - 8 July.

where (1) Zone A is the section of stem (about 9 nodes) below the first flowering node.
(2) Zone B is the section of stem with the 9 nodes which flower first.
(3) Zone C is the section of stem above the 9th flowering node.

Basal applications: 360 lb (0:14:28) broadcast and rotary cultivated in before sowing. Weedkiller: Simazine at 1 lb in 35 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 35 gals on 2 occasions.

Cultivations, etc.: Ploughed: 8 Oct - 3 Nov, 1969. Basal PK applied: 16 Apr, 1970. Rotary cultivated, seed drilled at 200 lb: 18 Apr. Weedkiller applied: 24 Apr. Insecticide applied: 17 June. Zone A defoliated: 22 June. Zone B defoliated: 6 July. Zone C decapitated: 7 - 8 July. Insecticide applied: 20 July. Harvested by hand: 7 Sept. Variety: Tarvin. Previous crops: Barley 1968 and 1969.

NOTE: Counts were made of the number of stems and pods. 1000 grain weights were measured.

Standard error per plot.
Grain, cwt: 2.62 or 20.2% (14 d.f.)

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70/R/BE/5

SUMMARY OF RESULTS

GRAIN: CWT

	O	B	O	C	Mean
	(±1.07)		(±1.07)		(±0.76)
O	17.4	13.7	16.0	15.0	15.5
A	16.0	4.9	12.0	8.9	10.4
			(±1.07)		(±0.76)
		O	17.2	16.2	16.7
		B	10.8	7.7	9.3
Mean (±0.76)			14.0	11.9	13.0

	O		A	
	O	B	O	B
	(±1.51)			
O	18.1	13.9	16.4	7.7
C	16.7	13.4	15.7	2.0

Mean D.M. %: 81.4

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SPRING BEANS

(70/R/BE/6)

Seed rates, row spacing and growth regulators, Fosters O and E III 1970.

Design: 3 randomised blocks of 4 plots, split into 4.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatments: All combinations of:-
Whole plots: 1. Seed rates: 200 (1), 400 (2) lb.
2. Distance between rows: 21 inches, sown by 'Smythe' drill (W), 5.5 inches, sown by 'Tume' drill (C).
Sub plots: 3. Growth regulators: None (O), 'B9' at 4 lb a.i. (B), 'F529' at 2 lb a.i. (F), 'JF2579' at 4 lb a.i. (J). Each as a spray in 56 gals.

Basal applications: 360 lb (0:14:28) broadcast and rotary cultivated in before sowing. Weedkiller: Simazine at 1 lb in 35 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 35 gals on 2 occasions.

Cultivations, etc.: Ploughed: 8 Oct - 3 Nov, 1969. Basal PK applied: 16 Apr, 1970. Rotary cultivated, seed drilled: 18 Apr. Weedkiller applied: 24 Apr. Growth regulators applied: 11 June. Insecticide applied: 17 June and 20 July. Harvested by hand: 11 Sept. Variety: Tarvin. Previous crops: Barley 1968 and 1969.

NOTE: Stem heights were measured. Counts were made of numbers of stems and pods. 1000 grain weights were measured.

Standard errors per plot. Grain, cwt:
Whole plot: 1.03 or 6.1% (6 d.f.)
Sub plot: 3.01 or 17.9% (24 d.f.)

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70/R/BE/6

SUMMARY OF RESULTS

GRAIN: CWT

	1	2	O	B	F	J	Mean
	(±0.60)			(1) and (2)			(±0.42)
W	15.2	15.1	17.9	15.3	15.4	12.0	15.2
C	17.6	19.5	19.9	19.5	20.9	13.9	18.6
				(1) and (2)			(±0.42)
		1	19.1	16.5	17.4	12.7	16.4
		2	18.7	18.3	19.0	13.2	17.3
Mean (±0.87)			18.9	17.4	18.2	13.0	16.9

Mean D.M. %: 79.7

(1) (±1.15) For use in vertical and diagonal comparisons only
(2) (±1.23) For use in horizontal and interaction comparisons only

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SPRING BEANS

(70/R/BE/7)

Chemical control of soil-borne pathogens, Barnfield (Valley Section, part of plot 3 and 4) 1970.

Design: 2 blocks of 2 plots split into 5.

Area of each sub plot: 0.0014. Area harvested: 0.0006.

Treatments: All combinations of:-

Whole plots: 1. Manuring: Classical treatments since 1968:-
- Plot 3: no manures (O)
- Plot 4: P, K, Na, Mg (30 lb P as superphosphate, 200 lb K as sulphate of potash, 80 lb Na as agricultural salt, 20 lb Mg as sulphate of magnesia) (PKNaMg)

Sub plots: 2. Chemical control:-
- None (O)
- Nematicide, 10% aldicarb ('Temik') at 10 lb a.i. (N)
- Fungicide, 50% benomyl at 20 lb a.i. (F)
- Insecticide, 50% gamma BHC at 2 lb a.i. (I)
- Nematicide, fungicide and insecticide (as above) together. (NFI)

All plots were rotary cultivated immediately after application of chemicals.

Basal applications: Manures - none. Weedkiller: Simazine at 1 lb in 20 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.

Cultivations, etc.: P, K, Na, Mg applied: 21 Nov, 1969. Ploughed: 1 - 19 Dec. Chemical control treatments applied, all plots rotary cultivated: 20 Mar, 1970. Seed drilled at 200 lb: 20 Apr. Weedkiller applied: 24 Apr. Insecticide applied: 17 June. Harvested by hand: 3 Sept. Variety: Maris Bead.

NOTE: Wilted plants were counted during the season. Crop samples were taken for root disease assessment, and soil samples for counting Sitona beetle larvae.
Counts were made of stem eelworm (Ditylenchus dipsaci) incidence.

Standard error per sub plot.
Grain, cwt: 2.44 or 15.1% (8 d.f.)

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70/R/BE/7

SUMMARY OF RESULTS

GRAIN: CWT

	0	N	F	I	NFI	Mean
			(±1.72)*			
0	9.5	19.5	15.7	13.3	16.3	14.9
PK Na Mg	15.3	20.2	15.5	13.1	23.0	17.4
Mean (±1.22)	12.4	19.8	15.6	13.2	19.7	16.2

Mean D.M. %: 79.4

* For use in horizontal and interaction comparisons only

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SPRING BEANS

(70/R/BE/8)

Broad bean mottle virus, Fosters O and E II 1970.

Design: 5 x 5 Latin square.

Area of each plot: 0.0064. Area harvested: 0.0048.

Treatments: Insecticides:-

None	(O)
Aldicarb ('Temik 10G') to soil at 10 lb a.i.	(TS)
BHC to soil at 1 lb a.i. in 600 gals	(BS)
BHC foliar spray at 0.5 lb a.i. in 150 gals on five occasions	(BF)
Menazon foliar spray at 0.25 lb a.i. in 150 gals on five occasions	(MF)

NOTE: All plots were rotary cultivated immediately after the TS and BS treatments.

Basal applications: 390 lb (0:14:28) broadcast.

Cultivations, etc.: Ploughed: 8 Oct and 1 - 3 Nov, 1969. Basal PK applied: 20 Mar, 1970. 'Temik 10G' and BHC applied to soil: 7 Apr. All plots rotary cultivated, seed drilled at 200 lb in 10 inch rows: 10 Apr. BF treatment applied: 26 May, 8 and 25 June, 8 and 22 July. MF treatment applied: 1 and 15 June, 7 and 22 July and 5 Aug. Combine harvested: 7 Sept. Variety: Maris Bead. Previous crops: Wheat, rye and vetches 1968, barley 1969.

NOTES: (1) The virus observed in this experiment is now known to be broad bean stain virus.

(2) The number of weevils and the percentage of plants infested with aphids were recorded on all plots on 5 and 19 June, 3 and 20 July and 10 Aug. Incidence of virus was recorded on all plots on 20 May, 8 and 25 June and 20 July.

Standard error per plot.
Grain, cwt: 1.25 or 9.4% (12 d.f.)

https://doi.org/10.23637/ERADOC-1-59 *pp 279*

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70/R/BE/8

SUMMARY OF RESULTS

GRAIN: CWT

O	TS	BS	BF	MF	Mean
		(±0.56)			
9.6	21.3	10.7	13.8	11.2	13.3

Mean D.M. %: 81.7

https://doi.org/10.23637/ERADOC-1-59 *pp 280*

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SPRING BEANS

(70/R/BE/9)

Rhizobium strains and lime, Sawyers I 1970.

Design: 3 randomised blocks of 6 plots, split into 3.

Area of each sub plot: 0.0011. Area harvested: 0.0006.

Treatments: All combinations of:-

Whole plots: 1. Seed inoculum (Rhizobium leguminosarum):-

None	(0)
Strain 1025	(1)
Strain 1034	(2)
Strain 1035	(3)
Strain 1036	(4)
Strain DP	(5)

Sub plots: 2. Ground chalk: 2 tons (L1) to obtain pH 5, 6 tons (L2) to obtain pH 6, 10 tons (L3) to obtain pH 7.

NOTE: pH of site was 4.5.

Basal applications: 360 lb (0:14:28) broadcast by hand. Insecticide: Demeton-s-methyl at 3.5 oz in 35 gals.

Cultivations, etc.: Ploughed: 31 Jan, 1970. Lime and basal PK applied: 11 Feb. Rotary cultivated, seed drilled at 200 lb: 17 Apr. Insecticide applied: 17 June. Harvested by hand: 14 Sept. Variety: Maris Bead. Previous crops: Fallow since 1959.

NOTE: Counts of Rhizobium leguminosarum in the soil were made in March.

Standard errors per plot. Grain, cwt:

Whole plot:	1.33	or 13.5% (10 d.f.)
Sub plot:	2.52	or 25.6% (24 d.f.)

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70/R/BE/9

SUMMARY OF RESULTS

GRAIN: CWT

	0	1	2	3	4	5	Mean
			(1) and (2)				(±0.59)
L1	8.9	8.9	9.5	8.6	9.4	9.3	9.1
L2	10.9	9.9	11.1	10.9	8.3	10.4	10.3
L3	9.6	9.0	12.8	11.4	9.2	9.1	10.2
Mean (±0.77)	9.8	9.3	11.2	10.3	9.0	9.6	9.9

Mean D.M. %: 79.2

(1) (±1.42) For use in horizontal and diagonal comparisons only.
(2) (±1.45) For use in vertical and interaction comparisons only

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SPRING BEANS

(70/R/BE/10)

Growth regulator 'PRB-8' (2-B-chloro-B-cyanoethyl-6-chloro-toluene)
Fosters O and E III 1970.

Design: 3 randomised blocks of 4 plots.

Area of each plot: 0.0022. Area harvested: 0.0005.

Treatments:- 'PRB-8':

None	(0)
0.45 oz a.i. in 56 gals	(1)
4.5 oz a.i. in 56 gals	(2)
45 oz a.i. in 56 gals	(3)

Basal applications: 360 lb (0:14:28) broadcast and rotary cultivated in before sowing. Weedkiller: Simazine at 1 lb in 35 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 35 gals on 2 occasions.

Cultivations, etc.: Ploughed: 8 Oct - 3 Nov, 1969. Basal PK applied: 16 Apr, 1970. Rotary cultivated, seed drilled at 200 lb: 18 Apr. Weedkiller applied: 24 Apr. Growth regulator applied: 11 June. Insecticide applied: 17 June and 20 July. Harvested by hand: 7 Sept. Variety: Tarvin. Previous crops: Barley 1968 and 1969.

NOTE: Stem heights were measured.

Standard error per plot.
Grain, cwt: 2.10 or 12.4% (6 d.f.)

SUMMARY OF RESULTS

GRAIN: CWT

0	1	2	3	Mean
		(±1.21)		
17.5	18.2	17.9	14.0	16.9

Mean D.M. %: 82.9

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SPRING BEANS

(70/S/BE/1)

Insecticide and Sitona, Saxmundham O and E North 1970.

Design: 6 randomised blocks of 3 plots.

Area of each plot: 0.0028. Area harvested: 0.0005.

Treatments: Insecticide: None (0), 2 lb gamma BHC (1), 4 lb gamma BHC (2) applied as a suspension of wettable powder, rotary cultivated in.

Basal applications: 7 cwt (0:14:28). Insecticide: Menazon ('Saphicol' at 0.5 pints in 40 gals).

Cultivations, etc.: Ploughed: 10 Sept, 1969 - 15 Sept. Test insecticide applied, basal PK applied, plots rotary cultivated, seed drilled at 200 lb: 20 Apr, 1970. Basal insecticide applied: 22 July. Harvested: 1 Sept. Variety: Maris Bead.

NOTE: Soil and plant samples were taken to estimate the population of Sitona larvae.

Standard error per plot.
Grain, cwt: 3.04 or 14.8% (10 d.f.)

SUMMARY OF RESULTS

GRAIN: CWT

0	1	2	Mean
	(±1.24)		
19.5	21.3	20.9	20.6

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POTATOES

(70/R/P/1)

Seed stocks, diseases and fungicide, Great Knott II 1970.

Design: 4 randomised blocks of 12 plots (plus one extra block for sampling). Plots split into 4.

Area of each sub plot: 0.0036. Area harvested: 0.0036.

Treatments: All combinations of:-

Whole plots: 1. Seed stocks, diseases and fungicide:
F, FB, FC, FCB, H, HC, HCB, HDE, HCOE, HCOL, HCRL, HCORL,
where F = Once grown seed from Rothamsted farm*
H = Healthy seed
B = Seed treated with fungicide (Benomyl 5% dust at 10 lb per ton of seed)
C = Chitted seed
O = Seed inoculated with Oospora
R = Seed inoculated with Rhizoctonia
E = Early inoculation (seed dipped in Oospora suspension on 8 Jan, 1970 and stored cold)
L = Late inoculation. (Applied to furrow at planting using vermiculite carrier).

Quarter plots: 2. Varieties: Pentland Crown (PC), King Edward (KE), Majestic (M), Record (R).

* For Pentland Crown and Record 'A' stocks were used.

Basal applications: 1120 lb (13:13:20). Weedkiller: Paraquat at 0.375 lb ion plus linuron at 1 lb in 39 gals. Fungicide: Mancozeb at 1.2 lb in 40 gals on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 oz applied with first mancozeb spray.

Cultivations, etc.: Ploughed: 28 Oct, 1969. Basal NPK applied: 23 Apr, 1970. Rotary cultivated: 4 May. Potatoes hand planted: 5 May. Weedkiller applied: 23 May. Fungicide and insecticide applied: 29 July. Fungicide applied: 14 Aug. Sprayed with undiluted BOV at 15 gals: 15 Sept. Lifted: 24 Sept. Previous crops: Barley 1968, fallow 1969.

NOTE: Emergence counts were made in June. On 6 July, 3 Aug and 3 Sept, plants were lifted from the sample plots for disease assessments on the progeny tubers. At harvest a sub-sample was taken for disease assessments in the eyes.

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Standard errors per plot. Total tubers, tons:
Whole plot: 1.329 or 9.0% (33 d.f.)
Sub plot: 1.008 or 6.8% (107 d.f.)

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70/R/P/1

SUMMARY OF RESULTS

TOTAL TUBERS: TONS

	KE	M	PC	R	Mean
	(1) and (2)				(±0.665)
F	15.24	14.02	14.20	11.22	13.67
FB	14.33	15.02	11.91	10.90	13.04
FC	15.91	15.79	15.48	12.69	14.97
FCB	16.71	16.71	16.42	14.44	16.07
H	13.07	14.63	13.58	12.22	13.38
HC	15.40	15.95	14.57	13.11	14.76
HCB	16.10	16.29	15.91	14.23	15.63
HDE	13.24	15.27	12.97	12.93	13.60
HCOE	16.45	17.42	16.65	14.70	16.30
HCOL	16.61	16.14	16.21	13.84	15.70
HCRL	14.45	15.87	15.96	14.19	15.11
HCROL	15.82	16.52	16.29	14.31	15.74
Mean (±0.145)	15.28	15.80	15.01	13.23	14.83

(1) (±0.795) For use in vertical and diagonal comparisons only
(2) (±0.504) For use in horizontal and interaction comparisons only

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70/R/P/1

% WARE: 1.75 INCH

	KE	M	PC	R	Mean
F	88.4	93.3	95.0	87.3	91.0
FB	84.8	92.5	93.7	85.7	89.1
FC	88.3	93.4	96.9	86.3	91.2
FCB	88.0	94.2	96.9	87.3	91.6
H	87.4	93.6	95.8	88.9	91.4
HC	90.9	94.1	96.8	90.4	93.1
HCB	89.9	92.8	96.1	89.5	92.1
HOE	89.5	93.6	94.5	88.2	91.5
HCOE	90.4	93.2	96.8	89.9	92.6
HCOL	92.1	94.8	96.4	90.0	93.3
HCRL	89.6	93.7	96.3	89.8	92.3
HCROL	90.6	94.3	95.8	89.1	92.4
Mean	89.2	93.6	95.9	88.5	91.8

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POTATOES

(70/W/P/1)

Seed stocks, diseases and fungicide, Woburn White Horse 1970.

Design: 4 randomised blocks of 4 plots split into twelve (plus one extra block for sampling).

Area of each sub-plot: 0.0036. Area harvested: 0.0036.

Treatments: All combinations of:-

Whole plots: 1. Varieties: Arran Pilot (AP), Majestic (M), Pentland Crown (PC), Record (R).

Twelfth plots: 2. Seed stocks, chitting, diseases, times of inoculation and fungicide.
F, FB, FC, FCB, H, HC, HCB, HOE, HCOE, HCOL, HCRL, HCORL,
where F = Once grown seed from Rothamsted farm*,
H = Healthy seed.
B = Seed treated with fungicide (Benomyl 5% dust at 10 lb per ton of seed).
C = Chitted seed.
O = Seed inoculated with Oospora.
R = Seed inoculated with Rhizoctonia.
E = Early inoculation.
L = Late inoculation.

* For Pentland Crown and Arran Pilot 'A' stocks were used.

Basal application: 10 cwt (13:13:20). Weedkiller: Linuron at 1.0 lb plus paraquat at 0.37 lb ion in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz on one occasion with fungicide.

Cultivations, etc.:
Deep-tine cultivated: 4 Sept, 1969. Ploughed: 18 - 23 Sept. NPK applied: 2 Apr, 1970. Power harrowed: 17 Apr. Rotary cultivated: 28 Apr. Potatoes planted: 29 Apr. Weedkiller applied: 15 May. Fungicide with insecticide applied: 31 July. Fungicide applied: 18 Aug. Sprayed with undiluted BOV at 15 gals: 18 Sept. Haulm destroyed mechanically: 23 Sept. Lifted: 30 Sept. Previous crop: Winter wheat 1968, fallow 1969.

NOTE: Samples were taken throughout the season from the sample block for tuber weight and number of different sizes. After harvest estimates were made of tuber infection with Oospora, Rhizoctonia, Helminthosporium and Phoma.

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Standard errors per plot. Total tubers, tons:
Whole plot: 0.629 or 3.4% (9 d.f.)
Sub plot: 1.984 or 10.6% (132 d.f.)

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70/W/P/1

SUMMARY OF RESULTS

	AP	M	PC	R	Mean
		TOTAL TUBERS: TONS			
		(1) and (2)			(±0.496)
F	14.53	16.20	18.30	14.24	15.82
FB	14.19	18.85	20.11	13.65	16.70
FC	15.26	20.05	23.67	15.50	18.62
FCB	16.01	19.79	22.06	16.52	18.59
H	16.39	19.21	16.83	17.52	17.49
HC	16.98	22.22	23.20	19.89	20.57
HCB	17.96	22.28	24.86	19.48	21.14
HOE	15.01	18.76	19.80	17.81	17.85
HCOE	14.86	20.51	21.42	18.54	18.83
HCOL	17.11	22.59	22.99	18.85	20.39
HCRL	16.50	19.89	19.95	18.44	18.69
HCORL	15.77	22.43	23.30	19.24	20.19
Mean (±0.314)	15.88	20.23	21.38	17.47	18.74

(1) (±0.992) For use in vertical and interaction comparisons only
(2) (±1.001) For use in horizontal and diagonal comparisons only

% WARE: 1.75 INCH

F	88.9	92.2	96.3	83.7	90.3
FB	85.3	89.7	96.8	76.9	87.2
FC	86.5	93.1	97.9	86.1	90.9
FCB	83.4	89.7	96.9	79.3	87.3
H	90.6	91.7	96.5	86.1	91.2
HC	84.9	93.3	97.8	87.6	90.9
HCB	85.3	90.6	98.1	87.9	90.5
HOE	87.4	91.8	97.4	86.2	90.7
HCOE	80.9	91.4	97.7	86.9	89.2
HCOL	86.2	93.0	98.1	89.5	91.7
HCRL	90.5	94.1	97.8	92.4	93.7
HCORL	90.9	94.7	98.2	92.4	94.0
Mean	86.7	92.1	97.5	86.2	90.6

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POTATOES

(70/R/P/2)

Chemicals and seed-borne fungi, Great Knott II 1970.

Design: 4 randomised blocks of 2 plots, split into 8. (Plus one extra block for sampling).

Area of each sub-plot: 0.0036. Area harvested: 0.0036.

Treatments: All combinations of:-
Whole plots: 1. Varieties: King Edward (KE), Pentland Crown (PC).
Sub-plots: 2. Seed treatment with chemicals: Benomyl powder (B), thiabendazole powder (T).
3. Rates of application: Diluted with kaolin dust to give 1% (1), 5% (2), 10% (3) a.i.
Together with additional treatments to sub-plots: None (0), kaolin dust (K).

NOTE: (1) All dust treatments were at 10 lb per ton of seed potatoes.

Basal applications: 10 cwt (13:13:20). Weedkiller: Linuron at 1 lb plus paraquat at 0.375 lb ion in 39 gals. Fungicide: Mancozeb at 1.2 lb in 40 gals on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 oz applied with the first mancozeb spray.

Cultivations, etc.: Ploughed: 28 Oct, 1969. Basal NPK applied: 23 Apr, 1970. Rotary cultivated: 7 May. Potatoes machine planted: 8 May. Weedkiller applied: 23 May. Fungicide and insecticide applied: 29 July. Fungicide applied: 14 Aug. Sprayed with undiluted BUV at 15 gals: 3 Sept. Lifted: 18 Sept. Previous crops: Barley 1968, fallow 1969.

NOTE: (2) Emergence counts were made, and samples were taken during the season for disease assessments. Diseases in the eyes of tubers were assessed after riddling.

Standard errors per plot. Total tubers, tons:
Whole plot: 1.004 or 7.6% (3 d.f.)
Sub plot: 0.578 or 4.4% (42 d.f.)

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SUMMARY OF RESULTS

	O	K	B1	B2	B3	T1	T2	T3	Mean
	TOTAL TUBERS: TONS								
	(1) and (2)								(±0.502)
KE	13.33	13.37	13.87	13.44	13.71	14.10	13.59	13.59	13.62
PC	12.69	12.91	13.24	12.86	12.95	12.42	12.43	12.82	12.79
Mean (±0.205)	13.01	13.14	13.55	13.15	13.33	13.26	13.01	13.20	13.21

(1) (±0.570) For use in vertical and diagonal comparisons only
(2) (±0.289) For use in horizontal and interaction comparisons only

	% WARE: 1.75 INCH								
KE	74.5	77.6	76.9	75.6	76.2	78.5	78.3	79.2	77.1
PC	95.6	95.9	95.8	96.4	96.0	95.4	95.9	95.2	95.8
Mean	85.0	86.7	86.4	86.0	86.1	87.0	87.1	87.2	86.4

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POTATOES

(70/W/P/2)

Nematodes and Verticillium - Woburn Broadmead I 1970.

Design: 4 randomised blocks of 4 plots.

Area of each plot: 0.0094. Area harvested: 0.0036.

Treatments:
Chemicals: None (O), methyl bromide at 870 lb (M) 'Temik' (aldicarb) at 6 lb a.i. (T), benomyl at 20 lb a.i. (B).

Basal applications: 10 cwt (13:13:20), 9 cwt Epsom salts. Weedkiller: Linuron at 1.5 lb plus paraquat at 0.37 lb ion in 33 gals, paraquat at 0.025 lb ion in 28 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz in 37 gals on one occasion with mancozeb.

Cultivations: Rotary cultivated twice: 10 Sept, 1969, 10 Oct. Deep-tine cultivated: 2 Jan, 1970. NPK applied: 2 Apr. Mg applied: 8 Apr. Methyl bromide applied under gas tight sheet: 22 Apr. Gas tight sheet removed: 29 Apr. 'Temik' and benomyl applied, rotary cultivated, potatoes planted: 30 Apr. Linuron plus paraquat applied: 13 May. Paraquat applied between rows: 2 June. Grubbed, rotary ridged: 6 June. Fungicide with insecticide applied: 31 July. Fungicide applied: 18 Aug. Sprayed with undiluted BOV at 20 gals: 7 Sept. Lifted: 15 Sept. Variety: Pentland Dell. Previous crops: Winter wheat 1968, potatoes 1969.

NOTE: Soil samples were taken after lifting for Heterodera rostochiensis cyst counts.

Standard error per plot:
Total tubers, tons: 1.313 or 19.3% (9 d.f.)

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70/W/P/2

SUMMARY OF RESULTS

O	M	T	B	Mean
		TOTAL TUBERS: TONS		
		(±0.656)		
1.96	14.18	6.26	4.84	6.81
		% WARE: 1.75 INCH		
34.5	91.8	84.1	69.4	70.0

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POTATOES

(70/W/P/3)

Much fertiliser and FYM - Woburn Stackyard C 1970.

Design: 3 blocks of 10 plots.

Area of each plot: 0.0021. Area harvested: 0.0009.

Treatments: FYM, fertilisers and methods of application:
F2DE, F4DE, F2DES, F4DES, F2S, F4S, D2, D4, D2F2DE, D4F2DE.
D2:D4 = 15:30 tons FYM dug in.
F2:F4 = 2 cwt N, 3 cwt P_2O_5, 3 cwt K_2O: 4 cwt N, 6 cwt P_2O_5, 6 cwt K_2O as 'Nitro-Chalk' 21% N and compound fertiliser (0:20:20).
DE:S:DES= Fertiliser applied deeply: shallowly: half deeply and half shallowly.

Basal applications: 5 cwt Epsom salts. Insecticides: Dimethoate at 4.8 fl oz in 40 gals. Menazon at 0.25 lb in 40 gals on two occasions with fungicide. Fungicide: Captafol ('Sanspor' at 2.5 pts in 40 gals) on two occasions with menazon.

Cultivations, etc.: Ploughed: 11 Nov, 1969. FYM and deeply applied PK applied and dug in: 3 Apr, 1970. Deep N and Mg applied, rotary cultivated twice, shallow N, PK applied and raked in, potatoes planted: 4 May. Ridged up: 19 May. Gaps replanted: 10 June. Dimethoate applied: 17 June. Menazon and fungicide applied: 6 July, 29 July. Lifted: 29 Sept. Variety: Desiree. Previous crops: Fallow 1968 and 1969.

NOTES: (1) Soil samples were taken in the spring for pH determinations.
(2) Leaf samples were taken in July for K analysis.
(3) Plant samples were taken at harvest for N, P and K content, and dry matter determinations.

Standard error per plot.
Total tubers, tons: 0.600 or 2.9% (18 d.f.)

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70/W/P/3

SUMMARY OF RESULTS

F2DE	F4DE	F2DES	F4DES	F2S	F4S	D2	D4	D2F2DE	D4F2DE	Mean
TOTAL TUBERS: TONS (±0.346)										
20.87	25.19	20.45	25.43	18.56	21.38	11.98	15.31	24.32	26.20	20.97
% WARE: 1.5 INCH										
94.7	96.2	94.6	96.9	96.4	96.2	89.8	93.0	95.9	95.8	95.0

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POTATOES

(70/R/P/5)

Chitting, spacing and seed size, Long Hoos IV 1970.

Design: 2 randomised blocks of 4 plots split into 8.

Area of each sub-plot: N plots - 0.0029, W plots - 0.0037.
Area harvested: N plots - 0.0029, W plots - 0.0037.

Treatments: All combinations of:-
Whole plots: 1. Distance between rows: 28 inches (N), 36 inches (W).
2. Seed size: Large (L), small (S).
Sub-plots: 3. Chitting: Early (E), late (L).
4. Spacing of seed within the row:
Seed 12 (1), 16 (2), 20 (3), 24 (4) inches apart within the row.

Basal applications: 10 cwt (13:13:20). Weedkiller: Linuron at 1 lb in 39 gals. Fungicide: Mancozeb at 1.2 lb in 40 gals on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 oz applied with the first mancozeb spray. Seed treatment: 1% benomyl dust at 10 lb dust per ton of tubers.

Cultivations, etc.: Ploughed: 28 Oct, 1969. Basal NPK applied: 23 Apr, 1970. Plots rotary cultivated, potatoes hand planted: 4 May. Weedkiller applied: 23 May. Fungicide and insecticide applied: 29 July. Fungicide applied: 14 Aug. Sprayed with undiluted BOV at 15 gals: 16 Sept. Lifted: 29 Sept. Variety: King Edward. Previous crops: Barley 1968, s.beans 1969.

NOTE: Emergence counts were made, and stem and plant counts made prior to lifting but after burning off.

Standard error per sub-plot.
Total tubers, tons: 1.029 or 8.4% (24 d.f.)

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70/R/P/5

SUMMARY OF RESULTS

TOTAL TUBERS: TONS

	1	2	3	4	Mean
		(±0.364)*			(±0.236)
N	13.81	13.09	13.06	12.45	13.10
W	12.54	11.38	11.63	10.25	11.45
		(±0.364)*			(±0.236)
L	13.99	12.65	13.03	12.18	12.96
S	12.37	11.81	11.67	10.52	11.59
		(±0.364)			(±0.182)
E	13.56	12.16	12.33	10.64	12.17
L	12.79	12.31	12.36	12.06	12.38
Mean (±0.257)	13.18	12.23	12.35	11.35	12.28

	L	S	E	L
	(±0.334)		(±0.257)*	
N	14.48	11.72	13.24	12.97
W	11.44	11.46	11.11	11.79
			(±0.257)*	
		L	13.01	12.92
		S	11.34	11.85

* For use in horizontal and interaction comparisons only

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70/R/P/5

% WARE: 1.75 INCH

	1	2	3	4	Mean
N	86.0	89.3	89.2	91.5	89.0
W	85.5	88.7	91.2	91.1	89.1
L	82.0	87.3	87.7	89.4	86.6
S	89.4	90.7	92.8	93.2	91.5
E	86.3	90.6	89.5	91.3	89.4
L	85.2	87.4	90.9	91.3	88.7
Mean	85.7	89.0	90.2	91.3	89.1

	L	S	E	L
N	87.0	91.0	89.3	88.7
W	86.1	92.1	89.5	88.7
		L	87.2	85.9
		S	91.6	91.5

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POTATOES

(70/W/P/5)

Chemicals and scab - Woburn Gt Hill Bottom I 1970.

Design: 5 randomised blocks of 6 plots.

Area of each plot: 0.0043. Area harvested: 0.0021.

Treatments:
Chemicals: None (O), captafol at 70 lb a.i. (C), maneb at 70 lb a.i. (M), quintozene at 70 lb a.i. (Q), tecnazene at 35 lb a.i. (T1), tecnazene at 70 lb a.i. (T2) as dusts.

Basal applications: 10 cwt (13:13:20). Weedkiller: Linuron at 1.0 lb plus paraquat at 0.37 lb ion in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz in 37 gals on one occasion with mancozeb.

Cultivations, etc.: Rotary cultivated: 15 Oct, 1969. Deep-tine cultivated: 3 Nov. NPK applied: 2 Apr, 1970. Treatments applied, rotary cultivated, potatoes planted: 30 Apr. Weedkiller applied: 15 May. Grubbed: 3 June. Rotary ridged: 5 June. Fungicide applied with insecticide: 31 July. Fungicide applied: 18 Aug. Sprayed with undiluted BOV at 20 gals: 7 Sept. Lifted: 16 Sept. Variety: Maris Piper. Previous crops: Potatoes 1968, fallow 1969.

NOTE: Soil samples were taken from all plots except those receiving maneb, in May and after harvest for analysis of treatment residues. Samples were taken after harvest for estimates of scab infection.

Standard error per plot.
Total tubers, tons: 1.656 or 12.5% (20 d.f.)

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70/W/P/5

SUMMARY OF RESULTS

O	C	M	Q	T1	T2	Mean
TOTAL TUBERS: TONS (±0.741)						
15.07	13.74	14.94	13.52	12.12	10.28	13.28
% WARE: 1.5 INCH						
92.4	93.9	92.2	92.1	91.4	90.8	92.1

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POTATOES

(70/W/P/6)

Systemic nematicide - Woburn Butt Close 1970.

Design: 3 blocks of 8 plots.

Area of each plot: 0.0026. Area harvested: 0.0013.

Treatments: Nematicide:
Broadcast: None (S0), 4.3 (S1), 8.6 (S2), 17.2 lb (S4) of 10% granules of DP 1410 (S-methyl 1-(dimethylcarbamoyl)-N-((methylcarbamoyl)oxy)thioformimidate).
Broadcast and Foliar spray: 4.3 + 2 lb (S1F1), 4.3 + 4 lb (S1F2), 8.6 + 2 lb (S2F1), 8.6 + 4 lb (S2F2) of DP 1410.

Basal applications: 10 cwt (13:13:20) broadcast, plus 7.5 cwt (13:13:20) placed. Weedkiller: Linuron at 1 lb in 33 gals. Fungicide: Mancozeb at 1.2 lb in 37 gals on two occasions. Insecticide: Demeton-s-methyl at 3.5 fl oz on one occasion with fungicide.

Cultivations, etc.: Deep-tine cultivated: 3 Nov, 1969. NPK broadcast, deep-tine cultivated, 2 Apr, 1970. Nematicide broadcast: 4 May. NPK placed, potatoes planted, inter-row rotary cultivated and earthed up: 5 May. Weedkiller applied: 15 May. Nematicide spray applied: 3 June. Fungicide applied: 31 July, 18 Aug. Insecticide applied: 31 July. Lifted: 29 Sept. Variety: Pentland Crown. Previous crops: Potatoes 1968, 1969.

NOTE: Soil samples were taken in May and after harvest for egg and larvae counts of Heterodera rostochiensis.

Standard error per plot.
Total tubers, tons: 1.413 or 8.4% (14 d.f.)

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70/W/P/6

SUMMARY OF RESULTS

S0	S1	S2	S4	S1F1	S1F2	S2F1	S2F2	Mean
TOTAL TUBERS: TONS (±0.816)								
9.43	18.23	19.45	19.04	16.38	16.84	18.40	17.59	16.92
% WARE: 1.5 INCH								
89.9	92.9	94.0	92.7	93.3	93.4	94.3	91.5	92.8

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POTATOES

(70/R/P/11)

Varieties and 'Ethrel', Long Hoos IV 1970.

Design: 4 blocks of 8 plots, randomisation restricted.

Area of each plot: 0.0051. Area harvested: 0.0006.

Treatments: All combinations of:-
1. Varieties: Arran Pilot (AP), King Edward (KE).
2. 'Ethrel'*: Seed soaked for 1 hour before planting: Not soaked (E0),'Ethrel' at 60 p.p.m. (E1), 120 p.p.m. (E2), 240 p.p.m. (E4).

* 2-chloroethylphosphonic acid.

Basal applications: 1120 lb (13:13:20). Weedkiller: Linuron at 1 lb in 39 gals. Fungicide: Mancozeb at 1.2 lb in 40 gals on 2 occasions. Insecticide: Demeton-s-methyl at 3.5 oz with first mancozeb spray.

Cultivations, etc.: Ploughed: 28 Oct, 1969. Basal NPK applied: 23 Apr, 1970. Plots rotary cultivated, potatoes machine planted: 30 Apr. Weedkiller applied: 23 May. Grubbed and rotary ridged: 17 June. Fungicide and insecticide applied: 29 July. Fungicide applied: 14 Aug. Lifted: 9 Sept. Previous crops: Barley 1968, spring beans 1969.

NOTE: Samples were taken every month for estimation of leaf areas, tuber numbers and tuber size distribution.

Standard error per plot.
Total tubers, tons: 1.224 or 11.9% (21 d.f.)

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70/R/P/11

SUMMARY OF RESULTS

	E0	E1	E2	E4	Mean
	TOTAL TUBERS: TONS				
		(±0.612)			(±0.306)
AP	7.95	9.60	7.91	7.65	8.28
KE	11.92	12.05	12.42	12.65	12.26
Mean (±0.433)	9.93	10.83	10.17	10.15	10.27
	% WARE: 1.5 INCH				
AP	90.6	94.2	94.0	92.9	92.9
KE	94.7	94.2	92.7	94.9	94.1
Mean	92.7	94.2	93.3	93.9	93.5

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POTATOES

(70/R/P/12)

Comparison of fungicides - Long Hoos IV 1970.

Design: 6 x 6 Latin square.

Area of each plot: 0.0129. Area harvested: 0.0043.

Treatments:

No fungicide	(O)
Fentin acetate at 0.1 lb plus maneb at 0.03 lb	(1A3M)
Fentin acetate at 0.3 lb plus maneb at 0.01 lb	(3A1M)
Fentin acetate at 0.1 lb plus maneb at 0.03 lb plus 10 lb wax	(1A3MW)
Dibutyltin diacetate at 0.7 lb	(D)
Fentin sulphide at 0.35 lb	(S)

All the fungicides were applied in 70 gals.

Basal applications: 1120 lb (13:13:20). Weedkiller: Linuron at 1 lb in 39 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.

Cultivations, etc.: Deep-tine cultivated: 10 Oct, 1969. Rotary cultivated: 15 Oct. Deep-tine cultivated: 20 Dec. Basal NPK applied: 23 Apr, 1970. Rotary cultivated, potatoes machine planted: 1 May. Weedkiller applied: 23 May. Grubbed and rotary ridged: 18 June. Insecticide applied: 30 July. Fungicide sprays applied: 4 Aug. Sprayed with undiluted BOV at 15 gals: 3 Sept. Lifted: 16 Sept. Variety: King Edward. Previous crops: Barley 1968, spring beans 1969.

Standard error per plot.
Total tubers, tons: 0.626 or 5.3% (20 d.f.)

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70/R/P/12

SUMMARY OF RESULTS

O	1A3M	3A1M	1A3MW	D	S	Mean
			TOTAL TUBERS: TONS			
			(±0.256)			
12.02	12.15	11.81	11.64	11.71	11.95	11.88
			% WARE: 1.5 INCH			
90.2	91.3	92.0	90.6	90.9	91.7	91.1

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POTATOES

(70/R/P/13)

Blight reference plots, Long Hoos IV 1970.

Design: 4 randomised blocks of 3 plots, split into 2.

Area of each sub plot: 0.0071. Area harvested: 0.0067.

Treatments: All combinations of:-
Whole plots: 1. Fungicide spray: None (O), mancozeb at 1.2 lb in 40 gals on 2 occasions (F), mancozeb at 1.2 lb in 40 gals on 2 occasions, plots used for sampling only (no yields recorded) (FS).
Sub plots: 2. Varieties: King Edward (KE), Pentland Crown (PC).

Basal applications: 1120 lb (13:13:20). Weedkiller: Linuron at 1 lb in 39 gals. Insecticide: Demeton-s-methyl at 3.5 oz in 40 gals.

Cultivations, etc.: Deep-tine cultivated: 10 Nov, 1969. Rotary cultivated: 15 Oct. Deep-tine cultivated: 20 Oct. Basal NPK applied: 23 Apr, 1970. Rotary cultivated, potatoes machine planted: 1 May. Weedkiller applied: 23 May. Grubbed and rotary ridged: 18 June. Insecticide applied to all plots, mancozeb applied to F and FS plots: 13 July. Mancozeb applied to F and FS plots: 14 Aug. Sprayed with undiluted BOV at 15 gals: 3 Sept. Lifted: 16 Sept. Previous crops: Barley 1968, spring beans 1969.

NOTE: Tubers were examined for blight (Phytophthora infestans).

Standard error per sub plot.
Total tubers, tons: Sub plot: 0.572 or 5.7% (6 d.f.)

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SUMMARY OF RESULTS

	KE	PC	Mean
	TOTAL TUBERS: TONS (±0.286)*		
O	10.95	9.59	10.27
F	10.55	9.29	9.92
Mean (±0.202)	10.75	9.44	10.10
	% WARE: 1.5 INCH		
O	89.7	97.8	93.8
F	90.3	97.8	94.1
Mean	90.0	97.8	93.9

* For use in horizontal and interaction comparisons only

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GRASS

(70/R/G/1)

Anhydrous ammonia, aqueous ammonia and urea solution, Bones Close 1970.

Design: 4 randomised blocks of 22 plots.

Area of each plot: 0.0184. Area harvested: 0.0054.

Treatments: None (N0) (2 plots* per block) and all combinations of:-

1. Nitrogen fertiliser:
   - Injected:
     - Anhydrous ammonia (IA)
     - Aqueous ammonia (IQ)
     - Urea solution (IU)
   - Broadcast 'Nitro-Chalk':
     - Applied in 3 equal dressings (BD)
     - Applied as a single dressing (BS)
2. N: 1 (N1), 2 (N2), 3 (N3), 4 (N4) cwt N (total for the season).

Basal applications: 8 cwt (0:14:28).

Cultivations, etc.: Remains of partly burnt straw from a fire at the farm in autumn 1968 spread over field: 29 Dec, 1969 to 8 Jan, 1970. Basal PK applied: 17 Mar. Aqueous ammonia injected, anhydrous ammonia injected (IA1 and IA2* plots): 19 Mar. Urea injected: 20 Mar. 'Nitro-Chalk' applied (treatment BS and first dressing of BD): 21 Mar. Anhydrous ammonia injected (excluding IA1 plots): 9 Apr. Cut 3 times: 3 June, 4 Aug, 19 Oct. 'Nitro-Chalk' applied after first 2 cuts for BD treatment.

* The anhydrous ammonia injector did not function properly for IA1 and IA2 on 19 Mar, and on 9 Apr, treatment IA2 was repeated on one of the N0 plots in each block. Yields from the IA treatments have been omitted from the analysis.

NOTE: Grass samples were taken to determine dry matter and percentage of N, P and K. Percentage of Mg was determined in some samples.

Standard errors per plot. Dry matter, cwt:

1st cut:	3.55 or 7.9% (45 d.f.)
2nd cut:	1.92 or 19.1% (45 d.f.)
3rd cut:	2.50 or 17.6% (45 d.f.)
Total of 3 cuts:	5.14 or 7.4% (45 d.f.)

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70/R/G/1

SUMMARY OF RESULTS

DRY MATTER: CWT

	IQ	IU	BD	BS	Mean
		1ST CUT			
		(±1.78)			(±0.89)
N1	46.3	43.3	42.6	46.7	44.7
N2	45.6	44.3	47.3	43.1	45.1
N3	45.1	44.5	48.0	43.4	45.2
N4	46.3	41.9	46.0	41.6	43.9
Mean (±0.89)	45.8	43.5	46.0	43.7	44.7

NO 36.7
IA N2 38.8
IA N3 41.6
IA N4 39.6

		2ND CUT			
		(±0.96)			(±0.48)
N1	7.5	7.7	8.7	7.6	7.9
N2	9.3	11.1	10.2	10.0	10.1
N3	10.5	10.4	10.8	11.8	10.9
N4	11.7	9.9	12.4	11.6	11.4
Mean (±0.48)	9.7	9.8	10.5	10.3	10.1

NO 3.1
IA N2 8.5
IA N3 11.2
IA N4 9.5

Mean D.M. % (All plots): 1st cut: 21.2
2nd cut: 25.4

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70/R/G/1

DRY MATTER: CWT

	IQ	IU	BD	BS	Mean
		3RD CUT			
		(±1.25)			(±0.62)
N1	3.7	3.9	13.1	5.1	6.5
N2	11.0	15.0	18.8	13.0	14.5
N3	15.8	18.3	18.0	17.2	17.3
N4	21.5	17.9	18.0	16.3	18.4
Mean (±0.62)	13.0	13.8	17.0	12.9	14.2

NO 2.1
IA N2 14.5
IA N3 17.6
IA N4 19.6

TOTAL OF 3 CUTS

		(±2.57)			(±1.28)
N1	57.5	55.0	64.4	59.4	59.1
N2	65.9	70.4	76.3	66.1	69.7
N3	71.4	73.1	76.9	72.4	73.4
N4	79.5	69.7	76.4	69.5	73.8
Mean (±1.28)	68.6	67.0	73.5	66.9	69.0

NO 41.9
IA N2 61.7
IA N3 70.3
IA N4 68.7

Mean D.M. % (All plots): 3rd cut: 24.4
Total of 3 cuts: 23.7

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GRASS

(70/R/G/3)

Weedkiller and aqueous N, Road Piece 1970, permanent grass.

Design: 4 randomised blocks of 28 plots.

Area of each plot: 0.0007. Area harvested: 0.0004.

Treatments: All combinations of:-

1. Weedkiller (dichlorprop/MCPA): None (H0), 20 (H1), 40 (H2), 60 (H3) oz total a.e. on 2 occasions.
2. Forms of nitrogen (on 2 occasions): Solid, as 'Nitro-Chalk' (21% N) applied immediately after the weedkiller (S), liquid as urea/ammonium nitrate (26% N) mixed with weedkiller (L).
3. Levels of nitrogen: 0.3 (N1), 0.6 (N2), 0.9 (N3) cwt N on each occasion.

Together with 4 additional treatments:
SN2 E HD, SN2 E H1, SN2 E H2, SN2 E H3
where 'Nitro-Chalk' was applied early (E) and the HD plots were treated with weedkiller on 2 occasions (Dalapon at 4 lb a.i. in 28 gals).

NOTE: The dichlorprop/MCPA was applied in 28 gals where solid fertiliser was used. The liquid fertiliser (with or without weedkiller) was applied as a spray in 10, 20 and 30 gals for rates 1, 2 and 3 respectively.

Basal applications: 560 lb (0:14:28).

Cultivations, etc.: Basal PK applied: 10 Apr, 1970. N applied to E plots: 27 Apr. Remaining N treatments and weedkillers (including dalapon) applied: 19 May. Cut: 16 June. N applied to E plots: 22 June. Remaining N treatments and weedkillers (including dalapon) applied: 30 June. Cut second time: 15 Oct.

NOTES: (1) Soil samples were taken for pH in May. Scores were made of weedkiller scorch and weed control. Scores were also made for grass cover and for fine-leaved grasses. On blocks II and IV the proportion of weeds to grasses at the second cut was determined.

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(2) On the second cut on one plot - L N3 H0 the material harvested was mainly docks. An estimated value was used in the analysis for second cut and total of 2 cuts.

(3) The percentage of N in herbage was determined.

Standard errors per plot. Dry matter: cwt.

1st cut:	3.92 or 16.4%	(69 d.f.)
2nd cut:	3.65 or 14.0%	(68 d.f.)
Total of 2 cuts:	5.09 or 10.2%	(68 d.f.)

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70/R/G/3

SUMMARY OF RESULTS

DRY MATTER: CWT

	N1	N2	N3	H0	H1	H2	H3	Mean
				1ST CUT				
		(±0.98)			(±1.13)			(±0.57)
S	24.1	24.2	23.5	26.5	25.5	21.7	22.0	23.9
L	23.4	24.3	23.4	25.1	24.9	22.9	21.9	23.7
					(±1.38)			(±0.69)
		N1		24.7	27.6	21.7	20.9	23.7
		N2		27.1	24.0	23.2	22.7	24.3
		N3		25.4	24.1	21.9	22.3	23.4
		Mean (±0.80)		25.8	25.2	22.3	22.0	23.8

SN2 E H0	18.5
SN2 E H1	22.9
SN2 E H2	26.9
SN2 E H3	25.5

General mean: 23.8
Mean D.M. %: 30.9

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70/R/G/3

DRY MATTER: CWT

	N1	N2	N3	H0	H1	H2	H3	Mean
			2ND CUT					
		(±0.91)			(±1.05)			(±0.53)
S	26.4	27.2	30.2	30.4	27.1	27.7	26.6	27.9
L	21.4	24.7	26.4	25.9	23.3	24.1	23.3	24.1
					(±1.29)			(±0.65)
		N1		26.2	23.4	22.4	23.4	23.9
		N2		28.4	24.2	26.5	24.8	26.0
		N3		29.8	28.1	28.8	26.5	28.3
		Mean (±0.75)		28.1	25.2	25.9	24.9	26.0

SN2 E H0	8.6
SN2 E H1	28.5
SN2 E H2	24.1
SN2 E H3	28.1

General mean: 25.5
Mean D.M.%: 26.4

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70/R/G/3

DRY MATTER: CWT

	N1	N2	N3	H0	H1	H2	H3	Mean
	TOTAL OF 2 CUTS							
	(±1.27)			(±1.47)				(±0.73)
S	50.4	51.5	53.7	56.8	52.7	49.4	48.6	51.9
L	44.8	49.0	49.5	50.6	48.2	47.0	45.1	47.8
				(±1.80)				(±0.90)
	N1			50.9	51.0	44.1	44.3	47.6
	N2			55.5	48.2	49.8	47.5	50.2
	N3			54.7	52.2	50.8	48.9	51.6
	Mean (±1.04)			53.7	50.5	48.2	46.9	49.8

SN2 E H0	27.1
SN2 E H1	51.3
SN2 E H2	51.1
SN2 E H3	53.7

General mean: 49.2
Mean D.M. %:

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SWEET CORN

(70/G/SC/1)

Nitrogen and seed rates Rothamsted Garden Plots.

Design: 4 randomised blocks of 12 plots.

Area of each plot: 0.0031. Area harvested: 0.0012.

Treatments: All combinations of:-
1. Seed spacing: 3 in. (R1), 6 in. (R2), 12 in. (R3) in rows 2 feet apart.
2. Nitrogen: None (N0), 0.5 (N1), 1.0 (N2), 1.5 (N3) cwt as 'Nitro-Chalk'.

Basal applications: 1230 lb (0:14:28) broadcast. Insecticide: Phorate at 1.5 lb drilled at 4 in. depth in the rows. Weedkiller: Atrazine at 1.5 lb in 35 gals.

Cultivations, etc.: Basal PK applied: 21 Nov, 1969. Ploughed: 23 Dec. Insecticide applied, seed drilled: 15 May, 1970. Weedkiller applied: 20 May. N applied: 3 June. Harvested by hand: 9 Sept. Variety: Early King. Previous crops: Fallow 1968, potatoes 1969.

NOTE: Cobs were counted and weighed in 2 grades:
1. Large saleable, 2. Small saleable.

Standard errors per plot:

Total saleable cobs, cwt:	11.68 or 11.8% (33 d.f.)
Number of saleable cobs, thousands:	2.74 or 13.1 (33 d.f.)

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SUMMARY OF RESULTS

	N0	N1	N2	N3	Mean
		TOTAL SALEABLE COBS: CWT			
		(±5.84)			(±2.92)
R1	88.6	112.8	138.7	118.2	114.6
R2	86.6	92.0	108.1	107.3	98.5
R3	78.0	78.7	97.4	80.6	83.7
Mean (±3.37)	84.4	94.5	114.7	102.0	98.9
		NUMBER OF SALEABLE COBS: THOUSANDS			
		(±1.37)			(±0.68)
R1	20.5	24.9	31.8	25.8	25.8
R2	18.6	18.4	21.4	21.2	19.9
R3	16.1	16.8	19.5	16.1	17.1
Mean (±0.79)	18.4	20.0	24.2	21.0	20.9

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MIXED CROPS

(70/R/M/4 and 70/W/M/4)

Ammonium phosphates for grass and barley, Rothamsted (R) West Barnfield II and Woburn (W) Stackyard Series B sideland, 1970.

Design (each field):-
Ryegrass: 3 randomised blocks of 16 plots.
Barley: 3 randomised blocks of 12 plots.

Area of each plot:
Ryegrass: 0.0010. Area harvested: 0.0006.
Barley: 0.0003. Area harvested: 0.00003.

Treatments:

No fertiliser	(O)
Mono-ammonium phosphate + ammonium sulphate*	(A)
Mono-sodium phosphoramidate + ammonium sulphate*	(M)
Sodium phosphordiamidate + ammonium sulphate*	(D)
Phosphoryl triamide	(T)

* To give the same N:P ratio as treatment T.

Ammonium nitrate to grass: 200 lb N in seedbed	(N)
Ammonium nitrate to barley: 100 lb N West Barnfield II (R), 150 lb N Stackyard B (W)	(N)

The treatments described above were applied either singly or in combinations, as shown below:-

To ryegrass: O (4 plots per block) and all combinations of:-
1. NP fertilisers: A, M, D, T.
2. Rates of fertiliser: To give 10 lb P, 13.5 lb N from NP fertiliser, plus ammonium nitrate at rate given above (1+N), to give 20 lb P, 27 lb N from NP fertiliser, plus ammonium nitrate (2+N), to give 20 lb P, 27 lb N from NP fertiliser (2).

To barley: O, N, monosodium phosphate at 10 lb P (P1) and 20 lb (P2) and all combinations of:-
1. NP fertilisers: A, M, D, T.
2. Rates of fertiliser: To give 10 lb P, 13.5 lb N from NP fertiliser, plus ammonium nitrate at rate given above (1+N), to give 20 lb P, 27 lb N from NP fertiliser, plus ammonium nitrate (2+N).

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Basal applications:
Ryegrass: 100 lb K as potassium sulphate. Weedkiller: Mecoprop ('Clovotox' at 4 pints in 45 gals).
Barley: 50 lb K as potassium sulphate.

Cultivations, etc.:-
West Barnfield II (R): Ploughed: 29 Sept, 1969.
Ryegrass: Treatment fertilisers and basal K applied: 2 Apr, 1970. Seed drilled at 30 lb: 17 Apr. Weedkiller applied: 29 May. Cut twice: 5 Aug and 16 Sept. Variety: S22 Italian.
Barley: Treatment fertilisers and basal K applied: 2 Apr, 1970. Seed drilled at 150 lb: 16 Apr. Cut green: 10 and 29 June (separate areas). Variety: Julia. Previous crops: Barley 1968 and 1969.
Stackyard B (W): Ploughed: 19 Nov, 1969.
Ryegrass: Treatment fertilisers and basal K applied: 3 Apr, 1970. Seed drilled at 30 lb: 7 Apr. Weedkiller applied: 29 May. Cut twice: 22 July and 17 Sept. Variety: S22 Italian.
Barley: Treatment fertilisers and basal K applied: 3 Apr, 1970. Seed drilled at 150 lb: 7 Apr. Cut green: 3 and 24 June (separate areas). Variety: Julia. Previous crops: Fallow 1968 and 1969.

NOTE: Crop samples were taken for determination of dry matter and N %.

Standard errors per plot.

Ryegrass, dry matter, cwt:			
West Barnfield II (R):	1st cut:	1.36 or 13.5%	(22 d.f.)
	2nd cut:	1.44 or 8.7%	(22 d.f.)
	Total of 2 cuts:	2.08 or 7.9%	(22 d.f.)
Stackyard B (W):	1st cut:	2.08 or 19.2%	(22 d.f.)
	2nd cut:	2.20 or 13.0%	(22 d.f.)
	Total of 2 cuts:	3.62 or 13.0%	(22 d.f.)
Barley, green crop, dry matter, cwt:			
West Barnfield II (R):	1st cut:	2.53 or 19.2%	(18 d.f.)
	2nd cut:	5.88 or 15.7%	(18 d.f.)
Stackyard B (W):	1st cut:	5.17 or 21.0%	(18 d.f.)
	2nd cut:	6.04 or 10.5%	(18 d.f.)

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70/R&W/M/4

SUMMARY OF RESULTS

RYEGRASS

DRY MATTER: CWT

WEST BARNFIELD II (R)

	A	M	D	T	Mean
		1ST CUT			
		(±0.78)			(±0.39)
1+N	12.1	9.7	10.8	11.3	11.0
2+N	9.7	11.1	13.3	10.3	11.1
2	7.8	8.3	9.0	7.2	8.1
Mean (±0.45)	9.8	9.7	11.0	9.6	10.0

O: 5.5

General mean: 8.9

Mean D.M. %: 35.1

2ND CUT

			(±0.83)		(±0.42)
1+N	17.6	19.4	19.3	18.0	18.6
2+N	16.9	18.1	18.5	17.7	17.8
2	13.3	12.9	13.4	12.3	13.0
Mean (±0.48)	15.9	16.8	17.1	16.0	16.5

O: 10.4

General mean: 14.9

Mean D.M. %: 23.0

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70/R&T/M/4

RYEGRASS

DRY MATTER: CWT

WEST BARNFIELD II (R)

TOTAL OF 2 CUTS

	A	M	D	T	Mean
		(±1.20)			(±0.60)
1+N	29.7	29.1	30.1	29.3	29.6
2+N	26.6	29.2	31.8	28.0	28.9
2	21.1	21.2	22.4	19.5	21.0
Mean (±0.69)	25.8	26.5	28.1	25.6	26.5

C: 15.9

General mean: 23.9

Mean D.M. %: 29.0

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70/R&W/M/4

RYEGRASS

DRY MATTER: CWT

STACKYARD B (W)

	A	M	D	T	Mean
		1ST CUT			
		(±1.20)			(±0.60)
1+N	15.2	14.4	12.5	14.7	14.2
2+N	12.5	13.6	15.1	14.6	13.9
2	4.5	4.1	5.4	3.6	4.4
Mean (±0.69)	10.7	10.7	11.0	11.0	10.8

C: 1.1

General mean: 8.4

Mean D.M. %: 31.1

2ND CUT

			(±1.27)		(±0.64)
1+N	22.0	20.2	19.2	23.6	21.2
2+N	21.5	21.3	21.7	22.3	21.7
2	7.5	8.4	9.1	6.9	8.0
Mean (±0.73)	17.0	16.6	16.7	17.6	17.0

C: 5.1

General mean: 14.0

Mean D.M. %: 32.8

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70/R&W/M/4

RYEGRASS

DRY MATTER: CWT

STACKYARD B (W)

TOTAL OF 2 CUTS

	A	M	D	T	Mean
		(±2.09)			(±1.04)
1+N	37.2	34.6	31.7	38.3	35.4
2+N	34.0	34.9	36.8	36.9	35.6
2	12.0	12.6	14.5	10.5	12.4
Mean (±1.21)	27.7	27.4	27.7	28.6	27.8

O: 6.3

General mean: 22.4

Mean D.M. %: 32.0

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70/R&T/M/4

BARLEY

GREEN CROP, DRY MATTER: CWT

WEST BARNFIELD II (R)

	P*	A	M	D	T	Mean
			1ST CUT			
			(±1.46)			(±0.65)
1+N	9.9	10.9	12.2	13.7	14.0	12.1
2+N	10.9	16.5	13.3	16.1	14.7	14.3
Mean (±1.03)	10.4	13.7	12.7	14.9	14.4	13.2
O:	6.5					
N:	10.8					
General mean:	12.5					
			2ND CUT			
			(±3.39)			(±1.52)
1+N	28.2	37.7	38.5	42.8	37.2	36.9
2+N	30.7	39.4	45.1	37.6	37.7	38.1
Mean (±2.40)	29.5	38.6	41.8	40.2	37.5	37.5
O:	22.8					
N:	31.4					
General mean:	35.8					

* Did not receive N

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70/R&H/M/4

BARLEY

GREEN CROP, DRY MATTER: CWT

STACKYARD B (W)

	P*	A	M	D	T	Mean
			1ST CUT			
			(±2.99)			(±1.34)
1+N	3.9	25.2	30.1	27.8	29.1	23.2
2+N	4.5	36.3	28.9	30.8	29.3	26.0
Mean (±2.11)	4.2	30.8	29.5	29.3	29.2	24.6
C:	4.9					
N:	27.0					
General mean:	23.2					
			2ND CUT			
			(±3.49)			(±1.56)
1+N	13.3	67.6	72.0	69.6	62.7	57.0
2+N	12.0	68.6	72.0	64.9	71.1	57.7
Mean (±2.47)	12.7	68.1	72.0	67.2	66.9	57.4
C:	13.6					
N:	66.8					
General mean:	53.6					

* Did not receive N

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METEOROLOGICAL RECORDS 1970 - ROTHAMSTED

(Departure from long-period means in brackets)

Month	Total sunshine: hours	Mean temperature: °F Air(1)	Dew point	In ground 1 ft.	4 ft.	Ground(2) frosts	Total rainfall:in. 1/1000 acre gauge	Rain(3) days	Drainage through 20 in. soil:in.	Wind(4) m.p.h.
Jan	33 (-18.6)	37.7 (+0.5)	36.3	39.6	43.7	17	2.93 (+0.42)	23	2.48	5.1
Feb	106 (+38.4)	36.4 (-1.7)	31.7	38.2	42.6	19	2.72 (+0.80)	20	2.51	8.1
Mar	95 (-21.5)	36.5 (-4.8)	32.3	38.6	41.3	23	1.96 (+0.07)	21	1.34	7.0
Apr	105 (-48.3)	43.2 (-2.7)	37.8	43.6	42.7	17	3.01 (+1.06)	21	1.44	7.3
May	202 (+ 8.3)	55.1 (+3.2)	47.4	53.4	47.5	0	0.93 (-1.22)	10	0.06	5.6
June	262 (+59.4)	60.9 (+3.6)	52.3	59.8	52.6	0	0.92 (-1.29)	7	Trace	5.1
July	156 (-34.7)	59.0 (-1.6)	52.9	59.7	55.5	1	2.06 (-0.49)	18	Trace	5.0
Aug	171 (- 8.9)	60.4 (+0.3)	54.1	60.9	57.0	0	2.53 (-0.05)	10	0.84	3.9
Sept	149 (+ 5.1)	57.5 (+1.4)	52.2	58.1	56.7	0	2.05 (-0.35)	12	0.69	4.5
Oct	97 (- 5.8)	51.2 (+2.0)	46.5	52.9	55.0	10	0.93 (-2.01)	12	Trace	6.1
Nov	52 (- 8.7)	45.1 (+2.7)	41.3	47.7	51.6	8	6.33 (+3.54)	23	5.03	6.4
Dec	36 (- 9.3)	37.9 (-0.6)	36.2	42.7	48.1	22	2.03 (-0.60)	17	1.18	6.1
Year	1464 (-44.8)	48.4 (+0.2)	43.4	49.6	49.5	117	28.40 (-0.12)	194	15.57	5.9

(1) Mean of maximum and minimum
(2) Number of nights grass min. was below 32 °F
(3) Number of days rainfall was 0.01 in. or more
(4) At 2 metres above ground level

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METEOROLOGICAL RECORDS 1970 - WOBURN

(Departure from long-period means in brackets)

Month	Total sunshine: hours	Mean temperature: °F Air(1)	Dew point	In ground 1 ft.	In ground 4 ft.	Ground(2) frosts	Total rainfall: in. 5 in. gauge	Rain(3) days	Wind(4) m.p.h.
Jan	32.3 (-19.7)	38.4 (+1.0)	36.5	39.6	44.5	17	2.20 (+0.09)	22	4.6
Feb	98.5 (+32.6)	36.8 (-1.1)	32.5	38.1	43.1	22	2.24 (+0.68)	20	6.8
Mar	101.8 (-16.4)	37.0 (-5.0)	33.7	38.6	41.8	23	1.76 (+0.11)	16	5.9
Apr	110.6 (-34.9)	44.1 (-2.5)	38.4	44.4	43.1	16	2.81 (+1.03)	22	6.3
May	203.2 (+19.7)	55.6 (+3.7)	47.4	54.6	47.8	1	0.26 (-1.92)	9	4.6
June	236.6 (+37.7)	60.9 (+3.1)	51.4	61.9	53.5	0	1.28 (-0.69)	8	4.5
July	160.5 (-20.1)	59.9 (-1.0)	52.1	60.6	56.3	0	1.66 (-0.58)	16	5.7
Aug	160.8 (-11.2)	60.3 (-0.2)	54.2	61.6	57.7	0	2.50 (+0.06)	11	3.8
Sept	159.4 (+25.1)	58.5 (+1.9)	52.3	58.5	57.4	0	1.54 (-0.53)	11	5.2
Oct	103.4 (+ 1.8)	51.5 (+1.5)	46.6	52.9	55.6	11	0.71 (-1.45)	8	6.4
Nov	60.7 (+ 2.0)	46.4 (+3.1)	41.2	47.7	52.1	10	5.14 (+2.67)	20	6.7
Dec	34.5 (-10.2)	38.6 (-0.4)	36.1	42.6	48.5	18	1.49 (-0.61)	12	4.9
Year	1462.3(+ 6.3)	49.0 (+0.3)	43.5	50.1	50.1	118	23.59 (-1.14)	175	5.5

(1) Mean of maximum and minimum
(2) Number of nights grass min. was below 32 °F
(3) Number of days rainfall was 0.01 in. or more
(4) At 2 metres above ground level

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METEOROLOGICAL RECORDS 1970 - SAXMUNDHAM

Month	Mean temperature: F Air(1)	Dew point	In ground under bare soil 1 ft.	Ground(2) frosts	Total rainfall:in. 5 in. gauge	Rain(3) days	Wind(4) m.p.h.
Jan	38.8	33.6	39.6	7	2.85	16	6.9
Feb	38.1	29.6	37.0	9	2.17	22	8.3
Mar	38.0	30.2	38.8	15	2.02	17	7.6
Apr	42.9	35.5	43.3	14	2.11	24	7.4
May	53.4	43.3	55.0	1	0.71	6	6.1
June	59.1	50.6	63.6	0	0.33	4+	5.2
July	58.3	49.4	63.0	0	1.10	9+	5.7
Aug	60.6	50.8	64.1	0	0.82	7	5.0
Sept	58.4	46.7	59.5	0	2.44	7	5.3
Oct	51.7	41.7	52.8	3	0.97	8	6.2
Nov	45.6	37.6	46.5	*	5.93	17	7.8
Dec	39.1	32.0	42.3	2+	1.34+	8+	6.2
Year	48.7	50.1	50.5	51+	22.79	145+	6.5

70/E/1

(1) Mean of maximum and minimum
(2) Number of nights grass min. was below 32 F
(3) Number of days rainfall was 0.01 in. or more
(4) At 2 metres above ground level
+ These figures may be underestimates
* Not recorded

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