ROTHAMSTED RESEARCH

Yields of the Field Experiments 2001

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Yieds of the Classical and Other Long-term Experiments - 2001

Rothamsted Research

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Yields of the Classical and other Long-term Experiments 2001

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CONVENTIONS

For each experiment current treatments are shown with the factor and level names which are used in the tables.

For each experiment references are given to previous years. These refer to the '(Numerical)(Results)' previous editions of 'Yields of the Field Experiments'.

For the classical and some long-term experiments reference is made to 'Details' - separate publications, giving full descriptions of treatments until 1977 & 1973, with full titles 'Details of the Classical and Long Term Experiments up to 1977' and 'Details of the Classical and Long Term Experiments up to 1973'.

The following conventions are observed unless otherwise stated.

All areas are in hectares. All plot dimensions are in metres.

All rates of application of fertilizers, sprays etc. are per hectare.

All yields are per hectare.

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

Fertilizers

27% N or 34.5% N means nitrogen as ammonium nitrate

Epsom salts	$MgSO_4.7H_2O$ 10% magnesium and 13% sulphur
Fishmeal	approximately 6.5% nitrogen
FYM	Farmyard manure (from bullocks)
Gypsum	17.5% sulphur
Kieserite	$MgSO_4H_2O$ 17.7% magnesium and 23.3% sulphur
Manganese sulphate	$Mn_2(SO_4)_3$ 27% manganese and 24% sulphur
Muriate of potash	60% K_2O
Nitrate of soda	$NaNO_3$ 16% nitrogen and 27% sodium
Rhodoman	A seed dressing containing manganese
Silicate of soda	Na_2SiO_3 37% sodium and 23% silica
Sulphur Gold	30% nitrogen and 7.6% sulphur
Sulphate of ammonia	$(NH_4)_2SO_4$ 21% nitrogen 24% sulphur
Sulphate of potash	K_2SO_4 50% K_2O and 18.4% sulphur
Tiger 90	90% sulphur
Thiovit	80% sulphur
Triple superphosphate (TSP)	47% P_2O_5

Cereal straw is removed unless otherwise stated.

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In the experimental diary;
T: Refers to treatments applied to part of the experiment.
B: Refers to basal operations and applications to the whole experiment.
GS: Growth stage.
tm): Tank mix; two or more products applied together.
tr.: means seed dressing

Machinery definitions as used in the diary.

Accord	Pneumatic drill with Suffolk coulters 12.5 cm apart.
Carrier	Drill with rigid tines 11.5 cm apart.
Combine drilled	Drill mounted behind a rotary harrow.
Dutch harrow	Rigid tine harrow
Fiona	Drill with Suffolk coulters 12 cm apart
Flexitine	Heavy spring-tine cultivator.
Hege	Drill with coulters 14 cm apart
Nodet Gougis	Pneumatic precision drill with variable spacing.
Nordsten	Drill with Suffolk coulters 12 cm apart.
Oyjord	Drill with Suffolk coulters 14.2 cm apart.
Rotaspike	Spiked rotary cultivator
Rotaridger	Rotary spiked cultivator for forming potato ridges
Shakerator	Deep tine cultivator with vibrating tines 60 cm apart and 45 cm deep.
Subsoiler	Deep tine cultivator with vibrating tines 60 cm apart and 45 cm deep
Thistlebar	Shallow cultivator used to weed fallows

Tables of means

The following abbreviations are used in variate headings:

Wheat, barley, oats, beans, lupins etc.
Grain: Grain (at 85% dry matter)
Straw: Straw (at 85% dry matter)

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

Standard errors

NOTES: (1) This report gives standard errors of differences, not of means.
(2) Annotations (e.g. * min rep, max-min, max rep) to S.E.Ds are only explained the first time they occur in any experiment.

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PESTICIDES USED

The following list of pesticides is based on The UK Pesticides Guide, CAB International and The British Crop Protection Council. CABI Publishing

KEY TO ABBREVIATIONS

A	Acaricide	**Ad**	Adjuvant
D	Desiccant	**F**	Fungicide
GR	Growth regulator	**H**	Herbicide
I	Insecticide	**M**	Molluscicide
N	Nematicide		

TRADE NAME	FUNCTION	ACTIVE INGREDIENT
Aagrano	F	
Ally	**H**	20% w/w metsulfuron-methyl
Alpha Simazine 50 SC	**H**	500 g/l simazine
Amistar	**F**	250 g/l azoxystrobin
Avadex Excel 15G	**H**	15% w/w tri-allate
Azural	**H**	360 g/l glyphosate
Barclay Mutiny	**H**	250 g/l bromoxynil
BASF 3C Chlormequat 720	**GR**	720 g/l chlormequat
Baytan Flowable	**F**	22.5:187.5 g/l fuberidazole + triadimenol
Bravo 500	**F**	500 g/l chlorothalonil
Decoy Wetex	**M,I**	2% w/w methiocarb
Dursban 4	**A,I**	480 g/l chlorpyrifos
Folicur	**F**	250 g/l tebuconazole
Harmony M	**H**	7.68% w/w metsulfuron-methyl + thifensulfuron-methyl
Judge	**M**	4% w/w thiocarb
Landmark	**F**	125:125 g/l epoxiconazole + kersoxim-methyl
Lexus Class WSB	**H**	33.3:16.7% w/w carfentrazone-ethyl + flupyrsulfuron-methyl
Mesurol	**M,I**	methiocarb seed treatment
Moddus	**GR**	250 g/l trinexapac-ethyl
Opus	**F**	125 g/l epoxiconazole
Raxil S	**F**	20:20 g/l tebuconazole + triazoxide
Sibutol	**F**	375:23 g/l biteranol + fuberidazole
Starane 2	**H**	200 g/l fluroxypyr
Sting ECO	**H**	120 g/l glyphosate
Stomp 400 SC	**H**	400 g/l pendimethalin
Tolkan Liquid	**H**	500 g/l isoproturon
Toil	**Ad**	95% w/w methylated vegetable oil
Topik	**H**	240 g/l clodinafop-propargyl
Touchdown	**H**	330 g/l glyphosate
Unix	**F**	75% w/w cyprodinil

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01/R/BK/1

BROADBALK

Object: To study the effects of organic manures and inorganic fertilisers on continuous w. wheat. From 1968 two three-year rotations were included: potatoes, beans, w. wheat and fallow, w. wheat, w. wheat. In 1979 the first rotation was changed to fallow, potatoes, w. wheat. In 1980 the second rotation reverted to continuous w. wheat. Since 1985 part of the second rotation was added to the first to extend the rotation to fallow, potatoes, w. wheat, w. wheat, w. wheat, in 1996 the fallow was replaced by w. oats and potatoes replaced by maize in 1997.

The 158th year, w. wheat, w. oats and forage maize.

For previous years see 'Details' 1967 and 1973, Station Report for 1966, pp. 229-231, Station Report for 1978, Part 2, Station Report for 1982, Part 2, pp. 5-44 and 74-00/BK/1.

Areas harvested:

	Section	
Wheat:	0	0.00366
	1	0.00673
	2,4,6 and 7	0.00556
	9	0.00585
Oats:	3	0.00556
Maize:	5	0.00162

Treatments:

In 2001 a number of the treatments were changed. The treatments are now: -

Whole plots

PLOT	Fertilizers and organic manures Treatments Plot	from 2001
01(FYM)N4	01	N4
21FYMN2	21	FYM N2
22FYM	22	FYM
03Nil	03	None
05(P)KMg	05	(P) K Mg
06N1(P)KMg	06	N1 (P) K Mg
07N2(P)KMg	07	N2 (P) K Mg
08N3(P)KMg	08	N3 (P) K Mg
09N4(P)KMg	09	N4 (P) K Kg
10N4	10	N4
11N4PMg	11	N4 P Mg
12N1+3+1(P)K2Mg2	12	N1+3+1 (P) K2 Mg2
13N4PK	13	N4 P K
14N4PK*(Mg*)	14	N4 P K* (Mg*)
15N5(P)KMg	15	N5 (P) K Mg
16N6(P)KMg	16	N6 (P) K Mg
17N1+4+1PKMg	17	N1+4+1 P K Mg
18N1+2+1PKMg	18	N1+2+1 P K Mg
19N1+1+1KMg	19	N1+1+1 K Mg
20N4KMg	20	N4 K Mg

01/R/BK/1

W. oats; Nitrogen and farmyard manure were not applied.

N1,N2,N3,N4,N5,N6: 48, 96, 144, 192, 240, 288 kg N as 33.5% N; to be applied at the same time as the second dressings in the split nitrogen plots for wheat and to the seedbed for forage maize.

Split N to wheat

N1+1+1, 1+2+1 etc: Rates as above. Timings: first two weeks of March, GS31 or mid-April (whichever comes first) and GS37/mid-May.

Split N to forage maize

N2+1,2+2,2+3,2+4: Rates as above. Timings: to the seedbed and post-emergence.

P: 35 kg P as triple superphosphate.

(P): (none), to be reviewed in 2004/5.

K: 90 kg K as potassium sulphate.

K2: 180 kg K as potassium sulphate (plus 450 kg K autumn 2000 only).

K*: 90 kg K as potassium chloride.

Mg: 12 kg Mg as kieserite.

Mg2: 24 kg Mg as kieserite (plus 60 kg Mg, autumn 2000 only).

(Mg*): (none), to be reviewed in 2004/5.

FYM: Farmyard manure at 35 t

Previous treatment: -

Whole plots

PLOT		Fertilizers and organic manures:-		
	Plot	Treatments until 1967	Treatments from 1968	Treatments from 1985 - 2000
01DN4PK	01	-	D N2 P K	D N4 P K
21DN2	21	D	D N2	D N2
22D	22	D	D	D
030	03	None	None	None
05F	05	P K Na Mg	P K (Na) Mg	PK Mg
06N1F	06	N1 P K Na Mg	N1 P K (Na) Mg	N1 P K Mg
07N2F	07	N2 P K Na Mg	N2 P K (Na) Mg	N2 P K Mg
08N3F	08	N3 P K Na Mg	N3 P K (Na) Mg	N3 P K Mg
09N4F	09	N*1 P K Na Mg	N4 P K (Na) Mg	N4 P K Mg
10N2	10	N2	N2	N2
11N2P	11	N2 P	N2 P	N2 P
12N2PNA	12	N2 P Na	N2 P Na	N2 P Na
13N2PK	13	N2 P K	N2 P K	N2 P K
14N2PKMG	14	N2 P Mg	N2 P K Mg	N2 P K Mg
15N5F	15	N2 P K Na Mg	N3 P K (Na) Mg	N5 P K Mg
16N6F	16	N*2 P K Na Mg	N2 P K (Na) Mg	N6 P K Mg
17N1+3FH	17	N2(A)	N2 2(P K (Na) Mg)	N1+3 2(PK Mg) (A)+
18N0+3FH	18	P K Na Mg(A)	N2 2(P K (Na) Mg)	N0+3 2(PK Mg) (A)+
19(C)	19	C	C	(C) (since 1989)
20N2KMG	20	N2 K Na Mg	N2 K (Na) Mg	N2 K Mg

(A) Alternating each year

\+ This change since 1980. Treatments shown are those to w. wheat; autumn N alternates. Maize received N3 2(PK Mg) on both plots 17 and 18.

W. oats; Nitrogen and dung were not applied.

N1,N2,N3,N4,N5,N6: 48, 96, 144, 192, 240, 288 kg N as sulphate of ammonia until 1967, except N* which was nitrate of soda. All as 'Nitro-Chalk' in spring from 1968 to 1985, as 34.5% N since 1986.

N0+3; N1+3: None in autumn + 144 kg N in spring; 48 kg N in autumn + 144 kg N in spring

P: 35 kg P as triple superphosphate in 1974 and since 1988, single superphosphate in other years

K: 90 kg K as sulphate of potash

Na: 55 kg Na as sulphate of soda

(Na): 16 kg Na as sulphate of soda until 1973

Mg: 30 kg Mg annually to Plot 14 (applied at 26 kg 1990 to 2000), 35 kg Mg every third year to other plots since 1974 (applied at 30 kg in 1991, 1994, 1997 and 2000 and at 15 kg on half rate treatments). All as kieserite since 1974, previously as sulphate of magnesia annually

D: Farmyard manure at 35 t

(C): Castor meal to supply 96 kg N until 1988, none since

F: Full rate P K (Na) Mg as above H: Half rate of above

Strips of sub-plots: Until 1967 wheat alone was grown on the experiment, with some bare fallowing. From 1968, ten strips of sub-plots (sections) were started with the following cropping:-

SECTION	1/W34	9/W42	0/W49	8/W6	6/W23	5/O	3/W3	7/W1	4/M	2/W2
Section	1	9	0*	8+	6**	5	3	7	4	2
Year										
1968	W	W	W	W	F	W	W	P	W	BE
1969	W	W	W	W	W	F	W	BE	P	W
1970	W	W	W	W	W	W	F	W	BE	P
1971	W	W	W	W	F	W	W	P	W	BE
1972	W	W	W	F	W	F	W	BE	P	W
1973	W	W	W	W	W	W	F	W	BE	P
1974	W	W	W	W	F	W	W	P	W	BE
1975	W	W	W	W	W	F	W	BE	P	W
1976	W	W	W	W	W	W	F	W	BE	P
1977	W	W	W	W	F	W	W	P	W	BE
1978	W	W	W	W	W	F	W	BE	P	W
1979	W	W	W	W	W	W	F	W	P	F
1980	W	W	W	W	W	W	W	F	W	P
1981	W	W	W	F	W	W	W	P	F	W
1982	W	W	W	W	W	W	W	W	P	F
1983	W	W	W	W	W	W	W	F	W	P
1984	W	W	W	W	W	W	W	P	F	W
1985	W	W	W	W	W	F	W	W	P	W
1986	W	W	W	W	W	P	F	W	W	W
1987	W	W	W	W	W	W	P	W	W	F
1988	W	W	W	F	W	W	W	F	W	P

01/R/BK/1

SECTION

Section	1	9	0*	8+	6**	5	3	7	4	2
Year										
1989	W	W	W	W	W	W	W	P	F	W
1990	W	W	W	W	W	F	W	W	P	W
1991	W	W	W	W	W	P	F	W	W	W
1992	W	W	W	W	W	W	P	W	W	F
1993	W	W	W	W	W	W	W	F	W	P
1994	W	W	W	F	W	W	W	P	F	W
1995	W	W	W	W	W	F	W	W	P	W
1996	W	W	W	W	W	P	O	W	W	W
1997	W	W	W	W	W	W	M	W	W	O
1998	W	W	W	W	W	W	W	O	W	M
1999	W	W	W	W	W	W	W	M	O	W
2000	W	W	W	W	W	O	W	W	M	W
2001	W	W	W	F	W	M	O	W	W	W

W = w. wheat, O = w. oats, P = potatoes, BE = s. beans, F = fallow, M = forage maize

* Straw incorporated since autumn 1986. ** No sprays except weedkillers since 1985. + No weedkillers.

NOTES: (1) For a fuller record of treatments see 'Details' etc.
(2) From autumn 1975 to autumn 1986, chalk was applied at 2.9 t each autumn to all plots in sets of Sections on a three-year cycle. Year 1: Sections 1,2,3. Year 2: Sections 6,7,8,9. Year 3: Sections 0,4,5. From autumn 1988 until autumn 1992 a five-year cycle was used. Year 1: Sections 1,3. Year 2: Sections 2,8. Year 3: Sections 7,9. Year 4: Sections 4,6. Year 5: Sections 0,5. None applied since autumn 1991.

Experimental diary:

All sections:

02-Oct-00	T	P	TSP at 171 kg, strips 11, 13, 14, 17, & 18.
04-Oct-00	T	FYM	FYM at 35.0 tonnes, strips 2.1 & 2.2, not oat section.
	T	K*	Muriate of potash at 181 kg, strip 14.
	T	K2	Sulphate of potash at 1518 kg, strip 12.
	T	K	Sulphate of potash at 217 kg, strips 5, 6, 7, 8, 9, 13, 15, 16, 17, 18, 19 & 20.
	T	MG2	Kieserite at 560 kg, strip 12.
	T	MG	Kieserite at 80 kg, strips 5, 6, 7, 8, 9, 11, 15, 16, 17, 18, 19 & 20.
	B		Ploughing started.
05-Oct-00	B		Ploughing completed.
12-Sep-01	B		Sting ECO at 4.0 l in 100 l, excluding section 8.

Cropped sections:

W. wheat

13-Aug-00	T		straw baled (sections 1, 2, 3, 5, 6, 7, 8 & 9)
17-Aug-00	T		chopped straw, section 0.
16-Jan-01	T	WW	Combination drilled, Hereward, tr. Sibutol, at 550 seeds/m^2 with Accord drill. Completed 17-Jan-2001 (no o&e's drilled).
26-Mar-01	T		1st split N applied.
04-May-01	T		Main N and 2nd split N applied
	T		Topik at 250 ml in 100 l.

01/R/BK/1

Experimental diary:

W. wheat

15-May-01	T		tm) Ally at 20 g in 100 l.
	T		tm) Starane 2 at 0.5 l in 100 l.
31-May-01	T		3rd split N applied
06-Jun-01	B		Opus at 0.7 l in 100 l, excluding section 6.
02-Jul-01	T		Folicur at 0.5 l in 200 l, excluding section 6.
07-Aug-01	T		Take pre-harvest samples from sections 9 and 4.
10-Aug-01	T		Azural at 4.0 l in 200 l, wheat and oats only, started.
11-Aug-01	T		Azural at 4.0 l in 200 l, wheat and oats only, completed.
21-Aug-01			Combined headlands, swathed straw.
22-Aug-01	T		Baled and removed straw from headlands.
23-Aug-01	T		Combine harvested plots for yield, swathed straw.
24-Aug-01	P		Combine harvested all remaining wheat, swathed straw.
	T		Sampled, baled and weighed straw.
25-Aug-01	T		Baled and carted straw, except section 0.

S. oats

02-Apr-01	T		Spring-tine cultivated.
03-Apr-01	T	SO	Combination drilled, Revisor, tr. Aagrano, at 350 seeds/m^2.
15-May-01	T		tm) Ally at 20 g in 100 l.
	T		tm) Starane 2 at 0.5 l in 100 l.
10-Aug-01	T		Azural at 4.0 l in 200 l, wheat and oats only, started.
11-Aug-01	T		Azural at 4.0 l in 200 l, wheat and oats only, completed.
23-Aug-01	T		Combine harvested plots for yield, and discards, swathed straw.
24-Aug-01	T		Sampled, baled and weighed straw.
25-Aug-01	T		Baled and carted straw.

Forage maize

21-May-01	T		Rotary harrowed.
	T	FM	Drilled, Hudson, tr. Mesurol, at 102,000 seeds/ha, with Nodet Gougis drill.
	T		Sting ECO at 4.0 l in 200 l.
31-May-01	T		Main N and 1st split N applied
25-Jun-01	T		Post-emergence N applied.
03-Jul-01	T		Mutiny at 2.4 l in 200 l.
10-Sep-01	T		Cut, sampled and weighed sample areas.
11-Sep-01	T		Harvested discard maize.

Fallow section 8

11-May-01	T	Rotavated, section 8.
24-May-01	T	Rotary harrowed, section 8, and all discard areas.
04-Jul-01	T	Rotary harrowed, section 8.
26-Jul-01	T	Rotary harrowed.
12-Sep-01	T	Topped thistle patches on section 8.

Note: Poor weather in autumn delayed drilling of w. wheat.
Winter oats were replaced by spring oats.
Poor weather prevented timely application of some N.
Samples of wheat and oat grain and straw, and forage maize were taken for chemical analysis. Unground wheat grain and straw and maize samples from selected treatments were archived.

01/R/BK/1 W. WHEAT

GRAIN TONNES/HECTARE

***** Tables of means *****

SECTION / PLOT	4/W1	7/W2	2/W3	6/W24	1/W35	9/W43	0/W50
01(FYM)N4	5.25	5.29	5.04	5.42	*	*	*
21FYMN2	4.27	5.10	4.68	4.84	4.58	4.75	3.23
22FYM	1.70	1.96	1.95	1.83	2.17	2.24	1.34
03Nil	0.51	0.60	0.63	0.76	0.39	0.35	0.85
05(P)KMg	0.65	0.71	0.49	0.56	0.43	0.43	0.49
06N1(P)KMg	2.69	1.99	1.59	2.32	2.32	2.15	2.33
07N2(P)KMg	4.42	3.28	2.63	3.63	2.85	3.09	2.23
08N3(P)KMg	5.56	4.25	3.34	4.20	3.63	3.83	2.98
09N4(P)KMg	6.14	5.42	4.37	4.96	4.89	4.75	4.66
10N4	4.82	3.56	2.16	2.04	1.49	1.59	1.35
11N4PMg	3.92	3.28	2.07	2.35	1.96	1.94	2.41
12N1+3+1(P)K2Mg2	6.03	5.86	5.30	5.55	5.24	5.26	4.57
13N4PK	5.11	4.02	3.25	4.29	4.27	4.45	3.35
14N4PK*(Mg*)	5.37	4.06	3.42	4.56	4.95	4.74	3.97
15N5(P)KMg	6.44	4.93	4.97	4.78	4.95	4.95	3.84
16N6(P)KMg	6.35	5.87	4.64	5.30	5.17	5.17	4.68
17N1+4+1PKMg	7.21	7.09	5.50	6.61	5.39	5.07	5.49
18N1+2+1PKMg	6.47	6.51	4.96	6.16	4.93	3.67	4.70
19N1+1+1KMg	4.26	4.04	4.34	4.28	4.46	2.72	4.12
20N4KMg	*	*	*	*	1.30	*	1.39

GRAIN MEAN DM% 83.4

STRAW TONNES/HECTARE

***** Tables of means *****

SECTION / PLOT	4/W1	6/W24	1/W35	9/W43
01(FYM)N4	3.01	2.31	*	*
21FYMN2	2.58	2.31	3.63	3.17
22FYM	1.11	0.78	1.87	1.70
03Nil	0.20	0.41	0.47	0.25
05(P)KMg	0.66	0.18	0.45	0.31
06N1(P)KMg	1.85	1.82	2.22	1.92
07N2(P)KMg	2.62	1.90	2.33	1.88
08N3(P)KMg	3.13	1.94	2.78	2.45
09N4(P)KMg	3.52	1.88	2.85	2.87
10N4	2.27	1.04	0.94	1.08
11N4PMg	1.55	1.39	1.39	1.40
12N1+3+1(P)K2Mg2	3.47	3.18	3.32	2.63
13N4PK	2.92	2.05	2.86	2.38
14N4PK*(Mg*)	2.95	2.37	2.84	2.15
15N5(P)KMg	4.01	2.74	2.80	2.43
16N6(P)KMg	3.62	2.85	3.18	2.65
17N1+4+1PKMg	4.23	3.70	4.11	2.87
18N1+2+1PKMg	3.74	3.70	3.83	1.81
19N1+1+1KMg	2.75	2.63	2.83	1.52
20N4KMg	*	*	0.97	*

STRAW MEAN DM% 84.8

01/R/BK/1 S. OATS

GRAIN TONNES/HECTARE

***** Tables of means *****

PLOT	GRAIN	STRAW
01(FYM)[N4]	3.79	2.12
21[FYMN2]	4.06	2.15
22[FYM]	3.62	1.62
03Nil	1.64	0.58
05(P)KMg	1.83	0.84
06[N1](P)KMg	2.46	1.12
07[N2](P)KMg	2.66	1.23
08[N3](P)KMg	2.86	1.42
09[N4](P)KMg	3.01	1.52
10[N2]	1.50	0.56
11[N2]PMg	2.23	0.98
12[N2](P)K2Mg2	1.97	0.93
13[N2]PK	1.83	0.75
14[N2]PK*(Mg*)	2.19	0.92
15[N5](P)KMg	2.96	1.46
16[N6](P)KMg	3.56	1.52
17[N1+3]PKMg	3.11	1.50
18[N0+3]PKMg	3.29	1.49
19KMg	1.80	0.66

GRAIN MEAN DM% 86.1

STRAW MEAN DM% 69.3

MAIZE

WHOLE CROP (100% DM) TONNES/HECTARE

***** Tables of means *****

PLOT	WHOLE CROP
01(FYM)N4	13.67
21FYMN2	13.54
22FYM	9.43
03Nil	2.29
05(P)KMg	1.71
06N1(P)KMg	7.57
07N2(P)KMg	11.80
08N3(P)KMg	10.27
09N4(P)KMg	7.96
10N4	2.73
11N4PMg	4.11
12N2+3(P)K2Mg2	6.80
13N4PK	6.76
14N4PK*(Mg*)	8.84
15N5(P)KMg	6.43
16N6(P)KMg	7.76
17N2+4PKMg	6.45
18N2+2PKMg	7.42
19N2+1KMg	5.20

CROP MEAN DM% 20.8

01/R/HB/2

HOOS BARLEY

Object: To study the effects of organic manures and inorganic fertilisers on continuous s. barley. From 1968 to 1978 a rotation of potatoes, beans and s. barley was practised. The rotation was discontinued in 1979 and continued in s. barley.

The 150 year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and 74-00/HB/2.

Treatments: All combinations of:-

Whole plots

1. **MANURE** Plot Fertilizers and organic manures:

		Form of N 1852-1966	Additional treatments 1852-1979	Changes since 1980	Additional treatments since 2001
---	11	None	-	-	
-P-	21	None	P	-	
--K	31	None	K(Na)Mg	-	
-PK	41	None	PK(Na)Mg	-	
A--	12	A	-	-	
AP-	22	A	P	-	
A-K	32	A	K(Na)Mg	-	
APK	42	A	PK(Na)Mg	-	
N----	131	N	-	-	
NP---	231	N	P	-	
N-K--	331	N	K(Na)Mg	-	
NPK--	431	N	PK(Na)Mg	-	
N--S-	134	N	Si	Si omitted	
NP-S-	234	N	P Si	"	
N-KS-	334	N	K(Na)MgSi	"	
NPKS-	434	N	PK(Na)MgSi	"	
N---S	132	N	-	Si added	
NP--S	232	N	P	"	
N-K-S	332	N	K(Na)Mg	"	
NPK-S	432	N	PK(Na)Mg	"	
N--SS	133	N	Si	-	
NP-SS	233	N	P Si	-	
N-KSS	333	N	K(Na)MgSi	-	
NPKSS	433	N	PK(Na)MgSi	-	
C(--)	14	C	-	PKMg omitted	
C(P-)	24	C	P	"	
C(-K)	34	C	K(Na)Mg	"	
C(PK)	44	C	PK(Na)Mg	"	
D1852	72	None	D	-	
(D)	71	None	(D)	-	
(A)	62	None	(Ashes)	-	
-	61	None	-	-	
D2001	73	-	-	-	D
P2KMg	63	-	-	-	P2KMg

Form of N: A sulphate of ammonia: N nitrate of soda - each to supply 48 kg N: C castor meal to supply 96 kg N
P: 35 kg P as triple superphosphate in 1974 and since 1988, single superphosphate in other years
P2: 44 kg P as triple superphosphate started in 2001.
K: 90 kg K as sulphate of potash

01/R/HB/2

(Na): 16 kg Na as sulphate of soda until 1973
Mg: 35 kg Mg as kieserite every third year since 1974 (applied at 30 kg in 1992, 1995 and 1998)(sulphate of magnesia annually until 1973). Annually to new plot 63.
Si: Silicate of soda at 450 kg
D1852: Farmyard manure at 35 t since 1852.
D2001: Farmyard manure at 35 t since 2001
(D): until 1852 - 1871 only
(Ashes): Weed ash 1852-1916, furnace ash 1917-1932, none since

Sub-plots

2. **N** Nitrogen fertilizer (kg N), as 'Nitro-Chalk', since 1968 (cumulative N applications until 1973, on a cyclic system since 1974):

0
48
96
144

Plus extra plots testing all combinations of:-

Whole plots

1 **MANURE** Fertilizers other than magnesium:

55AN2PK	Plot 55 AN2PK
56--PK	Plot 56 --PK
57NN2--	Plot 57 NN2
58NN2--	Plot 58 NN2

N2: 96 kg N as 'Nitro-Chalk' since 1968. Other symbols as above.

Sub-plots

2. **MGNESIUM** Magnesium fertilizer (kg Mg) as kieserite every third year since 1974:

0
35 (30 in 1992, 1995 and 1998)

NOTE: For a fuller record see 'Details' etc.

Experimental diary:

02-Jan-01	**T**	P, P2, K and Mg applied. K and Mg completed 05-Jan-01.
03-Jan-01	**T**	FYM and Si applied.
08-Jan-01	B	ploughed.
30-Mar-01	B	Combination drilled, Optic, tr. Raxil S, at 350 seeds/m^2 with the Accord drill.
19-May-01	B	tm)Ally at 20 g in 100 l.
	B	tm)Starane 2 at 0.5 l in 100 l.
21-May-01	**T**	N applied (27.5% N) applied by hand.
11-Jun-01	B	Opus at 0.4 l in 100 l.
02-Jul-01	B	Folicur at 0.5 l in 200 l.
06-Sep-01	**T**	Combine harvested, plots for yield, sampled and weighed straw, swathed straw, started.
07-Sep-01	**T**	Combine harvested remaining plots for yield, and discards. Sampled and weighed straw. Swathed straw.
11-Sep-01	B	Baled straw.

Note: Samples of grain and straw were taken for chemical analysis. Unground grain and straw samples from selected treatments were archived.

00/R/HB/2 MAIN PLOTS

GRAIN TONNES/HECTARE

***** Tables of means *****

N	0	48	96	144	Mean
MANURE					
---	0.64	0.63	0.67	0.82	0.69
-P-	1.23	2.18	2.26	2.10	1.94
--K	0.72	0.94	0.99	1.32	1.00
-PK	0.94	1.90	2.49	2.22	1.89
A--	0.58	0.57	0.47	0.22	0.46
AP-	1.37	1.53	1.70	1.92	1.63
A-K	0.71	1.01	1.23	1.10	1.01
APK	1.18	1.81	2.33	2.86	2.04
N----	0.90	0.84	1.31	1.01	1.01
NP---	1.55	2.09	2.91	2.75	2.32
N-K--	0.65	1.26	1.50	1.42	1.21
NPK--	1.25	1.92	2.60	2.49	2.06
N--S-	1.20	1.37	1.78	2.37	1.68
NP-S-	1.38	2.40	2.92	2.32	2.26
N-KS-	1.02	1.75	1.79	2.15	1.68
NPKS-	1.57	2.41	2.93	3.21	2.53
N---S	1.26	1.49	1.56	1.79	1.52
NP--S	1.44	2.34	2.69	3.10	2.39
N-K-S	1.07	1.36	1.72	2.14	1.57
NPK-S	1.18	2.21	2.78	3.18	2.34
N--SS	1.02	1.62	1.74	1.62	1.50
NP-SS	1.80	2.16	2.58	2.69	2.30
N-KSS	1.49	1.91	2.05	2.27	1.93
NPKSS	1.27	2.04	2.75	2.65	2.18
C(--)	1.18	1.83	1.92	1.79	1.68
C(P-)	1.23	2.21	2.70	2.64	2.20
C(-K)	0.65	1.83	1.83	2.25	1.64
C(PK)	0.99	2.05	2.38	2.96	2.10
D1852	3.71	4.25	5.08	4.69	4.43
(D)	0.84	0.82	1.18	2.88	1.43
(A)	0.85	1.19	1.36	1.35	1.19
-	0.97	0.87	1.01	0.99	0.96
D2001	2.30	2.64	3.28	3.22	2.86
P2K	1.64	2.81	2.39	2.62	2.36
Mean	1.23	1.77	2.08	2.21	1.82

GRAIN MEAN DM% 71.4

00/R/HB/2 MAIN PLOTS

STRAW TONNES/HECTARE

***** Tables of means *****

N	0	48	96	144	Mean
MANURE					
---	0.14	0.25	0.16	0.37	0.23
-P-	0.25	0.31	0.31	0.36	0.31
--K	0.12	0.32	0.33	0.27	0.26
-PK	0.27	0.50	0.51	0.76	0.51
A--	0.19	0.15	0.13	0.08	0.14
AP-	0.32	0.36	0.43	0.59	0.42
A-K	0.09	0.24	0.23	0.42	0.25
APK	0.26	0.38	0.50	0.66	0.45
N----	0.21	0.24	0.51	0.28	0.31
NP---	0.38	0.56	0.79	0.66	0.60
N-K--	0.17	0.24	0.46	0.47	0.33
NPK--	0.37	0.45	0.67	0.67	0.54
N--S-	0.28	0.30	0.72	0.49	0.45
NP-S-	0.22	0.50	0.54	0.36	0.40
N-KS-	0.18	0.30	0.34	0.47	0.32
NPKS-	0.19	0.43	0.57	0.68	0.47
N---S	0.31	0.39	0.45	0.59	0.43
NP--S	0.25	0.62	0.60	0.70	0.54
N-K-S	0.22	0.46	0.42	0.76	0.47
NPK-S	0.27	0.41	0.60	1.20	0.62
N--SS	0.18	0.30	0.31	0.37	0.29
NP-SS	0.43	0.31	0.67	0.46	0.47
N-KSS	0.24	0.37	0.36	0.47	0.36
NPKSS	0.18	0.30	0.56	0.53	0.39
D1852	1.15	1.26	1.53	1.24	1.30
(D)	0.19	0.18	0.20	0.47	0.26
(A)	0.25	0.35	0.35	0.38	0.33
-	0.33	0.19	0.26	0.49	0.32
D2001	0.68	0.78	1.01	0.87	0.83
P2K	0.33	0.74	0.50	0.64	0.55
Mean	0.29	0.41	0.50	0.56	0.44

STRAW MEAN DM% 80.2

EXTRA PLOTS

GRAIN TONNES/HECTARE

***** Tables of means *****

MANURE	551AN2PK	561--PK	571NN2--	581NN2--	Mean
MGNESIUM					
0	2.42	0.43	1.53	1.20	1.39
35	2.51	0.48	1.74	1.33	1.51
Mean	2.46	0.45	1.64	1.26	1.45

GRAIN MEAN DM% 78.4

01/R/WF/3

WHEAT AND FALLOW

Object: To study the effects of fallowing on unmanured w. wheat - Hoosfield.

The 146th year, s. wheat.

For previous years see 'Details' 1967, 1973 and 74-00/R/WF/3.

Whole plot dimensions: 9 x 211.

Treatments:
Two plots, one sown to w. wheat, one fallow; alternating in successive years.

Experimental diary:

20-Oct-00	T		Ploughed.
26-Oct-00	T		Flexitined.
21-Jan-01	T		Ploughed.
02-Apr-01	T		Combination drilled, Axona, tr. Sibutol, at 350 seeds/m^2 with the Accord drill.
15-May-01	T		tm)Ally at 20 g in 100 l.
	T		tm)Starane 2 at 0.5 l in 100 l.
22-May-01	T		Touchdown at 3.0 l in 200 l.
13-Jun-01	T		Folicur at 0.7 l in 100 l.
26-Jul-01	T		Rotary harrowed.
20-Aug-01	T		Azural at 4.0 l in 200 l.
07-Sep-01	T		Combine harvested plot for yield, and discards.
	T		Sampled, baled and weighed straw.
	T		Swathed straw.
11-Sep-01	T		Baled straw.

Note: Poor weather prevented drilling of winter wheat; spring wheat was sown instead.
Unground grain and straw was archived.

GRAIN AND STRAW TONNES/HECTARE

	GRAIN	STRAW
YIELD	0.91	0.15
MEAN DM%	82.8	85.0
PLOT AREA HARVESTED	0.05064	

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01/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures applied 1876-1901, and of additional phosphate applied since 1986, on the yield of continuous s. barley up to 1991, w. wheat since - Hoosfield.

The 146th year, s. wheat.

For previous years see 'Details' 1977, 1973 and 74-00/EX/4.

Treatments: All combinations of:-

Whole plots (P test)

1. **OLD RES** — Residues of manures applied annually 1876-1901:

O	None
D	Farmyard manure at 35 t
N	96 kg N as ammonium salts
P	34 kg P as superphosphate
NPKNAMG	N and P as above plus 137 kg K as sulphate of potash, 16 kg Na as sulphate of soda, 11 kg Mg as sulphate of magnesia

2. **P** — Maintenance P (20 kg P) applied annually from 2000 to maintain existing levels of available P in the soil. (P1) (P2) and (P3) are residues of P applied annually 1986-1992:

	2000-01	1986-92
O	None	None
P(P1)	20 kg P	44 kg P
P(P2)	20 kg P	87 kg P
P(P3)	20 kg P	131 kg P

NOTE: P treatments were applied at 61.5 kg P in error in 2000.

plus

Whole plots (K test, previously N test until 1991)

OLD RES — Residues of manures applied annually 1876-1901:

O	None
D	Farmyard manure at 35 t
N*	96 kg N as nitrate of soda
PK	34 kg P as superphosphate, 137 kg K as sulphate of potash
N*PK	N, P and K as above

Experimental diary:

K test:

17-Oct-00	**T**		P basal:(triple superphosphate at 98 kg), plots 2, 4, 6, 8 & 10.

P test:

17-Oct-00	**T**	P	P test:(triple superphosphate at 98 kg), plots 011-013, 031-033, 051-053, 071-073, & 091-093.
18-Oct-00	**T**	K	K basal/100 kg (muriate of potash at 250 kg), plots 1, 3, 5, 7 & 9.

All plots:

20-Oct-00	B	Ploughed.
26-Oct-00	B	Combination drilled, Hereward, tr. Sibutol, at 450 seeds/m^2 with the Accord drill.
21-Jan-01	B	Ploughed.

01/R/EX/4

Experimental diary:
Winter wheat failed, re-sown to spring wheat

02-Apr-01	B	:	Combination drilled, Axona, tr. Sibutol, at 350 seeds/m^2 with the Accord drill.
15-May-01	B	:	33.5% N at 433 kg.
15-May-01	B	:	tm) Ally at 20 g in 100 l.
	B	:	tm) Starane 2 at 0.5 l in 100 l.
13-Jun-01	B	:	Folicur at 0.7 l in 100 l.
20-Aug-01	B	:	Azural at 4.0 l in 200 l.
07-Sep-01	**T**	:	Combine harvested plots for yield, and discards.
	T	:	Sampled, baled and weighed straw.
	T	:	Swathed straw.
11-Sep-01	B	:	Baled straw.

Note: Winter wheat failed; re-sown to spring wheat.
Samples of grain and straw were taken for chemical analysis.

P TEST

GRAIN TONNES/HECTARE

***** Tables of means *****

P	0	P(P1)	P(P2)	P(P3)	Mean
OLD RES					
0	1.04	3.69	3.68	2.86	2.82
D	2.18	4.03	4.19	4.10	3.63
N	1.44	3.52	4.02	3.36	3.08
P	2.20	4.00	4.64	4.00	3.71
NPKNAMG	2.15	3.84	4.15	4.09	3.56
Mean	1.80	3.82	4.14	3.68	3.36

GRAIN MEAN DM% 84.1

STRAW TONNES/HECTARE

***** Tables of means *****

P	0	P(P1)	P(P2)	P(P3)	Mean
OLD RES					
0	0.34	2.03	1.86	1.65	1.47
D	1.25	2.16	1.98	1.98	1.84
N	0.40	1.82	2.28	1.36	1.47
P	0.86	1.74	2.30	1.77	1.67
NPKNAMG	0.84	1.87	2.54	1.70	1.74
Mean	0.74	1.92	2.19	1.69	1.64

STRAW MEAN DM% 83.7

PLOT AREA HARVESTED 0.00614

01/R/EX/4

K TEST

GRAIN TONNES/HECTARE

***** Tables of means *****

OLD RES	
0	2.47
D	3.20
N*	1.43
PK	0.91
N*PK	1.94
Mean	1.99

GRAIN MEAN DM% 84.0

STRAW TONNES/HECTARE

***** Tables of means *****

OLD RES	
0	1.68
D	1.69
N*	1.54
PK	1.05
N*PK	1.28
Mean	1.45

STRAW MEAN DM% 65.2

PLOT AREA HARVESTED 0.00614

01/R/PG/5

PARK GRASS

Object: To study the effects of organic manures and inorganic fertilisers and lime on old grass for hay.

The 146th year, hay.

For previous years see 'Details' 1977 and 1973 and 74-00/R/PG/5.

Treatments: Combinations of:-

Whole plots

1. **MANURE** Fertilizers and organic manures:

N1	Plot 1	N1
K	Plot 2/1	K since 1996 (as 2/2 before)
O(D)	Plot 2/2	None (D until 1863)
O	Plot 3	None
P	Plot 4/1	P
N2P	Plot 4/2	N2 P
N1MN	Plot 6	N1 P K Na Mg
MN	Plot 7	P K Na Mg
PNAMG	Plot 8	P Na Mg
MN(N2)	Plot 9/1	P K Na Mg (N2 until 1989)
N2MN	Plot 9/2	N2 P K Na Mg
N2PNAMG	Plot 10	N2 P Na Mg
N3MN	Plot 11/1	N3 P K Na Mg
N3MNSI	Plot 11/2	N3 P K Na Mg Si
O	Plot 12	None
(D/F)	Plot 13/1	None (D/F until 1994)
D/F	Plot 13/2	D/F
MN(N2*)	Plot 14/1	P K Na Mg (N2* until 1989)
N2*MN	Plot 14/2	N2* P K Na Mg
MN(N2*)	Plot 15	P K Na Mg (N2* until 1875)
N1*MN	Plot 16	N1* P K Na Mg
N1*	Plot 17	N1*
N2KNAMG	Plot 18	N2 K Na Mg
D	Plot 19	D
D/N*PK	Plot 20	D/N*P K

N1, N2, N3:	48, 96, 144 kg N as sulphate of ammonia
N1*, N2*:	48, 96 kg N as nitrate of soda (30 kg N to plot 20 in years with no farmyard manure)
P:	35 kg P (15 kg P to plot 20 in years with no farmyard manure) as triple superphosphate in 1974 and since 1987, single superphosphate in other years
K:	225 kg K (45 kg K to plot 20 in years with no farmyard manure) as sulphate of potash
Na:	15 kg Na as sulphate of soda
Mg:	10 kg Mg as sulphate of magnesia
Si:	Silicate of soda at 450 kg
D:	Farmyard manure at 35 t every fourth year
F:	Fishmeal every fourth year to supply 63 kg N
MN:	P K Na Mg as above

01/R/PG/5

Sub-plots

2. **LIME** Liming plots 1-17:

A	Ground chalk applied as necessary to achieve pH7
B	Ground chalk applied as necessary to achieve pH6
C	Ground chalk applied as necessary to achieve pH5
D	None

NOTE: Lime was applied regularly at the same rate, to all 'A' and 'B' sub-plots of plots 1 to 17 (except 12) from 1924. Differential liming started in 1975 on certain 'B' and 'C' sub-plots (except on plot 12) and in 1976 on certain 'A' sub-plots (including plot 12) and 12B. Lime was applied in 2000, the third application in a triennial scheme of soil pH analysis and remedial chalk applications.

LIME Liming plots 18-20:

NOTE: Differential rates of lime were applied to sub-plots 2 and 3 regularly 1920-1974. Since 1975 plot 18-1 has been split into two for treatments 'C' and 'D' as above and plot 18-3 split into two for treatments 'A' and 'B'. Plots 19 and 20 received no further chalk after 1978; plot 18/2 no further chalk after 1972.

Experimental diary:

18-Jan-01	**T**	P applied.
19-Feb-01	**T**	K, Mg, Na and Si applied.
20-Feb-01	**T**	FYM applied.
12-Apr-01	**T**	N applied.
26-Jun-01	**T**	Cut, sampled and weighed yield areas, plots 4/1-13, 18-20.
27-Jun-01	**T**	Cut, sampled and weighed, plots 1-3, 14-17, completed.
30-Jun-01	B	Mowed discards for hay, excluding s and w of plots 13, 18-20.
02-Jul-01	B	Turned hay.
03-Jul-01	B	Turned hay.
04-Jul-01	B	Turned, rowed up, baled and carted hay bales.
05-Jul-01	B	Topped.
06-Jul-01	B	Baled.
	B	Rowed up remaining grass.
03-Oct-01	**T**	Cut weighed and sampled yield areas and discards, started.
04-Oct-01	**T**	Cut weighed and sampled yield areas and discards completed.

Note: Samples of herbage from both cuts were taken for chemical analysis. Unground samples of herbage from all plots from both cuts were archived.

01/R/PG/5

1ST CUT (26,27/6/01) DRY MATTER TONNES/HECTARE

***** Tables of means *****

LIME / MANURE		A	B	C	D	MEAN
N1	1	3.43	2.05	2.06	0.77	2.08
K	2/1	2.87	2.82	1.09	1.13	1.98
O(D)	2/2	2.39	2.47	1.12	1.16	1.79
O	3	2.31	2.14	0.70	1.04	1.55
P	4/1	2.69	3.33	1.68	1.43	2.28
N2P	4/2	5.54	3.61	5.13	1.32	3.90
N1MN	6	5.79	5.13			5.46
MN	7	6.23	5.63	4.40	2.15	4.60
PNAMG	8	1.91	3.47	1.55	1.48	2.10
MN(N2)	9/1	4.36	4.69	4.80	1.45	3.82
N2MN	9/2	6.31	6.83	6.42	2.55	5.53
N2PNAMG	10	4.67	4.47	5.13	1.72	4.00
N3MN	11/1	8.14	7.19	6.65	2.42	6.10
N3MNSI	11/2	7.62	7.59	6.16	4.83	6.55
O	12	2.01	1.59	0.93	1.07	1.40
(D/F)	13/1	3.19	4.95	3.24	3.74	3.78
D/F	13/2	3.98	5.63	5.40	5.02	5.01
MN(N2*)	14/1	5.25	5.17	4.77	4.51	4.93
N2*MN	14/2	6.52	6.51	5.72	5.88	6.15
MN(N2*)	15	5.92	5.19	3.72	2.60	4.36
N1*MN	16	6.49	6.80	4.62	4.40	5.58
N1*	17	2.33	1.71	1.49	1.58	1.78
N2KNAMG0	18/1			4.93	1.84	3.39
N2KNAMG2	18/2					2.66
N2KNAMG1	18/3	2.05	2.39			2.22
D0	19/1					4.47
D2	19/2					6.76
D1	19/3					5.09
D/N*PK0	20/1					5.25
D/N*PK2	20/2					7.51
D/N*PK1	20/3					6.06

1ST CUT MEAN DM% 29.2

01/R/PG/5

2ND CUT (3,4/10/01) DRY MATTER TONNES/HECTARE

***** Tables of means *****

LIME / MANURE		A	B	C	D	MEAN
N1	1	1.31	1.47	0.61	0.09	0.87
K	2/1	1.78	1.75	1.03	0.74	1.32
O(D)	2/2	1.35	1.69	0.91	0.93	1.22
O	3	1.09	1.22	0.81	0.94	1.01
P	4/1	1.44	1.54	1.56	1.36	1.47
N2P	4/2	1.27	1.29	1.14	0.56	1.06
N1MN	6	2.53	2.44			2.49
MN	7	2.90	2.85	1.58	0.85	2.04
PNAMG	8	1.06	1.77	1.01	1.18	1.25
MN(N2)	9/1	2.24	2.11	1.30	0.17	1.45
N2MN	9/2	2.30	2.78	1.55	2.02	2.16
N2PNAMG	10	1.63	1.74	1.38	1.68	1.61
N3MN	11/1	3.34	3.37	2.95	3.26	3.23
N3MNSI	11/2	3.59	3.35	3.03	3.27	3.31
O	12	0.88	1.02	0.86	0.94	0.93
(D/F)	13/1	1.58	2.50	1.40	0.99	1.62
D/F	13/2	2.90	3.47	2.59	2.20	2.79
MN(N2*)	14/1	1.89	2.60	2.42	2.10	2.25
N2*MN	14/2	2.20	2.45	2.44	2.26	2.34
MN(N2*)	15	2.30	2.22	1.15	0.66	1.58
N1*MN	16	2.53	2.58	1.82	1.31	2.06
N1*	17	1.47	1.68	1.45	1.38	1.50
N2KNAMG0	18/1			0.92	0.08	0.50
N2KNAMG2	18/2					2.16
N2KNAMG1	18/3	1.47	1.66			1.57
D0	19/1					2.14
D2	19/2					3.22
D1	19/3					2.42
D/N*PK0	20/1					2.58
D/N*PK2	20/2					2.93
D/N*PK1	20/3					2.54

2ND CUT MEAN DM% 21.3

01/R/PG/5

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means *****

LIME / MANURE		A	B	C	D	MEAN
N1	1	4.73	3.52	2.67	0.86	2.95
K	2/1	4.64	4.57	2.12	1.88	3.30
O(D)	2/2	3.73	4.16	2.03	2.09	3.01
O	3	3.40	3.36	1.51	1.98	2.56
P	4/1	4.13	4.87	3.23	2.79	3.76
N2P	4/2	6.82	4.90	6.27	1.87	4.96
N1MN	6	8.32	7.57			7.95
MN	7	9.13	8.48	5.98	3.01	6.65
PNAMG	8	2.97	5.25	2.55	2.66	3.36
MN(N2)	9/1	6.60	6.80	6.10	1.61	5.28
N2MN	9/2	8.61	9.61	7.97	4.57	7.69
N2PNAMG	10	6.31	6.22	6.51	3.40	5.61
N3MN	11/1	11.48	10.56	9.60	5.68	9.33
N3MNSI	11/2	11.21	10.94	9.19	8.10	9.86
O	12	2.89	2.62	1.80	2.01	2.33
(D/F)	13/1	4.77	7.44	4.64	4.73	5.40
D/F	13/2	6.88	9.09	7.99	7.22	7.79
MN(N2*)	14/1	7.14	7.77	7.19	6.61	7.18
N2*MN	14/2	8.72	8.95	8.16	8.14	8.49
MN(N2*)	15	8.22	7.40	4.87	3.26	5.94
N1*MN	16	9.01	9.37	6.44	5.71	7.63
N1*	17	3.80	3.39	2.95	2.96	3.27
N2KNAMG0	18/1			5.86	1.92	3.89
N2KNAMG2	18/2					4.81
N2KNAMG1	18/3	3.52	4.05			3.79
D0	19/1					6.62
D2	19/2					9.98
D1	19/3					7.51
D/N*PK0	20/1					7.83
D/N*PK2	20/2					10.44
D/N*PK1	20/3					8.60

TOTAL OF 2 CUTS MEAN DM% 25.2

01/R/BN/7

BARNFIELD

Object: The experiment was designed to study the effects of organic and inorganic manures on continuous root crops. It was progressively modified to study effects on other crops.

The 159th year, grass and grass with clover

For previous years see 'Details' 1967 and 1973 and 74-00/R/BN/7.

Plot dimensions: 10.7 x 55.9.

Treatments:

Treatments to grass/clover, Sections 3-6: All combinations of:-

Whole plots

1. **MANURE**	Fertilizers and organic manures:	
	(D)	(D)
	(D)PK	(D) P K
	PKMG	P K (Na) Mg
	P	P
	PK	P K
	PMG	P (Na) Mg
	0	0

P: 35 kg P as triple superphosphate in 1974 and since 1987, single superphosphate in other years
K: 225 kg K as sulphate of potash
(Na): 90 kg Na as sodium chloride until 1973, none since
Mg: 90 kg Mg as kieserite every fourth year since 1974 (applied at 77 kg in 1990, 1994 and 1998)(sulphate of magnesia until 1973)
(D): Farmyard manure at 35 t until 1975, none since

Sub-plots

2. **N PERCUT**	Nitrogen fertilizer, last applied in 2000 (kg N per cut) as 34.5% N, cumulative to previous dressings and residues of forms of N previously each supplying 96 kg N per annum:	
	75	75, previously nitrate of soda, section 3
	100	100, previously sulphate of ammonia, section 4
	125	125, previously sulphate of ammonia + castor meal, section 5
	150	150, previously castor meal, section 6

No nitrogen fertilizer applied in 1995. Castor meal last applied 1971, nitrate of soda and sulphate of ammonia until 1959.

Plus one plot **MANURE** KMG 100

01/R/BN/7

Treatments to clover, sections 1 and 2 (not given nitrogen fertilizer):

MANURE Fertilizers and organic manures as for grass/clover above, excluding KMG.

NOTES: (1) P, K and D treatments were applied to Sections 1 and 2 until 1980. None were applied subsequently until the resumption of P and K treatments only, from 1985.

(2) From 2001 it has been decided to put this experiment into 'mothballs'. No fertilisers are to be applied, and no yields taken of the cuts. The grass sward to be maintained and cut at appropriate times.

Experimental diary:

13-Jul-00	B	Ploughed, /w, started.
14-Jul-00	B	Ploughed, /w, completed.
05-Aug-00	B	Rolled.
16-Aug-00	B	Rolled.
16-Aug-00	B	Springtined.
16-Aug-00	B	Combination drilled, grass/clover ley, at 31 kg with the Accord drill
29-Aug-00	B	Dursban 4 at 1.5 l in 200 l.
29-Aug-00	B	Judge at 5.0 kg.
19-Jan-01	B	Broadcast grass/clover seed at 31 kg.
21-Apr-01	B	Slit seeded, Dalgety field mixture, at approximately 13.0 kg, by contractor.
21-Apr-01	B	Rolled.
20-Jul-01	B	Mowed for hay.
21-Jul-01	B	Spread hay to disperse grass seed.
27-Jul-01	B	Baled hay.
27-Jul-01	B	Rowed up hay.
27-Jul-01	B	Carted bales.
07-Aug-01	B	Flat rolled.
29-Aug-01	B	Topped.

Extra Note - grass/clover mixture was made up of the following: -
16 Aug 2000 and 19 Jan 2001: Fennema 4.0 kg; Gilford 5.0 kg; Aberexcel 3.0 kg; Twystar 5.0 kg; Condesa 2.0 kg; Napoleon 4.0 kg perennial ryegrasses, Erecta Timothy 1.0 kg, Ensign White clover 2.0 kg in 26.0 kg mix.

21 Apr 2001: Aberlinnet 11.5; Premium 7.7; Fennema Inter 7.7; Aubisque 15.4; Gilford 19.2; Twyster 19.2; Tivoli 7.7 perennial ryegrasses, Erecta Timothy 3.9; Ensign clover 7.7 proportional weights in mixture.

01/R/GC/8

GARDEN CLOVER

Object: To study yields and pathogens of red clover grown continuously - Manor Garden.

The 148th year, red clover.

For previous years see 'Details' 1967 and 1973, and 74-00/R/GC/8.

Design: 2 blocks of 2 plots.

Whole plot dimensions: 1.00 x 1.40.

Treatments:

FUNG RES	Residual effects of fungicide to control *Sclerotinia trifoliorum*:
NONE	None
BENOMYL	Benomyl sprays during previous winters, last applied November 1989.

Experimental diary:

15-Jun-01	: B :	:	Cut clover.
	: B :	:	Area hand weeded, lightly cultivated and raked.
22-Jun-01	: B :	:	Applied chalk @ 1 t/ha.
	: B :	:	Applied PK as 0:18:36 @ 75:150 kg/ha.
	: B :	:	Applied Epsom salts @ 50 kg Mg/ha.
	: B :	:	Sowed Red Clover, Merviot @ 30 kg/ha.
	: B :	:	Irrigated 12.5mm.
31-Aug-01	: B :	:	Germination poor so seedlings (sown 31.7.01) transplanted @ 28 plants/sub-plot.

Note: Clover samples taken for chemical analysis.

FIRST AND ONLY CUT (15/6/01) DRY MATTER TONNES/HECTARE

***** Tables of means *****

FUNG RES	NONE	BENOMYL	Mean
	5.64	5.66	5.65

1ST CUT MEAN DM% 19.2

PLOT AREA HARVESTED 0.00010

https://doi.org/10.23637/ERADOC-1-258

01/W/RN/3

LEY/ARABLE

Object: To compare the effects on soil fertility of rotations with or without leys - Woburn, Stackyard D.

Sponsor: P.R. Poulton.

The 64th year, leys, w. beans, w. wheat, w. rye, forage maize.

For previous years see 'Details' 1967 & 1973 and 74-00/W/RN/3.

Design: 5 series of 8 plots, split for treatments other than rotations.

Whole plot dimensions: 8.53 x 40.7.

Treatments: All phases of four five-course rotations were originally present:

ROTATION

LEY	Clover/grass ley:	L, L, L, P, W
CLO	All legume ley:	SA, SA, SA, P, W until 1971 then CL, CL, CL, P, W
A	Arable with roots:	P, R, C, P, W until 1971 then P, B, B, P, W
A H	Arable with hay:	P, R, H, P, W until 1971 then P, B, H, P, W

P = potatoes, R = w. rye, C = carrots, W = w. wheat, B = s. barley, H = hay, L = clover/grass ley, SA = sainfoin ley, CL = red clover ley

Rotations themselves followed different cycles:

On four plots in each block the rotations were repeated

On four plots in each block arable rotations alternated each five years with ley rotations

From 1976 all the rotations were changed on all phases except for the first and second test crops in 1976:

LN 3	(Previous LEY) LN1, LN2, LN3, W, R
LC 3	(Previous CLO) LC1, LC2, LC3, W, R
AF	(Previous A) F, F, BE, W, R
AB	(Previous A H) B, B, BE, W, R

From 1998 rotations AF and AB are replaced by AM and ABe respectively. Phased in at the beginning of each treatment crop sequence.

AM	R, BE, M, W, R
ABe	R, M, BE, W, R

01/W/RN/3

ROTATION (continued)

LN1 to LN3 = three year grass ley with N, 1st year to 3rd year,
LC = clover/grass ley, no N, BE = beans (s. oats until 1980), F = fallow,
M = forage maize

Plots hitherto in alternating rotations were changed to test eight-year leys and two test crops:

LLN	LLN1, LLN2, LLN3, LLN4, LLN5, LLN6, LLN7, LLN8, W, R
LLC	LLC1, LLC2, LLC3, LLC4, LLC5, LLC6, LLC7, LLC8, W, R

LLN1 to LLN8 = eight year grass ley with nitrogen, first year to eighth year, similarly for LLC - clover/grass ley, no nitrogen

The new scheme started by sowing these new leys in spring 1976 on four phases and in spring 1977 on the fifth phase (2nd test crop in 1976).

In 1992 w. rye (R) replaced s. barley (B) as the second test crop.

Yields are taken from the leys, arable treatment crops and the test crops.

Treatments to first test crop w. wheat, all combinations of:

Whole plots:

1. **ROTATION** Rotations before wheat:

   LLN 8
   LN 3
   LLC 8
   LC 3
   AM
   ABe

1/2 plots:

2. **FYMRES66** Farmyard manure residues, last applied 1966:

   NONE
   FYM 38 t on each occasion

1/8 plots:

3. **N** Nitrogen fertilizer in spring 2001 (kg N) as 27% N for 1st split dressing, as 33.5% N for second and single dressings:

0				
70	)as a		40 + 30	)split dressings
140	)single	OR	40 + 100	)late Feb/early Mar
210	)dressing		40 + 170	)and GS31 or mid-Apr

01/W/RN/3

Treatments to second test crop w. rye, all combinations of:

Whole plots:

1. **ROTATION** Rotations before first test crop:

   LLN 8
   LN 3
   LLC 8
   LC 3
   AF
   AB

1/2 plots:

2. **FYMRES65** Farmyard manure residues, last applied 1965:

   NONE
   FYM 38 t on each occasion

1/8 plots:

3. **N** Nitrogen fertilizer in spring 2001 (kg N) as 33.5% N:

   0
   40
   80
   120

Treatments to leys:

FYM RES Farmyard manure residues:

NONE
FYM 38 t on each occasion, last applied 1964 to 1st and 6th year leys, 1963 to 2nd and 7th year leys, 1967 to 3rd and 8th year leys, 1966 to 4th year leys, 1965 to 5th year leys.

NOTE: Corrective K dressings (kg K_2O) as muriate of potash, applied to first test crop w. wheat and long-term leys in the wheat block, applied 5th October 2000.

Continuous rotations before wheat	No FYM half plots	FYM half plots
AM	260	260
ABe	280	260

None to other plots.

NOTE: Corrective K dressings (kg K_2O) as muriate of potash should have been applied to first test crop w. wheat and long-term leys in the wheat block for 2000. This was omitted in error and was applied 4th May 2001 to the second test crop, w. rye.

Continuous rotations before wheat	No FYM half plots	FYM half plots
AF	(265)	(245)
AB	(245)	(360)

None to other plots.

01/W/RN/3

Experimental diary:

Grass ley and clover/grass ley, 1st year (**ROTATION** LN1, LC1, LLN1 and LLC1)

01-Sep-00	T		Potassium sulphate at 140 kg, .
01-Sep-00	T		Triple superphosphate at 213 kg.
03-Sep-00	T		Azural at 4.0 l in 200 l, stubbles.
25-Sep-00	T		Ploughed, rotary harrowed, drilled grass/clover mix and grass mix, at 30 kg with the 4.0 m Accord Drill, rolled, to LC1, LN1, LLC1, LLN1 plots.
25-Sep-00	T		33.5% N at 149 kg, LN1, LLN1 plots.
25-Sep-00	T		33.5% N at 74 kg, LC1, LLC1 plots.
29-Mar-01	T		33.5% N at 224 kg, grass leys.
19-Jun-01	T		First cut yield strips, weighed and sampled, mowed discards.
20-Jun-01	T		Tedded hay.
22-Jun-01	T		Tedded hay.
23-Jun-01	T		Tedded hay.
24-Jun-01	T		Rowed up, round baled and carted hay.
04-Jul-01	T		Muriate of potash at 83 kg, grass and grass clover leys.
	T		33.5% N at 224 kg, grass leys.
06-Jul-01	T		Topped.
...14-Nov-01	T		Second cut yield strips, weighed and sampled, mowed discards

Grass leys 2nd to 8th year (**ROTATION** LN2-3 and LLN2-8)

29-Mar-01	T		Muriate of potash at 140 kg, all 2 - 8 year leys.
	T		Sulphate of potash at 140 kg, all 2 - 8 year leys.
	T		Triple superphosphate at 213 kg, all 2 - 8 year leys.
	T		33.5% N at 224 kg.
19-Jun-01	T		First cut yield strips, weighed and sampled, mowed discards.
20-Jun-01	T		Tedded hay.
22-Jun-01	T		Tedded hay.
23-Jun-01	T		Tedded hay.
24-Jun-01	T		Rowed up, round baled and carted hay.
04-Jul-01	T		Muriate of potash at 83 kg, all 2-8 year leys.
	T		33.5% N at 224 kg.
06-Jul-01	T		Topped.
10-Sep-01	T		Azural at 4.0 l in 200 l, ley plots 65, 66, 71, 72, 75, 76, 79, & 80.
17-Sep-01	T		Second cut, sampled and weighed yield strips and discards, LN£ and LLN8 only, baled and removed grass.
14-Nov-01	T		Second cut remaining grass strips for yield, weighed and sampled.
	T		Mowed discard grass.

Clover/grass leys 2nd to 8th year (**ROTATION** LC2-3 and LLC2-8)

29-Mar-01	T		Muriate of potash at 140 kg, all 2 - 8 year leys.
	T		Sulphate of potash at 140 kg, all 2 - 8 year leys.
	T		Triple superphosphate at 213 kg, all 2 - 8 year leys.
19-Jun-01	T		First cut yield strips, weighed and sampled, mowed discards.
20-Jun-01	T		Tedded hay.
22-Jun-01	T		Tedded hay.
23-Jun-01	T		Tedded hay.

01/W/RN/3

Experimental diary:

Clover/grass leys 2nd to 8th year (**ROTATION** LC2-3 and LLC2-8), continued.

24-Jun-01	T		Rowed up, round baled and carted hay.
04-Jul-01	T		Muriate of potash at 83 kg, all 2-8 year leys.
06-Jul-01	T		Topped.
10-Sep-01	T		Azural at 4.0 l in 200 l, ley plots 65, 66, 71, 72, 75, 76, 79, & 80.
17-Sep-01	T		Second cut, sampled and weighed yield strips and discards, LC3 and LLC8 only, baled and removed grass.
14-Nov-01	T		Second cut remaining grass strips for yield, weighed and sampled.
	T		Mowed discard grass.

W. beans, 2nd and 3rd treatment crop (**ROTATION** AM and ABe)

01-Sep-00	T		Potassium sulphate at 140 kg, by hand, plots 63 & 64.
01-Sep-00	T		Triple superphosphate at 127 kg, by hand, plots 63 & 64.
05-Oct-00	T		Potassium sulphate at 140 kg, by hand, plots 67 & 68.
05-Oct-00	T		Triple superphosphate at 127 kg, by hand, plots 67 & 68.
13-Nov-00	T		Broadcast Clipper, recleaned, at 30 seeds/m^2 by hand, ploughed.
15-Dec-00	B		Alpha Simazine 50 SC at 2.0 l in 200 l.
26-May-01	T		Bravo 500 at 1.5 l in 200 l.
20-Aug-01	T		Combine harvested, plots for yield, swathed straw.
29-Aug-01	T		Baled and carted straw.

Forage maize, 2nd treatment crop (**ROTATION** ABe)

11-May-01	T		Flexitined.
22-May-01	T		Rotary harrowed, drilled Orient, tr. Mesurol, at 10 seeds/m^2 with the Nodet drill.
06-Jun-01	T		33.5% N at 298 kg.
05-Jul-01	T		Barclay Mutiny at 2.4 l in 200 l.
25-Sep-01	T		Cut sample areas, weighed and sampled.
26-Sep-01	T		Cut remaining maize.

W. wheat, 1st test crop (W)

01-Sep-00	T		Potassium sulphate at 140 kg, excluding plots 39 & 40, following maize.
01-Sep-00	T		Triple superphosphate at 127 kg, excluding plots 39 & 40, following maize.
03-Sep-00	T		Azural at 4.0 l in 200 l, stubbles and old grass plots.
05-Oct-00	T		Muriate of potash (corrective K) at 260 kg K_2O, by hand, plots 39, 40 & 46 and at 280 kg K_2O plot 45.
05-Oct-00	T		Potassium sulphate at 140 kg, by hand, plots 39, 40.
05-Oct-00	T		Triple superphosphate at 127 kg, by hand, plots 39, 40.
05-Oct-00	T		Ploughed.
14-Oct-00	T		Rotary harrowed, drilled Claire, tr. Sibutol at 350 seeds/m^2 with the 4.0 m Accord drill.
18-Jan-01	T		tm) Stomp 400 SC at 2.0 l in 200 l.
	T		tm) Tolkan liquid at 1.0 l in 200 l.
16-Mar-01	T		First N applied to split N sub-plots.

01/W/RN/3

Experimental diary:
W. wheat, 1st test crop (W), continued.

08-May-01	: **T** :	:	Harmony M at 75 g in 200 l.
	: **T** :	:	tm) Opus at 0.5 l in 200 l.
	: **T** :	:	tm) BASF 3C Chlormequat 720 at 2.0 l in 200 l.
18-May-01	: **T** :	:	Second N to split N sub-plots and single dose to others.
25-May-01	: **T** :	:	Opus at 0.75 l in 200 l.
22-Aug-01	: **T** :	:	Combine harvested, plots for yield, and discards., and swathed straw
23-Aug-01	: B :	:	Sampled, baled and weighed straw.
29-Aug-01	: **T** :	:	Baled and carted straw.

W. rye, 2nd test crop (R) and 1st treatment crop (**ROTATION** ABe and AM)

01-Sep-00	: **T** :	:	Potassium sulphate at 140 kg.
01-Sep-00	: **T** :	:	Triple superphosphate at 127 kg.
03-Sep-00	: **T** :	:	Azural at 4.0 l in 200 l, stubbles.
25-Sep-00	: **T** :	:	Ploughed, (ABE)R and (AM)R plots and WR plots and rolled.
14-Oct-00	: **T** :	:	Rotary harrowed, drilled Esprit/Nikita blend, tr. Baytan at 310 seeds/m^2 with the 4.0 m Accord drill.
15-Dec-00	: **T** :	:	Lexus class at 60 g in 200 l.
04-May-01	: **T** :	:	Muriate of potash (delayed corrective application for 2000), at 245 kg K_2O to plots 2 % 5, 165 kg K_2O topl ot 6 aanf 360 kg K2O to plot 1.
08-May-01	: **T** :	:	tm) Opus at 0.5 l in 200 l.
	: **T** :	:	tm) BASF 3C Chlormequat 720 at 2.0 l in 200 l.
18-May-01	: **T** :	:	Test N applied to 2nd test crop. 33.5% N at 238 kg applied to treatment crop.
25-May-01	: **T** :	:	Opus at 0.75 l in 200 l.
22-Aug-01	: **T** :	:	Combine harvested, plots for yield, and discards and swathed straw.
23-Aug-01	: B :	:	Sampled, baled and weighed straw
29-Aug-01	: **T** :	:	Baled and carted straw, wheat.

Note: Poor weather prevented timely applications of N.
Samples of grain, straw and forage maize were taken. For chemical analysis.

01/W/RN/3

LEYS

1ST CUT (19/6/01) DRY MATTER TONNES/HECTARE

***** Tables of means *****

FYM RES LEY	NONE	FYM	Mean
LC1	0.68	0.82	0.75
LC2	5.99	6.31	6.15
LC3	7.23	7.08	7.15
LN1	3.51	3.68	3.60
LN2	7.66	8.11	7.89
LN3	6.67	7.23	6.95
LLC1	1.29	1.13	1.21
LLC2	6.39	7.16	6.78
LLC3	7.48	7.00	7.24
LLC4	5.71	4.40	5.05
LLC5	4.39	3.40	3.90
LLC6	3.62	4.21	3.91
LLC7	6.47	7.27	6.87
LLC8	5.18	4.35	4.76
LLN1	3.60	3.89	3.75
LLN2	7.81	7.72	7.76
LLN3	7.51	7.15	7.33
LLN4	7.76	7.46	7.61
LLN5	7.15	7.33	7.24
LLN6	6.77	7.73	7.25
LLN7	7.32	7.07	7.20
LLN8	7.25	7.68	7.47
Mean	5.79	5.83	5.81

1ST CUT MEAN DM% 28.5

01/W/RN/3

LEYS

2ND CUT (17/09/01 OR 14/11/01) DRY MATTER TONNES/HECTARE

***** Tables of means *****

FYM RES LEY	NONE	FYM	Mean
LC1	0.43	0.60	0.51
LC2	2.33	2.15	2.24
LC3	2.17	2.38	2.27
LN1	2.57	2.52	2.55
LN2	3.06	3.26	3.16
LN3	3.02	3.28	3.15
LLC1	0.61	0.34	0.47
LLC2	2.63	3.10	2.87
LLC3	1.78	2.37	2.07
LLC4	1.56	1.64	1.60
LLC5	1.00	1.06	1.03
LLC6	0.72	1.28	1.00
LLC7	1.53	1.43	1.48
LLC8	2.67	1.00	1.83
LLN1	1.81	1.53	1.67
LLN2	2.90	3.10	3.00
LLN3	2.68	2.77	2.73
LLN4	3.34	3.61	3.48
LLN5	2.42	2.39	2.40
LLN6	2.87	3.89	3.38
LLN7	3.86	4.06	3.96
LLN8	3.98	3.21	3.60
Mean	2.27	2.32	2.29

2ND CUT MEAN DM% 25.1

01/W/RN/3

LEYS

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means *****

FYM RES LEY	NONE	FYM	Mean
LC1	1.10	1.42	1.26
LC2	8.32	8.46	8.39
LC3	9.40	9.45	9.42
LN1	6.09	6.21	6.15
LN2	10.72	11.37	11.05
LN3	9.69	10.51	10.10
LLC1	1.90	1.47	1.69
LLC2	9.03	10.26	9.64
LLC3	9.26	9.37	9.31
LLC4	7.26	6.04	6.65
LLC5	5.40	4.46	4.93
LLC6	4.34	5.49	4.92
LLC7	8.00	8.70	8.35
LLC8	7.84	5.34	6.59
LLN1	5.42	5.42	5.42
LLN2	10.71	10.82	10.76
LLN3	10.19	9.92	10.05
LLN4	11.11	11.07	11.09
LLN5	9.57	9.71	9.64
LLN6	9.64	11.62	10.63
LLN7	11.19	11.13	11.16
LLN8	11.24	10.89	11.06
Mean	8.06	8.14	8.10

TOTAL OF 2 CUTS MEAN DM% 26.8

PLOT AREA HARVESTED 0.00200

01/W/RN/3

MAIZE

WHOLE CROP (100% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

FYMRES	NONE	FYM	Mean
	13.55	13.15	13.35

GRAIN MEAN DM% 27.4

PLOT AREA HARVESTED 0.00108

BEANS

GRAIN (85% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

FYMRES	NONE	FYM	Mean
	3.54	3.86	3.70

GRAIN MEAN DM% 82.0

PLOT AREA HARVESTED 0.00472

W.RYE (IN NON TEST YEAR)

GRAIN (85% DRY MATTER) TONNES/HECTARE

***** Tables of means *****

FYMRES	NONE	FYM	Mean
	3.17	3.30	3.23

GRAIN MEAN DM% 82.9

PLOT AREA HARVESTED 0.00472

01/W/RN/3

W. WHEAT

GRAIN TONNES/HECTARE

***** Tables of means *****

NSPLITFYM / **ROTATION**	Nsplit(noFYM)	Nsingle(FYM)	Mean
LLN 8	4.71	4.68	4.69
LN 3	5.82	4.44	5.13
LLC 8	5.34	4.18	4.76
LC 3	5.52	4.63	5.08
AM	2.34	2.23	2.28
ABe	3.42	2.51	2.97
Mean	4.52	3.78	4.15

N / **ROTATION**	-	1	2	3	Mean
LLN 8	3.38	4.46	5.81	5.12	4.69
LN 3	3.73	4.83	6.03	5.93	5.13
LLC 8	3.19	4.28	5.45	6.11	4.76
LC 3	4.20	4.93	5.96	5.22	5.08
AM	1.16	2.44	2.72	2.82	2.28
ABe	1.93	2.50	4.11	3.32	2.97
Mean	2.93	3.91	5.01	4.75	4.15

N / **NSPLITFYM**	-	1	2	3	Mean
Nsplit(noFYM)	2.99	4.55	5.52	5.04	4.52
Nsingle(FYM)	2.87	3.27	4.51	4.46	3.78
Mean	2.93	3.91	5.01	4.75	4.15

N / **ROTATION** / **NSPLITFYM**	-	1	2	3
LLN 8 Nsplit(noFYM)	3.35	5.17	5.58	4.72
Nsingle(FYM)	3.41	3.75	6.04	5.51
LN 3 Nsplit(noFYM)	3.82	5.49	6.76	7.22
Nsingle(FYM)	3.64	4.16	5.31	4.64
LLC 8 Nsplit(noFYM)	3.78	6.12	5.91	5.53
Nsingle(FYM)	2.60	2.44	4.99	6.69
LC 3 Nsplit(noFYM)	3.92	5.27	7.22	5.68
Nsingle(FYM)	4.48	4.58	4.70	4.76
AM Nsplit(noFYM)	1.05	2.54	2.76	3.01
Nsingle(FYM)	1.26	2.35	2.68	2.63
ABe Nsplit(noFYM)	2.04	2.67	4.86	4.09
Nsingle(FYM)	1.82	2.33	3.36	2.56

GRAIN MEAN DM% 85.8

01/W/RN/3

W. WHEAT

STRAW TONNES/HECTARE

***** Tables of means *****

NSPLITFYM ROTATION	Nsplit(noFYM)	Nsingle(FYM)	Mean
LLN 8	3.20	3.22	3.21
LN 3	2.84	2.13	2.49
LLC 8	2.32	1.59	1.96
LC 3	2.68	1.83	2.25
AM	0.80	0.68	0.74
ABe	1.41	0.88	1.15
Mean	2.21	1.72	1.97

N ROTATION	-	1	2	3	Mean
LLN 8	2.21	3.92	3.02	3.70	3.21
LN 3	2.04	2.29	2.86	2.75	2.49
LLC 8	1.67	2.01	1.94	2.21	1.96
LC 3	1.89	2.36	2.77	2.00	2.25
AM	0.56	0.82	0.75	0.82	0.74
ABe	0.88	1.03	1.61	1.06	1.15
Mean	1.54	2.07	2.16	2.09	1.97

N NSPLITFYM	-	1	2	3	Mean
Nsplit(noFYM)	1.58	2.43	2.51	2.31	2.21
Nsingle(FYM)	1.50	1.71	1.81	1.87	1.72
Mean	1.54	2.07	2.16	2.09	1.97

N ROTATION NSPLITFYM	-	1	2	3
LLN 8 Nsplit(noFYM)	1.92	3.84	2.77	4.26
Nsingle(FYM)	2.49	4.00	3.26	3.15
LN 3 Nsplit(noFYM)	2.09	2.93	3.32	3.03
Nsingle(FYM)	1.99	1.66	2.40	2.47
LLC 8 Nsplit(noFYM)	1.98	3.00	2.23	2.09
Nsingle(FYM)	1.36	1.02	1.66	2.34
LC 3 Nsplit(noFYM)	2.02	2.55	3.74	2.41
Nsingle(FYM)	1.75	2.17	1.80	1.59
AM Nsplit(noFYM)	0.62	0.88	0.79	0.89
Nsingle(FYM)	0.50	0.77	0.71	0.75
ABe Nsplit(noFYM)	0.85	1.40	2.17	1.21
Nsingle(FYM)	0.91	0.67	1.05	0.90

STRAW MEAN DM% 82.8

PLOT AREA HARVESTED 0.00183

01/W/RN/3

W. RYE

GRAIN TONNES/HECTARE

***** Tables of means *****

FYMRES64	NONE	FYM	Mean
ROTATION			
LLN 8	4.39	4.73	4.56
LN 3	4.44	4.32	4.38
LLC 8	4.23	3.92	4.08
LC 3	4.44	3.72	4.08
AF	2.48	2.80	2.64
AB	3.96	3.74	3.85
Mean	3.99	3.87	3.93

N	-	1	2	3	Mean
ROTATION					
LLN 8	3.46	4.21	5.21	5.36	4.56
LN 3	3.23	4.16	4.98	5.15	4.38
LLC 8	2.50	3.96	4.66	5.19	4.08
LC 3	3.58	3.81	4.45	4.48	4.08
AF	1.15	2.48	2.88	4.05	2.64
AB	2.74	3.64	4.34	4.67	3.85
Mean	2.78	3.71	4.42	4.82	3.93

N	-	1	2	3	Mean
FYMRES64					
NONE	2.77	3.78	4.41	5.02	3.99
FYM	2.79	3.65	4.44	4.62	3.87
Mean	2.78	3.71	4.42	4.82	3.93

N	-	1	2	3
ROTATION	**FYMRES64**			
LLN 8	NONE	3.57	4.39	4.86	4.75
	FYM	3.34	4.03	5.57	5.97
LN 3	NONE	3.30	4.19	4.96	5.33
	FYM	3.17	4.13	5.00	4.97
LLC 8	NONE	2.27	4.25	4.79	5.61
	FYM	2.73	3.66	4.53	4.76
LC 3	NONE	3.72	3.80	4.72	5.53
	FYM	3.44	3.82	4.18	3.44
AF	NONE	0.99	2.44	2.44	4.07
	FYM	1.32	2.52	3.33	4.03
AB	NONE	2.77	3.58	4.68	4.81
	FYM	2.72	3.71	4.01	4.53

GRAIN MEAN DM% 84.9

01/W/RN/3

W. RYE

STRAW TONNES/HECTARE

***** Tables of means *****

FYMRES64	NONE	FYM	Mean
ROTATION			
LLN 8	2.84	2.92	2.88
LN 3	2.67	2.55	2.61
LLC 8	2.87	3.05	2.96
LC 3	2.94	2.43	2.68
AF	1.72	1.69	1.70
AB	2.75	2.53	2.64
Mean	2.63	2.53	2.58

N	-	1	2	3	Mean
ROTATION					
LLN 8	2.32	2.96	2.93	3.31	2.88
LN 3	2.11	2.03	3.31	2.97	2.61
LLC 8	2.03	3.04	2.90	3.87	2.96
LC 3	2.52	2.15	3.08	2.99	2.68
AF	0.81	1.92	1.82	2.27	1.70
AB	1.73	2.74	2.75	3.33	2.64
Mean	1.92	2.47	2.80	3.12	2.58

N	-	1	2	3	Mean
FYMRES64					
NONE	1.95	2.55	2.73	3.31	2.63
FYM	1.89	2.40	2.87	2.94	2.53
Mean	1.92	2.47	2.80	3.12	2.58

N	-	1	2	3
ROTATION	**FYMRES64**			
LLN 8	NONE	2.74	3.30	2.28	3.05
	FYM	1.89	2.61	3.59	3.57
LN 3	NONE	2.21	1.86	3.45	3.15
	FYM	2.02	2.20	3.17	2.80
LLC 8	NONE	1.81	3.19	2.64	3.83
	FYM	2.25	2.90	3.16	3.91
LC 3	NONE	2.56	2.28	3.15	3.77
	FYM	2.48	2.02	3.00	2.22
AF	NONE	0.66	1.97	1.71	2.55
	FYM	0.96	1.87	1.94	1.99
AB	NONE	1.69	2.68	3.14	3.48
	FYM	1.76	2.79	2.36	3.19

STRAW MEAN DM% 83.4

PLOT AREA HARVESTED 0.00183

01/W/RN/12

ORGANIC MANURING

Object: To study, from crop yields and soil analyses, the effects of a range of types of organic matter - Woburn, Stackyard B.

Sponsor: P.R. Poulton.

The 37th year, w. wheat.

For previous years see 'Details' 1973 and 74-00/W/RN/12.

Design: 4 blocks of 8 plots split into 2.

Whole plot dimensions: 8.0 x 29.5.

Treatments: From 1966 to 1971 the experiment had a preliminary period designed to build up organic matter from different sources. An arable rotation was started on two blocks in 1972 and the remaining two blocks in 1973. After a period of testing the residues, a further period of accumulation was started; on two blocks (which included ley sown in 1979) in 1981 and on the other two (which included ley sown in 1980) in 1982. A second test phase began when leys on the first pair of blocks were ploughed for the 1st test crop in 1987 and on the second pair for the 1st test crop in 1988. From 1988 two blocks, and 1989 the other two, to 1994, plots were split into 6 sub-plots to test five levels of nitrogen and nil. From 1995 to 1997 residual effects of that nitrogen were measured. In 1998 to 2000 yields were taken from whole plots only. In 2201 plots were split into half-plots to test two rates of N.

Whole blocks

1. **CROPSEQ** Crop sequence:

WHEAT A	W. wheat, after w. wheat 1988, potatoes 1989, w. wheat 1990, w. beans 1991, w. wheat 1992-6, w. rye 1997, w. wheat 1998-2000
WHEAT B	W. wheat, after w. wheat 1987, potatoes 1988, w. wheat 1989, w. beans 1990, w. wheat 1991-6, w. rye 1997, w. wheat 1998-2000

Whole plots

2. **TREATMNT** Previous treatments:

(LC 8 GM)	Eight-year clover/grass ley until 1987 (WHEAT A) or 1986 (WHEAT B), green manure in the preliminary period
(LC 8 PT)	As above, peat in the preliminary period
(LC 6 LC)	Six-year clover/grass ley until 1987 (WHEAT A) or 1986 (WHEAT B), clover/grass ley in the preliminary period
(LC 6 LN)	As above, grass ley with N in the preliminary period
(FYM)	Farmyard manure annually 1981 to 1986 (WHEAT A) or 1985 (WHEAT B) and in the preliminary period
(STRAW)	Straw in both periods

01/W/RN/12

2. **TREATMNT** Previous treatments: (continued)

(FERT-FYM) Fertilizers only in both periods, rates of P, K & Mg equivalent to amounts in FYM

(FERT-STR) Fertilizers only in both periods, rates of P, K & Mg equivalent to amounts in straw (+P)

3. **N** Nitrogen treatment to half plots

N1 160 kg N split 40 + 80 + 40) Applied first two weeks of March, GS31
N2 200 kg N split 40 + 120 + 40) or mid-April (whichever comes first)
) and GS37/mid-May.

Experimental diary:

01-Sep-00	B		Potassium sulphate at 200 kg.
	B		Triple superphosphate at 106 kg.
03-Sep-00	B		Azural at 4.0 l in 200 l.
26-Sep-00	B		Ploughed.
04-Oct-00	B		Rotary harrowed.
	B	WW	Drilled, Claire, tr. Sibutol + Rhodoman, at 350 seeds/m^2, with the 4.0 m Accord drill.
20-Oct-00	B		Avadex Excel 15 g at 15.0 kg.
18-Jan-01	B		tm) Stomp 400 SC at 2.0 l in 200 l.
	B		tm) Tolkan liquid at 1.0 l in 200 l.
29-Mar-01	**T**	N1	33.5% N at 119 kg.
	T	N2	33.5% N at 119 kg.
08-May-01	B		tm) Landmark at 0.5 l in 200 l.
	B		tm) BASF 3C Chlormequat 720 at 2.0 l in 200 l.
	B		Harmony M at 75 g in 200 l.
11-May-01	**T**	N1	33.5% N at 238 kg.
	T	N2	33.5% N at 238 kg, topped up with 119 kg on 18-May-2001
01-Jun-01	B		Landmark at 0.7 l in 200 l.
06-Jun-01	**T**	N1	33.5% N at 119 kg.
	T	N2	33.5% N at 119 kg.
22-Aug-01	B		Combine harvested, plots for yield, and discards.
	B		Swathed straw.
23-Aug-01	B		Baled.
06-Sep-01	B		Carted bales.
10-Sep-01	B		Azural at 4.0 l in 200 l.

Note: Poor whether prevented timely applications of N.
Samples of grain were taken for chemical ananysis.

01/W/RN/12

GRAIN TONNES/HECTARE

***** Tables of means *****

CROPSEQ / TREATMNT	WHEAT A	WHEAT B	Mean
(LC 8 GM)	3.65	3.31	3.48
(LC 8 PT)	3.72	3.03	3.38
(LC 6 LC)	3.79	3.14	3.47
(LC 6 LN)	3.70	3.69	3.69
(FYM)	3.71	3.22	3.47
(STRAW)	4.15	2.36	3.25
(FERT-FYM)	3.05	2.49	2.77
(FERT-STR)	3.34	2.42	2.88
Mean	3.64	2.96	3.30

N / TREATMNT	N1	N2	Mean
(LC 8 GM)	3.35	3.61	3.48
(LC 8 PT)	3.26	3.49	3.38
(LC 6 LC)	3.32	3.61	3.47
(LC 6 LN)	3.83	3.56	3.69
(FYM)	3.52	3.41	3.47
(STRAW)	3.24	3.27	3.25
(FERT-FYM)	2.67	2.87	2.77
(FERT-STR)	2.77	3.00	2.88
Mean	3.25	3.35	3.30

N / CROPSEQ	N1	N2	Mean
WHEAT A	3.63	3.65	3.64
WHEAT B	2.86	3.05	2.96
Mean	3.25	3.35	3.30

TREATMNT / CROPSEQ	N1	N2
(LC 8 GM) WHEAT A	3.54	3.76
WHEAT B	3.17	3.45
(LC 8 PT) WHEAT A	3.62	3.82
WHEAT B	2.90	3.15
(LC 6 LC) WHEAT A	3.71	3.86
WHEAT B	2.93	3.35
(LC 6 LN) WHEAT A	3.88	3.52
WHEAT B	3.78	3.59
(FYM) WHEAT A	3.94	3.47
WHEAT B	3.10	3.34
(STRAW) WHEAT A	4.24	4.06
WHEAT B	2.23	2.48
(FERT-FYM) WHEAT A	2.90	3.20
WHEAT B	2.43	2.54
(FERT-STR) WHEAT A	3.19	3.50
WHEAT B	2.35	2.50

01/W/RN/12

GRAIN TONNES/HECTARE

*** Standard errors of differences of means ***

TREATMNT	N	CROPSEQ* TREATMNT
0.570	0.046	0.806

CROPSEQ* N	TREATMNT N	CROPSEQ* TREATMNT N
0.065	0.577	0.816

Except when comparing means with the same level(s) of

TREATMNT	0.130
CROPSEQ.TREATMNT	0.184

* Within the same level of **CROPSEQ** only

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
Blocks.Plots	14	0.806	24.4
Blocks.Plots.Subplots	16	0.184	5.6

GRAIN MEAN DM% 85.7

AVERAGE PLOT AREA HARVESTED 0.00574

01/R/CS/326 and 01/W/CS/326

AMOUNTS OF STRAW

Object: To study the effects of different amounts of straw, incorporated into the soil, on w. wheat - Rothamsted (R) Great Knott III, Woburn (W) Far Field I.

Sponsors: M.J. Glendining, P.C. Brookes.

The 15th year, w. wheat

For previous years see 87-00/R & W/CS/326.

Design: 4 randomised blocks of 4 plots (R).
3 randomised blocks of 4 plots (W).

Whole plot dimensions: 3.0 x 13.5 (R).
3.0 x 14.5 (W).

Treatments:

STRAW Amounts of straw incorporated into the seedbed (t per ha 85% DM), cumulative to previous annual dressings:

		R	W
NONE	None	-	-
NORMAL	Normal	5.1	3.0
2 NORMAL	Twice normal	10.2	6.0
4 NORMAL	Four times normal	20.4	12.0

Experimental diary:

Great Knott III (R):

16-Aug-00	T	-	Straw/removed
22-Aug-00	T		Chopped loaded straw.
	T	1	Straw/normal, 15.5 kg per plot.
	T	2	Straw/2 x normal, 31.0 kg per plot.
	T	4	Straw/4 x normal, 62.0 kg per plot.
13-Oct-00	B		Ploughed, /e.
19-Oct-00	B		Combination drilled, Hereward, tr. Sibutol, at 350 s/m^2 with the Accord drill.
17-Nov-00	B		Decoy Wetex at 5.0 kg.
26-Mar-01	B		33.5% N at 149 kg.
09-Apr-01	B		tm) Harmony M at 75 g in 100 l.
	B		tm) Topik at 125 ml in 100 l.
	B		tm) Toil at 1.0 l in 100 l.
05-May-01	B		33.5% N at 299 kg.
08-May-01	B		tm) Amistar at 0.5 l in 100 l.
	B		tm) Unix at 0.5 kg in 100 l.
	B		tm) BASF 3C Chlormequat 720 at 1.25 l in 100 l.
	B		tm) Moddus at 0.2 l in 100 l.
04-Jun-01	B		tm) Amistar at 0.7 l in 100 l.
	B		tm) Folicur at 0.5 l in 100 l.
25-Aug-01	B		Combine harvested plots for yield.
	B		Swathed straw.
29-Aug-01	B		Combine harvested, all remaining wheat.
	B		Sampled, baled and weighed straw.
	B		Swathed straw.

01/R/CS/326 and 01/W/CS/326

Experimental diary:

Far Field I (W):

01-Sep-00	B		Muriate of potash at 200 kg.
03-Sep-00	B		Azural at 4.0 l in 200 l.
13-Sep-00	T		Chopped loaded straw.
	T	1	Straw applied at 11.5 kg per plot.
	T	2	Straw applied at 23.0 kg per plot.
	T	4	Straw applied at 46.0 kg per plot.
21-Sep-00	B		Sting ECO at 2.0 l in 200 l.
25-Sep-00	B		Ploughed, /se.
03-Oct-00	B		Rotary harrowed.
	B		Drilled, Hereward, tr. Sibutol and Rhodoman, at 350 s/m^2 with the 4.0 m Accord drill.
20-Oct-00	B		Avadex Excel 15 g at 15.0 kg.
15-Dec-00	B		Lexus Class at 60 g in 200l.
30-Mar-01	B		Sulphur Gold 30.0% N, 7.6% S at 167 kg
	B		Sulphur Gold 30.0% N, 7.6% S at 167 kg
13-Apr-01	B		tm) Harmony M at 75 g in 200 l.
	B		tm) Starane 2 at 0.5 l in 200 l.
30-Apr-01	B		Sulphur Gold 30.0% N, 7.6% S at 333 kg.
	B		Sulphur Gold 30.0% N, 7.6% S at 333 kg.
08-May-01	B		tm) Opus at 0.5 l in 200 l.
	B		tm) BASF 3C Chlormequat 720 at 2.0 l in 200 l.
31-May-01	B		Opus at 0.7 l in 200 l.
21-Aug-01	B		Combine harvested, plots for yield, and discards.
	B		Swathed straw.
23-Aug-01	B		Sampled, baled and weighed straw.

Note: Grain & straw samples were taken for N analysis.

01/R/CS/326 GREAT KNOTT III (R)

GRAIN TONNES/HECTARE

***** Tables of means *****

STRAW	
NONE	6.55
NORMAL	6.50
2 NORMAL	6.31
4 NORMAL	6.26
Mean	6.40

*** Standard errors of differences of means ***

STRAW
0.181

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
Blocks.Plots	9	0.256	4.0

GRAIN MEAN DM% 86.8

STRAW TONNES/HECTARE

***** Tables of means *****

STRAW	
NONE	2.51
NORMAL	2.52
2 NORMAL	2.43
4 NORMAL	2.50
Mean	2.49

STRAW MEAN DM% 91.8

PLOT AREA HARVESTED 0.00324

01/W/CS/326 FAR FIELD I (W)

GRAIN TONNES/HECTARE

***** Tables of means *****

STRAW	
NONE	6.48
NORMAL	6.37
2 NORMAL	6.55
4 NORMAL	6.60
Mean	6.50

*** Standard errors of differences of means ***

STRAW
0.311

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
Blocks.Plots	6	0.381	5.9

GRAIN MEAN DM% 86.3

STRAW TONNES/HECTARE

***** Tables of means *****

STRAW	
NONE	3.23
NORMAL	3.47
2 NORMAL	3.97
4 NORMAL	3.67
Mean	3.59

STRAW MEAN DM% 89.4

PLOT AREA HARVESTED 0.00348

01/R/CS/477

CONTINUOUS MAIZE

Object: To monitor the fate of organic carbon in the soil organic matter - Hoosfield.

Sponsors: P.R. Poulton, J. Gaunt.

The fifth year, forage maize and s. barley.

For previous years see 97-00/R/CS/477

Design: 3 randomised blocks of 6 plots.

Plot dimensions: 12.0 x 25.0.

Treatments:-

CROP	Crop and straw treatments:
M	Continuous maize, stubble incorporated
MB	Maize, stubble incorporated then s. barley after five years
MTB	Maize, stubble plus 10 t maize tops incorporated, then s. barley after five years
(B)M	Maize, after three years of s. barley with straw removed
BTM	Continuous spring barley, straw removed plus 10 t maize tops incorporated
B	Continuous spring barley, straw removed

Experimental diary:

11-Oct-00	**T**	BTM, MTB:	Maize tops at 300 kg per plot.
17-Oct-00	B	:	Sulphate of potash at 217 kg.
	B	:	Triple superphosphate at 171 kg.
20-Oct-00	B	:	Ploughed, /n.
31-Mar-01	**T**	B, BTM:	Combination drilled, Optic, tr. Raxil S, at 350 s/m^2 with the Accord drill.
19-May-01	**T**	B, BTM:	tm)Ally at 20 g in 100 l.
	T	B, BTM:	tm)Starane 2 at 0.5 l in 100 l.
21-May-01	**T**	M, MB, MTB, (B)M:	Rotary harrowed.
	T	M, MB, MTB, (B)M:	Drilled, Hudson, tr. Mesurol at 102,000 seeds/ha, with the Nodet Gougis drill.
	T	M, MB, MTB, (B)M:	Sting ECO at 4.0 l in 200 l to maize plots.
31-May-01	**B**	:	33.5% N at 300 kg.
11-Jun-01	**T**	B, BTM:	Opus at 0.4 l in 100 l.
02-Jul-01	**T**	B, BTM:	Folicur at 0.5 l in 200 l.
03-Jul-01	**T**	M, MB, MTB, (B)M:	Mutiny at 2.4 l in 200 l.
05-Sep-01	**T**	B, BTM:	Cut and baled straw, headlands.
06-Sep-01	**T**	B, BTM:	Combine harvested plots for yield, swathed straw.
07-Sep-01	**T**	B, BTM:	Combine harvested, all remaining barley, swathed and straw.
29-Oct-01	**T**	M, MB, MTB, (B)M:	Cut yield areas by hand, weighed and sampled.
31-Oct-01	**T**	M, MB, MTB, (B)M:	Cut maize discards.

Note: Forage maize and barley grain samples taken for N analysis.

MAIZE

WHOLE CROP TONNES/HECTARE

***** Tables of means *****

Treatment	
M	9.16
MB	8.60
MTB	9.05
(B)M	9.40
Mean	9.05

*** Standard errors of differences of means ***

Treatment
1.093

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
Blocks.Plots	6	1.338	14.8

GRAIN MEAN DM% 26.1

PLOT AREA HARVESTED 0.00108

S. BARLEY

GRAIN TONNES/HECTARE

***** Tables of means *****

Treatment	
BTM	2.98
B	2.66
Mean	2.82

GRAIN MEAN DM% 79.5

PLOT AREA HARVESTED 0.00600

01/W/CS/478

CONTINUOUS MAIZE

Object: To monitor the fate of organic carbon in the soil organic matter - Woburn, Stackyard A I.

Sponsors: P.R. Poulton, J. Gaunt.

The fifth year, forage maize and s. barley.

For previous years see 97-00/W/CS/478.

Design: 3 randomised blocks of 6 plots.

Plot dimensions: 9.0 x 25.0.

Treatments:

CROP	Crop and straw treatments:
M	Continuous maize, stubble incorporated
MB	Maize, stubble incorporated then s. barley after five years
MTB	Maize, stubble plus 10 t maize tops incorporated, then s. barley after five years
(B)M	Maize after three years of spring barley, straw removed
BTM	Continuous spring barley, straw removed plus 10 t maize tops incorporated
B	Continuous spring barley, straw removed

Experimental diary:

10-Oct-00	**T**	BTM, MTB: Maize tops applied at 225 kg per plot.
20-Oct-00	B	: Potassium sulphate at 217 kg.
	B	: Triple superphosphate at 171 kg.
16-Jan-01	B	: Ploughed, /w.
09-Apr-01	B	: Flexitined.
12-Apr-01	**T**	B, BTM: Combination drilled, Optic, tr. Raxil S, at 350 s/m^2 with the Accord drill.
13-Apr-01	**T**	B, BTM: Stomp 400 SC at 2.0 l in 200 l.
22-May-01	**T**	: Rotary harrowed.
	T	M, MB, MTB, (B)M: Drilled, Orient, tr. Mesurol, at 10 s/m^2 with the Nodet drill.
06-Jun-01	B	: 33.5% N at 286 kg.
19-Jun-01	**T**	B, BTM: Harmony M at 40 g in 200 l.
05-Jul-01	**T**	M, MB, MTB, (B)M: Barclay Mutiny at 2.4 l in 200 l.
11-Sep-01	**T**	B, BTM: Combine harvested plots for yield, and discards, and swathed straw.
17-Sep-01	B	B, BTM: Baled and carted straw.
29-Oct-01	**T**	M, MB, MTB, (B)M: Hand harvested, weighed and sampled.
30-Oct-01	**T**	M, MB, MTB, (B)M: Harvested remaining maize with maize harvester.

Note: Forage maize and barley grain samples taken for N analysis.

01/W/CS/478 MAIZE

WHOLE CROP TONNES/HECTARE

***** Tables of means *****

Treatment	
M	11.00
MB	12.12
MTB	12.12
(B)M	13.21
Mean	12.11

*** Standard errors of differences of means ***

Treatment
1.631

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
Blocks.Plots	6	1.998	16.5

GRAIN MEAN DM% 42.6

PLOT AREA HARVESTED 0.00108

S. BARLEY

GRAIN TONNES/HECTARE

***** Tables of means *****

Treatment	
BTM	1.40
B	1.03
Mean	1.21

GRAIN MEAN DM% 84.9

PLOT AREA HARVESTED 0.00600

Rothamsted Experimental Station

The Weather : Monthly Summary : 2001

(Departure from 30-year means (1971 - 2000) in brackets)

	Sunshine		Mean temperatures oC								Rain			Drainage	Wind
			Maximum		Minimum		Dew	Ground	In ground under grass		Total mm		Rain	20 inch	***
	Hours	( )		( )		( )	point	frosts *	30 cm	100 cm	5" turf	wall	days **	mm	km/hr
January	84.2	(+29.1)	5.7	(-0.7)	0.40	(-0.5)	1.4	27	3.7	6.4	76.1	(+6.4)	16	74.8	8.2
February	89.0	(+18.3)	7.8	(+1.1)	1.50	(+0.8)	2.5	18	4.8	5.9	110.4	(+61.6)	16	92.5	9.3
March	68.4	(-38.8)	8.2	(-1.3)	2.60	(+0.2)	3.5	10	5.5	6.1	91.4	(+37.5)	22	70.5	9.8
April	133.2	(-13.6)	11.4	(-0.6)	4.10	(+0.5)	5.1	11	8.4	7.8	83.7	(+30.2)	23	40.5	10.4
May	223.2	(+28.3)	17.4	(+1.6)	7.80	(+1.5)	8.4	2	12.5	10.1	50.1	(+0.4)	7	24.9	8.5
June	230.4	(+40.1)	18.8	(+0.2)	9.70	(+0.5)	10.3	0	15.4	13.1	27.8	(-32.4)	9	0.4	7.2
July	199.8	(-3.5)	22.03	(+0.61)	13.01	(+1.65)	13.4	0	17.5	15.1	56.1	(+11.5)	10	6.4	6.4
August	199.2	(+2.4)	21.68	(+0.25)	12.87	(+1.52)	14.0	0	17.9	16.2	119.2	(+65.5)	17	35.0	5.7
September	127.6	(-14.7)	16.54	(-1.45)	10.00	(+0.56)	10.2	0	15.2	15.4	73.8	(+12.8)	16	29.6	7.9
October	100.7	(-11.4)	16.3	(+2.56)	10.55	(+3.9)	11.6	0	13.9	14.2	115.7	(+41.0)	20	96.9	7.6
November	80.7	(+14.5)	10.1	(+0.72)	3.67	(+0.34)	4.97	9	9.3	11.7	49.0	(-17.2)	17	30.9	8.1
December	73.7	(+25.6)	5.85	(-1.34)	0.67	(-1.25)	1.21	22	5.9	8.8	19.5	(-50.6)	12	22.5	9.1
Year	1610.1	(+72.4)	13.48	(+0.15)	6.41	(+0.82)		99			872.8	(+177.5)	185	524.9	8.2

* Number of nights grass minimum was below 0.0 oC

** Number of days rain was 0.2 mm or more

*** At 2 metres above ground

Woburn Experimental Farm

The Weather : Monthly Summary : 2001

(Departure from 30-year means (1971 - 2000) in brackets)

	Sunshine		Mean temperatures oC								Rain			Wind
			Maximum		Minimum		Dew	Ground	In ground under grass		Total mm		Rain	***
	Hours	( )		( )		( )	point	frosts *	30 cm	100 cm	Tipping bucket	( )	days **	km/hr
January	82.6	(+34.1)	6.0	(-0.7)	0.0	(-1.0)	1.5	21	3.8	6.5	50.0	(-5.3)	21.0	7.1
February	98.6	(+34.6)	8.2	(+1.1)	1.0	(+0.2)	2.3	17	4.9	5.8	79.6	(+39.0)	21.0	8.1
March	92.1	(-9.2)	8.4	(-1.5)	2.2	(+0.2)	3.7	10	5.6	6.0	97.6	(+48.0)	25.0	7.9
April	136.7	(+0.9)	11.9	(-0.4)	3.9	(+0.5)	4.9	4	8.6	7.6	80.4	(+27.7)	24.0	9.2
May	223.4	(+40.3)	17.8	(+1.8)	6.9	(+0.9)	9.5	0	12.0	9.4	48.2	(-4.5)	11.0	6.5
June	222.3	(+45.4)	19.4	(+0.5)	9.0	0.0	10.7	0	14.9	11.9	25.4	(-33.4)	12.0	6.8
July	195.6	(+2.0)	22.3	(+0.5)	12.4	(+1.2)	13.4	0	17.2	14.2	80.2	(+34.6)	11.0	6.0
August	172.2	(-12.4)	22.2	(+0.6)	12.3	(+1.2)	14.8	0	17.4	15.4	85.6	(+31.1)	19.0	6.2
September	74.5		17.0	(-1.3)	9.2	(+0.1)	10.3	0	14.8	14.6	70.4	(+12.3)	20.0	4.8
October	107.7	(+3.9)	16.7	(+2.6)	10.7	(+4.2)	12.4	0	13.8	13.8	111.6	(+47.2)	25.0	9.4
November	69.0	(+5.6)	10.4	(+0.8)	3.2	(-0.2)	5.2	2	9.2	11.5	53.0	(-4.2)	19.0	7.3
December	65.4	(+23.8)	5.9	(-1.6)	-0.6	(-2.5)	1.4	21	5.8	8.8	22.2	(-37.3)	18.0	6.6
Year	1540.1							75			804.2		226	

* Number of nights grass minimum was below 0.0 oC

** Number of days rain was 0.2 mm or more

*** At 2 metres above ground

Records missing from various categories in September due to sensor malfunction.