ROTHAMSTED RESEARCH

Yields of the Field Experiments 1974

Full Table of Content

Crop Sequences

Crop Sequences, Rothamsted Research (1975) Yields Of The Field Experiments 1974, pp 140 - 283 **- DOI: https://doi.org/10.23637/ERADOC-1-119**

74/R/CS/1

LEVELS OF N AND K

Object: To study the residual effects of N, P and K fertilisers applied to grass 1958-1967 and further dressings of P and K to arable crops 1969-71 - Harwoods Piece.

Sponsor: F.V. Widdowson.

The seventeenth year, barley.

For previous years see 58/Cg/2(t), 59/Cg/2(t), 60/Ci/1, 61/Dg/1, 62/C/11, 63/C/7, 64/C/6(t), 65/C/6(t), 66/C/5, 67/C/4, 68/C/4(t), 69/R/CS/1(t), 70/R/CS/1(t), 71/R/CS/1(t) and 72-73/R/CS/1.

Design: 4 randomised blocks of 12 plots split into 2.

Whole plot dimensions: 2.13 x 16.5. Sub plot area harvested: 0.00118.

Treatments: All combinations of:-

Whole plots: 1. NPK residues:

To grass 1958-67			To potatoes 1971		NPK RES
N	P	K	P	K	
0	1	0	1	0	N0 P1 K0
1	1	0	1	0	N1 P1 K0
1	1	1	1	1	N1 P1 K1
1	1	2	1	2	N1 P1 K2
2	1	0	1	0	N2 P1 K0
2	1	1	1	1	N2 P1 K1
2	1	2	1	2	N2 P1 K2
3	1	0	1	0	N3 P1 K0
3	1	1	1	1	N3 P1 K1
3	1	2	1	2	N3 P1 K2
3	0	2	0	2	N3 P0 K2
3	2	2	2	2	N3 P2 K2

To grass: N1, 2, 3 = 38, 75, 113 kg N per cut. P1, 2 = 75, 150 kg P205 per annum. K1, 2 = 38, 75 kg K20 per cut.

To potatoes: P1, 2 = 125, 250 kg P205. K1, 2 = 125, 250 kg K20. All arable crops received basal N.

Sub plots: 2. Residues of muriate of potash applied in three equal dressings 1969-1971 (kg K20 total):

	K20 RES
None	0
376	376

https://doi.org/10.23637/ERADOC-1-119

Basal applications: Manures: 'Nitro-Chalk' at 310 kg. Weedkiller: Paraquat at 0.56 kg ion in 220 l.

Seed: Julia, dressed with ethirimol, sown at 190 kg.

Cultivations, etc.:- Ploughed: 10 Sept, 1973. Paraquat applied: 28 Mar, 1974. Power harrowed: 2 Apr. Seed sown and N applied: 3 Apr. Combine harvested: 27 Aug.

Standard errors per plot. Grain, tonnes/hectare:
Whole plot: 0.247 or 4.3% (33 d.f.)
Sub plot: 0.334 or 5.9% (36 d.f.)

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/1

TABLES OF MEANS

GRAIN: TONNES/HECTARE

K20 RES

	0	376	Mean
NPK RES			
N0 P1 K0	5.60	5.70	5.65
N1 P1 K0	5.80	5.42	5.61
N1 P1 K1	5.52	5.97	5.74
N1 P1 K2	5.36	5.72	5.54
N2 P1 K0	5.59	5.76	5.68
N2 P1 K1	5.82	5.94	5.88
N2 P1 K2	5.77	5.67	5.72
N3 P1 K0	5.98	5.99	5.98
N3 P1 K1	5.67	5.47	5.57
N3 P1 K2	5.75	5.25	5.50
N3 P0 K2	6.25	5.70	5.98
N3 P2 K2	5.39	5.53	5.46
Mean	5.71	5.68	5.69

STANDARD ERRORS OF DIFFERENCES

NPK RES	K20 RES	NPK RES K20 RES
0.175	0.068	0.242

Except when comparing means with same level of NPK RES 0.236

Mean D.M. % 81.2

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74/R/CS/2

GRAZED REFERENCE PLOTS

Object: To study the residual effects of N, P and K fertilisers, applied 1959 - 1970, on grazed grass which now receives basal N only - Highfield IX.

Sponsor: F.V. Widdowson.

The sixteenth year, old grass.

For previous years see 64/B/11(t), 65/B/2, 66/B/2(t), 67/B/2, 68/B/3, 69-70/R/CS/2, 71/R/CS/2(t), 72-73/R/CS/2.

Basal application: 190 kg N as 'Nitro-Chalk' in 2 equal dressings.

Cultivations, etc.:- N applied: 13 Mar, 1974, 8 July.

NOTE: Grass was grazed throughout the season, yields were not taken.

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74/R/CS/6

WHEAT AFTER INTENSIVE BARLEY

Object: To study the effects of different periods of pre-cropping with barley on yields and incidence of take-all (Gaeumannomyces graminis), in wheat - Little Knott I.

Sponsors: D. Hornby, G.A. Salt.

The 14th year, winter wheat, beans.

NOTE: Only one quarter of the original experiment is continued since 1973.

For previous years see 61/C/8(t), 62/C/7, 63-66/C/2, 67/C/2(t), 68/C/2(t), 69/R/CS/6(t), 70/R/CS/6(t), 71/R/CS/6(t), 72/R/CS/6(t) and 73/R/CS/6.

Design: 2 replicates of 10 plots fully randomised.

Whole plot dimensions: 4.27 x 20.1. Plot area harvested: 0.00572.

Treatments: Crop sequence (1961-74):

														CROPSEQN
O	BE	B	B	B	B	B	B	WW	F	WW	WW	WW	WW	1
WS	O	BE	B	B	B	B	B	WW	WW	WW	F	WW	WW	2
O	WS	O	BE	B	B	B	B	WW	WW	WW	F	BE	WW	3
BE	O	WS	O	BE	B	B	B	WW	WW	WW	WW	F	BE	4
WS	BE	O	WS	O	BE	B	B	WW	WW	WW	WW	WW	F	5
WS	WS	BE	O	WS	O	BE	B	WW	WW	WW	WW	WW	WW	6
B	B	B	B	B	B	B	B	WW	WW	WW	WW	WW	WW	7
WS	WS	WS	WS	WS	WS	WS	WS	WW	WW	WW	WW	WW	WW	8
WS	WW	WW	WW	WW	WW	WW	F	WW	WW	WW	WW	WW	WW	9
BE	WW	P	B	BE	WW	P	B	F	WW	WW	WW	WW	WW	10

where: B = barley, WS = spring wheat, WW = winter wheat, BE = beans, O = oats, P = potatoes, F = fallow.

Basal applications:

Wheat: Manures: (0:14:28) at 250 kg combine drilled, 'Nitro-Chalk' at 500 kg. Weedkillers: Chlortoluron ('Dicurane 80 WP' at 4.5 kg in 440 l) and dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 370 l).

Beans: Manures: (0:14 :28) at 400 kg placement drilled. Insecticide: Phorate at 1.1 kg as granules.

Seed: Wheat: Cappelle, sown at 200 kg.
Beans: Minor, sown at 220 kg.

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Cultivations, etc.:- All plots ploughed: 29 Sept, 1973.
Wheat: Power harrowed and seed sown: 22 Oct. 'Dicurane' applied: 25 Oct. N applied: 16 Apr, 1974. 'Banlene Plus' applied: 7 May. Combine harvested: 29 Aug.
Beans: Power harrowed, seed sown and spring-tine cultivated: 27 Mar, 1974. Insecticide applied: 13 June. Combine harvested: 14 Oct.
Fallow plots: Power harrowed: 27 Mar, 1974. Rotary cultivated: 11 June.

NOTE: The Field Plots Committee has decided that yields from this experiment should no longer be published because of known soil irregularities on the small area of the original experiment remaining.

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/10 and 74/W/CS/10

LONG TERM LIMING

Object: To study the effects of different amounts of lime on the yields of a range of crops. The effects of P K, and Mg are also studied - Rothamsted (R) Sawyers I and Woburn (W) Stackyard C.

Sponsor: J. Bolton.

The 13th year, potatoes.

For previous years see 'Details' 1967, 68/C/3(t), 69/R&W/CS/10, 70/R&W/CS/10(t) and 71-73/R&W/CS/10.

Design: 2 randomised blocks of 16 plots.

Whole plot dimensions: 6.40 x 18.3. Sub plot area harvested: 0.00117.

Treatments: All combinations of:-

Whole plots: 1. Ground chalk (tonnes CaCO3) (total applied 1962-63): LIME

Rothamsted (R)	Woburn (W)	R	W
None	None	0	0
5	5	5	5
10	12	10	12
20	19	20	19

2. Phosphate, applied cumulatively to previous dressings, as superphosphate (kg P2O5): P2O5

None	0
125	125

3. Potassium, applied cumulatively to previous dressings as muriate of potash (kg K2O): K2O

None	0
188	188

Sub plots: 4. Magnesium, applied 1974 only, as Epsom salts (kg Mg): MG

None	0
112	112

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74/R/CS/10 and 74/W/CS/10

Basal applications:
Sawyers I (R): Manures: 190 kg N as 'Nitro-Chalk'. Weedkillers: Linuron at 1.2 kg plus paraquat at 0.42 kg ion in 450 l. Fungicide and insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.
Stackyard C (W): Manures: 250 kg N as 'Nitro-Chalk'. Weedkillers: Aminotriazole at 4.5 kg plus ammonium thiocyanate at 4.1 kg in 370 l. Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide and insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

Seed: Sawyers I (R) and Stackyard C (W): Pentland Crown.

Cultivations, etc.:-
Sawyers I (R): Ploughed: 19 Nov, 1973. Basal N applied: 23 Apr, 1974. Treatment P, K and Mg applied, spike rotary cultivated, potatoes planted: 24 Apr. Weedkiller applied: 17 May. Grubbed: 19 June. Rotary ridged: 21 June. Fungicide with insecticide applied: 11 July. Fungicide applied: 2 Aug. Haulm mechanically destroyed: 10 Sept. Sprayed with undiluted BOV at 225 l: 19 Sept. Lifted: 30 Oct.
Stackyard C (W): Aminotriazole plus ammonium thiocyanate applied: 13 Sept, 1973. Subsoiled, tines 140 cm apart 50 cm deep: 25 Oct. Ploughed: 13 Nov. Spring-tine cultivated: 4 Apr, 1974. Basal N, treatment P, K and Mg applied: 16 Apr. Rotary cultivated, potatoes planted: 17 Apr. Weedkiller applied: 15 May. Rotary ridged: 12 June. Fungicide with insecticide applied: 19 July. Fungicide applied: 7 Aug. Haulm mechanically destroyed: 12 Sept. Sprayed with undiluted BOV at 170 l. Lifted: 30 Sept.

NOTES: (1) Leaf samples were taken in July for N, P, K, Ca and Mg analysis.
(2) Photographs were taken and growth scores made in June.
(3) 74/R/CS/10. Estimated values were used in the analysis for yields from one whole plot, LIME - 20, P2O5 - 125, K2O - 0, because there was both visual and analytical evidence that K residues from an unknown source affected growth over most of the plot area.
(4) 74/W/CS/10. An anomalous yield from one sub plot LIME - 12, P2O5 - 125, K2O - 188, MG - 112, was treated as missing. An estimated value was used in the analysis.

Standard errors per plot. Total tubers: tonnes/hectare.
Sawyers I (R). Whole plot: 3.85 or 13.0% (14 d.f.)
Sub plot: 4.05 or 13.7% (15 d.f.)
Stackyard C (W). Whole plot: 3.86 or 15.8% (15 d.f.)
Sub plot: 4.13 or 16.9% (15 d.f.)

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/10 and 74/W/CS/10

TABLES OF MEANS

SAWYERS I (R)

TOTAL TUBERS: TONNES/HECTARE

	P2O5		K2O		MG		
	0	125	0	188	0	112	Mean
LIME							
0	10.0	36.5	23.8	22.7	18.0	28.5	23.2
5	25.6	37.9	23.2	40.3	29.1	34.4	31.7
10	28.3	40.1	20.1	48.3	33.0	35.3	34.2
20	24.5	33.5	11.4	46.7	28.7	29.3	29.0
		P2O5					
		0	16.6	27.6	20.1	24.0	22.1
		125	22.6	51.4	34.3	39.7	37.0
				K2O			
				0	19.2	20.0	19.6
				188	35.2	43.8	39.5
Mean					27.2	31.9	29.5

	K2O	0		188	
	MG	0	112	0	112
LIME	P2O5				
0	0	11.2	14.2	3.6	11.0
	125	34.2	35.7	22.9	53.2
5	0	21.9	26.2	21.6	32.6
	125	22.6	22.0	50.3	56.7
10	0	18.2	18.2	37.3	39.3
	125	20.7	23.3	56.0	60.5
20	0	12.6	10.4	34.6	40.4
	125	12.4	10.2	55.3	56.3

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74/R/CS/10 and 74/W/CS/10

SAWYERS I (R)

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

	P2O5		K2O		MG		
	0	125	0	188	0	112	Mean
LIME							
0	81.9	95.9	92.2	85.5	82.5	95.3	88.9
5	98.7	97.7	97.2	99.2	98.2	98.2	98.2
10	98.9	97.6	97.4	99.1	98.0	98.5	98.2
20	97.6	94.9	93.2	99.3	96.6	95.9	96.2
		P2O5					
		0	94.8	93.7	91.8	96.7	94.2
		125	95.2	97.8	95.8	97.2	96.5
				K2O			
				0	94.2	95.8	95.0
				188	93.4	98.1	95.8
Mean					93.8	97.0	95.4

	K2O	0		188	
	MG	0	112	0	112
LIME	P2O5				
0	0	80.0	92.5	63.6	91.4
	125	98.0	98.2	88.4	98.9
5	0	98.4	98.4	99.0	98.8
	125	96.0	96.0	99.3	99.5
10	0	98.1	98.8	99.3	99.2
	125	95.5	97.1	98.9	99.0
20	0	97.0	95.1	99.0	99.3
	125	90.9	90.0	99.6	99.1

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74/R/CS/10 and 74/W/CS/10

STACKYARD C (W)

TOTAL TUBERS: TONNES/HECTARE

	P205		K20		MG		
	0	125	0	188	0	112	Mean
LIME							
0	8.2	27.6	13.7	22.1	9.2	26.6	17.9
5	18.4	32.0	15.2	35.2	20.6	29.8	25.2
12	22.6	30.9	15.7	37.8	22.0	31.6	26.8
19	24.9	30.7	11.7	43.9	24.6	31.0	27.8
		P205					
		0	11.6	25.5	14.6	22.4	18.5
		125	16.6	44.0	23.6	37.0	30.3
				K20			
				0	13.4	14.8	14.1
				188	24.7	44.7	34.7
Mean					19.1	29.7	24.4

	K20	0		188	
	MG	0	112	0	112
LIME	P205				
0	0	4.9	11.6	2.6	13.6
	125	16.1	22.2	13.2	58.8
5	0	14.6	13.0	13.6	32.4
	125	17.2	16.0	37.0	57.9
12	0	15.1	14.6	20.0	41.0
	125	15.8	17.5	37.1	53.2
19	0	10.8	8.1	35.5	45.3
	125	12.9	15.0	39.0	55.7

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74/R/CS/10 and 74/W/CS/10

STACKYARD C (W)

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

	P205		K20		MG		
	0	125	0	188	0	112	Mean
LIME							
0	78.8	95.2	85.0	88.9	80.9	93.1	87.0
5	95.7	95.9	93.8	97.8	95.6	96.0	95.8
12	96.8	94.8	93.1	98.5	95.2	96.4	95.8
19	96.2	96.0	93.1	99.0	96.3	95.8	96.1
		P205					
		0	89.9	93.9	89.2	94.5	91.9
		125	92.7	98.2	94.8	96.1	95.5
				K20			
				0	89.8	92.7	91.3
				188	94.2	97.9	96.1
Mean					92.0	95.3	93.7

	K20	0		188	
	MG	0	112	0	112
LIME	P205				
0	0	64.6	87.7	72.1	90.6
	125	92.6	95.0	94.1	99.0
5	0	94.9	93.4	95.5	99.0
	125	93.9	93.1	98.3	98.4
12	0	96.0	95.4	97.2	98.8
	125	88.8	92.3	98.8	99.1
19	0	94.8	92.0	98.5	99.5
	125	93.0	92.8	99.0	99.0

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74/R/CS/10 and 74/W/CS/10

STANDARD ERRORS OF DIFFERENCES

TOTAL TUBERS

SAWYERS I (R)

LIME	P2O5	K2O	MG	LIME P2O5	LIME K2O	P2O5 K2O
1.93	1.36	1.36	1.01	2.72	2.72	1.93

LIME MG	P2O5 MG	K2O MG	LIME P2O5 K2O MG
2.40	1.70	1.70	4.80

Except when comparing means with same levels of

LIME	2.02
P2O5	1.43
K2O	1.43
LIME.P2O5.K2O	4.05

STACKYARD C (W)

LIME	P2O5	K2O	MG	LIME P2O5	LIME K2O	P2O5 K2O
1.93	1.36	1.36	1.03	2.73	2.73	1.93

LIME MG	P2O5 MG	K2O MG	LIME P2O5 K2O MG
2.42	1.71	1.71	4.84

Except when comparing means with same levels of

LIME	2.06
P2O5	1.46
K2O	1.46
LIME.P2O5.K2O	4.13

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74/W/CS/11

SOIL STRUCTURE

Object: To study the residual effects of peat, at a range of nitrogen levels, on the yield of wheat - Woburn Stackyard II.

Sponsor: A.E. Johnston.

The twelfth year, winter wheat.

For previous years see 64/C/20(t), 65/C/19(t), 66/C/11(t), 67/C/8(t), 68/C/31(t), 69/W/CS/11(t), 70/W/CS/11(t), 71/W/CS/11, 72/W/CS/11(t) and 73/W/CS/11.

Design: Single replicate of 5 x 4. Levels of peat in 4 randomised blocks of 5 plots.

Whole plot dimensions: 2.13 x 3.05. Area harvested: 0.00026.

Treatments: All combinations of:-

1. Peat (tonnes dry matter - total applied 1963-72):

	PEAT
None	0
8	8
55	55
110	110
165	165

2. Nitrogen fertiliser (kg N), cumulative to previous treatments:

	N
None	0
50	50
100	100
150	150

Basal applications: Manures: P at 85 kg, as triple superphosphate, K at 300 kg, as potassium bicarbonate, Mg at 55 kg as magnesium sulphate. Weedkiller: Ioxynil at 0.42 kg and mecoprop at 1.26 kg in 340 l.

Seed: Cappelle, sown at 150 kg.

Cultivations, etc.:- P, K and Mg applied, plots dug by hand: 28 Sept, 1973. Seed sown: 8 Oct. Weedkiller applied: 8 Apr, 1974. N applied: 24 Apr. Harvested by hand: 19 July.

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NOTE: Because birds started to attack the green ears the crop was harvested green at full ear emergence and yields of total produce only were taken. Three plots N - 0, PEAT - 0, 8 and 165 were so badly damaged that their yields are not presented.

TABLE OF MEANS

GREEN CROP, DRY MATTER: TONNES/HECTARE

	PEAT				
	0	8	55	110	165
N					
0	*	*	2.74	4.46	*
50	8.09	7.81	7.55	6.84	5.65
100	10.87	9.47	9.54	8.68	9.15
150	13.92	12.40	12.60	11.62	11.46

* Yields not presented.

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74/R/CS/13

N LEVELS TO OLD GRASS

Object: To study the effects of a range of nitrogen rates on yield and botanical composition of very old permanent pasture given a single dressing of P and K annually. N fixed by legumes is estimated and the effect of treatments on nutrients available in the soil is also studied - Park Grass Old Plot 6.

Sponsors: A.E. Johnston, R.C. Flint.

The tenth year, old grass.

For previous years see 65/C/33(t), 66/C/14, 67/C/10(t), 68/C/8(t), 69/R/CS/13(t), 70/R/CS/13(t), 71/R/CS/13, 72/R/CS/13(t) and 73/R/CS/13.

Design: 4 randomised blocks of 10 plots.

Whole plot dimensions: 1.83 x 10.1. Area harvested: 0.00086.

Treatments: Fertiliser nitrogen (kg N-total per annum applied in four equal dressings as 'Nitro-Chalk'):

	TOTAL N
None (sprayed with mecoprop to control legumes, two plots per block)	0(S)
None (two plots per block)	0
75	75
150	150
225	225
300	300
375	375
450	450

NOTE: Mecoprop applied 26 Apr, 6 Aug as 'Clovotox' at 11.2 l in 450 l.

Basal applications: 34 kg P as superphosphate, 224 kg K as potassium sulphate, 11 kg Mg as magnesium sulphate.

Cultivations, etc.:- Basal P, K and Mg applied: 10 Dec, 1973. Cut: 13 May, 1974, 1 July, 19 Aug and 14 Oct. N applied: 13 Mar and after each cut except the last.

Standard errors per plot. Dry matter: tonnes/hectare:

1st cut:	0.284 or 12.3% (29 d.f.)
2nd cut:	0.230 or 10.6% (29 d.f.)
3rd cut:	0.188 or 10.1% (29 d.f.)
4th cut:	0.210 or 15.4% (29 d.f.)
Total of 4 cuts:	0.522 or 6.8% (29 d.f.)

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74/R/CS/13

TABLES OF MEANS

DRY MATTER: TONNES/HECTARE

TOTAL N

O(S)	0	75	150	225	300	375	450	Mean
				1ST CUT				
0.33	1.20	1.34	2.04	3.17	4.05	4.42	4.95	2.30
				2ND CUT				
0.56	2.37	2.09	2.34	2.61	2.88	2.91	3.15	2.18
				3RD CUT				
0.30	1.62	1.55	2.11	2.26	2.90	2.87	3.20	1.87
				4TH CUT				
0.27	0.77	1.14	1.78	1.83	2.06	2.36	2.37	1.36
				TOTAL OF 4 CUTS				
1.45	5.96	6.12	8.27	9.87	11.88	12.56	13.68	7.72

STANDARD ERRORS OF DIFFERENCES. TOTAL N

	1ST CUT	2ND CUT	3RD CUT	4TH CUT	TOTAL OF 4 CUTS
O(S) v O	0.142	0.115	0.094	0.105	0.261
Between any of remainder	0.201	0.163	0.133	0.148	0.369
O(S) or O v any of remainder	0.174	0.141	0.115	0.128	0.319
Mean D.M. %	23.6	24.7	17.3	26.4	23.0

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74/R/CS/14

NPK TO OLD GRASS

Object: To study the effects of a range of P and K levels on yields of permanent pasture on sites with much or little P and K in the soil - Park Grass Old Plots 5/1 and 5/2.

Sponsor: A.E. Johnston.

The tenth year, old grass.

For previous years see 65/C/22(t), 66/C/13(t), 67/C/9(t), 68/C/7 and 69-73/R/CS/14.

Design: On each site:- A single replicate of 2 x 4 x 4 in 2 blocks of 16 plots each, with 2 x 2 additional plots in each block.

Whole plot dimensions: 1.83 x 10.1. Area harvested: 0.00086.

Treatments:

The experiment is duplicated on sites differing in previous history:-

	PLOT
Park Grass Plot 5/1: No P or K 1856-1964	5/1NORES
Park Grass Plot 5/2: Superphosphate to supply 34 kg P, sulphate of potash to supply 224 kg K annually 1856-1964	5/2PKRES

On each site, all combinations of:-

1. Nitrogen fertiliser (kg N for each cut):

	NPERCUT
33.6	33.6
67.2	67.2

2. Phosphate (kg P) as superphosphate annually:

	P
None	0
16.8	16.8
33.6	33.6
67.2	67.2

3. Potassium (kg K) as potassium chloride annually:

	K
None	0
112	112
224	224
448	448

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together with extra treatments, all combirations of:-

1. Nitrogen fertiliser (kg N for each cut):	NPERCUT
33.6	33.6
67.2	67.2
2. Residues of PK fertilisers applied 1965 only:	PKRES65
33.6 kg P, 56 kg K	34P56K
33.6 kg P, 336 kg K	34P336K

Cultivations, etc.:- P and K applied: 13 Dec, 1973. Cut: 5 June, 1974, 5 Aug, 14 Oct. N applied: 13 Mar and after first two cuts.

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74/R/CS/14

TABLES OF MEANS

PLOT 5/1 NORES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

1ST CUT

	P 0.0	16.8	33.6	67.2	Mean
K					
0	1.08	1.90	2.25	2.06	1.82
112	1.72	3.73	4.02	3.05	3.13
224	1.20	4.84	3.73	4.13	3.47
448	1.46	4.16	3.99	4.30	3.48
NPERCUT					
33.6	1.09	3.01	2.63	2.85	2.39
67.2	1.63	4.31	4.37	3.92	3.56
Mean	1.36	3.66	3.50	3.38	2.98

	K 0	112	224	448
NPERCUT				
33.6	1.65	2.40	2.79	2.73
67.2	1.99	3.86	4.16	4.22

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/14

PLOT 5/1 NORES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

2ND CUT

	P 0.0	16.8	33.6	67.2	Mean
K					
0	1.18	1.32	1.73	1.47	1.42
112	1.75	2.12	2.22	1.86	1.99
224	1.88	2.72	2.69	2.51	2.45
448	1.97	2.61	3.13	3.10	2.70
NPERCUT					
33.6	1.49	1.86	2.03	1.81	1.80
67.2	1.90	2.52	2.85	2.67	2.49
Mean	1.70	2.19	2.44	2.24	2.14

	K 0	112	224	448
NPERCUT				
33.6	1.30	1.56	2.08	2.26
67.2	1.55	2.42	2.82	3.15

https://doi.org/10.23637/ERADOC-1-119 *pp 22*

74/R/CS/14

PLOT 5/1 NORES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

3RD CUT

	P				
	0.0	16.8	33.6	67.2	Mean
K					
0	0.39	0.84	1.11	0.95	0.82
112	0.46	1.42	1.67	1.62	1.29
224	0.29	1.75	1.35	1.88	1.32
448	0.32	1.66	1.40	1.75	1.28
NPERCUT					
33.6	0.38	1.14	1.03	1.24	0.95
67.2	0.35	1.70	1.73	1.86	1.41
Mean	0.37	1.42	1.38	1.55	1.18

	K			
	0	112	224	448
NPERCUT				
33.6	0.62	0.90	1.07	1.20
67.2	1.02	1.68	1.57	1.37

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74/R/CS/14

PLOT 5/1 NORES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

TOTAL OF 3 CUTS

	P 0.0	16.8	33.6	67.2	Mean
K					
0	2.66	4.06	5.09	4.47	4.07
112	3.93	7.27	7.91	6.53	6.41
224	3.37	9.31	7.77	8.52	7.24
448	3.75	8.44	8.52	9.14	7.46
NPERCUT					
33.6	2.97	6.01	5.69	5.89	5.14
67.2	3.89	8.53	8.96	8.44	7.45
Mean	3.43	7.27	7.32	7.17	6.30

	K 0	112	224	448
NPERCUT				
33.6	3.57	4.86	5.94	6.18
67.2	4.57	7.96	8.55	8.74

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74/R/CS/14

PLOT 5/1 NORES

PKRES65 plots

DRY MATTER, TONNES/ HECTARE

	PKRES65 34P56K	34P336K	Mean
	1ST CUT		
NPERCUT			
33.6	1.20	1.22	1.21
67.2	1.29	1.06	1.18
Mean	1.24	1.14	1.19

Grand mean 2.62
Mean D.M. % 28.0

	2ND CUT		
NPERCUT			
33.6	1.31	1.26	1.29
67.2	1.41	1.48	1.44
Mean	1.36	1.37	1.36

Grand mean 1.99
Mean D.M. % 21.1

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/14

PLOT 5/1 NORES

PKRES65 plots

DRY MATTER, TONNES/HECTARE

	PKRES65 34P56K	PKRES65 34P336K	Mean
	3RD CUT		
NPERCUT			
33.6	0.54	0.43	0.49
67.2	0.44	0.41	0.42
Mean	0.49	0.42	0.45

Grand mean 1.03
Mean D.M. % 24.7

	TOTAL OF 3 CUTS		
NPERCUT			
33.6	3.05	2.91	2.98
67.2	3.13	2.95	3.04
Mean	3.09	2.93	3.01

Grand mean 5.64
Mean D.M. % 24.6

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74/R/CS/14

PLOT 5/2 PKRES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

1ST CUT

	P 0.0	16.8	33.6	67.2	Mean
K					
0	3.95	4.57	3.54	4.22	4.07
112	4.79	4.60	4.66	4.15	4.55
224	4.96	5.60	4.72	4.17	4.87
448	4.69	4.39	4.21	4.33	4.41
NPERCUT					
33.6	3.58	3.48	3.28	2.96	3.32
67.2	5.62	6.10	5.29	5.48	5.63
Mean	4.60	4.79	4.28	4.22	4.47

	K 0	112	224	448
NPERCUT				
33.6	2.89	3.76	3.34	3.30
67.2	5.26	5.35	6.39	5.51

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74/R/CS/14

PLOT 5/2 PKRES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

2ND CUT

	P				
	0.0	16.8	33.6	67.2	Mean
K					
0	3.13	2.99	2.93	3.04	3.02
112	2.92	3.33	3.29	2.77	3.08
224	3.36	3.76	3.49	2.78	3.35
448	3.57	3.07	2.71	3.11	3.12
NPERCUT					
33.6	2.78	2.54	2.66	2.28	2.56
67.2	3.70	4.04	3.54	3.58	3.72
Mean	3.24	3.29	3.10	2.93	3.14

	K			
	0	112	224	448
NPERCUT				
33.6	2.56	2.64	2.64	2.42
67.2	3.49	3.51	4.05	3.81

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74/R/CS/14

PLOT 5/2 PKRES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

3RD CUT

	P				
	0.0	16.8	33.6	67.2	Mean
K					
0	1.87	1.66	1.92	1.77	1.81
112	1.93	1.47	1.83	1.90	1.78
224	1.61	2.10	2.10	1.69	1.88
448	1.75	1.39	1.80	1.74	1.67
NPERCUT					
33.6	1.64	1.61	1.68	1.40	1.58
67.2	1.94	1.71	2.14	2.15	1.98
Mean	1.79	1.66	1.91	1.77	1.78

	K			
	0	112	224	448
NPERCUT				
33.6	1.58	1.58	1.69	1.50
67.2	2.03	1.99	2.06	1.84

https://doi.org/10.23637/ERADOC-1-119 *pp 29*

74/R/CS/14

PLOT 5/2 PKRES

Excluding PKRES65 plots

DRY MATTER, TONNES/HECTARE

TOTAL OF 3 CUTS

	P				
	0.0	16.8	33.6	67.2	Mean
K					
0	8.95	9.23	8.39	9.03	8.90
112	9.64	9.40	9.77	8.82	9.41
224	9.94	11.46	10.31	8.64	10.09
448	10.01	8.85	8.72	9.18	9.19
NPERCUT					
33.6	8.00	7.62	7.62	6.63	7.47
67.2	11.27	11.85	10.97	11.20	11.32
Mean	9.63	9.74	9.30	8.92	9.40

	K			
	0	112	224	448
NPERCUT				
33.6	7.02	7.97	7.67	7.22
67.2	10.78	10.84	12.51	11.17

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/14

PLOT 5/2 PKRES

PKRES65 plots

DRY MATTER, TONNES/HECTARE

	PKRES65		
	34P56K	34P336K	Mean
NPERCUT	1ST CUT		
33.6	3.86	3.75	3.80
67.2	5.13	5.73	5.43
Mean	4.49	4.74	4.62

Grand mean 4.50
Mean D.M. % 29.2

NPERCUT	2ND CUT		
33.6	2.82	2.74	2.78
67.2	3.33	3.52	3.42
Mean	3.07	3.13	3.10

Grand mean 3.13
Mean D.M. % 19.8

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74/R/CS/14

PLOT 5/2 PKRES

PKRES65 plots

DRY MATTER, TONNES/HECTARE

	PKRES65		
	34P56K	34P336K	Mean
	3RD CUT		
NPERCUT			
33.6	1.62	1.58	1.60
67.2	2.21	2.06	2.14
Mean	1.91	1.82	1.87

Grand mean 1.80
Mean D.M. % 22.3

TOTAL OF 3 CUTS

NPERCUT			
33.6	8.29	8.06	8.18
67.2	10.66	11.31	10.99
Mean	9.48	9.69	9.58

Grand mean 9.43
Mean D.M. % 23.8

https://doi.org/10.23637/ERADOC-1-119 *pp 32*

74/W/CS/16

IRRIGATION AND EELWORMS

Object: To study the cumulative effects of dazomet and irrigation on the yield and incidence of Heterodera spp. on potatoes grown continuously. The effects of growing susceptible and resistant varieties are also studied, either grown continuously or alternated - Woburn Butt Close.

Sponsors: K. Evans, D.M. Parrott.

The ninth year, potatoes.

For previous years see 66/C/32(t), 67/C/25, 68/C/19, 69/W/CS/16(t), 70-71/W/CS/16, 72/W/CS/16(t) and 73/W/CS/16.

Design: 3 blocks of 4 plots, sequences of varieties on strips of 2 half plots, dazomet on quarter plots.

Whole plot dimensions: 6.48 x 7.11. Area harvested: 0.00092.

Treatments: All combinations of:-

Whole plots: 1. Irrigation:

	IRRIGIN
None	None
Full	Full

Strips of half plots: 2. Cropping sequences with potatoes resistant (R) and susceptible (S) to potato cyst nematode:

1966	1967	1968	1969	1970	1971	1972	1973	1974	CROPSEQN
R	R	R	R	R	R	R	R	R	R/R/R/R
R	S	R	S	R	S	R	S	R	S/R/S/R
S	S	S	S	S	S	S	S	S	S/S/S/S
S	R	S	R	S	R	S	R	S	R/S/R/S

Quarter plots: 3. Dazomet (kg) applied cumulatively to previous fumigant treatments:

	DAZOMET
None	0
224	224

Irrigation treatments 1974 (mm water):

21 June	12.7
11 July	12.7
Total	25.4

NOTE: Treatments were applied to Series IV only. The similar experiment on Series I ended at harvest 1973.

https://doi.org/10.23637/ERADOC-1-119

Basal applications: Manures: (13:13:20) at 1510 kg. Weedkillers: Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide and insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

Seed: Resistant, Maris Piper. Susceptible, Pentland Dell.

Cultivations, etc.:- Dazomet applied, rotary cultivated: 9 Nov, 1973. Ploughed: 2 Jan, 1974. NPK applied: 8 Apr. Rotary cultivated, potatoes planted: 16 Apr. Ridges rolled: 18 Apr. Weedkiller applied: 16 May. Rotary ridged: 11 June. Fungicide with insecticide applied: 19 July. Fungicide applied: 7 Aug. Haulm mechanically destroyed: 11 Sept. Sprayed with undiluted BCV at 170 l: 18 Sept. Lifted: 29 Oct.

NOTE: Soil samples were taken on 8 Nov, 1973 and 24 Apr, 1974 for cyst and egg counts of Heterodera rostochiensis and H. pallida.

NOTES: (1) Because of the large difference in yield the plots receiving and not receiving dazomet were analysed separately. The standard errors for the former have not been shown.
(2) On two plots IRRIGTN - None, CROPSEQN - R/S/R/S, DAZOMET - 224 and IRRIGTN - None, CROPSEQN - S/S/S/S, DAZOMET - 0, the tubers rotted due to waterlogging. Estimated values were used in the analysis.

Standard errors per plot. Total tubers, tonnes/hectare.

DAZOMET 224	
CROPSEQN	5.38 or 19.4% (6 d.f.)
IRRIGTN x CROPSEQN	7.05 or 25.4% (7 d.f.)

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74/W/CS/16

TABLES OF MEANS

DAZOMET 0

CROPSEQN

IRRIGTN	R/R/R/R	S/R/S/R	S/S/S/S	R/S/R/S	Mean
	TOTAL TUBERS: TONNES/HECTARE				
None	11.7	18.5	6.1	2.8	9.8
Full	7.9	13.0	1.6	2.3	6.2
Mean	9.8	15.7	3.9	2.5	8.0

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

IRRIGTN					
None	72.1	91.3	28.6	51.0	60.8
Full	68.9	91.1	57.6	63.7	70.3
Mean	70.5	91.2	43.1	57.4	65.6

https://doi.org/10.23637/ERADOC-1-119

74/W/CS/16

DAZOMET 224

CROPSEQN

IRRIGTN	R/R/R/R	S/R/S/R	S/S/S/S	R/S/R/S	Mean
	TOTAL TUBERS: TONNES/HECTARE				
None	27.1	27.9	28.5	28.0	27.9
Full	31.8	22.3	25.2	31.1	27.6
Mean	29.4	25.1	26.9	29.5	27.7

STANDARD ERRORS OF DIFFERENCES

CROPSEQN	IRRIGTN CROPSEQN
4.39	5.98*

* Within the same level of IRRIGTN only

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

IRRIGTN					
None	90.3	94.5	88.6	86.4	90.0
Full	92.4	93.8	86.8	92.9	91.5
Mean	91.3	94.1	87.7	89.7	90.7

https://doi.org/10.23637/ERADOC-1-119 *pp 36*

74/R/CS/24

PK AND TAKE-ALL

Object: To study the effects of different amounts of phosphate, and potash fertiliser on the yields and incidence of take-all (Gaeumannomyces graminis) in winter wheat after continuous barley - West Barnfield II.

Sponsors: G.E.G. Mattingly, D.B. Slope.

The seventh year, winter wheat (after continuous barley 1968-73).

For previous years see 68/C/16(t), 69/R/CS/24, 70/R/CS/24(t) and 71-73/R/CS/24.

Design: 4 randomised blocks of 10 plots split into 2.

Whole plot dimensions: 5.33 x 20.1. Sub-plot area harvested: 0.00265.

Treatments: All combinations of:-

Whole plots: 1. Phosphate (kg P) as superphosphate:

	P
None	0
15 annually	15 A
60 annually	60 A
90 six-yearly, last applied autumn 1973	90 S
360 six-yearly, last applied autumn 1973	360 S

2. Potassium (kg K) annually as muriate of potash:

	K
30	30
120	120

Sub plots: 3. Residues of nitrogen fertiliser applied annually 1970-73 (kg N) as 'Nitro-Chalk':

	N RESID
(37.5)	(37.5)
(75.0)	(75.0)
(113)	(113)
(150)	(150)

Basal applications: Manures: 'Nitro-Chalk' at 500 kg. Weedkillers: Amitrotriazole ('Weedazol' at 22.5 l in 220 l), and Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 370 l).

Seed: Cappelle, sown at 200 kg.

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74/R/CS/24

Cultivations, etc.:- Six-yearly dressing of P applied: 10 Sept, 1973. Aminotriazole applied: 12 Sept. Ploughed: 10 Oct. Spring-tine cultivated and annual P and K applied: 15 Oct. Power harrowed: 20 Oct. Seed sown: 22 Oct. N applied: 16 Apr, 1974. 'Banlene Plus' applied: 7 May. Combine harvested: 30 Aug.

NOTE: Samples were taken in May and July for estimation of root-rotting diseases. Soil samples were taken in autumn for P and K analyses.

Standard error per plot.
Grain, tonnes/hectare: 0.558 or 9.0% (37 d.f.)

https://doi.org/10.23637/ERADOC-1-119 *pp 38*

74/R/CS/24

TABLES OF MEANS

GRAIN: TONNES/HECTARE

	P 0	15 A	60 A	90 S	360 S	Mean
K						
30	4.90	5.96	6.34	6.28	6.47	5.99
120	5.28	6.11	6.75	6.92	6.99	6.41
N RESID						
(37.5)	5.44	5.47	6.26	6.70	6.64	6.10
(75.0)	4.45	5.86	6.27	6.62	6.59	5.96
(113)	5.93	6.39	6.61	6.80	6.93	6.53
(150)	4.54	6.43	7.03	6.28	6.77	6.21
Mean	5.09	6.04	6.54	6.60	6.73	6.20

N RESID

	(37.5)	(75.0)	(113)	(150)
K				
30	5.69	5.95	6.13	6.19
120	6.52	5.97	6.94	6.22

STANDARD ERRORS OF DIFFERENCES

K	N RESID	P	K N RESID	K P	N RESID P	K N RESID P
0.125	0.176	0.197	0.251	0.279	0.395	0.586

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/24

GRAIN: TONNES/HECTARE

K	30					120				
P	0	15 A	60 A	90 S	360 S	0	15 A	60 A	90 S	360 S
N RESID										
(37.5)	4.80	5.31	6.07	6.23	6.02	6.08	5.62	6.46	7.16	7.25
(75.0)	4.95	5.68	5.95	6.63	6.54	3.95	6.04	6.60	6.61	6.64
(113)	4.89	6.29	6.43	6.35	6.69	6.98	6.49	6.80	7.26	7.17
(150)	4.98	6.56	6.90	5.89	6.63	4.10	6.29	7.15	6.66	6.90

Mean D.M. % 83.0

74/R/CS/24

STRAW: TONNES/HECTARE

	P 0	15 A	60 A	90 S	360 S	Mean
K						
30	3.99	4.23	4.11	4.28	4.43	4.21
120	4.73	4.91	4.95	5.09	4.65	4.87
N RESID						
(37.5)	4.14	4.57	4.32	4.82	4.44	4.46
(75.0)	4.40	4.30	4.51	4.64	4.25	4.42
(113)	4.95	4.68	4.45	4.76	4.70	4.71
(150)	3.96	4.72	4.83	4.52	4.77	4.56
Mean	4.36	4.57	4.53	4.69	4.54	4.54

N RESID

	(37.5)	(75.0)	(113)	(150)
K				
30	4.07	4.00	4.48	4.29
120	4.84	4.85	4.94	4.83

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74/R/CS/24

STRAW: TONNES/HECTARE

K	30					120				
P	0	15 A	60 A	90 S	360 S	0	15 A	60 A	90 S	360 S
N RESID										
(37.5)	3.65	3.96	4.22	4.26	4.24	4.62	5.17	4.42	5.37	4.64
(75.0)	3.92	3.98	3.65	4.26	4.16	4.87	4.62	5.37	5.03	4.35
(113)	4.89	4.30	4.11	4.12	4.95	5.01	5.06	4.79	5.39	4.45
(150)	3.50	4.67	4.44	4.47	4.39	4.42	4.78	5.21	4.58	5.15

Mean D.M. % 85.6

74/W/CS/34

NEMATICIDES IN CROP SEQUENCE

Object: To study the effects of a range of nematicides on incidence of Heterodera rostochiensis and yield of potatoes. Residual effects of previous treatments are studied in sugar beet and barley - Woburn Great Hill II and III.

Sponsor: A.G. Whitehead.

The sixth year, potatoes, sugar beet, barley.

For previous years see 71/W/CS/34(t), 72/W/CS/34(t) and 73/W/CS/34.

Design: 4 series of 3 blocks of 10 plots.

Whole plot dimensions: 4.27 x 9.14. Area harvested: Potatoes - 0.00139, barley - 0.00260.

Treatments: The experiment has four series with the following cropping:-

	1969	1970	1971	1972	1973	1974
Series I	P	P	P*	SB	B	P
Series II	P	P	P	P*	SB	B
Series III	P	B	P	P	P*	SB
Series IV	P	B	P	P	P	P*

P = potatoes, SB = sugar beet, B = barley.

* Treatments applied to potatoes, later crops test residual effects.

Treatments to potatoes (Series I) and barley (Series II):
All combinations of:-

1. Residues of nematicides:

	Potatoes - NEMACIDE(71) Barley - NEMACIDE(72)
Aldicarb	Aldicarb
Du Pont 1410	Dupont
Nemacur P (series I only)	Nemacur
CGA 10576 (series II only)	CGA

2. Rates of nematicide (kg a.i.):

	RATE
2.8	2.8
5.6	5.6
11.2	11.2
plus one untreated plot per block	0.0

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Treatments to sugar beet (Series III): All combinations of:-

1. Residues of nematicides:	NEMACIDE(73)
Benomyl	Benomyl
Du Pont 1410	Dupont
Dowco 275	Dowco
2. Rates of nematicide (kg a.i.):	RATE
Single rate (2.8 Du Pont 1410, Dowco 275: 5.6 benomyl)	Single
Double rate (5.6 Du Pont 1410, Dowco 275: 11.2 benomyl)	Double
Quadruple rate (11.2 Du Pont 1410, Dowco 275: 22.4 benomyl)	Quad
plus one untreated plot per block	0.0

Treatments to potatoes (Series IV): All combinations of:-

1. Nematicides:	NEMACIDE(74)
Benomyl	Benomyl
Carbofuran	Carbofur
Thiabendazole	Thiabend
2. Rates of nematicide (kg a.i.):	RATE
5.6	5.6
11.2	11.2
22.4	22.4
plus one untreated plot per block	0.0

Standard applications:
Potatoes (Series I and IV): Manures: (13:13:20) at 1940 kg. Weedkillers: Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.
Sugar beet (Series III): Manures: Magnesian limestone at 5 tonnes. (0:14:28) at 750 kg, N at 180 kg as 'Nitro-Chalk'. Boron at 6.7 kg B203 (as 'Solubor') applied with insecticide. Insecticide: Demeton-s-methyl at 0.21 kg in 390 l. Weedkiller: Phenmedipham at 1.1 kg in 340 l.
Barley (Series II): Manures: (20:15:15) at 500 kg, combine drilled. Weedkiller: Ioxynil at 0.52 kg and mecoprop at 1.6 kg in 280 l.

Seed: Potatoes: Pentland Crown.
Sugar beet: Klein E, sown at 8.0 kg.
Barley: Julia, dressed with ethirimol, sown at 160 kg.

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Cultivations, etc.:-

Potatoes (Series I): Subsoiled, tines 140 cm apart and 50 cm deep: 15 Oct, 1973. Ploughed: 4 Dec. Spring-tine cultivated: 1 Apr, 1974. NPK applied, spring-tine cultivated: 8 Apr. Rotary cultivated, potatoes planted: 9 Apr. Weedkiller applied: 15 May. Rotary ridged: 11 June. Fungicide with insecticide applied: 12 July. Fungicide applied: 6 Aug. Haulm mechanically destroyed: 10 Sept. Sprayed with undiluted BOV at 170 l: 18 Sept. Lifted: 30 Sept.

Sugar beet (Series III): Magnesian limestone applied: 29 Oct, 1973. Ploughed: 4 Dec. Spring-tine cultivated: 1 Apr, 1974. N & PK applied: 2 Apr. Power harrowed, rolled, seed sown: 3 Apr. Weedkiller applied: 26 May. Boron and insecticide applied: 24 June. Rotary cultivated: 1 July.

NOTE: Crop destroyed because of very poor germination.

Barley (Series II): Ploughed: 4 Dec, 1973. Spring-tine cultivated with crumbler, seed sown: 28 Mar, 1974. Weedkiller applied: 7 May. Combine harvested: 21 Aug.

Potatoes (Series IV): Ploughed: 4 Dec, 1973. Spring-tine cultivated: 1 Apr, 1974. Treatments applied, all plots harrowed: 4 Apr. NPK applied, spring-tine cultivated: 8 Apr. Rotary cultivated, potatoes planted: 9 Apr. Weedkiller applied: 15 May. Rotary ridged: 11 June. Fungicide with insecticide applied: 12 July. Fungicide applied: 6 Aug. Haulm mechanically destroyed: 10 Sept. Sprayed with undiluted BOV at 170 l: 18 Sept. Lifted: 30 Sept.

NOTE: Soil samples were taken before applying treatments and after harvest for counts of cysts, eggs and larvae of Heterodera rostochiensis.

Standard errors per plot.

Potatoes (Series I). Total tubers: tonnes/hectare: 4.26 or 10.3% (18 d.f.)
Potatoes (Series IV). Total tubers: tonnes/hectare: 4.32 or 12.7% (18 d.f.)
Barley (Series II), Grain: tonnes/hectare: 0.257 or 5.5% (18 d.f.)

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74/W/CS/34

TABLES OF MEANS

POTATOES (SERIES I)

RATE

NEMACIDE(71)	2.8	5.6	11.2	Mean
	TOTAL TUBERS: TONNES/HECTARE			
Aldicarb	45.6	42.9	48.0	45.5
Dupont	39.9	41.3	43.9	41.7
Nemacur	38.5	40.6	43.9	41.0
Mean	41.3	41.6	45.3	42.7

RATE 0.0 28.2

Grand mean 41.3

STANDARD ERRORS OF DIFFERENCES

NEMACIDE(71)	RATE	NEMACIDE(71) RATE & RATE 0.0
2.01	2.01	3.48

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

NEMACIDE(71)				
Aldicarb	97.5	97.2	96.6	97.1
Dupont	96.6	96.9	95.2	96.3
Nemacur	95.3	95.9	96.7	96.0
Mean	96.5	96.7	96.2	96.4

RATE 0.0 94.0

Grand mean 96.2

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74/W/CS/34

POTATOES (SERIES IV)

RATE

NEMACIDE(74)	5.6	11.2	22.4	Mean
	TOTAL TUBERS: TONNES/HECTARE			
Benomyl	30.4	32.4	37.2	33.3
Carbofur	40.9	45.9	42.4	43.1
Thiabend	22.0	31.5	34.5	29.3
Mean	31.1	36.6	38.0	35.2

RATE 0.0 23.6

Grand mean 34.1

STANDARD ERRORS OF DIFFERENCES

NEMACIDE(74)	RATE	NEMACIDE(74) RATE & RATE 0.0
2.04	2.04	3.53

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

NEMACIDE(74)				
Benomyl	96.4	97.3	96.9	96.9
Carbofur	95.7	96.1	95.5	95.7
Thiabend	91.2	95.6	96.2	94.3
Mean	94.4	96.3	96.2	95.6

RATE 0.0 94.5

Grand mean 95.5

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74/W/CS/34

BARLEY (SERIES II)

RATE

	2.8	5.6	11.2	Mean
NEMACIDE(72)	GRAIN: TONNES/HECTARE			
Aldicarb	4.51	4.71	5.25	4.82
Dupont	4.63	4.62	4.43	4.56
CGA	4.67	4.44	4.65	4.59
Mean	4.60	4.59	4.78	4.66

RATE 0.0 4.74

Grand mean 4.67

STANDARD ERRORS OF DIFFERENCES

NEMACIDE(72)	RATE	NEMACIDE(72) RATE & RATE 0.0
0.121	0.121	0.210

NEMACIDE(72)	STRAW: TONNES/HECTARE			
Aldicarb	2.24	2.23	2.51	2.33
Dupont	2.12	2.10	1.97	2.06
CGA	2.06	2.09	2.12	2.09
Mean	2.14	2.14	2.20	2.16

RATE 0.0 2.11

Grand mean 2.16

Mean D.M. % Grain: 80.7
Straw: 88.0

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74/W/CS/35

NEMATICIDES DOSAGE

Object: To study the effects of rates and methods of applying nematicides on Heterodera rostochiensis and yield of potatoes, residual effects are studied in sugar beet and barley - Woburn Stackyard AII.

Sponsor: A.G. Whitehead.

The third year, potatoes, sugar beet, barley.

For previous years see 72/W/CS/35(t) and 73/W/CS/35.

Design: 3 series of 4 replicates of 2 x 9.

Whole plot dimensions: 4.27 x 6.10. Areas harvested: Potatoes - 0.00087, sugar beet - 0.00130, barley - 0.00173.

Treatments:-
The experiment has three series with the following cropping:-

	1968-71	1972	1973	1974
Series I	P	P*	SB	B
Series II	P	P	P*	SB
Series III	P	P	P	P*

P = Potatoes, SB = Sugar beet, B = Barley

* Treatments applied to potatoes, later crops test residual effects.

Treatments to Series I (1972), Series II (1973) and Series III (1974):
All combinations of:-
1. Varieties

	VARIETY
Maris Piper	Piper
Pentland Crown	Crown

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2. Nematicides (kg)	NEMACIDE
None	None
Dazomet (half before, half after autumn ploughing)	
220	Daz2
330	Daz3
440	Daz4
660	Daz6
Dazomet, 220, 'Telone', 220, all after autumn ploughing	Daz2/Te2
'Telone', all after autumn ploughing	Te4
'DuPont 1410', 5.6 a.i. in spring	DuP
'Telone' 220, after autumn ploughing, 'DuPont 1410' 5.6 a.i, in spring	Te2/DuP

Sugar beet and barley test residual effects of potato varieties - RESVAR(73), RESVAR(72) - and nematicide - RESNEM(73), RESNEM(72).

Standard applications:-

Potatoes: Manures: (13:13:20) at 1940 kg. Weedkiller: Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

Sugar beet: Manures: Magnesian limestone at 5 tonnes. N at 180 kg as 'Nitro-Chalk'. (0:14:28) at 650 kg. Boron at 6.7 kg B203 (as 'Solubor') applied with insecticide. Insecticide: Demeton-s-methyl at 0.25 kg in 280 l and at 0.21 kg in 390 l when applied with 'Solubor'. Weedkiller: Phenmedipham at 1.1 kg in 340 l.

Barley: Manures: (20:15:15) at 450 kg. Weedkillers: Ioxynil at 0.52 kg plus mecoprop at 1.6 kg in 280 l.

Seed: Barley: Julia, dressed with ethirimol, sown at 160 kg.
Sugar beet: Klein E, sown at 8 kg.
Potatoes: Maris Piper and Pentland Crown.

Cultivations, etc.:-

Potatoes: Deep-tine cultivated: 30 Oct, 1973. Dazomet applied, all plots rotary cultivated: 31 Oct. Ploughed, dazomet and 'Telone' applied: 1 Nov. Spring-tine cultivated: 4 Apr, 1974. NPK applied, spring-tine cultivated: 8 Apr. 'DuPont 1410' applied: 10 Apr. Rotary cultivated, potatoes planted, inter-row rotary cultivated and ridged up: 11 Apr. Weedkiller applied: 15 May. Fungicide with insecticide applied: 18 July. Insecticide applied: 7 Aug. Haulm mechanically destroyed: 12 Sept. Sprayed with undiluted BCV at 170 l: 18 Sept. Lifted: 14 Oct.

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Sugar beet: Magnesian limestone applied: 29 Oct, 1973. Ploughed: 7 Dec. Spring-tine cultivated: 30 Mar, 1974. N and PK applied: 1 Apr. Power harrowed: 2 Apr. Seed sown: 3 Apr. Weedkiller applied: 26 May. Insecticide applied: 5 June. Singled: 6 June. Insecticide with 'Solubor' applied: 24 June. Lifted: 22 Nov.

Barley: Ploughed: 7 Dec, 1973. Spring-tine cultivated: 27 Mar, 1974. Spring-tine cultivated with crumbler: 28 Mar. Seed sown: 29 Mar. Rolled: 2 Apr. Weedkiller applied: 14 May. Combine harvested: 22 Aug.

NOTE: Soil samples were taken before treatments were applied and after harvest for cyst and egg counts of Heterodera rostochiensis.

Standard errors per plot.

Potatoes, Total tubers:	tonnes/hectare:	6.01 or 9.3%	(47 d.f.)
Sugar beet, Roots (washed):	tonnes/hectare:	2.82 or 11.1%	(47 d.f.)
Total sugar:	tonnes/hectare:	0.429 or 11.8%	(47 d.f.)
Barley, Grain:	tonnes/hectare:	0.319 or 4.9%	(47 d.f.)

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TABLES OF MEANS

POTATOES

TOTAL TUBERS: TONNES/HECTARE

	NEMACIDE									
	None	Daz2	Daz3	Daz4	Daz6	Daz2/Te2	Te4	DuP	Te2/DuP	Mean
VARIETY										
Piper	41.6	65.5	74.7	78.1	74.3	70.7	59.8	66.7	72.1	67.1
Crown	38.9	63.0	67.7	65.5	75.8	61.9	53.5	65.6	69.9	62.4
Mean	40.2	64.3	71.2	71.8	75.1	66.3	56.7	66.1	71.0	64.7

STANDARD ERRORS OF DIFFERENCES

VARIETY	NEMACIDE	VARIETY* NEMACIDE
1.42	3.17	4.47

* Within the same level of VARIETY only

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POTATOES

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

	NEMACIDE									
	None	Daz2	Daz3	Daz4	Daz6	Daz2/Te2	Te4	DuP	Te2/DuP	Mean
VARIETY										
Piper	92.8	94.3	95.5	95.6	96.7	95.8	94.6	92.0	94.3	94.6
Crown	94.1	93.2	95.5	97.2	96.0	97.1	96.1	94.2	97.2	95.6
Mean	93.5	93.7	95.5	96.4	96.4	96.4	95.4	93.1	95.7	95.1

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SUGAR BEET

ROOTS (WASHED): TONNES/HECTARE

	RESNEM(73) None	Daz2	Daz3	Daz4	Daz6	Daz2/Te2	Te4	DuP	Te2/DuP	Mean
RESVAR(73)										
Piper	24.8	25.6	23.9	24.0	26.4	26.4	23.7	22.7	23.1	24.5
Crown	22.9	26.5	28.2	25.0	28.7	26.5	25.8	27.0	25.2	26.2
Mean	23.9	26.0	26.1	24.5	27.5	26.4	24.7	24.9	24.1	25.4

STANDARD ERRORS OF DIFFERENCES

RESVAR(73)	RESNEM(73)	RESVAR(73)* RESNEM(73)
0.67	1.48	2.09

* Within the same level of RESVAR(73) only

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SUGAR BEET

SUGAR PERCENTAGE

	RESNEM(73)									
	None	Daz2	Daz3	Daz4	Daz6	Daz2/Te2	Te4	DuP	Te2/DuP	Mean
RESVAR(73)										
Piper	14.4	14.3	14.2	14.2	14.4	14.4	14.1	14.4	14.2	14.3
Crown	14.3	14.5	14.6	14.2	14.3	14.5	14.3	14.6	14.2	14.4
Mean	14.4	14.4	14.4	14.2	14.4	14.5	14.2	14.5	14.2	14.3

74/W/CS/35

SUGAR BEET

TOTAL SUGAR: TONNES/HECTARE

	RESNEM(73)									
	None	Daz2	Daz3	Daz4	Daz6	Daz2/Te2	Te4	DuP	Te2/DuP	Mean
RESVAR(73)										
Piper	3.58	3.67	3.40	3.41	3.79	3.80	3.35	3.26	3.26	3.50
Crown	3.29	3.83	4.10	3.54	4.12	3.86	3.67	3.95	3.59	3.77
Mean	3.44	3.75	3.75	3.48	3.96	3.83	3.51	3.60	3.43	3.64

STANDARD ERRORS OF DIFFERENCES

RESVAR(73)	RESNEM(73)	RESVAR(73)* RESNEM(73)
0.101	0.225	0.318

* Within the same level of RESVAR(73) only

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BARLEY

GRAIN: TONNES/HECTARE

	RESNEM(72) None	Daz2	Daz3	Daz4	Daz6	Daz2/Te2	Te4	DuP	Te2/DuP	Mean
RESVAR(72)										
Piper	6.16	6.68	6.75	6.94	6.30	6.09	6.48	6.40	6.40	6.47
Crown	6.37	6.22	6.70	6.63	6.66	6.65	6.71	6.18	6.49	6.51
Mean	6.26	6.45	6.72	6.79	6.48	6.37	6.59	6.29	6.44	6.49

STANDARD ERRORS OF DIFFERENCES

RESVAR(72)	RESNEM(72)	RESVAR(72)* RESNEM(72)
0.075	0.163	0.230

* Within the same level of RESNEM(72) only

Mean D.M. % 87.1

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74/W/CS/35

BARLEY

STRAW: TONNES/HECTARE

	RESNFM(72) None	Daz2	Daz3	Daz4	Daz6	Daz2/Te2	Te4	DuP	Te2/DuP	Mean
RESVAR(72)										
Piper	3.88	4.17	4.23	4.64	3.99	3.91	4.34	3.78	4.07	4.11
Crown	4.21	4.03	4.35	4.31	4.37	4.29	4.22	3.82	4.05	4.18
Mean	4.05	4.10	4.29	4.48	4.18	4.10	4.28	3.80	4.06	4.15

Mean D.M. % 86.7

74/R/CS/41

CULTIVATIONS AND SOIL INVERTEBRATES

Object: To study the effects of cultivations on yields of grass and on populations of soil animals - Road Piece.

Sponsor: C.A. Edwards.

The sixth year, old grass, new grass.

For previous years see 69/R/CS/41(t), 70/R/CS/41(t) and 71-73/R/CS/41.

Design: 4 blocks of 8 plots randomisation restricted.

Whole plot dimensions: 6.40 x 7.32. Area harvested: 0.00074.

Treatments: Cultivations and reseeding:	CULTIVTN
No treatments to old grass (two plots per block)	O
Grass ploughed up:-	
In spring 1969, reseeded after fewest cultivations needed to produce a seedbed	SF
In spring 1969, reseeded after many seedbed cultivations	SM
In autumn 1969, reseeded spring 1970 after many seedbed cultivations	AM
Every spring since 1969, reseeded each year after fewest cultivations needed to produce a seedbed	SFR
Every spring since 1969, reseeded each year after many seedbed cultivations	SMR
Every autumn since 1969, reseeded every following spring after many seedbed cultivations	AMR

Seeds mixture for 1974: 8.8 kg S215 Meadow Fescue, 5.4 kg Contessa Meadow Fescue, 2.0 kg Nina certified Wild White Clover, 5.4 kg S48 Timothy, 0.8 kg Old Pasture Wild White Clover. Mixture sown at 22 kg.

Basal applications: Manures: (0:14:28) at 540 kg in autumn, (25:0:16) at 440 kg in spring, (25:0:16) at 220 kg after each cut except the last.

https://doi.org/10.23637/ERADOC-1-119

Cultivations, etc.:- AMR plots ploughed: 19 Sept, 1973. Basal PK applied: 14 Dec. SMR and SFR plots ploughed: 26 Feb, 1974. Basal NK applied: 5 Mar. Disced AMR and SMR plots four times, SFR plots twice: 9 Apr. Disced all plots to be sown: 10 Apr. Disced, seed sown and harrowed all plots to be sown: 11 Apr. AMR, SMR and SFR plots cut twice: 29 July, 4 Dec. Other plots cut three times: 29 May, 29 July, 4 Dec. NK applied to all plots except AMR, SMR and SFR: 4 June, and to all plots: 5 Aug.

NOTE: Soil cores were taken for total fauna and quadrats were sampled on each plot for earthworms.

Standard errors per plot. Dry matter: tonnes/hectare.

1st cut:	0.368	or 8.1% (13 d.f.)
2nd cut:	0.458	or 19.1% (22 d.f.)
3rd cut:	0.376	or 17.4% (22 d.f.)
Total of 3 cuts:	0.680	or 9.2% (22 d.f.)

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74/R/CS/41

TABLES OF MEANS

DRY MATTER: TONNES/HECTARE

	CULTIVTN					CULTIVTN			
	0	SF	SM	AM	Mean	SFR	SMR	AMR	Mean
1st cut	4.61	4.18	4.26	4.96	4.52				
2nd cut	2.24	2.63	3.26	3.41	2.88	1.90	1.82	1.72	2.40**
3rd cut	2.00	1.70	1.89	1.67	1.82	2.37	2.52	3.12	2.16**
Total of 3 cuts	8.86	8.51	9.41	10.04	9.20	4.28	4.34	4.84	7.39**

STANDARD ERRORS OF DIFFERENCES

	CULTIVTN	
	0 v any of remainder	Between remainder
1st cut	0.225	0.260
2nd cut	0.281	0.324
3rd cut	0.230	0.266
Total of 3 cuts	0.416	0.481

Mean D.M. %
1st cut: 24.7
2nd cut: 22.0
3rd cut: 23.7
Total of 3 cuts: 23.5

** Grand mean

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74/W/CS/49

RESISTANCE TO CYST NEMATODE

Object: To study the residual effects of formalin, applied at different times to winter and spring sown wheat 1970-72, and of previous cropping with resistant and susceptible winter oats on yield and incidence of cereal cyst nematode on spring wheat.

Sponsor: T.D. Williams.

The fifth year, spring wheat.

For previous years see 70/W/CS/49(t), 71/W/CS/49(t), 72/W/CS/49(t) and 73/W/CS/49. (Until 1972 the title of the experiment was 'Fumigant and N'.)

Design: A single replicate of 4 blocks of 4 plots, split into 8.

Whole plot dimensions: 2.16 x 21.0. Sub plot area harvested: 0.00041.

Treatments: All combinations of:-

Whole plots:

1. Crops, sowing dates and times of applying formalin in the period 1970-1972: CROPETC

Winter wheat sown in autumn, formalin in early autumn	WWA
Winter wheat sown in spring, formalin in early autumn	WWS
Spring wheat sown in spring, formalin in early autumn	WSS
Spring wheat sown in spring, formalin in early spring	WSS*

Quarter plots (broadways):

2. Residues of nitrogen fertiliser (kg N) applied annually 1970-1972, basal N in 1973 and 1974: NRESID

75	75
125	125
176	176
226	226

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3. Formalin in 1970-1972: FORMALIN

1970	1971	1972	
None	None	None	000
None	Formalin	None	0F0
Formalin	None	Formalin	F0F
Formalin	Formalin	Formalin	FFF

Half plots (lengthways):

4. Varieties of oats in 1973: VARIETY(73)

Peniarth - susceptible to cereal cyst nematode	SUSCEPT
Peniarth x Avena sterilis - resistant to cereal cyst nematode	RESISTNT

Basal applications: Manures: (20:15:15) at 450 kg combine drilled. Weedkiller: Paraquat applied at 0.56 kg ion in 370 l, ioxynil at 0.63 kg plus mecoprop at 1.96 kg in 340 l.

Seed: Kleiber sown at 190 kg.

Cultivations, etc.:- Paraquat applied: 12 Sept, 1973. Sub soiled, tines 140 cm apart and 50 cm deep: 24 Sept. Rotary cultivated: 18 Oct. Ploughed: 14 Nov. Spring-tine cultivated with crumbler, seed sown: 28 Mar, 1974. Ioxynil with mecoprop applied: 8 May. Combine harvested: 29 Aug.

NOTES: 1. Soil samples were taken before sowing and after harvest for counts of Heterodera avenae eggs.
2. Plant samples were taken in May for counts of root invasion by Heterodera avenae.
3. Due to a combine harvester fault the yields from 4 plots were not taken. Estimated values were used in the analysis.

Standard errors per plot. Grain, tonnes/hectare:

Whole plot:	0.412 or 17.9% (6 d.f.)
Pooled half and quarter plot:	0.409 or 17.8% (68 d.f.)

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74/W/CS/49

TABLES OF MEANS

GRAIN: TONNES/HECTARE

	N-RESID				FORMALIN				VARIETY(73)		
	75	125	176	226	000	0F0	F0F	FFF	SUSCEPT	RESISTNT	Mean
CROPETC											
WWA	2.44	2.27	2.33	1.86	2.19	2.21	2.42	2.08	2.13	2.32	2.23
WWS	2.06	2.33	2.21	2.43	2.12	2.55	2.27	2.09	2.15	2.37	2.26
WSS	2.50	2.55	2.57	2.36	2.71	2.35	2.55	2.36	2.31	2.68	2.50
WSS*	2.02	2.23	2.43	2.18	2.13	2.20	2.27	2.25	2.06	2.37	2.21
N-RESID											
75					2.57	2.18	2.22	2.06	2.21	2.31	2.26
125					2.38	2.11	2.29	2.62	2.12	2.58	2.35
176					2.20	2.99	2.34	2.00	2.23	2.54	2.38
226					2.01	2.04	2.67	2.11	2.10	2.31	2.21
FORMALIN											
000									2.24	2.34	2.29
0F0									2.15	2.51	2.33
F0F									2.23	2.52	2.38
FFF									2.03	2.36	2.20
Mean									2.16	2.43	2.30

STANDARD ERRORS OF DIFFERENCES

CROPETC	NRESID	FORMALIN	VARIETY(73)	CROPETC NRESID	CROPETC FORMALIN	CROPETC VARIETY(73)
0.291	0.102	0.102	0.072	0.281	0.281	0.199
Unless same level of CROPETC				0.205	0.205	0.145

NRESID FORMALIN	NRESID VARIETY(73)	FORMALIN VARIETY(73)
0.205	0.145	0.145

Mean D.M. % 80.5

https://doi.org/10.23637/ERADOC-1-119

74/W/CS/55

FUMIGATION AND N

Object: To study cumulative effects of dazomet and nitrogen fertiliser on pathogens and yield of spring beans grown continuously - Woburn Butt Furlong.

Sponsors: J. McEwen, G.A. Salt, D. Hornby.

The sixth year, spring beans.

For previous years see 69/W/BE/1(t) and 70-73/W/CS/55.

Design: 3 blocks of 6 plots.

Whole plot dimensions: 2.13 x 4.27. Area harvested: 0.00020.

Treatments: All combinations of:-

1. Dazomet (kg per annum) cumulative 1969-74:

	DAZOMET
None	0
450	450

2. Nitrogen fertiliser (kg N per annum) cumulative 1969-74:

	N
None	0
126	126
252	252

Basal applications: Manures: (0:14:28) at 400 kg, placement drilled. Weedkiller: Paraquat at 0.56 kg ion in 370 l. Insecticide: Demeton-s-methyl at 0.25 kg in 340 l.

Seed: Minor, sown at 200 kg.

Cultivations, etc.:- Paraquat applied: 13 Sept, 1973. Ploughed: 12 Oct. Dazomet applied, rotary cultivated: 18 Oct. Ploughed: 2 Jan, 1974. Spring-tine cultivated with crumbler, seed sown: 7 Mar. First half N applied: 2 Apr. Second half N applied: 14 May. Insecticide applied on two occasions: 4 June, 11 July. Hand harvested: 17 Sept.

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NOTES: (1) Soil samples were taken for counts of ectoparasitic nematodes.
(2) Plant samples were taken for observation of fungal pathogens.
(3) Counts were made of number of stems and pods before harvest.
(4) 1000 grain weights and % nitrogen in grain were determined.

Standard error per plot.
Grain: tonnes/hectare: 0.323 or 14.5% (10 d.f.)

TABLES OF MEANS

GRAIN: TONNES/HECTARE

	N			
	0	126	252	Mean
DAZOMET				
0	2.28	1.71	1.69	1.89
450	1.93	2.71	3.03	2.56
Mean	2.11	2.21	2.36	2.23

STANDARD ERRORS OF DIFFERENCES

DAZOMET	N	DAZOMET N
0.152	0.186	0.263

Mean D.M.% 80.5

https://doi.org/10.23637/ERADOC-1-119 *pp 66*

74/W/CS/66

DAZOMET AND NITROGEN

Object: To study the cumulative effects of dazomet and nitrogen on pathogens and yield of maize grown continuously - Woburn Butt Furlong.

Sponsors: A.J. Barnard, D. Hornby.

The fourth year, maize.

For previous years see 71/W/CS/66(t), 72/W/CS/66(t) and 73/W/CS/66.

Design: 4 blocks of 2 plots split into 4.

Whole plot dimensions: 2.13 x 16.5. Sub plot area harvested: 0.00039.

Treatments: All combinations of:-

Whole plots: 1. Dazomet (kg per annum) cumulative 1971-74:

	DAZOMET
0	0
450	450

Sub plots: 2. Nitrogen fertiliser (kg N per annum) cumulative 1971-74:

	N
50 to seedbed	50
100 to seedbed	100
150 to seedbed	150
100 to seedbed, 50 five weeks after germination	100+50

Basal applications: Manures: (0:14:28) at 860 kg. Weedkiller: Atrazine at 1.1 kg in 280 l.

Seed: Pioneer 131, sown at 31 kg.

Cultivations, etc.:- Ploughed: 20 Nov, 1973. Spring-tine cultivated, dazomet applied, all plots rotary cultivated twice: 21 Nov. Ploughed: 2 Jan, 1974 Spring-tine cultivated: 1 Apr. PK applied: 16 Apr. Spring-tine cultivate weedkiller applied, power harrowed: 29 Apr. Rolled: 30 Apr. Seedbed N applied, sown by hand: 1 May. Late N applied: 10 July. Harvested by hand 25 Nov.

NOTES: (1) Soil samples were taken in spring before sowing and again after harvest for counts of ectoparasitic nematodes.
(2) Plant samples were taken in September to assess incidence of stem and leaf pathogens.

Standard error per sub plot.
Grain, tonnes/hectare: 0.366 or 11.7% (18 d.f.)

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74/W/CS/66

TABLES OF MEANS

GRAIN: TONNES/HECTARE

	N				
	50	100	150	100+50	Mean
DAZOMET					
0	1.89	3.21	2.86	3.36	2.83
450	3.38	3.47	3.58	3.26	3.42
Mean	2.64	3.34	3.22	3.31	3.13

STANDARD ERRORS OF DIFFERENCES

N	DAZOMET* N
0.183	0.259

* Within the same level of DAZOMET only

Mean D.M. % 93.3

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74/W/CS/78

NEMATODES AND VERTICILLIUM

Object: To study the residual effects of methyl bromide, aldicarb and benomyl (applied to potatoes in 1971) on Heterodera rostochiensis and Verticillium on a fourth potato crop in 1974 - Woburn Broadmead I.

Sponsors: D.C.M. Corbett, G.A. Hide.

The fourth year, potatoes.

For previous years see 71/W/CS/78(t), 72/W/CS/78(t) and 73/W/CS/78.

Design: 4 blocks of 6 plots, split into 2.

Whole plot dimensions: 2.84 x 12.8. Sub plot area harvested: 0.00147.

Treatments: All combinations of:-

Whole plots: 1. Residues of chemicals applied in 1971 (kg):		CHEMICAL
	None	None
	Aldicarb, 6.7	Aldicarb
	Benomyl, 22.4	Benomyl
	Aldicarb, 6.7 + benomyl, 22.4	Ald/Ben
	Dazomet, 336	Dazomet
	Methyl bromide, 975	Methylbr
Sub plots: 2. Varieties:		VARIETY
	Pentland Crown	P Crown
	Pentland Dell	P Dell

Basal applications: Manures: Ground chalk at 5 tonnes. (13:13:20) at 1510 kg. Weedkiller: Linuron at 1.2 kg plus paraquat at 0.42 kg ion in 280 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

Cultivations, etc.:- Deep-tine cultivated: 14 Sept, 1973. Ground chalk applied: 18 Sept. Deep-tine cultivated: 10 Dec. Spring-tine cultivated: 1 Apr, 1974. Power harrowed: 5 Apr. NPK applied: 8 Apr. Rotary cultivated, potatoes planted: 11 Apr. Weedkiller applied: 17 May. Grubbed: 14 June. Rotary ridged: 18 June. Fungicide with insecticide applied: 12 July. Fungicide applied: 7 Aug. Haulm mechanically destroyed: 10 Sept. Sprayed with undiluted BOV at 170 l. Lifted: 1 Oct.

https://doi.org/10.23637/ERADOC-1-119

NOTES: (1) Verticillium leaf symptoms were scored at weekly intervals from July 5 to August 30 inclusive.
(2) Soil samples were taken after harvest for counts of numbers of cysts, eggs and larvae of Heterodera rostochiensis and propagules of Verticillium.

NOTE: One plot CHEMICAL - Aldicarb, VARIETY - P Dell was planted with P Crown in error. An estimated value was used in the analysis.

Standard errors per plot. Total tubers: tonnes/hectare.
Whole plot: 2.84 or 26.8% (15 d.f.)
Sub plot: 3.15 or 29.7% (17 d.f.)

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74/W/CS/78

TABLES OF MEANS

CHEMICAL

VARIETY	None	Aldicarb	Benomyl	Ald/Ben	Dazomet	Methylbr	Mean
	TOTAL TUBERS: TONNES/HECTARE						
P Crown	13.1	11.3	21.8	16.5	13.6	12.7	14.8
P Dell	3.4	4.5	9.8	11.9	4.0	4.8	6.4
Mean	8.2	7.9	15.8	14.2	8.8	8.7	10.6

STANDARD ERRORS OF DIFFERENCES

	VARIETY	CHEMICAL	VARIETY CHEMICAL
	0.91	2.01	2.55
Except when comparing means with same level of: CHEMICAL			2.23

PERCENTAGE WARE: 3.81CM (1.5 INCH) RIDDLE

VARIETY							
P Crown	93.1	90.2	92.7	92.7	92.5	93.9	92.5
P Dell	56.9	56.4	73.8	73.4	52.1	57.3	61.7
Mean	75.0	73.3	83.2	83.0	72.3	75.6	77.1

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/82

CHEMICAL CONTROL OF SOIL-BORNE PATHOGENS

Object: To study the residual effects of a range of chemicals, on pathogens and yield of beans grown continuously for eight years - Barnfield Section 1 Plot 3.

Sponsors: D. Hornby, G.A. Salt.

The fourth year, spring beans.

For previous years see 71/R/BE/1(t), 72/R/CS/82(t) and 73/R/CS/82.

Design: 4 blocks of 6 plots.

Whole plot dimensions: 3.73 x 2.29. Area harvested: 0.00039.

Treatments (applied cumulatively 1971-73):	CHEM RES
None	None
Dexon, fungicide, at 78.5 kg	Dexon
BHC, insecticide, at 4.48 kg	BHC
Aldicarb, nematicide, at 11.2 kg	Aldicarb
Formalin, biocide, at 3000 l of a 38% solution of formaldehyde	Formalin
Dexon, aldicarb and formalin together at the above rates	Dx/Al/Fo

NOTE: Treatment Dx/Al/Fo received only aldicarb and formalin treatments in 1971.

Basal applications: Manures: PKMg as Plot 4 on Barnfield:- Triple superphosphate at 170 kg, sulphate of potash at 540 kg and kieserite at 540 kg. Weedkiller: Paraquat at 0.56 kg ion in 220 l. Insecticide: Demeton-s-methyl at 0.25 kg in 220 l.

Seed: Maris Bead, sown at 220 kg.

Cultivations, etc.:- Paraquat applied: 12 Sept, 1973. KMg applied: 12 Dec. P applied: 17 Dec. Ploughed: 20 Dec. Power harrowed: 2 Apr, 1974. Rotary harrowed: 4 Apr. Seed sown and spring-tine cultivated: 5 Apr. Insecticide applied: 13 June. Harvested by hand: 19 Sept.

https://doi.org/10.23637/ERADOC-1-119

NOTE: Development of wilt was recorded during July and August. Crop samples were taken for root disease assessment. Number of stems and crop height were recorded.

Standard error per plot.
Grain, tonnes/hectare: 0.492 or 16.2% (15 d.f.)

TABLES OF MEANS

GRAIN: TONNES/HECTARE

CHEM RES

None	Dexon	BHC	Aldicarb	Formalin	Dx/Al/Fo	Mean
2.54	3.20	2.92	3.40	2.54	3.59	3.03

STANDARD ERROR OF DIFFERENCES

CHEM RES

0.348

Mean D.M.% 81.4

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/90

CULTIVATIONS FOR CEREALS

Object: To study the engineering aspects - power requirements, rate of work, revenue and costs - of different tillage systems for wheat. Effects on weeds, soil pathogens and yields are also studied - Meadow.

Sponsors: D.E. Patterson (N.I.A.E.), R. Moffitt.

The third year, winter wheat.

For previous years see 72/R/CS/90(t) and 73/R/CS/90.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 13.7 x 33.8. Area harvested: 0.01031.

Treatments: Tillage systems:-	TILLAGE
Three passages of the tractor (three-pass system): Ploughed* 20 cm deep (8 inches): spring-tine cultivated: drilled	1
Four-pass system: Tine cultivated* 15 cm deep (6 inches): tine cultivated 15 cm: spring-tine cultivated: drilled	2
Two-pass system: Ploughed* 20 cm deep: spring-tine cultivated and drilled	3
Two-pass system: Ploughed* 10 cm deep (4 inches): spring-tine cultivated and drilled	4
Two-pass system: Tine cultivated* 20 cm deep: spring-tine cultivated and drilled	5
Two-pass system: Tine cultivated* 10 cm deep: spring-tine cultivated and drilled	6
Two-pass system: spring-tine cultivated, tine cultivated 10 cm deep**: rotary cultivated and drilled	7
Two-pass system: Sprayed with paraquat (0.56 kg ion in 220 l on 4 Oct): Bettinson direct drilled	8
Two-pass system: Rotary digger (N.I.A.E.) cultivated*: spring-tine cultivated and drilled	9
Two-pass system: Rotary digger cultivated* (20 cm deep): spring-tine cultivated and drilled	10

NOTE: Rotary digger (N.I.A.E.) - depth of working: rotor 10 cm, tines 20 cm.

* Cultivations done on 5-7 Sept, 1973.
** Cultivations done on 24 Sept.

All other cultivations and all drilling done on 10-11 Oct. A disc drill was used on all treatments except 8.

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/90

Basal applications: Manures: (10:24:24) at 310 kg combine drilled. 'Nitro-Chalk' at 300 kg. Weedkiller: Mecoprop ('Runcatex CMPP' at 8.41 in 220 l).

Seed: Cappelle, sown at 190 kg.

Cultivations, etc.:- N and weedkiller applied: 18 Apr, 1974.
Combine harvested: 10 Sept.

NOTES: Observations and determinations were made as follows:-
(1) Soil: Mechanical analysis and profile descriptions, moisture determinations, bulk densities, soil aggregate stability, organic matter, pH, nutrient distribution and photographs.
(2) Implements: Depth and width of work, forward speed, wheel slip, draught, p.t.o. power, labour requirements.
(3) Crop: Plant and tiller counts, disease and weed assessments, aerial photographs. Numbers of slugs, earthworms and other surface and soil fauna were estimated.

Standard error per plot.
Grain, tonnes/hectare: 0.432 or 8.5% (18 d.f.)

TABLE OF MEANS

GRAIN: TONNES/HECTARE

TILLAGE

1	2	3	4	5	6	7	8	9	10	Mean
5.61	5.41	4.98	5.00	4.96	4.91	4.91	5.13	4.84	5.03	5.08

STANDARD ERROR OF DIFFERENCES

TILLAGE

0.352

Mean D.M. % 76.6

https://doi.org/10.23637/ERADOC-1-119

74/W/CS/99

EFFECTS OF BREAKS ON TAKE-ALL

Object: To study the phenomenon of 'take-all' (Gaeumannomyces graminis) decline in barley - Woburn Butt Furlong.

Sponsor: D. Hornby.

The third year, barley, spring beans.

For previous years see 72/W/CS/99(t) and 73/W/CS/99.

Design: 2 blocks of 9 plots.

Whole plot dimensions: 5.33 x 15.2. Area harvested: Barley - 0.00434, spring beans - 0.00406.

Treatments: Previous crops:-

1968-71	1972	1973	PREVCROP
B	B	B (5 plots per block)	B/B/B
B	F	B	B/F/B
B	F	BE	B/F/BE

B = Barley, BE = Beans, F = Fallow

Standard applications:
All plots: Weedkiller: Paraquat at 0.56 kg ion in 370 l.
Barley: Manures: (20:15:15) at 410 kg combine drilled. Weedkiller: Ioxynil at 0.53 kg and mecoprop at 1.6 kg in 280 l.
Spring beans: Manures: (0:14:28) at 400 kg placement drilled. Weedkiller: Simazine at 1.1 kg in 390 l. Insecticide: Demeton-s-methyl at 0.25 kg in 390 l.

Seed: Barley: Julia, dressed with ethirimol, sown at 160 kg.
Spring beans, Minor sown at 200 kg.

Cultivations, etc.:-
All plots: Paraquat applied: 12 Sept, 1973. Ploughed: 25 Oct - 5 Nov. Spring-tine cultivated with crumbler: 7 Mar, 1974,
Barley: Spring-tine cultivated with crumbler second time: 22 Mar, 1974. Seed sown: 26 Mar. Weedkiller applied: 8 May. Combine harvested: 21 Aug.
Spring beans: Seed sown: 7 Mar, 1974. Weedkiller applied: 23 Mar. Insecticide applied: 21 June. Combine harvested: 17 Sept.
Fallow: Spring-tine cultivated with crumbler second time: 22 Mar, 1974. Power harrowed: 7 May.

NOTE: Soil samples were taken before sowing and after harvest and plant samples in July for incidence of 'take-all' (Gaeumannomyces graminis).

Standard error per plot.
Barley. Grain: tonnes/hectare: 0.328 or 8.1% (10 d.f.)

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74/W/CS/99

TABLES OF MEANS

BARLEY. GRAIN: TONNES/HECTARE

PREVCROP

B/B/B	B/F/B	B/F/BE	Mean
3.98	4.34	4.20	4.06

STANDARD ERRORS OF DIFFERENCES

	PREVCROP
B/B/B v B/F/B or B/F/BE	0.254
B/F/B v B/F/BE	0.328

SPRING BEANS. GRAIN: TONNES/HECTARE

Mean 3.84

Mean D.M. % 77.4

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/106

CHEMICAL CONTROL OF PATHOGENS

Objcct: To study the effects of a range of chemicals on the yield and pathogens of ryegrass - Claycroft.

Sponsors: J.F. Jenkyn, E.W. Broom, R.T. Plumb.

The second year, ryegrass.

For previous year see 73/R/CS/106.

Design: 3 randomised blocks of 10 plots split into 3.

Whole plot dimensions: 4.27 x 16.7. Area harvested: 0.00050.

Treatments: All combinations of:-

Whole plots: 1. Chemicals applied cumulatively to 1973 treatments (kg a.i.):-

	CHEMICAL
None, 3 plots per block	0
BAS 3170F 1.12 kg per cut	BA
Benomyl 1.12 kg per cut	BE
Captafol 2.24 kg per cut	CA
Dezomet 400 kg, September 1972 only	DA
Endosulfan, 2.8 l of 'Thiodan', repeated frequently	EN
Menazon, 0.7 l of 'Saphi-Col', repeated frequently	ME
Endosulfan + menazon, repeated frequently	EN+ME

NOTE: Chemicals, with the exception of captafol, were applied: 9 Apr, 1974, 18 June, 7 Aug. Endosulfan and menazon were applied on 17 July also. Captafol was applied: 8 Apr, 6 June, 8 Aug.

Sub plots: 2. Compound fertiliser (25:0:16) applied for each cut (kg N):

	NPERCUT
38	38
75	75
150	150

Basal applications: Manures: (0:14:28) at 1250 kg.

Seed: Gremie, sown at 45 kg in 1973.

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/106

Cultivations, etc.:- PK applied: 14 Dec, 1973. NK treatments applied: 27 Feb, 1974, 3 June, 2 Aug. Cut: 29 May, 25 July, 20 Dec.

NOTES: (1) Counts of mites (Abacarus hystrix) were made on 5 Apr, 25 July, 27 Aug, 28 Oct.
(2) Assessments of infection by Ryegrass mosaic virus were made on 4 Apr, 25 July.
(3) Leaf, root and soil samples were taken in autumn to determine endosulfan residues.
(4) Soil was sampled in December to determine numbers of soil fauna including earthworms.
(5) Observations were made on foliar diseases.

Standard errors per plot. Dry matter: tonnes/hectare.

1st cut:	Whole plot:	0.367 or 4.7%	(20 d.f.)
	Sub plot:	0.488 or 6.3%	(44 d.f.)
2nd cut:	Whole plot:	0.350 or 11.6%	(20 d.f.)
	Sub plot:	0.343 or 11.4%	(44 d.f.)
3rd cut:	Whole plot:	0.241 or 11.8%	(20 d.f.)
	Sub plot:	0.323 or 15.8%	(44 d.f.)
Total of 3 cuts:	Whole plot:	0.559 or 4.4%	(20 d.f.)
	Sub plot:	0.682 or 5.3%	(44 d.f.)

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/106

TABLES OF MEANS

DRY MATTER: TONNES/HECTARE

1ST CUT

CHEMICAL

	O	BA	BE	CA	DA	EN	ME	EN+ME	Mean
NPERCUT									
38	6.11	6.25	5.66	6.03	6.70	6.81	6.06	6.51	6.23
75	8.22	8.14	8.11	8.14	8.26	8.87	8.17	9.06	8.34
150	8.44	8.73	9.03	9.01	8.89	9.37	8.30	9.34	8.80
Mean	7.59	7.71	7.60	7.73	7.95	8.35	7.51	8.30	7.79

STANDARD ERRORS OF DIFFERENCES

	NPERCUT	CHEMICAL	NPERCUT CHEMICAL
	0.126		
O v any of remainder		0.245	0.362
Between any of remainder		0.300	0.443
Except when comparing means with same level of CHEMICAL			
O			0.230
Between any of remainder			0.399

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74/R/CS/106

DRY MATTER: TONNES/HECTARE

2ND CUT

CHEMICAL

	0	BA	BE	CA	DA	EN	ME	EN+ME	Mean
NPERCUT									
38	1.57	1.34	1.29	1.19	1.51	2.16	1.50	1.49	1.52
75	3.10	3.04	3.30	2.92	3.05	3.61	3.04	3.28	3.15
150	4.48	4.07	4.59	4.07	4.45	4.69	4.08	4.49	4.39
Mean	3.05	2.82	3.06	2.73	3.00	3.49	2.87	3.09	3.02

STANDARD ERRORS OF DIFFERENCES

	NPERCUT	CHEMICAL	NPERCUT CHEMICAL
	0.089		
0 v any of remainder		0.233	0.299
Between any of remainder		0.285	0.366
Except when comparing means with same level of CHEMICAL			
0			0.162
Between any of remainder			0.280

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/106

DRY MATTER: TONNES/HECTARE

3RD CUT

CHEMICAL

	0	BA	BE	CA	DA	EN	ME	EN+ME	Mean
NPERCUT									
38	1.36	1.48	1.07	1.40	1.67	1.15	1.75	1.19	1.38
75	2.33	1.96	2.30	2.19	2.56	2.11	2.26	2.42	2.28
150	2.53	2.57	2.18	2.78	2.76	2.09	2.35	2.29	2.46
Mean	2.07	2.00	1.85	2.12	2.33	1.78	2.12	1.97	2.04

STANDARD ERRORS OF DIFFERENCES

	NPERCUT	CHEMICAL	NPERCUT CHEMICAL
	0.083		
0 v any of remainder		0.160	0.238
Between any of remainder		0.196	0.291
Except when comparing means with same level of CHEMICAL			
0			0.152
Between any of remainder			0.264

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74/R/CS/106

DRY MATTER: TONNES/HECTARE

TOTAL OF 3 CUTS

CHEMICAL

	O	BA	BE	CA	DA	EN	ME	EN+ME	Mean
NPERCUT									
38	9.04	9.07	8.02	8.62	9.88	10.12	9.31	9.19	9.13
75	13.65	13.14	13.71	13.25	13.87	14.59	13.48	14.76	13.77
150	15.44	15.36	15.80	15.86	16.09	16.14	14.73	16.12	15.64
Mean	12.71	12.52	12.51	12.58	13.28	13.62	12.51	13.36	12.85

STANDARD ERRORS OF DIFFERENCES

	NPERCUT	CHEMICAL	NPERCUT CHEMICAL
	0.176		
O v any of remainder		0.373	0.526
Between any of remainder		0.456	0.644
Except when comparing means with same level of CHEMICAL			
O			0.322
Between any of remainder			0.557

Mean D.M. %
1st cut: 26.3
2nd cut: 29.6
3rd cut: 35.3
Total of 3 cuts: 30.4

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74/R/CS/107

VARIETIES AND PATHOGENS

Object: To compare the yields and susceptibilities to diseases of a range of Italian and Perennial Ryegrass varieties - Long Hoos IV.

Sponsors: R.T. Plumb, J.F. Jenkyn.

The second year, Italian and perennial ryegrass.

For previous year see 73/R/CS/107.

Design: 2 blocks of 2 whole plots split into 5 (Italian), 6 (Perennial) sub plots.

Whole plot dimensions: Italian - 13.1 x 6.10, perennial - 15.8 x 6.10.
Sub plot area harvested: 0.00056.

Treatments:-

Whole plots: 1. Ryegrass type:		TYPE
	Italian	Italian
	Perennial	Perennal
Sub plots: 2. Varieties and sowing time:		VARIETY
	Italian varieties (sown autumn 1972 except where stated):	
	Asso, sown spring 1973	Asso(S)
	Grasslands Manawa	Manawa
	R.V.P.	RVP
	R.V.P., sown spring 1973	RVP(S)
	S.22	S.22
	Perennial varieties (all sown autumn 1972):	
	Endura	Endura
	Glasnevin Leafy	Glasnevi
	Gremie	Gremie
	Monta C.I.V.	Monta
	Reveille	Reveille
	S.24	S.24

Basal applications: Manures: (0:14:28) at 900 kg. (25:0:16) at 300 kg in spring and after each cut except the last.

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74/R/CS/107

Cultivations, etc.:- PK applied: 7 Mar, 1974. NK applied: 7 Mar, 7 June, 5 Aug. Cuts: 5 June, 31 July and 10 Jan, 1975.

NOTES: (1) Counts of mites (Abacarus hystrix) were made on 19 July, 16 Sept, 21 Oct.
(2) Assessments of infection by Ryegrass Mosaic Virus were made on 21 May, 4 June, 25 July.
(3) Observations were made on foliar diseases.

Standard errors per sub plot. Dry matter: tonnes/hectare.

1st cut:	0.334	or 4.2% (9 d.f.)
2nd cut:	0.304	or 8.5% (9 d.f.)
3rd cut:	0.159	or 7.3% (9 d.f.)
Total of 3 cuts:	0.436	or 3.2% (9 d.f.)

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/107

TABLES OF MEANS

DRY MATTER: TONNES/HECTARE

TYPE			Italian					Perennal				
VARIETY	Asso(S)	Manawa	RVP	RVP(S)	S22	Endura	Glasnevi	Gremie	Monta	Reveille	S24	Mean
					1ST CUT (5/6/74)							
	8.50	8.70	8.34	8.11	8.55	6.32	6.94	8.41	8.36	6.70	9.43	8.03
					2ND CUT (31/7/74)							
	3.78	4.17	4.13	3.86	4.19	3.98	2.86	2.70	3.49	2.64	3.65	3.59
					3RD CUT (10/1/75)							
	2.54	2.34	2.40	2.54	1.90	2.62	2.11	1.54	1.98	1.45	2.62	2.18
					TOTAL OF 3 CUTS							
	14.83	15.21	14.88	14.51	14.63	12.91	11.90	12.65	13.83	10.78	15.70	13.80

STANDARD ERRORS OF DIFFERENCES. For use only in comparisons within the same TYPE

1st cut:	0.334	Mean D.M. %	29.7
2nd cut:	0.304		29.8
3rd cut:	0.159		29.1
Total of 3 cuts:	0.436		29.5

74/R/CS/109

BENOMYL AND SCLEROTINIA

Object: To study the effects of times of applying benomyl and captafol on yield, and on the incidence of Sclerotinia rot of clover - Fosters O & E III.

Sponsor: J.F. Jenkyn.

The second year, red clover.

For previous year see 73/R/CS/109.

Design: 3 randomised blocks of 10 plots.

Whole plot dimensions: 4.27 x 4.27. Area harvested: 0.00039.

Treatments: Fungicide	FUNGCIDE
None (5 plots per block)	0
Benomyl, two sprays, early Sept and early Oct	BEN(E)
Benomyl, two sprays, early Oct and early Nov	BEN(M)
Benomyl, two sprays, early Nov and early Dec	BEN(L)
Benomyl, five sprays, early Sept until early Jan	BEN(EML)
Captafol, five sprays, early Sept until early Jan	CAP(EML)

NOTES:
1. Benomyl applied 18 Sept, 1973, 12 Oct, 7 Nov, 6 Dec and 4 Jan, 1974 at 0.56 kg in 290 l.
2. Captafol applied on same dates at 1.34 kg in 290 l.
3. Sclerotinia infected soil was spread on all plots on 7 Sept, 1972.

Basal applications: Manures: (0:14:28) at 540 kg. Muriate of potash at 126 kg. Magnesium sulphate (Epsom salts) at 350 kg.

Cultivations, etc.:- PK and Mg applied: 27 Feb, 1974. K applied: 7 Mar. Cut once: 5 July.

NOTE: Counts were made of apothecia of Sclerotinia on 25 Oct, 1973. Estimates of percentage cover of clover were made in June 1974.

Standard error per plot. Dry matter, tonnes/hectare:
1st and only cut: 0.422 or 13.7% (22 d.f.)

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/109

TABLE OF MEANS

DRY MATTER: TONNES/HECTARE

1ST AND ONLY CUT

FUNGCIDE

0	BEN(E)	BEN(M)	BEN(L)	BEN(EML)	CAP(EML)	Mean
3.47	1.92	2.08	2.89	3.99	2.52	3.07

STANDARD ERRORS OF DIFFERENCES

	FUNGCIDE
0 v any of remainder	0.267
Between any of remainder	0.345

Mean D.M. % 17.6

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74/R/CS/110 and 74/W/CS/110

FERTILISER AND FYM

Object: To study the residual effects of a range of rates of NPK fertiliser, and FYM applied to potatoes on the yields of winter wheat - Rothamsted, Stackyard (R) and Woburn, Great Hill II (W).

Sponsor: F.V. Widdowson.

The second year, winter wheat.

For previous year see 73/R&W/CS/110.

Design: 3 randomised blocks of 18 plots split into 2.

Whole plot dimensions: 4.27 x 16.2. Sub plot area harvested: 0.00217.

Treatments: All combinations of:-

Whole plots. 1. Farmyard manure in 1973 (tonnes) to supply 377 kg N: FYM(73)

	(R)	(W)
None	0	0
80 Stackyard (R), 63 Great Hill II (W)	80	63

2. N and PK fertilisers in 1973 to give rates of nitrogen* (kg N): N(73)

188
377
565

3. Times of applying PK fertilisers in 1973: TIME(73)

All in autumn — Autumn
All in spring — Spring
Half in autumn, half in spring — Aut/Spng

Sub plots. 4. Nitrogen fertiliser to wheat in 1974 (kg N): N 74

None — 0
63 — 63

* The ratio of N:P2O5:K2O was 1:1.5:1.5 for all N(73) treatments.

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Basal applications:-
Stackyard (R): Weedkillers: Chlortoluron ('Dicurane' 80 WP at 4.5 kg in 440 l). MCPA, mecoprop and dicamba ('Banlene Plus' at 4.5 kg in 220 l).
Great Hill II (W): Weedkiller: Ioxynil at 0.63 kg plus mecoprop at 1.9 kg in 280 l.

Seed: Cappelle, dressed with dieldrin, sown at Stackyard (R) 200 kg, Great Hill II (W) 190 kg.

Cultivations, etc.:-
Stackyard (R): Deep-tine cultivated twice, power harrowed, seed sown: 26 Oct, 1973. Chlortoluron applied: 1 Nov. N applied: 16 Apr, 1974. 'Banlene Plus' applied: 30 Apr. Combine harvested: 30 Aug.
Great Hill II (W): Deep-tine cultivated twice: 29 Oct, 1973. Seed sown: 30 Oct. N applied: 18 Apr, 1974. Weedkiller applied: 20 Apr. Combine harvested: 30 Aug.

NOTE: Crop samples were taken for nitrate N analysis.

Standard errors per plot. Grain, tonnes/hectare:

Stackyard (R):	Whole plot:	0.489 or 8.1%	(34 d.f.)
	Sub plot:	0.535 or 8.8%	(36 d.f.)
Great Hill II (W):	Whole plot:	0.260 or 9.6%	(34 d.f.)
	Sub plot:	0.289 or 10.7%	(36 d.f.)

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74/R/CS/110 and 74/W/CS/110

TABLES OF MEANS

STACKYARD (R)

GRAIN: TONNES/HECTARE

	N(73)			TIME(73)			N 74		
	188	377	565	Autumn	Spring	Aut/Spng	0	63	Mean
FYM(73)									
0	7.00	6.42	5.50	6.14	6.46	6.32	6.44	6.17	6.31
80	6.70	5.51	5.20	5.99	5.66	5.76	6.20	5.41	5.80
			N(73)						
			188	6.98	6.82	6.75	6.86	6.84	6.85
			377	5.82	6.10	5.97	6.37	5.56	5.96
			565	5.39	5.26	5.40	5.73	4.97	5.35
					TIME(73)				
					Autumn		6.24	5.89	6.06
					Spring		6.31	5.81	6.06
					Aut/Spng		6.42	5.67	6.04
Mean							6.32	5.79	6.06

	TIME(73)	Autumn		Spring		Aut/Spng	
	N 74	0	63	0	63	0	63
FYM(73)	N(73)						
0	188	6.70	7.43	6.18	7.52	6.48	7.70
	377	6.65	5.23	7.05	6.68	7.35	5.57
	565	5.74	5.09	6.10	5.26	5.76	5.06
80	188	7.46	6.35	7.51	6.07	6.86	5.97
	377	5.45	5.95	5.71	4.96	6.03	4.95
	565	5.45	5.27	5.32	4.37	6.02	4.75

Mean D.M. % 83.8

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74/R/CS/110 and 74/W/CS/110

STACKYARD (R)

STANDARD ERRORS OF DIFFERENCES

FYM(73)	N(73)	TIME(73)	N 74	FYM(73) N(73)	FYM(73) TIME(73)	N(73) TIME(73)
0.133	0.163	0.163	0.103	0.230	0.230	0.282
			FYM(73) N 74	N(73) N 74	TIME(73) N 74	FYM(73) N(73) TIME(73) N 74
			0.168	0.206	0.206	0.505

Except when comparing means with same levels of

FYM(73)	0.146		
N(73)		0.178	
TIME(73)			0.178
FYM(73).N(73).TIME(73)			0.437

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/110 and 74/W/CS/110

STACKYARD (R)

STRAW: TONNES/HECTARE

	N(73)			TIME(73)			N 74		
	188	377	565	Autumn	Spring	Aut/Spng	0	63	Mean
FYM(73)									
0	5.34	6.22	6.36	6.00	6.00	5.93	5.86	6.09	5.98
63	6.50	6.55	6.40	6.39	6.52	6.53	6.50	6.46	6.48
			N(73)						
			188	5.96	5.83	5.97	5.66	6.17	5.92
			377	6.33	6.47	6.36	6.38	6.39	6.38
			565	6.29	6.49	6.36	6.51	6.25	6.38
					TIME(73)				
					Autumn		6.10	6.29	6.19
					Spring		6.33	6.20	6.26
					Aut/Spng		6.13	6.33	6.23
Mean							6.18	6.27	6.23

FYM(73)	TIME(73) N 74 N(73)	Autumn 0	Autumn 63	Spring 0	Spring 63	Aut/Spng 0	Aut/Spng 63
0	188	5.11	6.07	4.52	5.61	4.82	5.91
	377	6.14	6.23	6.67	6.08	6.01	6.20
	565	6.38	6.06	6.83	6.27	6.28	6.36
63	188	6.54	6.12	6.62	6.55	6.38	6.78
	377	6.05	6.91	6.77	6.34	6.62	6.59
	565	6.37	6.35	6.54	6.32	6.65	6.14

Mean D.M. % 91.4

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/110 and 74/W/CS/110

GREAT HILL II (W)

GRAIN: TONNES/HECTARE

	N(73)			TIME(73)			N 74		
	188	377	565	Autumn	Spring	Aut/Spng	0	63	Mean
FYM(73)									
0	2.40	2.69	2.73	2.62	2.59	2.60	1.99	3.22	2.61
63	2.87	2.88	2.65	2.72	2.74	2.94	2.29	3.31	2.80
			N(73)						
			188	2.60	2.57	2.73	2.14	3.13	2.63
			377	2.88	2.64	2.84	2.14	3.43	2.79
			565	2.52	2.80	2.75	2.14	3.24	2.69
						TIME(73)			
						Autumn	2.14	3.19	2.67
						Spring	2.15	3.19	2.67
						Aut/Spng	2.13	3.42	2.77
Mean							2.14	3.26	2.70

FYM(73)	TIME(73) N 74 N(73)	Autumn 0	Autumn 63	Spring 0	Spring 63	Aut/Spng 0	Aut/Spng 63
0	188	1.95	3.01	1.96	2.57	1.75	3.13
	377	2.11	3.39	1.96	3.38	1.90	3.43
	565	2.16	3.09	2.15	3.54	2.00	3.41
63	188	2.22	3.22	2.44	3.29	2.50	3.53
	377	2.33	3.70	2.19	3.03	2.38	3.66
	565	2.10	2.72	2.18	3.32	2.25	3.33

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/110 and 74/W/CS/110

GREAT HILL II (W)

STANDARD ERRORS OF DIFFERENCES

FYM(73)	N(73)	TIME(73)	N 74	FYM(73) N(73)	FYM(73) TIME(73)	N(73) TIME(73)
0.071	0.087	0.087	0.056	0.123	0.123	0.150
			FYM(73) N 74	N(73) N 74	TIME(73) N 74	FYM(73) N(73) TIME(73) N 74
			0.090	0.110	0.110	0.270

Except when comparing means with same levels of

FYM(73)	0.079			
N(73)		0.096		
TIME(73)			0.096	
FYM(73).N(73).TIME(73)				0.236

Mean D.M. % 82.2

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74/R/CS/110 and 74/W/CS/110

GREAT HILL II (W)

STRAW: TONNES/HECTARE

	N(73)			TIME(73)			N 74		
	188	377	565	Autumn	Spring	Aut/Spng	0	63	Mean
FYM(73)									
0	1.61	1.88	1.94	1.81	1.80	1.81	1.40	2.22	1.81
63	2.11	2.04	1.99	1.95	2.10	2.09	1.77	2.33	2.05
			N(73)						
			188	1.81	1.92	1.85	1.49	2.23	1.86
			377	2.04	1.93	1.90	1.66	2.25	1.96
			565	1.79	2.00	2.10	1.59	2.34	1.97
					TIME(73)				
					Autumn		1.57	2.19	1.88
					Spring		1.61	2.30	1.95
					Aut/Spng		1.57	2.33	1.95
Mean							1.58	2.27	1.93

	TIME(73) N 74	Autumn		Spring		Aut/Spng	
FYM(73)	N(73)	0	63	0	63	0	63
0	188	1.32	2.02	1.21	1.83	1.21	2.04
	377	1.60	2.26	1.52	2.27	1.33	2.29
	565	1.39	2.28	1.53	2.43	1.46	2.55
63	188	1.64	2.24	1.78	2.87	1.79	2.36
	377	1.90	2.41	1.81	2.11	1.82	2.17
	565	1.57	1.93	1.78	2.27	1.83	2.57

Mean D.M. % 79.0

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74/R/CS/116

EFFECTS OF STEM EELWORM

Object: To study the effects of applying field bean straw infested with two races of stem eelworm (Ditylenchus dipsaci) on the yield and subsequent infestation of field beans - Highfield O and E III.

Sponsor: D.J. Hooper.

The second year, spring beans.

For previous year see 73/R/CS/116.

Design: 3 randomised blocks of 6 plots.

Whole plot dimensions: 4.27 x 9.14. Area harvested: 0.00293.

Treatments: All combinations of:-

	EELWORM
1. Bean straw infested with stem eelworm (Ditylenchus dipsaci) worked into soil, autumn 1972:-	
Oat race	Oat
Giant race	Giant
2. Rate of application of straw (tonnes) to give populations of eelworms:-	RATE
None	0
Single, 3.1	Single
Double, 6.2	Double

Basal applications: Manures: (0:14:28) at 400 kg. Weedkillers: Simazine at 0.84 kg in 340 l, paraquat at 0.56 kg ion in 220 l. Insecticide: Demeton-s-methyl at 0.25 kg in 220 l.

Seed: Minor, sown at 220 kg.

Cultivations, etc.:- Paraquat applied: 4 Oct, 1973. Disced and ploughed: 18 Dec. Spring-tine cultivated: 8 Mar, 1974. Power harrowed, seed sown and spring-tine cultivated: 26 Mar. Simazine applied: 5 Apr. Insecticide applied: 13 June. Combine harvested: 30 Sept.

NOTE: Stems showing symptoms of attack by stem eelworm were counted in mid-August. Samples of seed were taken at maturity to assess seed infestation.

Standard error per plot.
Grain, tonnes/hectare: 0.461 or 23.0% (11 d.f.)

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/116

TABLES OF MEANS

GRAIN: TONNES/HECTARE

RATE

	0	Single	Double	Mean
EELWORM				
Oat		2.39	1.84	2.12
Giant		1.83	1.61	1.72
Mean	2.17	2.11	1.72	2.00

STANDARD ERRORS OF DIFFERENCES

EELWORM	RATE	EELWORM RATE
0.266	0.266	0.376

Mean D.M. % 74.5

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74/R/CS/123

EFFECTS OF VIRUSES

Object: To study the effects of virus infection on yield and persistence of ryegrass and red clover in pure and mixed stands - Garden Plot 14.

Sponsors: A.J. Cockbain, R.T. Plumb.

The second year, red clover and Italian ryegrass.

For previous year see 73/R/CS/123.

Design: 4 randomised blocks of 8 plots split into 2.

Whole plot dimensions: 3.35 x 1.22. Area harvested: 0.00011.

Treatments: All combinations of:-

Whole plots: 1. Crop and inoculation with virus:		CROP VIR
	Red clover uninoculated	Clover/0
	Italian ryegrass uninoculated	Grass/0
	Red clover and Italian ryegrass (mixed within rows) uninoculated	CloGr/0
	Red clover inoculated with Pea Mosaic Virus (PMV)	Clover/P
	Italian ryegrass inoculated with Ryegrass Mosaic Virus (RMV)	Grass/R
	Red clover and Italian ryegrass (mixed) inoculated with PMV	CloGr/P
	Red clover and Italian ryegrass (mixed) inoculated with RMV	CloGr/R
	Red clover and Italian ryegrass (mixed) inoculated with PMV and RMV	CloGr/PR
Sub plots: 2. Aldicarb (kg) after each cut:		ALDICARB
	None	0
	10	10

NOTE: Inoculation with PMV was unsuccessful.

Basal applications: Manures: (0:14:28) at 800 kg, 'Nitro-Chalk' at 300 kg after each cut.

Cultivations, etc.:- PK applied: 30 Oct, 1973. Aldicarb applied: 3 June, 1974, 25 July, 19 Sept. Cut and N applied: 28 May, 11 July, 9 Sept.

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NOTES: (1) Crop was scored for Ryegrass Mosaic Virus: 2 May.
(2) Mites (Abacarus hystrix) were counted on 11 July, 9 Sept, 21 Oct.
(3) Red clover was sampled for virus incidence during the period 29 Oct to 10 Nov.
(4) 3rd cut. Because of a faulty balance the yields from 3 whole plots CROP VIR - Clogr/PR, Clover/0, and Clogr/P were not recorded. Estimated values were used in the analysis.

Standard errors per plot. Dry matter: tonnes/hectare:

1st cut.	Whole plot:	0.833 or 10.7%	(21 d.f.)
	Sub plot:	0.761 or 9.7%	(24 d.f.)
2nd cut.	Whole plot:	0.585 or 10.3%	(21 d.f.)
	Sub plot:	0.419 or 7.4%	(24 d.f.)
3rd cut.	Whole plot:	0.769 or 14.3%	(18 d.f.)
	Sub plot:	0.640 or 11.9%	(21 d.f.)
Total of 3 cuts.	Whole plot:	1.766 or 9.4%	(18 d.f.)
	Sub plot:	1.012 or 5.4%	(21 d.f.)

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74/R/CS/123

TABLES OF MEANS

1ST CUT. DRY MATTER: TONNES/HECTARE

ALDICARB

	0	10	Mean
CROP VIR			
Clover/0	7.27	7.31	7.29
Grass/0	7.95	8.98	8.47
CloGr/0	8.17	7.84	8.00
Clover/P	6.11	6.66	6.38
Grass/R	7.78	8.46	8.12
CloGr/P	8.58	8.76	8.67
CloGr/R	7.87	8.84	8.35
CloGr/PR	6.89	7.47	7.18
Mean	7.58	8.04	7.81

STANDARD ERRORS OF DIFFERENCES

CROP VIR	ALDICARB	CROP VIR ALDICARB
0.589	0.190	0.702
Except when comparing means with same level of CROP VIR		0.538

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74/R/CS/123

2ND CUT. DRY MATTER: TONNES/HECTARE

	ALDICARB		
	0	10	Mean
CROP VIR			
Clover/0	5.74	6.75	6.24
Grass/0	4.10	5.70	4.90
CloGr/0	5.61	5.36	5.48
Clover/P	5.59	6.16	5.87
Grass/R	4.25	5.52	4.89
CloGr/P	5.33	6.18	5.75
CloGr/R	6.18	6.10	6.14
CloGr/PR	5.93	6.01	5.97
Mean	5.34	5.97	5.66

STANDARD ERRORS OF DIFFERENCES

CROP VIR	ALDICARB	CROP VIR ALDICARB
0.414	0.105	0.464
Except when comparing means with same level of CROP VIR		0.296

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74/R/CS/123

3RD CUT. DRY MATTER: TONNES/HECTARE

	ALDICARB 0	ALDICARB 10	Mean
CROP VIR			
Clover/0	5.10	7.34	6.22
Grass/0	2.61	4.07	3.34
CloGr/0	5.73	6.26	6.00
Clover/P	5.36	5.85	5.61
Grass/R	3.17	4.18	3.67
CloGr/P	5.97	6.37	6.17
CloGr/R	5.89	6.12	6.00
CloGr/PR	6.10	5.84	5.97
Mean	4.99	5.75	5.37

STANDARD ERRORS OF DIFFERENCES

CROP VIR	ALDICARB	CROP VIR ALDICARB
0.544	0.160	0.631
Except when comparing means with same level of CROP VIR		0.453

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74/R/CS/123

TOTAL OF 3 CUTS. DRY MATTER: TONNES/HECTARE

	ALDICARB		
	0	10	Mean
CROP VIR			
Clover/0	17.77	21.78	19.77
Grass/0	14.66	18.75	16.71
CloGr/0	19.51	19.46	19.48
Clover/P	17.05	18.67	17.86
Grass/R	15.20	18.16	16.68
CloGr/P	19.80	21.39	20.59
CloGr/R	19.93	21.06	20.50
CloGr/PR	18.59	19.23	18.91
Mean	17.81	19.81	18.81

STANDARD ERRORS OF DIFFERENCES

CROP VIR	ALDICARB	CROP VIR ALDICARB
1.248	0.253	1.347
Except when comparing means with same level of CROP VIR		0.716

Mean D.M. %	1st cut:	21.1
	2nd cut:	21.2
	3rd cut:	20.8
	Total of 3 cuts:	21.0

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74/R/CS/125

VARIETIES AND ALDICARB

Object: To study the residual effects of previous cropping and aldicarb on yield and incidence of Heterodera avenae on spring oats - Pennell's Piece.

Sponsor: T.D. Williams.

The second year, oats. The experiment is sited on what was previously the spring wheat series of the Cereal Disease Reference Plots (see 73/R/RN/9).

For previous year see 73/R/CS/125.

Design: 2 randomised blocks of 6 plots split into 2 breadthways for residual effects of aldicarb and 3 lengthways for residual effects of oat varieties.

Whole plot dimensions: 4.27 x 17.1. Sub plot area harvested: 0.00091.

Treatments: All combinations of:-

Whole plots: 1. Previous crops until 1972: PREVCROP(72)

1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	
W	W	W	BE	O	W	W	W	BE	O	W/W/BE/O
W	W	BE	O	W	W	W	BE	O	W	W/BE/O/W
W	BE	O	W	W	W	BE	O	W	W	BE/O/W/W
BE	O	W	W	W	BE	O	W	W	W	O/W/W/W
O	W	W	W	BE	O	W	W	W	BE	W/W/W/BE
W	W	W	W	W	W	W	W	W	W	W/W/W/W

where W = spring wheat, BE = spring beans, O = spring oats

Sub plots: 2. Aldicarb (kg), applied in 1973: ALDICARB(73)

None	0
5	5

3. Varieties of oats in 1973: VARIETY(73)

Nelson, resistant to Heterodera avenae	Nelson/R
Mostyn, susceptible to Heterodera avenae	Mostyn/S
Weibull's W16840, resistant to Heterodera avenae	W16840/R

NOTE: All sub plots were sown to variety Manod, susceptible, in 1974.

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Basal applications: Manures: (20:14:14) at 310 kg. Weedkiller: Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 340 l), paraquat at 0.56 kg ion in 220 l.

Seed: Manod, sown at 190 kg.

Cultivations, etc.:- Ploughed: 17 Sept, 1973. Paraquat applied: 3 Apr, 1974. Power harrowed, seed sown and PK applied: 5 Apr. Weedkiller applied: 29 May. Combine harvested: 28 Aug.

NOTES: (1) Soil samples were taken on 29 Aug, 1974 for determination of eelworm populations.

(2) Due to an error in combining the yield from one plot -

PREVCROP(72)	BE/O/W/W
ALDICARB(73)	5
VARIETY(73)	Nelson/R

was not recorded. An estimated value was used in the analysis.

Standard error per plot. Grain: tonnes/hectare:

Whole plot:		0.285 or 12.6% (5 d.f.)
Sub plot:	ALDICARB(73):	0.254 or 11.2% (6 d.f.)
	VARIETY(73):	0.326 or 14.4% (12 d.f.)
	ALDICARB(73) x VARIETY(73):	0.366 or 16.2% (11 d.f.)

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TABLE OF MEANS

GRAIN: TONNES/HECTARE

PREVCROP(72)

	W/W/BE/O	W/BE/O/W	BE/O/W/W	O/W/W/W	W/W/W/BE	W/W/W/W	Mean
ALDICARB(73)							
0	1.97	2.27	2.06	2.05	2.84	2.28	2.24
5	2.12	2.19	1.82	2.54	2.50	2.51	2.28
VARIETY(73)							
Nelson/R	1.91	2.09	1.53	2.50	2.64	2.57	2.21
Mostyn/S	2.17	2.27	2.21	1.97	2.78	2.27	2.28
W16840/R	2.06	2.33	2.08	2.41	2.58	2.34	2.30
Mean	2.04	2.23	1.94	2.29	2.67	2.39	2.26

ALDICARB(73)	PREVCROP(72) VARIETY(73)	W/W/BE/O	W/BE/O/W	BE/O/W/W	O/W/W/W	W/W/W/BE	W/W/W/W
0	Nelson/R	1.83	2.09	1.89	2.46	2.85	2.46
	Mostyn/S	1.98	2.31	2.03	1.92	2.97	2.08
	W16840/R	2.08	2.41	2.27	1.76	2.70	2.28
5	Nelson/R	1.98	2.09	1.17	2.53	2.44	2.67
	Mostyn/S	2.35	2.23	2.39	2.02	2.59	2.46
	W16840/R	2.03	2.24	1.89	3.06	2.46	2.41

STANDARD ERRORS OF DIFFERENCES

PREVCROP(72)	ALDICARB(73)	VARIETY(73)	PREVCROP(72) ALDICARB(73)	PREVCROP(72) VARIETY(73)	PREVCROP(72) ALDICARB(73) VARIETY(73)
0.285	0.104	0.133	0.336	0.390	0.478
Except when comparing means with same level of					
PREVCROP(72)			0.254	0.326	0.439
PREVCROP(72).ALDICARB(73)					0.416
PREVCROP(72).VARIETY(73)					0.392

Mean D.M. % 76.3

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74/R/CS/127

RIDGING, ALDICARB AND DITYLENCHUS

Object: To study the effects of ridging and aldicarb on yields of onions and incidence of Ditylenchus dipsaci - Great Field II.

Sponsor: A.G. Whitehead.

The second year, onions.

For previous year see 73/R/CS/127.

Design: 6 randomised blocks of 2 plots split into 2.

Whole plot dimensions: 7.62 x 3.05. Sub plot area harvested: 0.00108.

Treatments: Cumulative on those in 1973: All combinations of:-

Whole plots: 1. Sowing method:		SOWING
	On the flat	Flat
	On ridges	Ridge
Sub plots: 2. Aldicarb (kg):		ALDICARB
	None	0.0
	2.4	2.4

Basal applications: Manures: (13:13:20) at 1880 kg. Weedkiller: Propachlor ('Ramrod' at 6.7 kg in 450 l).

Seed: Robusta, fumigated with methyl bromide, sown at 6.7 kg.

Cultivations, etc.:- Ploughed: 17 Dec, 1973. NPK applied, rotary cultivated twice, ridged, seed sown, aldicarb and propachlor applied: 5 Apr, 1974. Hand weeded: 4 June, 4 July. Lifted by hand: 17 Sept.

NOTES: (1) Soil samples were taken before applying aldicarb and after harvest for counts of Ditylenchus dipsaci.
(2) Three plots, treatment SOWING - Ridge, ALDICARB - 0.0 and 2.4, SOWING - Flat, ALDICARB - 0.0 were incorrectly treated in 1973 and 1974. Estimated values were used in the analysis
(3) Many seedlings died from drought resulting in an uneven plant.
(4) The yields of the plots not given aldicarb were very small because of soil borne pathogens and were therefore analysed separately from the others. The standard errors for the former have not been shown.

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Standard error per sub plot. ALDICARB 2.4 only.
Sound onions, tonnes/hectare: 1.68 or 9.1% (4 d.f.)

TABLES OF MEANS

SOUND ONIONS: TONNES/HECTARE

SOWING

	Flat	Ridge	Mean
ALDICARB			
0.0	4.2	2.6	3.4
2.4	20.5	16.3	18.4

STANDARD ERROR OF DIFFERENCES. ALDICARB 2.4 only

SOWING

0.97

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74/R/CS/129

PESTICIDES AND PEST PREDATORS

Object: To study the residual effects of commonly used soil pesticides on predatory arthropods and to determine effects on yield of wheat - Road Piece.

Sponsor: C.A. Edwards.

The second year, winter wheat.

For previous year see 73/R/WW/8.

Design: 4 blocks of 6 plots.

Whole plot dimensions: 4.27 x 6.10. Area harvested: 0.00130.

Treatments: Residues of chemicals applied autumn 1972 (kg):-

	CHEM RES
None	None
Benomyl at 4.5	Benomyl
Endrin at 3.6	Endrin
Endosulfan at 0.08	Endosulf
Tetradifon at 2.2	Tetradif
Phorate at 3.6	Phorate

Basal applications: Manures: (0:14:28) at 380 kg combine drilled. 'Nitro-Chalk' at 350 kg. Weedkiller: Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 370 l).

Seed: Cappelle, seed not dressed, sown at 200 kg.

Cultivations, etc.:- Disced twice and ploughed: 25 Sept, 1973. Power harrowed and seed sown: 25 Oct. N applied: 18 Apr, 1974. Weedkiller applied: 7 May. Combine harvested: 30 Aug. Previous crops: Grass 1972, wheat 1973.

NOTE: Numbers of earthworms were estimated.

Standard error per plot.
Grain, tonnes/hectare: 0.419 or 8.1% (15 d.f.)

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TABLE OF MEANS

GRAIN: TONNES/HECTARE

CHEM RES

None	Benomyl	Endrin	Endosulf	Tetradif	Phorate	Mean
4.84	5.18	5.47	5.28	5.13	5.31	5.20

STANDARD ERROR OF DIFFERENCES

CHEM RES

0.296

Mean D.M. % 83.4

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74/R/CS/130

EFFECTS OF EARTHWORM INOCULATION

Object: To study the effects of different species of earthworms on yield and other characteristics of new grass - Fosters O & E.

Sponsor: J.R. Lofty.

The 1st year, ley.

Design: 3 blocks of 4 plots.

Whole plot dimensions: 8.53 x 9.14. Area harvested: 0.00046.

Treatments: Inoculation with earthworm species:

	WORMSPEC
None	None
Allolobophora longa at 15 per square metre	Allolobo
Lumbricus terrestris at 5 per square metre	Lumbricu
Six species - A.caliginosa, A.chlorotica, A.longa, A.rosea, L.rubellus, L.terrestris at a total of 35 per square metre	SixSpec

NOTES: (1) Earthworms were applied in late May, 1974. It was intended to repeat the applications in November but this was postponed until 1975 because of prevailing weather conditions.
(2) The site had been fallowed continuously since 1960.

Basal applications: Manures: (10:24:24) at 310 kg in seedbed. (25:0:16) at 440 kg for the first cut and at 220 kg for the second and third cuts.

Seed: 8.0 kg Perennial Ryegrass Combi, 5.3 kg Perennial Ryegrass S23, 8.0 kg Perennial Ryegrass S24, 6.7 kg Cocksfoot S26, 6.7 kg Cocksfoot S37, 2.7 kg Timothy S48, 2.7 kg Timothy S51, 2.0 kg New Zealand White Clover Huia, 0.7 kg Old Pasture Wild White Clover. Sown at 42.6 kg.

Cultivations, etc.:- NPK applied: 21 Aug, 1973. Rotary harrowed: 28 Aug. Seed sown: 30 Aug. NK applied: 25 Mar, 1974, 3 June, 31 July. Cut: 31 May, 30 July, 17 Dec.

Standard errors per plot. Dry matter: tonnes/hectare.

1st cut:	0.185 or 2.5% (6 d.f.)
2nd cut:	0.503 or 12.6% (6 d.f.)
3rd cut:	0.281 or 11.3% (6 d.f.)
Total of 3 cuts:	0.663 or 4.8% (6 d.f.)

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TABLES OF MEANS

DRY MATTER: TONNES/HECTARE

WORMSPEC

None	Allolobo	Lumbricu	SixSpec	Mean
		1ST CUT		
7.99	7.55	7.44	6.89	7.47
		2ND CUT		
4.16	3.77	4.21	3.86	4.00
		3RD CUT		
2.66	2.56	2.42	2.31	2.49
		TOTAL OF 3 CUTS		
14.81	13.88	14.06	13.05	13.95

STANDARD ERRORS OF DIFFERENCES	WORMSPEC	Mean D.M. %
1st cut	0.151	24.1
2nd cut	0.411	29.5
3rd cut	0.230	36.0
Total of 3 cuts	0.541	29.9

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74/R/CS/131

EFFECTS OF EARTHWORM DESTRUCTION

Object: To study the effects of eliminating earthworms on yield and soil structure of old grass - Appletree.

Sponsor: J.R. Lofty.

The 1st year, old grass.

Design: 4 blocks of 4 plots.

Whole plot dimensions: 7.62 x 7.62. Area harvested: 0.00046.

Treatments: Chemicals:

	CHEMICAL
None (2 plots per block)	None
Benomyl at 5 kg	Benomyl
Chlordane at 10 kg	Chlordan

NOTE: Treatments were applied on 29 May, 1974.

Basal applications: Manures: (0:14:28) at 540 kg in winter, (25:0:16) at 440 kg for the first cut and at 220 kg for the second and third cut.

Cultivations, etc.:- PK applied: 13 Dec, 1973. NK applied: 5 Mar, 1974, 4 June, 5 Aug. Cut three times: 31 May, 29 July, 3 Dec. Previous crops: Grass since 1962.

NOTE: Soil samples were taken in late November to assess earthworm populations.

Standard errors per plot. Dry matter, tonnes/hectare.

1st cut:	0.317 or 4.6% (10 d.f.)
2nd cut:	0.686 or 14.8% (10 d.f.)
3rd cut:	0.694 or 44.0% (10 d.f.)
Total of 3 cuts:	1.208 or 9.2% (10 d.f.)

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TABLES OF MEANS

DRY MATTER: TONNES/HECTARE

CHEMICAL

None	Benomyl	Chlordan	Mean
	1ST CUT		
6.81	6.85	7.00	6.87
	2ND CUT		
4.84	4.80	4.12	4.65
	3RD CUT		
1.48	1.79	1.56	1.58
	TOTAL OF 3 CUTS		
13.12	13.44	12.68	13.09

STANDARD ERRORS OF DIFFERENCES

	1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
CHEMICAL				
None v Benomyl or Chlordan	0.194	0.420	0.425	0.740
Benomyl v Chlordan	0.224	0.485	0.491	0.854
Mean D.M. %	22.0	26.2	32.2	26.8

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/133

CONTROL OF PATHOGENS

Object: To study the effects of a range of chemicals on incidence of pathogens and yield of maize - Long Hoos VI/VII 6.

Sponsors: A.J. Barnard, K.E. Fletcher, D.J. Hooper, D. Hornby, R.T. Plumb, T.D. Williams, J.C. Wilson.

The first year, maize.

Design: 3 randomised blocks of 9 plots split into 3.

Whole plot dimensions: 2.13 x 18.3.

Treatments: All combinations of:-

		CHEMICAL
Whole plots: 1. Chemicals:		
	None (4 plots per block)	None
	Aldicarb, 4.5 kg as granules to seedbed	Aldicarb
	Benomyl, 11.2 kg as dust to seedbed	Benomyl
	Dazomet, 450 kg as granules in early spring	Dazomet
	Phorate, 1.65 kg as granules drilled with the seed	Phorate
	Benomyl + dazomet + phorate, at above rates and times	Be/Da/Ph
Sub plots: 2. Nitrogen fertiliser (kg N):		N
	50	50
	100	100
	150	150

Basal applications: Manures (0:14:28) at 870 kg. Weedkillers: Atrazine ('Vectal' at 3.4 kg in 340 l).

Seed: Cargill Primeur 170, sown at 123,000 seeds per ha.

Cultivations, etc.:- PK applied, ploughed: 12 Nov, 1973. Spring-tine cultivated: 23 Mar, 1974. Dazomet applied: 28 Mar. Benomyl and aldicarb treatments applied, power harrowed, seed sown: 6 May. N applied: 31 May. Weedkiller applied: 20 May. Previous crops: Winter wheat 1972, fallow 1973.

NOTES: (1) Aphids (Rhopalosiphum padi) were assessed on two occasions.
(2) Barley Yellow Dwarf Virus was assessed on one occasion.
(3) Wireworm (Agriotes sp.) damage to seedlings was assessed.
(4) Yields were not taken as cobs did not reach maturity in the wet autumn and started to rot.

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74/R/CS/135

DIRECT DRILLING AND DISEASES

Object: To study the effects of direct drilling on pathogens and yield of winter barley - Meadow.

Sponsor: R.D. Prew.

The first year, winter barley.

Design: 2 randomised blocks of 3 plots.

Whole plot dimensions: 26.7 x 30.5. Area harvested: 0.00929.

Treatments: Cultivations:

	CULTIVTN
Ploughed, spring-tine cultivated, drilled (P)	Plough
Chisel ploughed twice, disced, drilled (C)	Chisel
Paraquat to stubble, direct drilled (D)	Direct

NOTE: Paraquat was applied at 0.56 kg ion in 220 l.

Basal applications: Manures: (10:24:24) at 250 kg combine drilled. 'Nitro-Chalk' at 300 kg. Weedkiller: Mecoprop ('Compitox Extra' at 4.2 l in 220 l).

Seed: Maris Otter sown at 170 kg, dressed fungicide only.

Cultivations, etc.:- P plots ploughed, C plots deep-tine cultivated: 6 Sept, 1973. D plots sprayed with paraquat: 18 Sept. C plots deep-tine cultivated: 10 Oct. P plots spring-tine cultivated, C plots disced and all plots sown: 11 Oct. N applied: 17 Apr, 1974. Mecoprop applied: 1 May. Combine harvested: 30 Aug. Previous crops: Barley 1972 and 1973.

NOTE: Root diseases were assessed in spring and summer and foliar diseases throughout the year.

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TABLE OF MEANS

GRAIN: TONNES/HECTARE

CULTIVTN

Plough	Chisel	Direct	Mean
5.05	5.36	4.33	4.91

Mean D.M. % 85.4

https://doi.org/10.23637/ERADOC-1-119

74/W/CS/138

CONTROL OF PCN

Object: To study the effects of rates and depths of applying nematicides on control of Heterodera rostochiensis (PCN) and yield of early and maincrop potatoes - Woburn Butt Close.

Sponsor: A.G. Whitehead.

The first year, potatoes.

Design: 2 series (for early and maincrop varieties respectively) each of 3 blocks of 7 plots.

Whole plot dimensions: 2.84 x 7.01. Area harvested: 0.00100.

Treatments: To each series: Nematicides, times and depths of application:

	NEMACIDE
None	None
Autumn applications, all also given dichloropropene (200 kg) injected at 20 cm:	
Dazomet at 100 kg, worked in to top 7.5 cm of soil	DiD1/7.5
Dazomet at 100 kg, worked in to top 15 cm of soil	DiD1/15
Dazomet at 200 kg, worked in to top 7.5 cm of soil	DiD2/7.5
Dazomet at 200 kg, worked in to top 15 cm of soil	DiD2/15
Dichloropropene at 200 kg in autumn, injected at 20 cm + 'Du Pont 1410' at 6 kg (a.i.) in spring	DiDP
'Du Pont 1410' at 6 kg (a.i.) in spring	DP

Basal applications: Manures: (13:13:20) at 1880 kg. Weedkillers: Paraquat at 0.56 kg ion in 370 l. Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide with insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

Seed: Early, Arran Pilot. Maincrop, Pentland Crown.

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Cultivations, etc.:-
Early and maincrop potatoes: Paraquat applied: 13 Sept, 1973. Subsoiled, tines 140 cm apart 50 cm deep: 25 Sept. Ploughed: 2 Nov. Dichloropropene and dazomet applied: 7 Nov. Rotary cultivated maincrop: 7 Nov. Early crop: 19 Dec. NPK applied, 'Du Pont 1410' applied, rotary cultivated: 1 Apr, 1974. Potatoes planted: 2 Apr. Inter-row rotary cultivated and earthed up: 11 Apr. Weedkiller applied: 8 May. Fungicide with insecticide applied: 19 July. Fungicide applied: 7 Aug. Early crop lifted: 19 Aug.
Maincrop: Haulm mechanically destroyed: 11 Sept. Sprayed with undiluted BCV at 170 l. Lifted: 14 Oct.
Previous crops: Potatoes 1972, barley 1973.

NOTE: Soil samples were taken in autumn 1973 and after harvest 1974 for cyst and egg counts of Heterodera rostochiensis.
Early. One plot NEMACIDE None was incorrectly treated. An estimated value was used in the analysis.

Standard errors per plot. Total tubers, tonnes/hectare:
Early: 2.08 or 6.4% (11 d.f.)
Maincrop: 3.96 or 7.0% (12 d.f.)

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TABLES OF MEANS

NEMACIDE

None	DiD1/7.5	DiD1/15	DiD2/7.5	DiD2/15	DiDP	DP	Mean
			EARLY				
			TOTAL TUBERS: TONNES/HECTARE				
15.5	31.7	27.9	34.9	36.1	41.6	41.7	32.7
			PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE				
56.3	79.4	77.4	83.2	81.9	85.0	83.1	78.0
			MAINCROP				
			TOTAL TUBERS: TONNES/HECTARE				
30.4	61.2	52.4	56.5	60.0	72.8	62.6	56.6
			PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE				
88.1	94.8	94.4	94.3	93.7	94.4	93.8	93.4

STANDARD ERRORS OF DIFFERENCES: TOTAL TUBERS: TONNES/HECTARE.

	NEMACIDE
EARLY	1.70
MAINCROP	3.23

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74/R/CS/139

FUNGICIDES AND K

Object: To study the effects of fungicides and rates of potassium on the incidence of mildew and yield of barley - W. Barnfield II.

Sponsors: J.F. Jenkyn, E.W. Broom.

The first year, barley.

Design: 3 randomised blocks of 16 plots.

Whole plot dimensions: 4.27 x 20.1. Area harvested: 0.00429.

Treatments: All combinations of:

1. Fungicides:		FUNGCIDE
	None (duplicated)	None
	Ethirimol as a seed dressing (commercially dressed)	Ethirimo
	Tridemorph, foliar spray at 0.53 kg in 340 l	Tridemor
2. Potassium fertiliser (kg K20):		K20
	None	0
	50	50
	100	100
	200	200

Basal applications: Manures: (30:13:0) at 340 kg, combine drilled. Weedkillers: Dicamba with mecoprop and MCPA ('Tetralex Plus' at 7.0 l in 220 l). Paraquat 0.56 kg ion in 220 l.

Seed: Zephyr, sown at 160 kg.

Cultivations, etc.:- Paraquat applied: 4 Oct, 1973. Ploughed: 10 Oct. K applied: 8 Mar, 1974. Spring-tine cultivated: 23 Mar. Power harrowed: 26 Mar. Seed sown: 28 Mar. Weedkiller applied: 21 May. Combine harvested: 23 Aug. Previous crops: Barley 1972 and 1973.

NOTE: Soil samples for P and K were taken from selected plots in March. Counts were made of seedling emergence. Foliar diseases were assessed on three occasions. Crop samples were taken for K analysis on 17 July, 1974.

Standard error per plot.
Grain, tonnes/hectare: 0.271 or 6.9% (34 d.f.).

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TABLES OF MEANS

GRAIN: TONNES/HECTARE

	K20				
	0	50	100	200	Mean
FUNGCIDE					
None	3.22	3.56	3.84	3.87	3.62
Ethirimo	3.68	4.37	4.41	4.77	4.31
Tridemor	3.54	4.08	4.44	4.56	4.15
Mean	3.42	3.90	4.13	4.26	3.93

STANDARD ERROR OF DIFFERENCES

	FUNGCIDE	K20
None v Ethirimo or Tridemor	0.096	0.111
Ethirimo v Tridemor	0.111	

	FUNGCIDE K20
Between any of FUNGCIDE, None	0.156
Between any of FUNGCIDE, Ethirimo or Tridemor	0.221
Between any of FUNGCIDE, None and any of Ethirimo or Tridemor	0.191

Mean D.M.% 84.4

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74/R/CS/140

CHEMICAL REFERENCE PLOTS

Object: To study the persistence in soil of four agricultural chemicals applied annually, singly and in combination and their effects on soil microflora and on yield of barley - Long Hoos V3.

Sponsors: G.G. Briggs, N. Walker, R. MacDonald.

The first year, barley.

Design: Two replicates of 2 x 2 x 2 x 2 fully randomised.

Whole plot dimensions: 4.06 x 4.57. Area harvested: 0.00075.

Treatments: All combinations of:-

1. Fungicide:	FUNGCIDE
None	None
Benomyl at 4 kg applied 28 March, 1974	Benomyl
2. Insecticide:	INSCTCDE
None	None
Chlorfenvinphos at 2 kg applied 28 March, 1974	Chlorfen
3. Nematicide:	NEMACIDE
None	None
Aldicarb at 6 kg applied 28 March, 1974	Aldicarb
4. Weedkiller:	WEEDKLLR
None	None
Chlortoluron at 2 kg applied 2 Apr, 1974	Chlortol

Basal applications: Manures: (0:20:20) at 1000 kg. 'Nitro-Chalk' at 380 kg. Weedkiller: Dicamba with mecoprop and MCPA ('Banlene Plus' at 5.6 l in 340 l).

Seed: Julia - undressed, sown at 160 kg.

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Cultivations, etc.:- PK applied: 24 Oct, 1973. Ploughed: 7 Dec.
Spring-tine cultivated: 27 Mar, 1974. Power harrowed: 28 Mar.
Seed drilled and N applied: 29 Mar. Weedkiller applied: 21 May.
Combine harvested: 21 Aug. Previous crops: Maize and sweetcorn 1972, potatoes 1973.

NOTE: The following assessments were made:
Seedling emergence, weed numbers in April, mildew and aphid numbers in June, barley yellow dwarf virus in July, algae on soil surface in July and chemical residues throughout the season.

Standard error per plot.
Grain, tonnes/hectare: 0.343 or 5.6% (16 d.f.)

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TABLES OF MEANS

GRAIN: TONNES/HECTARE

	INSCTCDE		NEMACIDE		WEEDKLLR		Mean
	None	Chlorfen	None	Aldicarb	None	Chlortol	
FUNGCIDE							
None	5.99	6.15	5.94	6.20	6.19	5.95	6.07
Benomyl	6.19	6.36	6.25	6.31	6.58	5.97	6.28
INSCTCDE							
None			5.97	6.21	6.24	5.94	6.09
Chlorfen			6.22	6.29	6.53	5.98	6.26
NEMACIDE							
None					6.19	6.00	6.09
Aldicarb					6.58	5.92	6.25
Mean					6.39	5.96	6.17

	NEMACIDE	None		Aldicarb	
	WEEDKLLR	None	Chlortol	None	Chlortol
FUNGCIDE	INSCTCDE				
None	None	5.62	6.04	6.45	5.84
	Chlorfen	6.21	5.89	6.48	6.01
Benomyl	None	6.20	6.01	6.68	5.88
	Chlorfen	6.72	6.06	6.72	5.94

STANDARD ERRORS OF DIFFERENCES

FUNGCIDE	INSCTCDE	NEMACIDE	WEEDKLLR	FUNGCIDE INSCTCDE	FUNGCIDE NEMACIDE	FUNGCIDE WEEDKLLR	INSCTCDE NEMACIDE
0.121	0.121	0.121	0.121	0.172	0.172	0.172	0.172

INSCTCDE WEEDKLLR	NEMACIDE WEEDKLLR	FUNGCIDE INSCTCDE NEMACIDE WEEDKLLR
0.172	0.172	0.343

Mean D.M. % 85.3

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74/R/CS/144

N AND WEEDKILLER

Object: To study the effects of two rates of solid or liquid nitrogen in combination with three frequencies of applying weedkiller, on weed control and yield of old grass - Bones Close.

Sponsors: A. Penny, F.V. Widdowson, R.C. Flint.

The first year, old grass.

Design: 3 blocks of 20 plots.

Whole plot dimensions: 2.13 x 9.14. Area harvested: 0.00111.

Treatments: All combinations of:-

1. Form of nitrogen fertiliser: NFORM

Solid, 'Nitro-Chalk', 25% N	Solid
Liquid, urea/ammonium nitrate, 26% N	Liquid

2. Rate of nitrogen fertiliser per cut (kg N): NPERCUT

50	50
100	100

3. Frequency of applying weedkiller(2,4-DB, Na salt, 3.4 l plus MCPA, K salt, 0.67 l plus benazolin, K salt, 0.45 l): WEEDKLLR

None	None
For 1st cut	Cut/1
For 1st and 2nd cuts	Cut/12
For 1st, 2nd and 3rd cuts	Cut/123

plus four treatments given no nitrogen fertiliser, NPERCUT(0), and receiving WEEDKLLR as above.

NOTE: Volumes applied were:-

(a) Liquid N-50:	154 l
(b) Liquid N-100:	307 l
(c) Liquid N-50 + weedkiller:	165 l
(d) Liquid N-100 + weedkiller:	318 l
(e) Weedkiller:	318 l

Basal applications: Manures: (0:14:28) at 500 kg.

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Cultivations, etc.:- PK applied: 21 Feb, 1974. N and weedkiller applied: 5 Apr, 18 June, 14 Aug. Cut three times: 30 May, 30 July, 9 Oct.

NOTES: (1) Visual scores of leaf scorch were made within four days of application of treatments.
(2) Samples from each cut were taken for the assessment of weights of grass and weeds, and of N in each.

Standard errors per plot. Dry matter: tonnes/hectare.

1st cut:	0.393	or 7.4% (38 d.f.)
2nd cut:	0.207	or 7.9% (38 d.f.)
3rd cut:	0.160	or 8.6% (38 d.f.)

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TABLES OF MEANS

1ST CUT. DRY MATTER: TONNES/HECTARE

	NPERCUT		WEEDKLLR				
	50	100	None	Cut/1	Cut/12	Cut/123	Mean
NFORM							
Solid	5.37	6.10	5.75	5.79	5.65	5.73	5.73
Liquid	5.11	5.98	5.95	5.20	5.45	5.58	5.55
		NPERCUT					
		50	5.65	5.10	5.07	5.13	5.24
		100	6.06	5.90	6.03	6.17	6.04
Mean			5.85	5.50	5.55	5.65	5.64

	WEEDKLLR				
	None	Cut/1	Cut/12	Cut/123	Mean
NPERCUT(0)	4.40	3.62	4.01	3.65	3.92

STANDARD ERRORS OF DIFFERENCES

NFORM	NPERCUT	WEEDKLLR	NFORM NPERCUT	NFORM WEEDKLLR	NPERCUT WEEDKLLR	WEEDKLLR NPERCUT(0)
0.113	0.113	0.160	0.160	0.227	0.227	0.321

Grand mean 5.29

Mean D.M. % 23.7

NOTE: Cut/1 = Cut/12 = Cut/123

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2ND CUT. DRY MATTER: TONNES/HECTARE

	NPERCUT		WEEDKLLR				
	50	100	None	Cut/1	Cut/12	Cut/123	Mean
NFORM							
Solid	2.75	3.56	3.22	3.33	3.08	2.97	3.15
Liquid	2.37	3.13	2.89	2.85	2.67	2.60	2.75
		NPERCUT					
		50	2.67	2.68	2.42	2.48	2.56
		100	3.44	3.50	3.33	3.10	3.34
Mean			3.06	3.09	2.88	2.79	2.95

	WEEDKLLR				
	None	Cut/1	Cut/12	Cut/123	Mean
NPERCUT(0)	1.15	1.27	1.22	1.19	1.21

STANDARD ERRORS OF DIFFERENCES

NFORM	NPERCUT	WEEDKLLR	NFORM NPERCUT	NFORM WEEDKLLR	NPERCUT WEEDKLLR	WEEDKLLR NPERCUT(0)
0.060	0.060	0.084	0.084	0.119	0.119	0.169

Grand mean 2.60

Mean D.M. % 23.1

NOTE: Cut/12 = Cut/123

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3RD CUT. DRY MATTER: TONNES/HECTARE

	NPERCUT		WEEDKLLR				
	50	100	None	Cut/1	Cut/12	Cut/123	Mean
NFORM							
Solid	2.05	2.88	2.59	2.49	2.34	2.44	2.46
Liquid	1.56	2.42	1.86	2.09	2.09	1.91	1.99
		NPERCUT					
		50	1.84	1.83	1.73	1.81	1.80
		100	2.60	2.75	2.71	2.54	2.65
Mean			2.22	2.29	2.22	2.17	2.23

	WEEDKLLR				
	None	Cut/1	Cut/12	Cut/123	Mean
NPERCUT(0)	0.37	0.35	0.40	0.34	0.37

STANDARD ERRORS OF DIFFERENCES

NFORM	NPERCUT	WEEDKLLR	NFORM NPERCUT	NFORM WEEDKLLR	NPERCUT WEEDKLLR	WEEDKLLR NPERCUT(0)
0.046	0.046	0.065	0.065	0.092	0.092	0.131

Grand mean 1.85

Mean D.M. % 18.3

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/148

SLOW-RELEASE N

Object: To compare a slow-release form of nitrogen with a conventional form, at a range of rates, using potatoes as the test crop - Pastures.

Sponsors: D. Cox, T.M. Addiscott.

The first year, potatoes.

Design: 2 randomised blocks of 18 plots.

Whole plot dimensions: 4.27 x 16.2. Area harvested: 0.00230.

Treatments: All combinations of:-

1. Form of nitrogen fertiliser:

	N FORM
'Gold N', sulphur-coated urea	Gold N
'Nitro-Chalk', ammonium nitrate/calcium carbonate	Nitro C

2. Rate of nitrogen fertiliser (kg N):

	N RATE
None	0
50	50
100	100
150	150
200	200
250	250
300	300
350	350
400	400

Basal applications: Manures: (0:20:20) at 800 kg, muriate of potash at 270 kg. Weedkillers: Linuron at 1.2 kg and paraquat at 0.42 kg ion in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l on two occasions. Insecticide: Demeton-s-methyl at 0.25 kg applied with mancozeb on first occasion.

Seed: Pentland Crown.

Cultivations,etc.:- Ploughed: 23 Nov, 1973. Spring-tine cultivated: 17 Apr, 1974. Basal manures applied: 25 Apr. N treatments applied: 26 Apr. Spike rotary cultivated, seed planted: 30 Apr. Weedkiller applied: 21 May. Grubbed: 19 June. Rotary ridged: 21 June. Fungicide and insecticide applied: 11 July. Fungicide applied: 2 Aug. Haulm mechanically destroyed: 16 Sept. Sprayed with undiluted BOV at 220 l: 17 Sept. Lifted: 30 Oct.

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Previous crops: Barley 1972, wheat 1973.

NOTES: Leaf samples were taken on 3 July for N determinations. Scores for tuber formation were made on 18 June. Visual scores for senescence were made on 13 Sept.

Standard error per plot.
Total tubers, tonnes/hectare: 2.97 or 4.6% (18 d.f.)

TABLES OF MEANS

	N RATE								
	0	50	100	150	200	250	300	350	400	Mean
TOTAL TUBERS: TONNES/HECTARE										
N FORM										
Gold N		57.3	61.4	61.7	65.4	68.8	68.4	68.4	66.3	64.7
Nitro C		60.1	65.3	67.3	69.5	67.3	68.0	65.8	69.5	66.6
Mean	51.1	58.7	63.3	64.5	67.4	68.0	68.2	67.1	67.9	64.0

STANDARD ERRORS OF DIFFERENCES

N FORM	N RATE	N FORM N RATE
1.05	2.10	2.97

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

N FORM									
Gold N	99.2	99.4	99.4	99.2	99.4	99.2	99.3	98.8	99.2
Nitro C	99.2	99.3	99.2	99.2	99.1	99.3	99.2	99.1	99.2
Mean	98.8	99.2	99.3	99.3	99.2	99.2	99.3	99.3	98.9	99.2

https://doi.org/10.23637/ERADOC-1-119

74/R/CS/149 and 74/W/CS/149

LIQUID FERTILISERS

Object: To study the effects of a range of rates and methods of applying liquid fertilisers on the quality and yield of potatoes - Rothamsted (R), Geescroft and Woburn (W) Lansome III.

Sponsors: F.V. Widdowson, A. Penny.

The first year, potatoes.

Design: 3 randomised blocks of 24 plots.

Whole plot dimensions: Geescroft (R): 4.27 x 15.2. Lansome III (W): 4.27 x 12.2. Area harvested: Geescroft (R) - 0.00217, Lansome III (W) - 0.00173.

Treatments: All combinations of:-

1. Form and method of applying fertiliser:

	APPLICN
Granules, broadcast over the plough furrow	GB
Liquid fertiliser, sprayed onto the plough furrow	LS
Liquid fertiliser placed in bands on each side of the seed	LP
Liquid fertiliser divided, 2/3 onto the plough furrow, 1/3 placed on each side of the seed	LSP

2. Rate of nitrogen and phosphorus fertiliser (kg N and kg P_2O_5):

	NP RATE
188	N2 P2
282	N3 P3
377	N4 P4

3. Ratio of potassium rate to nitrogen and phosphorus rate:

	K RATIO
$N:P_2O_5:K_2O$ = 1:1:1	1.0
$N:P_2O_5:K_2O$ = 1:1:1.5	1.5

Basal applications:-

Geescroft (R): Weedkillers: Linuron at 1.2 kg plus paraquat at 0.42 kg ion in 450 l. Fungicide and insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

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Lansome III (W): Weedkillers: Linuron at 1.2 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide and insecticide: Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide: Mancozeb at 1.3 kg in 450 l.

Seed: Geescroft (R) and Lansome III (W): Pentland Crown.

Cultivations, etc.:-

Geescroft (R): Ploughed: 16 Oct, 1973. Spring-tine cultivated, treatments applied: 16 Apr, 1974. Treatments applied, rotary cultivated, potatoes planted: 23 Apr. Weedkiller applied: 17 May. Grubbed: 20 June. Rotary ridged: 22 June. Fungicide with insecticide applied: 11 July. Fungicide applied: 2 Aug. Haulm mechanically destroyed: 16 Sept. Sprayed with undiluted BOV at 220 l: 17 Sept. Lifted: 22 Oct. Previous crops: Barley 1972, fallow 1973.

Lansome III (W): Subsoiled, tines 140 cm apart, 50 cm deep: 12 Nov, 1973. Ploughed: 14 Dec. Spring-tine cultivated: 10 Apr. Plough furrow treatments applied: 18 Apr. Rotary cultivated, potatoes planted, placed treatments applied: 19 Apr. Weedkiller applied: 16 May. Rotary ridged: 12 June. Fungicide with insecticide applied: 18 July. Fungicide applied: 7 Aug. Haulm mechanically destroyed: 16 Sept. Sprayed with undiluted BOV at 170 l: 18 Sept. Lifted: 23 Oct. Previous crops: Barley 1972, beans 1973.

NOTES: (1) Leaf and haulm samples were taken for N, P, K and Mg analyses.
(2) Lansome III (W): One plot APPLICN - GB, NP RATE - N^4P^4, K RATIO - 1.5 had many fewer plants because of cloddiness of soil. An estimated value was used in the analysis.
(3) Lansome III (W): There was evidence of a fertility trend across the site and yields adjusted for trend are presented.

Standard errors per plot. Total tubers, tonnes/hectare.

Geescroft (R):	4.63	or 7.1% (46 d.f.)
Lansome III (W):	4.50	or 6.4% (44 d.f.)

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TABLES OF MEANS

GEESCROFT (R)

TOTAL TUBERS: TONNES/HECTARE

	NP RATE			K RATIO		
	N2 P2	N3 P3	N4 P4	1.0	1.5	Mean
APPLICN						
GB	67.6	67.6	69.8	66.6	70.1	68.4
LS	66.3	66.6	62.8	65.0	65.4	65.2
LP	63.1	63.5	58.5	61.0	62.5	61.7
LSP	70.0	66.3	64.0	65.8	67.7	66.8
			NP RATE			
			N2 P2	65.4	68.1	66.7
			N3 P3	65.0	67.1	66.0
			N4 P4	63.5	64.0	63.8
Mean				64.6	66.4	65.5

NP RATE	N2 P2		N3 P3		N4 P4	
K RATIO	1.0	1.5	1.0	1.5	1.0	1.5
APPLICN						
GB	65.3	70.0	67.7	67.5	66.8	72.8
LS	65.7	66.8	63.4	69.8	66.1	59.5
LP	61.4	64.9	63.1	63.9	58.4	58.6
LSP	69.2	70.8	65.6	67.0	62.7	65.2

STANDARD ERRORS OF DIFFERENCES

APPLICN	NP RATE	K RATIO	APPLICN NP RATE	APPLICN K RATIO	NP RATE K RATIO	APPLICN NP RATE K RATIO
1.54	1.34	1.09	2.67	2.18	1.89	3.78

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GEESCROFT (R)

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

	NP RATE N2 P2	N3 P3	N4 P4	K RATIO 1.0	1.5	Mean
APPLICN						
GB	96.6	96.0	95.8	96.1	96.2	96.1
LS	95.6	95.8	94.8	95.3	95.5	95.4
LP	97.1	96.1	97.1	96.4	97.1	96.8
LSP	95.3	95.3	95.9	95.2	95.8	95.5
			NP RATE			
			N2 P2	96.0	96.2	96.1
			N3 P3	95.6	96.0	95.8
			N4 P4	95.6	96.1	95.9
Mean				95.8	96.1	95.9

NP RATE	N2 P2		N3 P3		N4 P4	
K RATIO	1.0	1.5	1.0	1.5	1.0	1.5
APPLICN						
GB	96.8	96.4	96.3	95.7	95.1	96.5
LS	96.0	95.2	95.5	96.1	94.4	95.2
LP	96.9	97.3	95.3	96.9	97.1	97.1
LSP	94.5	96.0	95.3	95.4	95.9	95.8

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LANSUME III (W)

TOTAL TUBERS: TONNES/HECTARE

	NP RATE			K RATIO		
	N2 P2	N3 P3	N4 P4	1.0	1.5	Mean
APPLICN						
GB	67.4	73.3	76.3	71.9	72.8	72.4
LS	63.4	64.4	75.6	66.2	69.4	67.8
LP	67.2	71.7	74.7	69.5	72.9	71.2
LSP	69.1	73.4	69.4	68.6	72.7	70.6
			NP RATE			
			N2 P2	65.8	67.8	66.8
			N3 P3	68.4	73.0	70.7
			N4 P4	73.0	75.0	74.0
Mean				69.1	71.9	70.5

NP RATE	N2 P2		N3 P3		N4 P4	
K RATIO	1.0	1.5	1.0	1.5	1.0	1.5
APPLICN						
GB	67.4	67.4	70.1	76.6	78.3	74.4
LS	61.4	65.4	62.4	66.4	74.9	76.4
LP	67.1	67.4	68.5	74.9	72.9	76.4
LSP	67.1	71.1	72.7	74.0	66.0	72.9

STANDARD ERRORS OF DIFFERENCES

APPLICN	NP RATE	K RATIO	APPLICN NP RATE	APPLICN K RATIO	NP RATE K RATIO	APPLICN NP RATE K RATIO
1.52	1.33	1.06	2.62	2.16	1.85	3.71

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LANSOME III (W)

PERCENTAGE WARE: 4.44 CM (1.75 INCH) RIDDLE

	NP RATE			K RATIO		
	N2 P2	N3 P3	N4 P4	1.0	1.5	Mean
APPLICN						
GB	93.8	95.9	96.7	95.8	95.1	95.5
LS	93.1	95.2	95.8	94.1	95.3	94.7
LP	96.0	96.3	96.2	95.8	96.6	96.2
LSP	92.8	95.8	96.6	95.2	95.0	95.1
			NP RATE			
			N2 P2	93.8	94.1	93.9
			N3 P3	95.7	95.9	95.8
			N4 P4	96.1	96.5	96.3
Mean				95.2	95.5	95.3

NP RATE	N2 P2		N3 P3		N4 P4	
K RATIO	1.0	1.5	1.0	1.5	1.0	1.5
APPLICN						
GB	94.5	93.1	95.8	96.1	97.0	96.3
LS	91.7	94.5	95.4	94.9	95.2	96.4
LP	96.4	95.7	95.5	97.2	95.4	97.0
LSP	92.5	93.1	96.1	95.4	96.8	96.4

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74/S/CS/1

VARIETIES, N AND CCC

Object: To study the effects of nitrogen fertiliser, at a range of rates and times, and chlormequat (CCC) on the yield of two varieties of winter wheat - Saxmundham, Oldershaw's and Garner's plots.

Sponsors: F.V. Widdowson, A.E. Johnston.

The ninth year, winter wheat.

For previous years see 66/C/30(t), 67/C/23(t), 68/C/39, 69-70/S/CS/1, 71/S/CS/1(t), 72/S/CS/1(t) and 73/S/CS/1.

Design: A single replicate of 4 x 2 x 2 x 2 in 4 blocks of 4 plots, each split lengthways into 2, plus one additional plot per block. Additionally all the plots are split breadthways into 3.

Whole plot dimensions: 5.49 x 40.2. Sub-plot area harvested: 0.00355.

Treatments: All combinations of:-

Whole plots (All sown at a seed rate of 170 kg with 13 cm (5 inches) between the rows):

1. Number of previous continuous wheat crops: PREVCROP

5	5 Wheat
6	6 Wheat
7	7 Wheat
8	8 Wheat

2. Chlormequat (kg): CCC

None	0.0
1.7 in 340 l	1.7

Half plots:

3. Times of applying nitrogen fertiliser: N TIME

All in April (22 April)	April
Half in early April (8 April), half in early May (7 May)	Apr/May

4. Varieties: VARIETY

Cappelle	Cappelle
Maris Huntsman	Huntsman

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Pairs of sixth plots: 5. Rates of nitrogen fertiliser in addition to 62 kg N in autumn (4 Oct) (kg N): N RATE

50	50
100	100
150	150

Together with one extra plot per block which had 4 previous wheat crops and was sown with Cappelle at a seed rate of 180 kg with 20 cm (8 inches) between the rows and tested all combinations of:- EXTRA

Whole plots: 1. Chlormequat (kg): CCC

None	0.0
1.7 in 340 l	1.7

Half plots: 2. Nitrogen fertiliser in autumn (4 Oct) (kg N): AUTUMN N

None	0
62	62

Pairs of sixth plots: 3. Nitrogen fertiliser in spring (22 April) (kg N): SPRING N

50	50
100	100
150	150

Basal applications: Manures: 1260 kg (0:20:20) applied to stubble before ploughing. 31 kg P_2O_5 and K_2O broadcast at drilling as (20:10:10) except extra plots receiving no autumn N which received (0:20:20). Weedkillers: Terbutryne and related triazines ('Prebane' at 4.5 kg in 340 l&, Ioxynil at 0.63 kg with mecoprop at 1.9 kg in 450 l.

Cultivations, etc.:- First basal PK applied: 19 Sept, 1973. Ploughed: 25 Sept. Spring-tine cultivated: 3 Oct. Seed sown and second basal PK applied: 4 Oct. 'Prebane' applied: 5 Oct. Ioxynil and mecoprop applied: 2 Apr, 1974. Growth regulator applied: 7 May. Combine harvested: 28 Aug.

NOTE: Green crop samples were taken for estimates of total dry matter and leaf areas.

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NOTES: (1) 4 plots:-

PREVCROP	6 wheat	6 wheat	7 wheat	7 wheat
CCC	0.0	0.0	0.0	0.0
N TIME	April	Apr/May	April	Apr/May
VARIETY	Cappelle	Huntsman	Huntsman	Cappelle
N RATE	150	150	150	150

were badly damaged by birds and no yields were taken. Estimated values were used in the analysis.

(2) On the EXTRA plots one of the whole plots receiving CCC was waterlogged and infested with blackgrass causing a decrease in plant population.

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74/S/CS/1

TABLES OF MEANS

GRAIN: TONNES/HECTARE

PREVCROP

	5 Wheat	6 Wheat	7 Wheat	8 Wheat	Mean
CCC					
0.0	6.17	6.11	6.25	6.13	6.17
1.7	6.37	6.39	6.25	6.34	6.34
N TIME					
April	6.37	6.22	6.33	6.15	6.27
Apr/May	6.18	6.29	6.18	6.32	6.24
VARIETY					
Cappelle	5.96	6.00	6.04	6.05	6.01
Huntsman	6.59	6.50	6.47	6.42	6.49
N RATE					
50	5.41	5.46	5.27	5.40	5.39
100	6.42	6.62	6.72	6.74	6.63
150	6.98	6.67	6.76	6.57	6.75
Mean	6.27	6.25	6.25	6.24	6.25

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EXTRA

GRAIN: TONNES/HECTARE

	AUTUMN N		SPRING N			
	0	62	50	100	150	Mean
CCC						
0.0	5.02	5.65	4.21	5.59	6.20	5.33
1.7	4.22	5.04	3.82	4.78	5.31	4.63
		AUTUMN N				
		0	3.56	4.81	5.49	4.62
		62	4.47	5.55	6.02	5.35
Mean			4.01	5.18	5.76	4.98

AUTUMN	0			63		
SPRING N	50	100	150	50	100	150
CCC						
0.0	3.79	5.18	6.08	4.63	6.00	6.33
1.7	3.33	4.45	4.89	4.30	5.11	5.72

Mean D.M. % 84.8

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EXTRA

STRAW: TONNES/HECTARE

	AUTUMN N		SPRING N			
	0	62	50	100	150	Mean
CCC						
0.0	3.35	3.86	2.90	3.75	4.16	3.60
1.7	2.97	3.34	2.80	3.27	3.40	3.16
		AUTUMN N				
		0	2.71	3.13	3.65	3.16
		62	3.00	3.89	3.91	3.60
Mean			2.85	3.51	3.78	3.38

AUTUMN N		0			63	
SPRING N	50	100	150	50	100	150
CCC						
0.0	2.52	3.35	4.17	3.29	4.15	4.15
1.7	2.90	2.90	3.12	2.71	3.64	3.67

Mean D.M. % 83.2

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