ROTHAMSTED RESEARCH

Yields of the Field Experiments 2007

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Results of the Classical and Other Long-term Experiments 2007

Rothamsted Research

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Results of the Classical and other Long-term Experiments

2007

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List of Experiments in the 2007 Yield Book

R/BK/1	Broadbalk
R/HB/2	Hoos Barley
R/WF/3	Wheat and Fallow
R/EX/4	Exhaustion Land
R/PG/5	Park Grass
R/GC/8	Garden Clover (1)
R/CS/326 & W/CS/326	Amounts of Straw
R/CS/477 & W/CS/478	Continuous Maize
W/RN/3	Ley Arable
W/RN/12	Organic Manuring (2)

(1) includes Yields for 2006 and 2007. 2006 data omitted from 2006 Yield Book
(2) includes grass/clover yields for 2004-6

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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.

Anhydrous Sulphate of Soda

CopperMan	25% w/w soluble manganese (as Mn) + 5% w/w soluble copper as (Cu) + 43.3% w/w soluble sulphur (as SO_3) + 17.4% w/w soluble (as S)
Double Top	27% nitrogen and 30% SO_3
FYM	Farmyard manure (from bullocks)
Kieserite	$MgSO_4H_2O$ 17.7% magnesium and 23.3% sulphur
Magnesium Sulphate	16% MgO (9.6% Mg), 32% SO_3 (13% S)
Manganese sulphate	$Mn_2 (SO_4)_3$ 27% manganese and 24% sulphur
Muriate of potash	60% K_2O
Nitram	34.5% N as Ammonium Nitrate
Nitraprill	34.5% N (Nitric N 17.3%, Ammoniacal N 17.2%) as Ammonium Nitrate
Nitrate of soda	$NaNO_3$ 16% nitrogen and 27% sodium
Nitro-Chalk	Calcium Ammonium Nitrate 27% N

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Pelleted poultry manure	3.5% N
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
Triple superphosphate (TSP)	47% P_2O_5

Cereal straw is removed unless otherwise stated.

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 12.5cm apart
Combine drilled	Drill mounted behind a rotary harrow.
Dutch harrow	Rigid tine harrow
Flexitine	Heavy spring-tine cultivator
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
Plough/N	Furrow slice turned to the North (-/S = South, -/E = East, -/W = West)
Shakerator	Deep tine cultivator with vibrating tines 60cm apart and 45 cm deep
Subsoiler	Deep tine cultivator with vibrating tines 60cm apart and 45 cm deep

Application code: This is used to identify the kind of application
a = application (cultivations, harvest, etc), p = pesticide, f = fertiliser, and s = seed.

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	**TR**	Trace elements

Trade Name	Function	Active ingredient
Ally Max SX	**H**	143 + 143 g/l metsulfuron-methyl + tribenuron-methyl
Alpha Briotril Plus 19/19	**H**	190+190 g/l bromoxynil + ioxynil
Alpha Simazine 500	**H**	500 g/l simazine
Amistar Opti	**F**	100:500 g/l azoxystrobin + chlorothalonil
Azural	**H**	360 g/l glyphosate
Barclay Gallup 360	**H**	360 g/l glyphosate
BASF 3C Chlormequat 720	**GR**	720 g/l chlormequat
Biopower	**AD**	20.2 + 6.7% w/w/ 3,6-dioaeicosylsulphate sodium salt + 3,6-dioxaoctadecylsuphate sodium salt
Bravo 500	**F**	500 g/l chlorothalonil
Callisto	**H**	100 g/l mesotrione
Carbetamex	**H**	70% w/w carbetamide
Clean Crop Wanderer	**F**	500 g/l chlorothalonil
Clinic Ace	**H**	360 g/l glyphosate
Corbel	**F**	750 g/l fenpropimorph
Decoy Wetex	**M**	20g/kg methiocarb
Deuce	**F**	233 + 67 g/l boscalid + epoxiconazole
Duplosan KV	**H**	600 g/l mecoprop-P
Entice	**M**	40 g/kg metaldehyde
Fandango	**F**	100:100 g/l fluoxastrobin + prothioconazole
Flexity	**F**	300 g/l metrafenone
Folicur	**F**	250 g/l tebuconazole
Hallmark with Zeon Technology	**I**	100 g/l lambda cyhalothrin
Ice	**H**	60 + 300 g/l flufenacet + pendimethalin
Jupital	**F**	500 g/l chlorothalonil
Landgold Epoxiconazole	**F**	125 g/l epoxiconazole
Lexus Class	**H**	33.3 + 16.7% carfentrazone-ethyl + Flupyrsulfuron-methyl
Optica	**H**	600 g/l mecoprop-P
Opus	**F**	125 g/l epoxyconazole
Pacifica	**H**	10 + 30 g/kg idosulfuron-methyl-sodium + mesosulfuron-methyl
Quantum 75 DF	**H**	750 g/kg tribenuron-ethyl
Samson	**H**	40 g/l nicosulfuron
Sedema Manganese Sulphate	**TR**	Manganese Sulphate
Splice	**F**	233 + 67 g/l boscalid + epoxyconazole
Standon Fenpropimorph 750	**F**	750 g/l fenpropimorph
Starane 2	**F**	200 g/l fluroxypyr
Vivid	**F**	250 g/l pyraclostrobin
Weedazol-TL	**H**	225g/l amitrol

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07/R/BK/1

BROADBALK

Object: To study the effects of organic manures and inorganic fertilisers on continuous w. wheat and wheat in rotation. 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 164th year, w. wheat, w. oats and forage maize.

For previous years see 'Details' 1967 and 1973, Station Report for 1966, pp. 229-234; Station Report for 1968, Part 2; Station Report for 1982, Part 2, pp 5-44 and Yield Books for 74-O6R//BK/1.

Areas harvested:

	Section	
Wheat:	0	0.00320
	1	0.00589
	2,4,6 and 7	0.00487 (*see note 4, below)
	8,9	0.00512
Oats:	3	0.00487
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
21FYMN3	2.1	FYM N2 (1)
22FYM	2.2	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 Mg
10N4	10	N4
11N4PMg	11	N4 P Mg
12N1+3+1(P)K2Mg2	12	N1+3+1 (P) K2 Mg2 (2)
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

(1) FYM N3 since 2005

(2) N1+3+1 (P) KMg since 2006

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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 2010/11.
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.
(Mg*):	(none), to be reviewed in 2010/11
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 ½[P K (Na) Mg]	N1+3 ½[P K Mg] (A)+
18N0+3FH	18	P K Na Mg (A)	N2 ½[P K (Na) Mg]	N0+3 ½[P K 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 ½[PK Mg] on both plots 17 and 18. These treatments shown incorrectly in 1999-2002 Yield books.

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07/R/BK/1

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:	30kg 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, the experiment was divided into 10 sections with the following cropping:-

SECTION

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

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Section	1	9	0*	8+	6**	5	3	7	4	2
Year										
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
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
2002	W	W	W	W	W	W	M	W	W	O
2003	W	W	F	W	W	W	W	O	W	M
2004	W	W	F	W	W	W	W	M	O	W
2005	W	W	W	W	W	O	W	W	M	W
2006	W	W	W	W	W	M	O	W	W	W
2007	W	W	W	W	W	W	M	W	W	O

W = w. wheat, O = w. oats (spring oats 2001), 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 2.9t 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.

(3) In 2003 and 2004 section 0 was used for an experiment (CS/595) investigating different herbicides to control *Equisetum arvense.*

(4) In 2006 parts of plots 2.2, 06, 09 and 14 on Section 4 used for a nutrition trial with the application of urea. 5m was cut off the end of these plots before the yield measurement was taken.

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Experimental Diary:

All Sections:			Rate	Unit
05-Sep-06	p	Weedazol-TL Sections 0-4, 6, 7, 9	20.00	l/200 l/ha
28- Sep-06	a	Topped Section 8	1.00	
04-Oct-06	f	Farm Yard Manure Strips 21, 22, excluding section 2	35.00	t/ha
09-Oct-06	f	Triple superphosphate strips 11, 13, 14, 17, 18	171.00	kg/ha
	f	Muriate of Potash Strip 14	181.00	kg/ha
14-Oct-06	a	Plough/S		
16- Oct-06	a	Cultipressed		
09-Jan-07	a	Erect rabbit fence		
12-Mar-07	f	Sulphate of Potash Strips 5-9, 12, 13, 15-20	217.00	kg/ha
14-Mar-07	f	Kieserite Strips 5-9, 11, 12, 15-20, strip 10 section 9 in error	80.00	kg/ha
01-May-07	a	Flexitined E and W headlands		
08-May-07	a	Mow / Rotavate paths		
09-May-07	a	Mow / Rotavate paths		
10-May-07	a	Remove rabbit fence S O&E's		
	a	Flexitined O&E's		
11-May-07	a	Power Harrowed O&E's		
25-May-07	a	Mow / Rotavate paths		
14-Jun-07	a	Mow / Rotavate paths		
19-Jun-07	a	Mow / Rotavate paths		
25-Jun-07	a	Mow/Rotavate paths - down paths		
26-Jul-07	a	Mow / Rotavate paths		
10-Aug-07	a	Rogue wild oats/thistles/weeds		
10-Sep-07	a	Remove rabbit fence		

Cropped sections:

W. Wheat			Rate	unit
01-Nov-06	a	Combination drilled wheat plots		
	s	Hereward tr Redigo Twin + Deter	350.00	seeds/m^2
03-Nov -06	p	Ice Sections 0, 1, 4-7, 9	4.00	l/200 l/ha
04-Dec-06	p	Decoy Wetex excluding section 3	7.00	kg/ha
14-Mar-07	f	Nitraprill strips 12, 17, 18, 19, wheat	139.00	kg/ha
23-Apr-07	p	Clean Crop Wanderer all wheat except section 6	1.00	l/200 l/ha
	p	Deuce all wheat except section 6	1.00	l/200 l/ha
24-Apr-07	f	Nitraprill strips 6, 19, wheat	139.00	kg/ha
	f	Nitraprill strips 7, 18, wheat	278.00	kg/ha
	f	Nitraprill strips 21, 8, 12, wheat	417.00	kg/ha
	f	Nitraprill strips 1, 9, 10, 11, 13, 14, 17, 20, wheat	556.00	kg/ha
	f	Nitraprill strip 15, wheat	696.00	kg/ha
	f	Nitraprill strip 16, wheat	835.00	kg/ha

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			Rate	Unit
09-May-07	p	Ally Max SX wheat and oats excluding section 8	42.00	g/200 l/ha
	p	Starane 2 wheat and oats excluding section 8	0.75	l/200 l/ha
22-May-07	p	Amistar Opti wheat excluding Sec 6	1.25	l/200 l/ha
	p	Opus wheat excluding Sec 6	0.60	l/200 l/ha
	f	Nitraprill Strips 12, 17, 18, 19, wheat	139.00	kg/ha
11-Jun-07	f	Double Top 2 m on W end of plots 225 and 095	40.00	Kg N/ha
12-Jun-07	f	Double Top 2 m on W end of plots 225 and 095	40.00	Kg N/ha
14-Jun-07	p	Amistar Opti wheat, excluding section 6	1.00	l/200 l/ha
	p	Landgold Epoxiconazole wheat, excluding section 6	0.40	l/200 l/ha
26-Aug-07	a	Combine harvest, plots for yield, and swath straw - sections 0 and 1		
27-Aug-07	a	Combine harvest, plots for yield and swath straw - sections 4-9		
	a	Sample, bale and weigh straw section 1		
28-Aug-07	a	Combine harvest plot edges to allow straw weight to be taken		
	a	Sample, bale and weigh straw sections 5 & 8		
29-Aug-07	a	Combine harvest discards and swath straw		
	a	Chop straw section 0		
02-Sep-07	a	Baled remaining wheat straw		

W. Oats			Rate`	Unit
02-Nov-06	a	Combination drilled oat plots		
	s	Gerald r Baytan Secure	350.00	seeds/m^2
04-Dec-06	s	Decoy Wetex excluding section 3	7.00	kg/ha
19-Dec-06	p	Lexus Class - oats	60.00	g/200 l/ha
	p	Hallmark with Zeon Technology - oats	50.00	ml/200 l/ha
09-May-07	p	Ally Max SX wheat and oats excluding section 8	42.00	g/200 l/ha
	p	Starane 2 wheat and oats excluding section 8	0.75	l/200 l/ha
24-May-07	p	Amistar - oats	0.60	l/200 l/ha
	p	Flexity - oats	0.20	l/200 l/ha
06-Aug-07	a	Combine harvest plots for yield and swath straw - oats		
08-Aug-07	a	Sample, bale and weigh straw - oats		
11-Aug-07	a	Baled discard oat straw		

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Forage Maize			Rate	Unit
21-Apr-07	p	Clinic Ace - section 3, pre Maize	4.00	l/200 l/ha
01-May-07	a	Flexitined maize plots		
02-May-07	f	Maize N and 1st N Nitraprill plot 063, maize	139.00	kg/ha
	f	Maize N and 1st N Nitraprill Plots 073, 123, 173, 183, 193, maize	278.00	kg/ha
	f	Maize N and 1st N Nitraprill Plots 213, 083, maize	417.00	kg/ha
	f	Maize N and 1st N Nitraprill Plots 013, 093, 103, 113, 133, 143, maize	556.00	kg/ha
	f	Maize N and 1st N Nitraprill Plot 153, maize	696.00	kg/ha
	f	Maize N and 1st N Nitraprill Plot 163, maize	835.00	kg/ha
	a	Power Harrowed Maize plots		
	a	Nodet drilled maize plots		
	s	Hudson Tr Mesurol maize plots	10.20	seeds/m^2
	a	Rolled maize plots		
06-Jun-07	f	2nd split N Nitraprill Plot 193, maize	139.00	kg/ha
	f	2nd split N Nitraprill Plot 183, maize	278.00	kg/ha
	f	2nd split N Nitraprill Plot 123, maize	417.00	kg/ha
	f	2nd split N Nitraprill Plot 173, maize	556.00	kg/ha
14-Jun-07	p	Samson maize plots	1.50	l/200 l/ha
19-Jun-07	p	Callisto maize plots	0.75	l/200 l/ha
18-Sep-07	a	Cut harvest strips, weighed and sampled - maize		
25-Sep-07	a	Cut maize discards		

Wilderness			Rate	Unit
30-Apr-07	a	Topped Wilderness, middle section		
01-Jun-07	a	Topped grazed section		
18-Jun-07	a	Topped Wilderness, middle section		
25-Sep-07	a	Topped Wilderness, middle section		
21-Dec-07	a	Topped Wilderness, middle section		

Note: Samples of wheat and oat grain and straw, and maize were taken for chemical analysis. Unground wheat grain and straw from section 1 and maize from section 3 were archived.

https://doi.org/10.23637/ERADOC-1-217

07/R/BK/1

WHEAT

GRAIN TONNES/HECTARES

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

SECTION / PLOT	5/W1	4/W2	7/W3	8/W6	6/W30	0/W3	1/W41	9/W49	Mean
01(FYM)N4	8.60	6.68	6.23	*	3.96	*	*	*	6.37
21FYMN3	9.90	9.00	8.48	2.48	5.01	5.24	6.21	7.96	6.78
22FYM	5.31	3.86	3.66	2.18	3.91	2.55	3.94	4.96	3.80
03Nil	1.07	1.07	1.17	1.33	0.97	0.50	0.85	0.17	0.99
05(P)KMg	1.33	1.20	1.03	2.24	0.92	0.41	1.05	0.71	1.11
06N1(P)KMg	3.29	3.14	1.52	1.70	1.56	1.14	2.02	2.19	2.07
07N2(P)KMg	4.96	4.30	2.46	1.35	1.59	2.16	3.22	2.24	2.78
08N3(P)KMg	5.67	5.14	3.34	1.92	1.89	1.97	3.12	2.89	3.24
09N4(P)KMg	7.31	6.04	5.22	2.27	2.90	4.28	4.93	4.89	4.73
10N4	6.04	3.79	0.66	0.79	1.73	0.76	1.11	0.35	1.90
11N4PMg	4.64	2.96	3.31	1.80	1.87	2.56	2.54	3.19	2.86
12N1+3+1(P)K2Mg2	8.29	6.39	5.19	2.59	2.68	4.62	4.82	5.19	4.97
13N4PK	7.15	5.40	4.45	1.54	2.54	3.52	4.29	4.20	4.14
14N4PK*(Mg*)	6.91	5.05	3.68	1.46	2.48	3.46	4.31	4.52	3.98
15N5(P)KMg	7.89	6.11	4.12	1.30	2.13	3.39	3.90	4.30	4.14
16N6(P)KMg	9.00	7.50	5.91	1.77	4.10	5.67	5.29	4.97	5.53
17N1+4+1PKMg	8.76	7.71	6.05	2.01	4.29	5.41	5.16	4.80	5.52
18N1+2+1PKMg	7.98	6.79	5.48	2.19	2.84	3.76	3.77	2.61	4.43
19N1+1+1KMg	6.02	5.11	4.02	1.81	2.42	2.73	3.91	1.30	3.42
20N4KMg	*	*	*	*	*	0.99	0.41	*	0.70

GRAIN MEAN DM% 82.2

STRAW TONNES/HECTARES

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

SECTION / PLOT	5/W1	4/W2	7/W3	8/W6	6/W30	0/W3	1/W41	9/W49	Mean
01(FYM)N4	3.51	*	*	*	*	*	*	*	3.51
21FYMN3	4.58	*	*	5.51	*	*	2.21	*	4.10
22FYM	2.49	*	*	4.80	*	*	1.93	*	3.08
03Nil	0.13	*	*	2.31	*	*	0.16	*	0.87
05(P)KMg	0.26	*	*	4.83	*	*	0.23	*	1.77
06N1(P)KMg	0.86	*	*	2.86	*	*	0.33	*	1.35
07N2(P)KMg	1.73	*	*	3.23	*	*	0.84	*	1.93
08N3(P)KMg	1.26	*	*	3.17	*	*	0.81	*	1.74
09N4(P)KMg	2.35	*	*	4.69	*	*	1.62	*	2.89
10N4	1.38	*	*	3.48	*	*	0.30	*	1.72
11N4PMg	0.90	*	*	4.41	*	*	0.56	*	1.96
12N1+3+1(P)K2Mg2	2.27	*	*	5.24	*	*	1.38	*	2.96
13N4PK	1.90	*	*	4.51	*	*	1.23	*	2.55
14N4PK*(Mg*)	1.78	*	*	5.89	*	*	0.92	*	2.86
15N5(P)KMg	2.24	*	*	6.56	*	*	1.19	*	3.33
16N6(P)KMg	3.03	*	*	5.89	*	*	1.60	*	3.51
17N1+4+1PKMg	2.81	*	*	4.26	*	*	1.39	*	2.82
18N1+2+1PKMg	2.79	*	*	5.39	*	*	1.04	*	3.07
19N1+1+1KMg	1.85	*	*	5.01	*	*	1.15	*	2.67
20N4KMg	*	*	*	*	*	*	0.02	*	0.02

STRAW MEAN DM% 86.2

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07/R/BK/1

W.OATS

TONNES/HECTARE

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

PLOT	GRAIN	STRAW
01(FYM)[N4]	5.10	2.57
21[FYMN2]	6.87	4.13
22[FYM]	7.21	4.18
03Nil	1.93	0.65
05(P)KMg	2.52	0.85
06[N1](P)KMg	2.96	1.14
07[N2](P)KMg	3.29	1.24
08[N3](P)KMg	3.74	1.77
09[N4](P)KMg	3.65	1.77
10[N4]	5.11	2.37
11[N4]PMg	5.31	2.40
12[N1+3+1](P)K2Mg2	3.97	1.61
13[N4]PK	3.39	1.41
14[N4]PK*(Mg*)	3.32	1.57
15[N5](P)KMg	3.85	1.67
16[N6](P)KMg	5.87	2.93
17[N1+4+1]PKMg	5.37	2.63
18[N1+2+1]PKMg	3.45	1.62
19[N1+1+1]KMg	2.60	1.25
MEAN DM%	87.3	84.8

PLOT AREA HARVESTED 0.00487

FORAGE MAIZE

WHOLE CROP (100% DM) TONNES/HECTARES

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

PLOT	Whole Crop
01(FYM)N4	14.74
21FYMN3	14.58
22FYM	13.99
03Nil	2.15
05(P)KMg	3.57
06N1(P)KMg	6.67
07N2(P)KMg	9.20
08N3(P)KMg	11.35
09N4(P)KMg	12.82
10N4	0.93
11N4PMg	3.66
12N2+3(P)K2Mg2	10.90
13N4PK	11.19
14N4PK*(Mg*)	11.06
15N5(P)KMg	11.43
16N6(P)KMg	11.10
17N2+4PKMg	9.25
18N2+2PKMg	8.79
19N2+1KMg	7.37
MEAN%DM	24.40

PLOT AREA HARVESTED 0.00162

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07/R/HB/2

HOOS BARLEY

Object: To study the effects of organic manures and inorganic fertilizers 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 experiment was modified for 2003. The main plots continue as previously. The Silicate Test plots continue but are not split to test rates of N (basal N is applied). The remaining plots are to be used to study the effect on yield of P residues, (basal N applied).

The 156th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and Yield Books 74-06/R/HB/2.

Main plots

Treatments:

Whole plots

1. MANURE	Plot	Fertilizers and Organic Manures Form of N 1852-1966	Additional treatments 1852-2002	Treatments since 2003
---	11	None	-	-
-P-	21	None	P	(P)
--K	31	None	K (Na) Mg	K(Mg)
-PK	41	None	PK (Na) Mg	(P) K (Mg)
A--	12	A	-	-
AP-	22	A	P	(P)
A-K	32	A	K (Na) Mg	K(Mg)
APK	42	A	PK (Na) Mg	(P) K (Mg)
D1852	72	None	D	D
(D)	71	None	(D)	(D)
(A)	62	None	(Ashes)	(Ashes)
-	61	None	-	-
D2001 [(a)]	73[(a)]	-	D	D
P2KMg [(a)]	63 [(a)]	-	P2KMg	P2KMg

[(a)] Plots 63 and 73 started in 2001

Form of N: A, sulphate of ammonia to supply 48kg N
P: 35 kg P as triple superphosphate in 1974 and from 1988 to 2002, single superphosphate in other years
(P): (none), P application to be reviewed for 2008
P2: 44kg P as triple superphosphate
K: 90 kg k as sulphate of potash
(Na): (none), 16 kg Na as sulphate of soda until 1973
Mg: 35kg 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.
(Mg): (none), Mg application to be reviewed for 2008

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D1852: Farmyard manure at 35t since 1852
D2001: Farmyard manure at 35t since 2001
(D): Farmyard manure 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

Silicate Test plots

Treatments:

Whole plots

MANURE	Plot	Fertilizers: Additional treatment 1852-1979	Changes since 1980	Treatments since 2003
N----	131	-	-	N3
NP---	231	P	-	N3 (P)
N-K--	331	K(Na)Mg	-	N3 K(Mg)
NPK--	431	PK(Na)Mg	-	N3(P)K(Mg)
N—S	134	Si	Si omitted	N3 (Si)
NP-S-	234	P Si	Si omitted	N3(P) (Si)
N-KS-	334	K(Na)MgSi	Si omitted	N3 K(Mg)(Si)
NPKS-	434	PK(Na)MgSi	Si omitted	N3(P)K(Mg)(Si)
N---S	132	-	Si added	N3 Si
NP--S	232	P	Si added	N3(P) Si
N-K-S	332	K(Na)Mg	Si added	N3 K(Mg) Si
NPK-S	432	PK(Na)Mg	Si added	N3(P)K(Mg) Si
N--SS	133	Si	-	N3 Si
NP-SS	233	P Si	-	N3(P) Si
N-KSS	333	K(Na)MgSi	-	N3 K(Mg) Si
NPKSS	433	PK(Na)MgSi	-	N3(P)K(Mg) Si

N: From 1852-1966 whole plots received 48kg N as nitrate of soda. Between 1968-2002 whole plots were split to test 4 rates of N as "Nitro-chalk" (cumulative applications until 1973, on a cyclic system from 1974).
N3: Basal N, 144kg as "Nitro-chalk" since 2003
Si: Silicate of soda at 450kg (Note: S also refers to silicate of soda)
(Si): Silicate of soda omitted since 1980
P, (P), K, Mg, (Mg), (Na): as above

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P Test plots

Treatments:

Since 2003 the remaining plots [ex-Castor meal (plots 14, 24, 34 & 44) and those testing combinations of NPK with and without Mg (plots 55, 56, 57 & 58)] have been used to study the effect of P residues on yield. Previous treatments have resulted in different levels of available P in the soil. Large dressing of K were applied to some plots to increase levels of exchangeable K in the soil such that K should not limit yield; plots 141 and 241 were sacrificed and used as discard areas so that the K application did not encroach on adjacent no K plots on the Silicate Test. Other plots received the normal rate of K. The level of exchangeable Mg in the soil is such that Mg should not limit yield; the need to apply Mg will be reviewed for 2008.

Whole plots
Manure

Plot	Treatment since 2003
142	N3K*
143	N3K*
144	N3K*
242	N3K*
243	N3K*
244	N3K*
341	N3K
342	N3K
343	N3K
344	N3K
441	N3K
442	N3K
443	N3K
444	N3K
551	N3K
552	N3K
561	N3K
562	N3K
571	N3K*
572	N3K*
581	N3K*
582	N3K*

N3: Basal N, 144kg as “Nitro-chalk”
K: 90kg K as sulphate of potash
K*: 450kg K as sulphate of potash

In 2005 the extra dressings of K (i.e. K*) was stopped and the whole experiment reverted to K dressings of 90 kg K/ha/year.

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07/R/HB/2

Experimental Diary

			Rate	Unit
25-Sep-06	p	Weedazol-TL	20.00	l/200 l/ha
13-Nov-06	f	Triple Superphosphate - Plots 631-634	215.00	kg/ha
	f	Sulphate of Potash Plots 141-144, 241-244, 311-444, 551-582, 631-634	217.00	kg/ha
	f	Kieserite Plots 631-634	223.00	kg/ha
14-Nov-06	f	Silicate of Soda Plots 132-433. Applied to plots 131-431, 134-434 in error	450.00	kg/ha
20-Nov-06	f	Farm Yard Manure Plots 721-4, 731-4	35.00	t/ha
22-Nov-06	a	Plough/ N		
02-Feb-07	s	Optic tr Raxil Pro	350.00	seeds/m^2
07-Feb-07	a	Rolled		
05-Apr-07	f	Nitro-chalk - Plots 114, 122, 2134, 224, 312, 323, 411, 424, 612, 622, 632, 714, 723, 733	175.00	kg/ha
	f	Nitro-chalk - Plots 111, 121, 214, 221, 311, 322, 413, 423, 614, 623, 633, 713, 724, 734	349.00	kg/ha
	f	Nitro-chalk - Plots 113, 124, 211, 222, 313, 321, 412, 421, 611, 621, 631, 712, 721, 732	524.00	kg/ha
10-Apr-07	f	Nitro-chalk - series 5, C and AA, and O&E's	524.00	kg/ha
17-May-07	p	Fandango	1.00	l/200 l/ha
	p	Flexity	0.30	l/200 l/ha
	p	Alpha Briotril Plus 19/19	1.50	l/200 l/ha
	p	Optica	2.00	l/200 l/ha
02-Jun-07	p	Amistar Opti	1.00	l/200 l/ha
	p	Corbel	0.50	l/200 l/ha
26-Jun-07	a	Rogue wild oats/thistles/weeds plants on plots	38.00	
03-Sep-07	a	Combine harvest, plots for yield and swath straw - completed 4-Sep-07		
	a	Combine harvest discards		
	a	Baled		
04-Sep-07	a	Combine harvest, plots for yield		
	a	straw		
	a	Swath, sample, bale and weigh straw		
12-Sep-07	a	Row up straw on headland		

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07/R/HB/2

MAIN PLOTS

GRAIN TONNES/HECTARE

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

N	0	48	96	144	Mean
MANURE					
---	0.87	0.92	1.16	1.12	1.02
-P-	1.34	2.70	2.71	4.01	2.69
--K	0.00	0.00	0.00	0.00	0.00
-PK	1.06	2.07	3.69	3.29	2.53
A--	0.87	0.99	1.10	1.76	1.18
AP-	1.80	2.87	3.07	2.82	2.64
A-K	0.00	0.00	0.00	0.00	0.00
APK	1.07	2.30	3.76	2.65	2.45
FYM1852onwards	5.35	6.49	6.27	6.94	6.26
FYM1852-1871	0.00	2.78	1.99	1.97	1.68
(A)	1.13	1.44	1.70	1.19	1.37
-	0.36	0.58	1.30	0.56	0.70
FYM2001onwards	4.26	4.84	5.82	5.92	5.21
P2K	1.96	4.04	4.89	5.42	4.08
Mean	1.43	2.29	2.68	2.69	2.27

GRAIN MEAN DM% 88.6

STRAW TONNES/HECTARE

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

N	0	48	96	144	Mean
MANURE					
---	0.22	0.51	0.78	0.81	0.58
-P-	0.34	0.98	1.28	1.17	0.94
--K	0.00	0.00	0.00	0.00	0.00
-PK	0.62	1.24	1.55	1.54	1.24
A--	0.47	0.46	0.92	0.83	0.67
AP-	0.73	1.21	1.19	1.27	1.10
A-K	0.00	0.00	0.00	0.00	0.00
APK	0.59	1.28	1.78	1.02	1.17
FYM1852onwards	2.48	3.04	3.52	3.32	3.09
FYM1852-1871	0.00	1.30	1.20	0.95	0.86
(A)	0.79	1.11	1.48	1.44	1.20
-	0.12	0.42	0.94	0.80	0.57
FYM2001onwards	1.56	1.68	1.20	2.70	1.79
P2K	0.48	1.33	1.45	1.87	1.28
Mean	0.60	1.04	1.23	1.27	1.04

STRAW MEAN DM% 81.6

https://doi.org/10.23637/ERADOC-1-217

07/R/HB/2

SILICATE PLOTS

GRAIN TONNES/HECTARE

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

PK Silicate	N3--	N3P-	N3-K	N3PK	Mean
(-)-	2.25	3.94	0.00	5.02	2.80
(Si)-	2.53	4.37	2.21	5.26	3.59
(-)Si	3.42	4.85	0.00	4.61	3.22
(Si)Si	2.98	4.73	2.74	4.52	3.74
Mean	2.79	4.47	1.24	4.85	3.34

GRAIN MEAN DM% 83.9

PHOSPHATE PLOTS

GRAIN TONNES/HECTARE

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

PLOTS	
142.	3.67
143.	3.41
144.	3.11
242.	4.93
243.	5.00
244.	4.62
341.	4.10
342.	4.16
343.	3.09
344.	2.09
441.	4.66
442.	5.07
443.	5.02
444.	4.53
551.	2.41
552.	2.64
561.	0.00
562.	0.00
571.	2.46
572.	2.73
581.	1.25
582.	0.94

GRAIN MEAN **DM% 81.8**

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07/R/WF/3

WHEAT AND FALLOW

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

The 152nd year, w. wheat.

For previous years see 'Details' 1967, 1973 and Yield Books for 74-06/R/WF/3.

Whole plot dimensions: 9 x 211 m

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

Experimental Diary:

			Rate	Unit
13-Oct-06	p	Barclay Gallup 360	4.00	l/200 l/ha
19-Oct-06	a	Plough/ N		
01-Nov-06	a	Combination Drilled		
	s	Hereward tr Redigo Twin + Deter, Plot 2	350.00	seeds/m^2
03-Nov-06	p	Ice	4.00	l/200 l/ha
08-Dec-06	p	Entice	7.00	kg/ha
12-Mar-07	a	Springtined fallow, Plot 1		
11-Apr-07	p	Pacifica - wheat	0.50	kg/200 l/ha
	p	Biopower - wheat	1.00	l/200 l/ha
23-Apr-07	p	Clean Crop Wanderer	1.00	l/200 l/ha
	p	Deuce	1.00	l/200 l/ha
02-May-07	a	Power harrowed fallow plots		
22-May-07	p	Amistar Opti	1.25	l/200 l/ha
	p	Opus	0.80	l/200 l/ha
06-Jun-07	a	Mow/Rotavate paths		
14-Jun-07	a	Mow/Rotavate paths		
26-July-07	a	Rotavate fallow		
27-Aug-07	a	Combine harvest and chop straw - O&E's		
03-Sep-07	a	Combine harvest, plots for yield		
04-Sep-07	a	Swath, sample, bale and weigh straw		

Note: Unground grain and straw was archived.

GRAIN AND STRAW YIELDS TONNES/HECTARE

Grain	1.29
Straw	0.22

Grain and Straw % Dry Matter

Grain	84.30
Straw	90.84

PLOT AREA HARVESTED 0.04431

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07/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures applied 1856 -1901, and of additional phosphate applied since 1986, on the yield of continuous s. barley up to 1991, w. wheat since – Hoosfield.

The 152nd year, w. wheat.

For previous years see 'Details' 1977, 1973 and Yield Books for 74-06/R/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:

	2000-07	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)

1. 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

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07/R/EX/4

2. K Potassium applied annually for 2007 as muriate of potash

O	None
K1	75 kg K_2O (62.2 kg K)
K2	150 kg K_2O (124.5 kg K)

Whole plots

Nitrogen: 50 kg N as ammonium sulphate (to supply sufficient S) during first two weeks in March, 200 kg N as ammonium nitrate at GS31/mid-April (whichever comes first) and 50 kg N as ammonium nitrate at GS37 (not later than mid-May)

Experimental diary:

K test:

			Rate	Unit
12-Oct-06	f	Muriate of Potash - 023, 043, 063, 083, 103	125.00	kg/ha
	f	Muriate of Potash – 024, 044, 064, 084, 104	250.00	kg/ha
	f	Basal P (triplesuperphosphate) – plots 02, 04, 06, 08, 10	98.00	kg/ha

P test:

			Rate	Unit
12-Oct-06	f	Triplesuperphosphate – plots 011–013, 031–033, 051-053, 071–073, 091-093	98.00	kg/ha
	f	Basal K (muriate of potash) – plots 01, 03, 05, 07, 09	250.00	kg/ha

All Plots			Rate	Unit
13-Oct-06	p	Barclay Gallup 360	4.00	l/200 l/ha
19-Oct-06	a	Plough/ N		
30-Oct-06	a	Combination Drilled		
	s	Xi19 tr Redigo Sib Secure	350.00	seeds/m^2
03-Nov-07	p	Ice	4.00	l/200 l/ha
08-Dec-07	p	Entice	7.00	kg/ha
12-Mar-07	f	Sulphate of Ammonia	238.00	kg/ha
11-Apr-07	p	Pacifica	0.50	kg/200 l/ha
	p	Biopower	1.00	l/200 l/ha
23-Apr-07	p	Clean Crop Wanderer	1.00	l/200 l/ha
	p	Deuce	1.00	l/200 l/ha
26-Apr-07	f	Nitraprill	580.00	kg/ha
22-May-07	p	Amistar Opti	1.25	l/200 l/ha
	p	Opus	0.80	l/200 l/ha
06-Jun-07	a	Mow/Rotavate paths		
14-Jun-07	a	Mow/Rotavate paths		
25-Jun-07	a	Mow/Rotavate paths		
07-Aug-07	a	Mow/Rotavate paths		
27-Aug-07	a	Combine harvest O&E's		
	a	Chop straw O&E's		
03-Sep-07	a	Combine harvest, plots for yield		
	a	Swath straw		
04-Sep-07	a	Sample, bale and weigh straw		

Note: Samples of grain and straw were taken for chemical analysis.

https://doi.org/10.23637/ERADOC-1-217

07/R/EX/4

P TEST

GRAIN TONNES/HECTARE

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

P_RES / OLD_RES	O	P1	P2	P3	Mean
O	1.93	4.22	5.25	5.38	4.20
D	2.85	4.66	5.27	5.53	4.58
N	1.81	3.95	4.78	4.65	3.80
P	3.28	4.77	5.71	5.10	4.72
NPKNAMG	2.09	3.67	5.03	5.13	3.98
Mean	2.39	4.26	5.21	5.16	4.26

GRAIN MEAN DM% 84.1

STRAW TONNES/HECTARES

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

P_RES / OLD_RES	O	P1	P2	P3	Mean
O	0.38	0.99	1.64	1.51	1.13
D	0.75	1.29	1.58	1.42	1.26
N	0.82	1.64	1.98	1.93	1.59
P	1.07	1.16	1.63	1.75	1.40
NPKNAMG	0.61	1.04	1.58	1.78	1.25
Mean	0.73	1.22	1.68	1.68	1.33

STRAW MEAN DM% 90.4

PLOT AREA HARVESTED 0.00525

https://doi.org/10.23637/ERADOC-1-217

07/R/EX/4

K TEST

GRAIN TONNES/HECTARE

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

K Test				
OLD_RES	K0	K1	K2	Mean
O	4.10	4.74	5.19	4.53
D	4.37	4.85	5.18	4.70
N*	4.49	4.58	4.56	4.53
PK	5.10	4.51	4.87	4.89
N*PK	4.09	3.62	4.46	4.06
Mean	4.43	4.46	4.85	4.54
rep.	10	5	5	

GRAIN MEAN DM% 84.0

STRAW TONNES/HECTARE

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

K Test				
OLD_RES	K0	K1	K2	Mean
O	1.49	1.58	1.41	1.49
D	0.90	1.35	1.46	1.15
N*	1.57	1.59	1.66	1.60
PK	1.35	1.06	1.30	1.26
N*PK	0.87	0.81	1.14	0.92
Mean	1.24	1.28	1.39	1.29
rep.	10	5	5	

STRAW MEAN DM% 89.0

PLOT AREA HARVESTED 0.00525

https://doi.org/10.23637/ERADOC-1-217

07/R/PG/5

PARK GRASS

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

The 152nd year, hay.

For previous years see 'Details' 1977 and 1973 and Yield Books for 74-06/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)
None (FYM)	Plot 2/2	None (FYM until 1863)
None	Plot 3	None
P	Plot 4/1	P
N2P	Plot 4/2	N2 P
N1PKNaMg	Plot 6	N1 P K Na Mg
PKNaMg	Plot 7	P K Na Mg
PNaMg	Plot 8	P Na Mg
PKNaMg(N2)	Plot 9/1	P K Na Mg (N2 until 1989)
N2PKNaMg	Plot 9/2	N2 P K Na Mg
N2PNaMg	Plot 10	N2 P Na Mg
N3PKNaMg	Plot11/1	N3 P K Na Mg
N3PKNaMgSi	Plot 11/2	N3 P K Na Mg Si
None	Plot 12	None
(FYM/F)	Plot 13/1	None (FYM/F until 1993/1995)
FYM/PM	Plot 13/2	FYM/PM (FYM/F until 1999)
PKNaMg (N2*)	Plot 14/1	P K Na Mg (N2* until 1989)
N2*PKNaMg	Plot 14/2	N2* P K Na Mg
PKNaMg (N2*)	Plot 15	P K Na Mg (N2* until 1875)
N1*PKNaMg	Plot 16	N1* P K Na Mg
N1*	Plot 17	N1*
N2KNaMg	Plot 18	N2 K Na Mg
FYM	Plot 19	FYM
FYM/N*PK	Plot 20	FYM/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
FYM:	Farmyard manure at 35 t every fourth year

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07/R/PG/5

1. Manure Fertilizers and organic manures (cont'd)

F:	Fishmeal every fourth year to supply 63 kg N (stopped 1999; replaced by PM
PM	Pelleted poultry manure at 2 t, every fourth year to supply 63 kg N (started 2003)

Sub-plots

2. Lime Liming plots 1-18 (excluding 18/2):

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 1965 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 2006; the fifth application in a triennial scheme of soil pH analysis and remedial chalk applications.

[This note was incorrect in 97-01/R/PG/5 Yield book entries.]

Lime Liming plots 18-20

NOTE: Differential rates of lime were applied to sub-plots 2 and 3 regularly 1920–1964. 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 1968; plot 18/2 no further chalk after 1972.

[This note was incorrect in 97-01/R/PG/5 Yield book entries.]

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07/R/PG/5

Experimental diary:

			Rate	Unit
15-Jan-07	f	Triple Superphosphate - Plots 4/1, 4/2, 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14/1, 14/2, 15, 16	171.00	kg/ha
	f	Triple Superphosphate -Plot 20	73.00	kg/ha
01-Feb-07	f	Sulphate of Potash - Plots 2/1, 6, 7, 9/1, 9/2, 11/1, 11/2, 14-16, 18	542.00	kg/ha
	f	Sulphate of Potash - Plot 20	108.00	kg/ha
	f	Anhydrous Sulphate of Soda - Plots 6-11/2, 14-16, 18	43.00	kg/ha
	f	Magnesium Sulphate - Plots 6-11/2, 14-16, 18	111.00	kg/ha
	f	Silicate of Soda - Plot 11/2	450.00	kg/ha
02-Feb-07	f	Poultry manure - Plot 13/2	2.00	t/ha
13-Mar-07	a	Rolled		
05-Apr-07	f	Nitrate of Soda - Plot 20	188.00	kg/ha
	f	Nitrate of Soda - Plots 16, 17	300.00	kg/ha
	f	Nitrate of Soda - Plot 14/2	600.00	kg/ha
	f	Sulphate of Ammonia - Plots 1, 6a, 6b	229.00	kg/ha
	f	Sulphate of Ammonia - Plots 4/2, 9/2, 10, 18	457.00	kg/ha
	f	Sulphate of Ammonia - Plots 11/1, 11/2	686.00	kg/ha
13-Apr-07	a	Mow/Rotavate paths - External paths completed 16-Apr-07		
30-Apr-07	a	Mow/Rotavate paths - completed 8-May-07		
02-Jul-07	a	Cut harvest strips, weighed and sampled - plots 11/1-13/2, 18-20.		
03-Jul-07	a	Cut harvest strips, weighed and sampled -all remaining plots		
04-Jul-07	a	Mowed		
05-Jul-07	a	Turned hay		
	a	Rowed up hay		
	a	Baled (36 bales)		
09-Jul-07	a	Topped to tidy		
	a	Row up		
10-Jul-07	a	Baled discard topped grass		
30-Jul-07	a	Mow / Rotavate paths		
05-Nov-07	a	Mow / Rotavate paths		
06-Nov-07	a	Cut harvest strips, weighed and sampled completed 7-Nov-07		
07-Nov-07	a	Mowed		
	a	Row up		
	a	Baled		
13-Mar-07	a	Chain swiped discards around trees		

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07/R/PG/5

1ST CUT (2-3/7/07) DRY MATTER TONNES/HECTARES

***** Table of means *****

Grand mean 3.44

Manure	Lime	a	b	c	d	Mean
N1	1	2.69	2.39	1.22	0.54	1.71
K	2/1	1.91	2.08	0.96	1.15	1.52
None(FYM)	2/2	2.37	2.87	1.18	1.60	2.01
None	3	2.27	2.36	1.23	1.38	1.81
P	4/1	2.84	3.24	2.21	2.20	2.62
N2P	4/2	2.64	2.76	2.87	1.44	2.43
N1PKNaMg	6	5.07	4.70			4.89
PKNaMg	7	4.84	4.92	4.18	2.28	4.05
PNaMg	8	2.62	3.04	2.98	3.17	2.95
PKNaMg(N2)	9/1	4.68	4.68	3.81	0.97	3.54
N2PKNaMg	9/2	5.13	4.93	4.80	4.08	4.73
N2PNaMg	10	3.21	2.96	3.69	2.31	3.04
N3PKNaMg	11/1	5.83	6.24	5.50	4.33	5.48
N3PKNaMgSi	11/2	5.79	5.52	5.78	5.03	5.53
None	12	2.40	2.12	1.41	1.64	1.90
(FYM/F)	13/1	3.86	3.84	3.06	2.62	3.35
FYM/PM	13/2	3.92	4.55	4.01	4.21	4.17
PKNaMg(N2*)	14/1	4.68	4.79	4.09	3.47	4.26
N2*PKNaMg	14/2	3.59	4.64	4.30	4.31	4.21
PKNaMg(N2*)	15	4.32	4.85	3.30	2.12	3.65
N1*PKNaMg	16	4.28	4.11	3.69	2.96	3.76
N1*	17	2.97	3.09	2.39	2.45	2.73
N2KNaMg	18	3.96	4.22	3.81	1.81	3.45
N2KNaMg	18/2					4.31
FYM	19/1					4.63
FYM	19/2					4.81
FYM	19/3					4.23
FYM/N*PK	20/1					4.81
FYM/N*PK	20/2					5.85
FYM/N*PK	20/3					4.87

1ST CUT MEAN DM% 21.1

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07/R/PG/5

2ND CUT (6-7/11/07) DRY MATTER TONNES/HECTARES

****** Table of means *****

Grand mean 1.57

Manure	Lime	a	b	c	d	Mean
N1 1		1.14	1.08	0.64	0.49	0.84
K 2/1		0.80	0.85	0.35	0.52	0.63
None(FYM) 2/2		1.13	1.25	0.70	0.72	0.95
None 3		1.12	1.19	0.70	0.89	0.98
P 4/1		1.53	1.60	1.52	1.38	1.51
N2P 4/2		1.23	1.18	1.13	0.72	1.07
N1PKNaMg 6		2.74	2.53			2.64
PKNaMg 7		2.77	2.79	2.01	1.39	2.24
PNaMg 8		1.56	1.36	1.38	1.46	1.44
PKNaMg(N2) 9/1		2.71	2.76	1.64	0.24	1.84
N2PKNaMg 9/2		1.88	1.64	1.36	2.48	1.84
N2PNaMg 10		1.43	0.97	0.85	1.35	1.15
N3PKNaMg 11/1		2.39	2.24	1.39	3.24	2.31
N3PKNaMgSi 11/2		2.85	2.40	1.83	3.36	2.61
None 12		1.32	0.85	0.29	0.64	0.77
(FYM/F) 13/1		2.41	1.66	0.61	0.46	1.29
FYM/PM 13/2		1.24	1.72	1.30	1.19	1.36
PKNaMg(N2*) 14/1		2.48	2.41	2.41	1.94	2.31
N2*PKNaMg 14/2		1.42	1.82	2.04	1.68	1.74
PKNaMg(N2*) 15		2.24	2.47	2.07	1.25	2.01
N1*PKNaMg 16		2.47	2.40	1.63	1.24	1.94
N1* 17		1.45	1.24	0.81	0.84	1.08
N2KNaMg 18		1.03	1.17	1.58	0.86	1.16
N2KNaMg 18/2						1.48
FYM 19/1						2.28
FYM 19/2						2.48
FYM 19/3						2.12
FYM/N*PK 20/1						2.05
FYM/N*PK 20/2						2.47
FYM/N*PK 20/3						1.99

2ND CUT MEAN DM% 28.11

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07/R/PG/5

TOTAL OF TWO CUTS DRY MATTER TONNES/HECTARES

***** Table of means *****

Grand mean 5.01

Manure	Lime	a	b	c	d	Mean
N1	1	3.82	3.47	1.87	1.02	2.55
K	2/1	2.71	2.93	1.31	1.67	2.16
None(FYM)	2/2	3.51	4.11	1.88	2.32	2.96
None	3	3.39	3.55	1.93	2.27	2.79
P	4/1	4.36	4.83	3.73	3.58	4.13
N2P	4/2	3.87	3.93	4.01	2.16	3.49
N1PKNaMg	6	7.81	7.23			7.52
PKNaMg	7	7.61	7.72	6.19	3.67	6.30
PNaMg	8	4.17	4.40	4.35	4.63	4.39
PKNaMg(N2)	9/1	7.39	7.45	5.45	1.21	5.37
N2PKNaMg	9/2	7.01	6.57	6.16	6.56	6.58
N2PNaMg	10	4.63	3.92	4.53	3.67	4.19
N3PKNaMg	11/1	8.21	8.48	6.89	7.57	7.79
N3PKNaMgSi	11/2	8.64	7.92	7.62	8.39	8.14
None	12	3.73	2.97	1.70	2.28	2.67
(FYM/F)	13/1	6.27	5.50	3.67	3.08	4.63
FYM/PM	13/2	5.16	6.27	5.31	5.40	5.53
PKNaMg(N2*)	14/1	7.16	7.20	6.50	5.41	6.57
N2*PKNaMg	14/2	5.02	6.47	6.34	6.00	5.96
PKNaMg(N2*)	15	6.57	7.32	5.37	3.37	5.65
N1*PKNaMg	16	6.75	6.51	5.32	4.20	5.69
N1*	17	4.42	4.33	3.20	3.29	3.81
N2KNaMg	18	4.99	5.39	5.39	2.67	4.61
N2KNaMg	18/2					5.79
FYM	19/1					6.91
FYM	19/2					7.30
FYM	19/3					6.35
FYM/N*PK	20/1					6.86
FYM/N*PK	20/2					8.32
FYM/N*PK	20/3					6.86

TOTAL OF 2 CUTS MEAN DM% 24.60

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06/R/GC/8

GARDEN CLOVER

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

The 153rd year, red clover.

For previous years see `Details' 1967 and 1973, and Yield Books for 74-05/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:

			Rate	Unit
05-Oct-05	p	Azural	6.00	l/10 l/ha
30-Nov-05	a	Hand dig		
	f	Magnesium Sulphate	520.00	kg/ha
	f	Triple Superphosphate	158.00	kg/ha
	f	Sulphate of Potash	300.00	kg/ha
	f	Chalk	1.25	t/ha
15-Mar-06	a	Erect rabbit fence		
19-Apr-06	a	Hand raked		
	a	Hand sow		
	s	Miluus	30.00	kg/ha
	a	Erect new fence and netting, completed 23-May-06		
13-Jul-06	s	Miluus, re-sow failed areas	30.00	kg/ha
17-Aug-06		First cut taken		
07-Nov-06		Second cut taken		

NOTE: Samples of clover taken from each cut for chemical analysis

https://doi.org/10.23637/ERADOC-1-217

06/R/GC/8

1ST CUT (17/8/06) DRY MATTER TONNES/HECTARE

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

FUNG_RES	NONE	BENOMYL	Mean
	0.72	0.84	0.78

1ST CUT MEAN DM% 33.4

1ST CUT PLOT AREA HARVESTED 0.00014

2ND CUT (07/11/06) DRY MATTER TONNES/HECTARE

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

FUNG_RES	NONE	BENOMYL	Mean
	0.92	1.25	1.09

2ND CUT MEAN DM% 18.9

2ND CUT PLOT AREA HARVESTED 0.00014

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

FUNG_RES	NONE	BENOMYL	Mean
	1.64	2.09	1.87

TOTAL OF 2 CUTS MEAN DM% 26.1

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07/R/GC/8

GARDEN CLOVER

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

The 154th year, red clover.

For previous years see `Details' 1967 and 1973, and Yield Books for 74-06/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:

			Rate	Unit
05-Apr-07	f	Magnesium Sulphate - Whole experiment	520.00	kg/ha
	f	Triple Superphosphate -Whole experiment	158.00	kg/ha
	f	Sulphate of Potash - Whole experiment	300.00	kg/ha
	f	Chalk – Whole experiment	1.25	t/ha
30-Apr-07	a	First Cut		
20-Jun-07	a	Second cut		
04-Oct-07	a	Third cut		

NOTE: Samples of clover taken from each cut for chemical analysis

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07/R/GC/8

FIRST CUT (30/4/07) DRY MATTER TONNES/HECTARE

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

FUNG_RES	NONE	BENOMYL
	3.84	4.23

Grand mean 4.03

1ST CUT MEAN DM% 16.6

SECOND CUT (20/06/07) DRY MATTER TONNES/HECTARE

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

FUNG_RES	NONE	BENOMYL
	2.48	2.51

Grand mean 2.49

2ND CUT MEAN DM% 17.2

THIRD CUT (04/10/07) DRY MATTER TONNES/HECTARE

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

FUNG_RES	NONE	BENOMYL
	1.85	1.76

Grand mean 1.80

3RD CUT MEAN DM% 19.5

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

FUNG_RES	NONE	BENOMYL
	8.16	8.49

Grand mean 8.33

TOTAL OF 3 CUTS MEAN DM% 17.8

PLOT AREA HARVESTED CUT 0.00014

https://doi.org/10.23637/ERADOC-1-217

07/W/RN/3

LEY/ARABLE

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

Sponsors: P. R. Poulton and A. J. Macdonald

The 70th year, leys, w. beans, w. wheat, w. rye, forage maize

For previous years see 'Details' 1967 & 1973 and Yield Books for 74-06/W/RN/3.

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

Whole plot dimensions: 8.53 x 40.7 m

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 1988 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

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

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07/W/RN/3

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 eight 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).

From 2007 plots previously in the 1st cycle of testing eight-year leys followed by two arable test crops (i.e. those plots which were changed to eight-year ley treatments in 1976 or 1977) will change to a three-year arable rotation followed by two arable test crops. Plots will not be "phased in" but will join the relevant point in the rotation.

LLN/AO (Previously 1st cycle, 8-year grass ley) R, BE, O, W, R
LLC/ABe (Previously 1st cycle, 8-yr grass/clover ley) R, O, BE, W, R.
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:

   LLN8
   LN 3
   LLC 8
   LC 3
   LLN/AO not yet in phase
   LLC/Abe not yet in phase
   AM
   ABe

1/ 2 plots:

2. **NSPLIT(FYM res)** Farmyard manure residues, last applied 1960s:
   Split N v single N dressing to wheat, tested 2001-5

   Nsplit (noFYM)
   Nsingle(FYM)

1/8 plots:

3. **N** Nitrogen fertilizer as split dressings in spring 2007

(kg N) as 34.5% N:		
0	0	
80	40 + 40	) To be applied late February/early
160	40 + 120	) March and mid-April
240	40 + 200	)

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

Whole plots:

1. **ROTATION** Rotations before first test crop (except LLN/AO, LLC/ABe):

LLN8
LN 3
LLC 8
LC 3
LLN/AO not yet in phase
LLC/ABe not yet in phase
AM
ABe

1/ 2 plots:

2. **NSPLIT(FYM res)** Farmyard manure residues, last applied 1960s:

Nsplit to wheat (no FYM)
Nsingle to wheat (FYM)

1/8 plots:

3. **N** Nitrogen fertilizer in spring 2007 (kg N) as 34.5%:

0
50
100
150

Treatments to leys:

FYM RES Farmyard manure residues:

NONE
FYM 38 t on each occasion, last applied 1960s.

NOTE: Corrective K dressings (kg K_2O) as muriate of potash, applied where necessary to first test crop w. wheat and long-term leys in the wheat block, applied 12 October 2006.

Continuous rotations	No FYM	FYM Res
Before wheat	Half plots	Half plots
ABe	350	260
AM	210	220

None to other plots.

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Experimental Diary:

Grass Ley and clover/grass ley 1st year (**ROTATION** LN1 and LC1)

			Rate	Unit
25-Sep-06		Azural	4.00	l/200 l/ha
12-Oct-06	f	Triple Superphosphate - Plots 3,4,13,14	213.00	kg/ha
17-Oct-06	f	Sulphate of Potash - Plots 3,4,13,14	140.00	kg/ha
	a	Plough new leys, wheat, rye, maize, bean plots ploughed, /NW		
29-Oct-06	a	Accord drilled		
	s	Grass plots; Promesse, Timothy: Laura Fescue, 50:50	30.00	kg/ha
	s	Grass / clover plots; Promesse Timothy: Laura Fescue: Chieftain White Clover, 44:44:12	30.00	kg/ha
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
11-Jun-07	a	Cut harvest strips, weighed and sampled grass plots		
	a	Mowed grass plots		
12-Jun-07	a	Turned hay grass plots		
19-Jun-07	a	Rowed up hay, grass plots		
	a	Baled grass plots		
22-Jun-07	a	Topped grass plots, to tidy		
25-Jun-07	f	Nitraprill grass plots	217.00	kg/ha
	f	Muriate of Potash grass plots	83.00	kg/ha
12-Nov-07	a	Cut harvest strips, weighed and sampled Ley plots, 2nd cut		
	a	Mowed Ley plots		
	a	Baled Ley plots		

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

			Rate	Unit
09-Nov-06	f	Nitram grass only plots	145.00	kg/ha
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
	f	Triple Superphosphate -2-8 year leys, plots 7, 8, 11, 12,23, 24, 25, 26, 29, 30, 31, 32, 55, 56, 57, 58, 59, 60, 61, 62	213.00	kg/ha
11-Jun-07	a	Cut harvest strips, weighed and sampled grass plots		
	a	Mowed grass plots		
12-Jun-07	a	Turned hay grass plots		
19-Jun-07	a	Rowed up hay, grass plots		
	a	Baled grass plots		
22-Jun-07	a	Topped grass plots, to tidy		
25-Jun-07	f	Nitraprill grass plots	217.00	kg/ha
	f	Muriate of Potash grass plots	83.00	kg/ha
28-Jun-07	p	Cleancrop Hoedown plots 57, 58, 61, 62	1/200	l/ha
17-Aug-07	p	Clinic Ace plots 57, 58, 61, 62	1/200	l/ha
12-Nov-07	a	Cut harvest strips, weighed and sampled Ley plots, 2nd cut		
	a	Mowed and Baled Ley plots		

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

			Rate	Unit
09-Nov-06	f	Nitram grass/clover only plots	72.00	kg/ha
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
	f	Muriate of Potash clover/grass leys, plots 3, 4, 7, 8, 11, 12, 13, 14, 23, 24, 25, 26, 29, 30, 31, 32, 55, 5657, 58, 59, 60, 61, 62	167.00	kg/ha
	f	Nitraprill - Grass leys, plots 3, 4, 7, 8, 23, 24, 29, 30, 55, 56, 59, 60	218.00	kg/ha
11-Jun-07	a	Cut harvest strips, weighed and sampled grass plots		
	a	Mowed grass plots		
12-Jun-07	a	Turned hay grass plots		
19-Jun-07	a	Rowed up hay, grass plots		
	a	Baled grass plots		
22-Jun-07	a	Topped grass plots, to tidy		
25-Jun-07	f	Nitraprill grass plots	217.00	kg/ha
	f	Muriate of Potash grass plots	83.00	kg/ha
28-Jun-07	p	Cleancrop Hoedown plots 55, 56, 59, 60	1/200	l/ha
17-Aug-07	p	Clinic Ace plots 55, 56, 59, 60	1/200	l/ha
12-Nov-07	a	Cut harvest strips, weighed and sampled Ley plots, 2nd cut		
	a	Mowed and Baled Ley plots		

Winter Beans (ROTATION)

			Rate	Unit
09-Nov-06	a	Broadcast bean plots		
	s	Wizard recleaned bean plots	28.00	seeds/m^2
	a	Plough bean plots	1.00	
	a	Power Harrowed bean plots	1.00	
10-Nov-06	p	Alpha Simazine 500 all bean plots	2.00	l/220 l/ha
	p	Carbetamex bean plots except plots 53, 54	2.00	l/220 l/ha
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
23-May-07	p	Folicur - bean plots	0.75	l/200 l/ha
	p	Hallmark with Zeon Technology - bean plots	75.00	ml/200 l/ha
19-Jun-07	p	Folicur bean plots	0.75	l/200 l/ha
05-Sep-07	a	Combine harvest, plots for yield wheat, Rye and Bean plots		
	a	Swath straw wheat, Rye and Bean plots		
	a	Combine harvest discards wheat, Rye and Bean plots		
08-Sep-07	a	Baled wheat, rye, oat and bean straw		

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W. Oats (ROTATION)

			Rate	Unit
29-Oct-06	a	Accord drilled		
	s	Gerald tr Baytan Secure - oat plots	350.00	seeds/m^2
19-Dec-06	p	Lexus Class oat plots	60.00	g/200 l/ha
	p	Hallmark with Zeon Technology - oat plots	50.00	ml/200 l/ha
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
25-Apr-07	f	Nitraprill - Oat arable treatment plots 21, 22, 51, 52	290.00	kg/ha
17-May-07	p	Amistar Opti - Oat plots	0.60	l/200 l/ha
	p	Flexity - Oat plots	0.60	l/200 l/ha
05-Sep-07	a	Combine harvest, plots for yield		
	a	Swath straw		
	a	Combine harvest discards		
08-Sep-07	a	Baled wheat, rye, oat and bean straw		

Forage maize (ROTATION)

			Rate	Unit
12-Oct-06	f	Triple Superphosphate - Plots 1, 2, 5, 6, 9, 10, 15-22, 27, 28, 33, 34-54, 63-80	127.00	kg/ha
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
27-Apr-07	a	Flexitined maize plots		
01-May-07	a	Nodet drilled		
	s	Hudson tr Mesurol	10.20	seeds/m^2
03-May-07	f	Nitraprill maize plots	290.00	kg/ha
01-Jun-07	p	Callisto - Maize	1.50	l/200 l/ha
18-Sep-07	a	Cut harvest strips, weighed and sampled		
25-Sep-07	a	Mowed maize plots		
	a	Baled maize plots		

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W. Wheat (1st TEST CROP)

			Rate	Unit
25-Sep-06		Azural	4.00	l/200 l/ha
12-Oct-06	f	Muriate of Potash - Plot 67, corrective K	7.54	kg/plot
	f	Muriate of potash - Plot 68, corrective K	10.15	kg/plot
	f	Muriate of potash - Plot 73, corrective K	6.38	kg/plot
	f	Muriate of Potash - Plot 74, corrective K	6.09	kg/plot
	f	Triple Superphosphate - Plots 1,2,5,6,9,10,15-22,27,28,33,34-54,63-80	127.00	kg/ha
29-Oct-06	a	Accord drilled		
29-Oct-06	s	Glasgow tr Redigo Twin – wheat plots	350.00	seeds/m^2
14-Mar-07	f	Nitraprill - wheat plot N1	232.00	kg/ha
	f	Nitraprill - wheat plot N2	464.00	kg/ha
	f	Nitraprill - wheat plot N3	696.00	kg/ha
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
27-Mar-07	p	Pacifica - Wheat plots	0.50	kg/200 l/ha
	p	Biopower, Wheat plots	1.00	l/200 l/ha
20-Apr-07	p	Splice - W. Wheat	1.00	l/200 l/ha
	p	Jupital - W. Wheat	1.00	l/200 l/ha
24-Apr-07	f	Nitraprill - Wheat plots N1, 652, 664, 673, 681, 694, 704, 711, 724, 731, 742, 753, 762, 772, 783, 792, 802	116.00	kg/ha
	f	Nitraprill - Wheat plots N2, 653, 663, 672, 682, 692, 702, 713, 721, 732, 744, 751, 763, 771, 782, 791, 803	348.00	kg/ha
	f	Nitraprill - Wheat plots N3, 651, 662, 674, 684, 693, 701, 714, 722, 733, 743, 754, 761, 774, 781, 793, 804	580.00	kg/ha
20-May-07	p	Opus - Wheat plots	0.75	l/200 l/ha
	p	Vivid - Wheat plots	0.40	l/200 l/ha
	p	Jupital - Wheat plots	1.00	l/200 l/ha
	p	Sedema Manganese Sulphate - Wheat plots	5.00	kg/200 l/ha
10-Jun-07	p	Amistar Opti - Wheat plots	1.00	l/200 l/ha
	p	Opus - Wheat plots	0.40	l/200 l/ha
05-Sep-07	a	Combine harvest, plots for yield.		
	a	Swath straw		
	a	Combine harvest discards		
08-Sep-07	a	Baled straw		

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W. Rye (2nd TEST CROP and ROTATION)

			Rate	Unit
25-Sep-06		Azural	4.00	l/200 l/ha
11-Oct-06	f	Chalk - Block 3	5.00	t/ha
12-Oct-06	f	Triple Superphosphate - Plots 1,2,5,6,9,10,15-22,27,28,33,34-54,63-80	127.00	kg/ha
29-Oct-06	a	Power harrowed		
01-Nov-06	a	Accord drilled		
	s	Hacada tr. Baytan, Rye plots 9,10, 15, 16	350.00	seeds/m^2
	a	Rolled Block 1		
16-Mar-07	f	Sulphate of Potash - whole experiment excluding plots 3, 4, 13, & 14	140.00	kg/ha
20-Apr-07	p	Quantum 75 DF - rye plots	30.00	g/200 l/ha
	p	BASF 3C Chlormequat 720 - rye plots	2.25	l/200 l/ha
23-Apr-07	f	Nitraprill - Rye plots N1, 334, 341, 354, 364, 374, 381, 393, 404, 411, 423, 431, 443, 454, 463, 474, 482	145.00	kg/ha
	f	Nitraprill - Rye plots N2, 333, 344, 352, 362, 371, 382, 391, 402, 413, 421, 433, 442, 451, 464, 473, 481	290.00	kg/ha
	f	Nitraprill - Rye plots N3, 332, 342, 353, 363, 372, 383, 392, 403, 412, 424, 434, 441, 452, 461, 472, 483	435.00	kg/ha
25-Apr-07	f	Nitraprill - Rye arable treatment plots 01, 02, 05, 06, 09, 10, 15, 16	290.00	kg/ha
10-Jun-07	p	Amistar Opti - Rye plots	1.00	l/200 l/ha
05-Sep-07	a	Combine harvest, plots for yield		
	a	Swath straw		
	a	Combine harvest discards		
08-Sep-07	a	Baled straw		

Note: Samples of grain, forage maize and herbage taken for chemical analysis.

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LEYS

1ST CUT (11/6/07) DRY MATTER TONNES/HECTARES

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

FYM_RES	NONE	FYM	Mean
LEY			
LC1	2.07	1.63	1.85
LC2	2.48	3.28	2.88
LC3	5.94	5.75	5.84
LN1	2.98	3.02	3.00
LN2	5.35	6.30	5.83
LN3	7.63	6.79	7.21
LLC6	5.66	3.41	4.54
LLC7	4.39	4.01	4.20
LLC8	3.29	3.52	3.40
LLN6	5.89	6.25	6.07
LLN7	5.08	5.33	5.21
LLN8	7.21	7.62	7.42
Mean	4.83	4.74	4.79

1ST CUT MEAN DM% 21.9

2ND CUT (12/11/07) DRY MATTER TONNES/HECTARE

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

FYM_RES	NONE	FYM	Mean
LEY			
LC1	1.98	1.82	1.90
LC2	2.28	3.06	2.67
LC3	-	-	-
LN1	1.68	2.28	1.98
LN2	2.65	2.51	2.58
LN3	-	-	-
LLC6	2.63	1.97	2.30
LLC7	2.55	2.55	2.55
LLC8	-	-	-
LLN6	3.32	3.01	3.17
LLN7	2.49	4.04	3.26
LLN8	-	-	-
Mean	2.45	2.66	2.56

2ND CUT MEAN DM% 31.6

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TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

FYM_RES LEY	NONE	FYM	Mean
LC1	4.05	3.45	3.75
LC2	4.76	6.35	5.55
LC3	5.94	5.75	5.84
LN1	4.66	5.30	4.98
LN2	8.01	8.80	8.41
LN3	7.63	6.79	7.21
LLC6	8.30	5.38	6.84
LLC7	6.94	6.56	6.75
LLC8	3.29	3.52	3.40
LLN6	9.21	9.26	9.24
LLN7	7.57	9.37	8.47
LLN8	7.21	7.62	7.42
Mean	6.46	6.51	6.49

TOTAL OF 2 CUTS MEAN DM% 25.3

NOTE: No second cut was taken for LC3, LN3, LLC8 and LLN8

PLOT AREA HARVEST 0.00200

ARABLE TREATMENT CROPS

W. RYE

GRAIN TONNES/HECTARES

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

FYMRES ROTATION	NONE	FYM	Mean
ABe	4.16	3.49	3.83
AM	3.52	2.96	3.24
LLn/AO	4.39	4.89	4.64
LLc/ABe	5.21	4.03	4.62
Mean	4.32	3.84	

GRAIN MEAN DM% 83.8

PLOT AREA HARVESTED 0.00413

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MAIZE

WHOLE CROP TONNES/HECTARES

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

FYMRES / **ROTATION**	NONE	FYM	Mean
AM	8.52	6.89	7.70
ABe	5.58	7.03	6.31
Mean	7.05	6.96	

MEAN DM% 26.1

PLOT AREA HARVESTED 0.00108

BEANS

GRAIN TONNES/HECTARES

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

FYMRES / **ROTATION**	NONE	FYM
AM	1.93	2.24
LLn/AO	2.85	3.16
LLc/ABe	3.19	2.98
ABe	3.35	3.82

GRAIN MEAN DM% 84.2

PLOT AREA HARVESTED 0.00413

W. OATS

GRAIN TONNES/HECTARES

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

Grand mean 5.07

FYMRES / **ROTATION**	NONE	FYM
LLC/ABe	4.84	5.29
LLN/AO	4.96	5.20

GRAIN MEAN DM% 89.5

PLOT AREA HARVESTED 0.00413

https://doi.org/10.23637/ERADOC-1-217

07/W/RN/3

W. WHEAT (1st TEST CROP)

GRAIN TONNES/HECTARES

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

FYMRES	None	FYM	Mean
ROTATION			
LLN	5.14	5.60	5.37
LN	3.92	4.46	4.19
LLc/ABe	4.91	5.68	5.30
LC	4.78	4.91	4.84
AM	5.17	5.24	5.20
ABe	4.04	4.80	4.42
LLn/AO	5.59	4.97	5.28
LLc	5.28	4.89	5.09
Mean	4.85	5.07	4.96

N	0	80	160	240	Mean
ROTATION					
LLN	3.94	7.28	5.09	5.17	5.37
LN	3.25	5.76	5.21	2.52	4.19
LLc/ABe	3.77	6.76	6.11	4.55	5.30
LC	3.80	5.75	5.32	4.50	4.84
AM	1.89	5.93	7.24	5.76	5.20
ABe	2.40	5.87	5.83	3.58	4.42
LLn/AO	4.91	6.29	5.94	3.99	5.28
LLc	4.19	6.44	5.10	4.62	5.09
Mean	3.52	6.26	5.73	4.34	4.96

N	0	80	160	240	Mean
FYMRES					
none	3.42	6.15	5.54	4.30	4.85
FYM	3.62	6.36	5.92	4.37	5.07
Mean	3.52	6.26	5.73	4.34	4.96

N		0	80	160	240
ROTATION	FYMRES				
LLN	none	3.77	7.30	4.62	4.86
	FYM	4.10	7.27	5.56	5.49
LN	none	3.21	5.33	4.86	2.26
	FYM	3.30	6.18	5.56	2.79
LLc/ABe	none	3.59	6.27	5.77	4.02
	FYM	3.95	7.24	6.46	5.08
LC	none	3.17	6.54	4.73	4.69
	FYM	4.44	4.96	5.92	4.30
AM	none	1.47	5.88	7.13	6.22
	FYM	2.31	5.98	7.35	5.31
ABe	none	2.74	5.45	5.12	2.85
	FYM	2.07	6.28	6.54	4.30
LLn/AO	none	5.33	6.06	6.23	4.76
	FYM	4.50	6.53	5.66	3.21
LLc	none	4.05	6.40	5.90	4.77
	FYM	4.33	6.48	4.31	4.46

GRAIN MEAN DM% 85.80

PLOT AREA HARVESTED 0.00192

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07/W/RN/3

W. RYE (2nd TEST CROP)

GRAIN TONNES/HECTARES

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

FYMRES	none	FYM	Mean
ROTATION			
LLn	4.46	4.80	4.63
Ln	4.19	4.37	4.28
LLc	4.43	4.70	4.57
Lc	4.22	4.27	4.25
AM	3.25	3.41	3.33
ABe	3.45	3.73	3.59
LLn/AO	4.87	5.02	4.94
LLc/ABe	5.00	5.10	5.05
Mean	4.23	4.42	4.33

N	0	50	100	150
ROTATION				
LLn	3.34	4.45	5.35	5.36
Ln	2.83	4.49	4.97	4.82
LLc	3.31	4.41	5.44	5.10
Lc	2.61	3.93	5.08	5.36
AM	1.92	2.94	4.14	4.32
ABe	2.01	3.06	4.59	4.68
LLn/AO	4.07	4.51	5.99	5.20
LLc/ABe	4.07	5.40	5.46	5.26
Mean	3.02	4.15	5.13	5.01

N	0	50	100	150
FYMRES				
none	2.98	4.02	5.10	4.82
FYM	3.06	4.28	5.15	5.21

N		0	50	100	150
ROTATION	**FYMRES**				
LLn	none	3.24	4.29	5.20	5.09
	FYM	3.45	4.62	5.50	5.63
Ln	none	2.93	4.61	4.83	4.39
	FYM	2.74	4.38	5.10	5.25
LLc	none	3.09	4.41	5.36	4.87
	FYM	3.53	4.41	5.53	5.33
Lc	none	2.55	4.06	4.91	5.36
	FYM	2.68	3.81	5.24	5.36
AM	none	1.96	2.62	4.10	4.32
	FYM	1.88	3.27	4.19	4.33
ABe	none	1.81	2.75	4.78	4.44
	FYM	2.21	3.36	4.41	4.93
LLn/AO	none	4.28	3.88	6.20	5.10
	FYM	3.86	5.13	5.78	5.29
LLc/ABe	none	3.99	5.54	5.47	4.99
	FYM	4.14	5.26	5.46	5.54

GRAIN MEAN DM% 84.8

PLOT AREA HARVESTED 0.00192

https://doi.org/10.23637/ERADOC-1-217

07/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.

Sponsors: P. R. Poulton and A. J. Macdonald

The 43rd year, forage maize

For previous years see 'Details' 1973 and Yield Books for 74-06/W/RN/12.

Design: 4 blocks of 8 plots

Whole plot dimensions: 8.0 x 29.5 (8.0 x 26.5 on Block III).

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 on 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 2001 plots were split into half-plots to test two rates of N.
For 2003 the experiment was modified to test further inputs of organic matter. An arable rotation (w. rye, s. barley, w. beans, w. wheat, forage maize) was started on seven plots within each block; the eighth was sown to a grass/clover ley.

Whole plots

1. **Treatment** (Not necessarily applied each year):

1966-1971/2	1979/82-1986/7	Since 2003
Fd	Fd	F
Ln	Lc6	F
St	St	St
Gm	Lc8	CC
Pt	Lc8	Co
Fs	Fs	Dg10
Dg	Dg	Dg25
Lc	Lc6	Lc

F: no organic amendment. St: chopped straw at 7.5t/ha. CC: cover crop prior to spring sown crops. Co: compost at 40t/ha. Dg10: FYM at 10t/ha. Dg25: FYM at 25t/ha. Dg: FYM at 50t/ha. Fd: fertilizers equivalent to FYM. Fs: fertilizers equivalent to straw (+P). Lc/Lc6/Lc8: grass/clover leys. Ln: grass ley + N. Gm: green manure. Pt: peat.

Since 2003, all treatments, except Dg25, have also received PKS fertilizers:
20 kg P/ha, 83 kg K/ha, 36 kg S/ha

https://doi.org/10.23637/ERADOC-1-217 *pp 50*

07/W/RN/12

In addition in 2003 F and CC treatments received 120 kg N/ha, St received 90 kg N/ha. Dg10 received 60 kg N/ha. No N was applied to Dg25, Co or Lc treatments.

Nitrogen
In 2007 all plots, except Lc (permanent grass/clover), split into 6 to test rates of N. For crops receiving nitrogen rates rotate as follows:
N0 > N1 > N2 > N3 > N4 > N5 > N0 etc.
For 2007 maize crop nitrogen rates (kg N/ha) were:
0, 50, 100, 150, 200, 250 as nitro-chalk (27% N), split 50 kg N to the seedbed (except NO) and the remainder post-emergence.

Experimental Diary:

			Rate	Unit
25-Sep-06	p	Azural	4.00	l/200 l/ha
29-Sep-06	a	Direct Drill		
	s	Rivona Mustard, CC plots	350.00	seeds/m^2
27-Mar-07	p	Clinic Ace maize plots	4.00	l/200 l/ha
12-Apr-07	f	DG 10 plots, F.Y.M.	10.00	t/ha
	f	DG 25 plots, F.Y.M.	25.00	t/ha
	f	CO plots, Compost	40.00	t/ha
13-Apr-07	f	ST plots, Wheat straw	7.50	t/ha
	a	Topped ST plots, to chop straw	2.00	
16-Apr-07	a	Plough / NW		
30-Apr-07	f	Sulphate of Potash all plots except Dg25	200.00	kg/ha
	f	Triple Superphosphate all plots except Dg25	97.50	kg/ha
01-May-07	a	Nodet Drilled		
	s	Hudson tr Mesurol	10.20	seeds/m^2
23-May-07	f	Nitraprill - N plots, maize	145.00	kg/ha
01-Jun-07	p	Callisto - maize	1.50	l/200 l/ha
11-Jun-07	a	1st cut grass/clover		
12-Jun-07	a	Turned hay - grass plots		
19-Jun-07	a	Rowed up hay – grass/clover plots		
	a	Baled grass plots		
22-Jun-07	a	Topped grass/clover plots, to tidy		
26-Jun-07	f	Nitraprill - Post emergent N, Maize, N2 plots, completed 26-Jun-07	145.00	kg/ha
	f	Nitraprill - Post emergent N, Maize, N3 plots, completed 26-Jun-07	290.00	kg/ha
	f	Nitraprill - Post emergent N, Maize, N4 plots, completed 26-Jun-07	345.00	kg/ha
	f	Nitraprill - Post emergent N, Maize, N5 plots, completed 26-Jun-07	580.00	kg/ha
25-Jul-07	p	Alpha Bromotril P - maize plots	2.50	l/200 l/ha
19-Sep-07	a	Cut harvest strips, weighed and sampled		
25-Sep-07	a	Mowed maize plots		
	a	Baled maize plots		
27-Sep-07	a	Rowed up and baled remaining maize tops		
12-Nov-07	a	2nd cut grass/clover, harvest strips, weighed and sampled		
	a	Mowed and baled		

NOTE: Samples of maize and grass were taken for chemical analysis.

https://doi.org/10.23637/ERADOC-1-217

07/W/RN/12

FORAGE MAIZE

WHOLE CROP (100% DM) TONNES/HECTARE

***** Table of means *****

Nitrogen / **Treatment**	0	50	100	150	200	250	Mean
F(Fd)	2.74	5.47	7.53	6.61	7.01	7.12	6.08
F(Ln,Lc6)	3.81	6.57	7.53	7.81	8.41	8.37	7.08
St(St)	4.20	6.53	7.53	8.86	9.11	8.95	7.53
CC(Gm,Lc8)	3.80	7.27	8.64	7.88	9.30	8.09	7.50
Co(Pt,Lc8)	5.36	8.45	7.70	9.15	10.29	10.76	8.62
Dg10(Fs)	4.32	6.86	8.06	8.61	8.42	8.35	7.44
Dg25(Dg)	5.60	9.34	10.64	11.28	11.00	11.24	9.85
Mean	4.26	7.21	8.23	8.60	9.08	8.98	7.73

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

Table	**Treatment**	**Nitrogen**	**Treatment** **Nitrogen**
rep.	24	28	4
s.e.d.	0.765	0.379	1.193
d.f.	18	105	78.92

Except when comparing means with the same level(s) of
Treatment 1.004
d.f. 105

MEAN DM% 25.2

GRASS/CLOVER

DRY MATTER TONNES/HECTARE

***** Table of means *****

Year	1st Cut	2nd Cut	Total
2003	-	-	-
2004	1.82	-	1.82
2005	1.86	0.13	1.99
2006	4.07	-	4.07
2007	3.12	1.36	4.48

Note: See previous Yield Books (2004-06) for cutting dates

https://doi.org/10.23637/ERADOC-1-217

07/R/CS/326 and 07/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 21st year, w. wheat

For previous years see Yield Books for 87-06/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). 0.004 ha
3.0 x 14.5 (W).

Treatments:

STRAW Amounts of straw incorporated into the seedbed (t/ha), cumulative to previous annual dressings:

		R	W
NONE	None	-	-
NORMAL	Normal	5.47	3.54
2 NORMAL	Twice normal	10.93	7.08
4 NORMAL	Four times normal	22.00	14.16

Experimental Diary:

Great Knott III (R)

			Rate	Unit
16-Aug-06	a	Baled remove straw		
06-Sep-06	p	Azural	3.00	l/200 l/ha
12-Oct-06	a	Load straw normal	22.14	kg/plot
	a	Load Straw - 2 x Normal	44.28	kg/plot
	a	Load Straw - 4 x Normal	89.12	kg/plot
19-Oct-06	a	Plough/ E		
29-Oct-06	a	Combination Drilled		
	s	Hereward tr Redigo Twin + Deter	350.00	seeds/m^2
03-Nov-06	p	Ice	4.00	l/200 l/ha
07-Nov-06	p	Decoy Wetex	5.00	kg/ha
04-Dec-06	p	Entice	7.00	kg/ha
16-Mar-07	f	Double Top	148.00	kg/ha
05-Apr-07	p	Hallmark with Zeon Technology	50.00	ml/200 l/ha
11-Apr-07	p	Pacifica	0.50	kg/200 l/ha
	p	Biopower	1.00	l/200 l/ha
13-Apr-07	p	Clean Crop Wanderer	1.00	l/200 l/ha
	p	Splice	1.00	l/200 l/ha
26-Apr-07	f	Nitraprill	435.00	kg/ha
22-May-07	p	Amistar Opti	1.25	l/200 l/ha
	p	Landgold Epoxiconazole	0.60	l/200 l/ha
20-Jun-07	a	Mow / Rotavate paths		

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03-Sep-07	a	Combine harvest, plots for yield
	a	Swath straw
	a	Sample, bale and weigh straw

Experimental Diary:

Far Field I (W)

			Rate	Unit
27-Aug-06	a	Baled, remove straw		
26-Sep-06	p	Azural	4.00	l/200 l/ha
30-Sep-06	f	Muriate of Potash	200.00	kg/ha
01-Oct-06	f	Triple Superphosphate	300.00	kg/ha
18-Oct-06	a	Load Straw normal	15.40	kg/plot
	a	Load straw Normal x 2	30.80	kg/plot
	a	Load straw Normal x 4	61.60	kg/plot
19-Oct-06	a	Topped to chop straw		
20-Oct-06	a	Plough/NW		
29-Oct-06	a	Power Harrowed		
	a	Accord Drilled		
	s	Hereward tr Redigo Twin +Deter	375.00	seeds/m^2
19-Dec-06	p	Hallmark with Zeon Technology	50.00	ml/200 l/ha
15-Mar-07	f	Double Top	148.00	kg/ha
27-Mar-07	p	Pacifica	0.50	kg/200 l/ha
	p	Biopower	1.00	l/200 l/ha
20-Apr-07	p	Splice	1.00	l/200 l/ha
	p	Jupital	1.00	l/200 l/ha
02-May-07	f	Double Top	518.00	kg/ha
20-May-07	p	Opus	0.75	l/200 l/ha
	p	Vivid	0.40	l/200 l/ha
	p	Bravo 500	1.00	l/200 l/ha
	p	Sedema Manganese Sulphate	5.00	kg/200 l/ha
05-Sep-07	a	Combine harvest, plots for yield		
	a	Swath straw		
07-Sep-07	a	Weighed and sampled straw		

NOTE: Grain and straw samples were taken for analysis.

https://doi.org/10.23637/ERADOC-1-217

07/R/CS/326

GRAIN TONNES/HECTARE

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

TREATMENT	
-	6.44
1	6.39
2	6.87
4	6.86
Mean	6.64

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

Treatment
0.183

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

Stratum	d.f.	s.e.	cv%
Blocks.Plots	9	0.258	3.9

GRAIN MEAN DM% 84.4

STRAW TONNES/HECTARE

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

TREATMENT	
-	2.72
1	2.82
2	3.15
4	3.16
Mean	2.96

STRAW MEAN DM% 90.4

PLOT AREA HARVESTED 0.00284

https://doi.org/10.23637/ERADOC-1-217 *pp 55*

07/W/CS/326

GRAIN TONNES/HECTARE

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

TREATMENT

-	3.63
1	4.33
2	3.90
4	3.62
Mean	3.87

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

TREATMENT

0.390

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

Stratum	d.f.	s.e.	cv%
Blocks.Plots	6	0.478	12.3

Grain mean dm% 85.7

STRAW TONNES/HECTARE

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

TREATMENT

-	3.10
1	2.80
2	2.73
4	2.94
Mean	2.89

Straw mean dm% 80.2

Plot area harvested 0.00299

https://doi.org/10.23637/ERADOC-1-217

07/R/CS/477

CONTINUOUS MAIZE

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

Sponsors: P. R. Poulton and A. J. Macdonald

The 11th year, forage maize and s. barley

For previous years see Yield Books for 97-06/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
(M)B	S. barley after five years maize, stubble incorporated
MT	Maize, stubble plus 10 t maize tops incorporated
(B)M	Maize, after three years of s. barley with straw removed
BT	Continuous spring barley, straw removed plus 10 t maize tops incorporated
B	Continuous spring barley, straw removed

Experimental diary:

				Rate	Unit
03-Oct-06	f	BT,MT	Maize tops - Plots 3, 6, 9, 12, 16, 18	10.00	t/ha
12-Oct-06	f		Triple Superphosphate	171.00	kg/ha
	f		Muriate of Potash	181.00	kg/ha
19-Oct-06	a		Plough/ N		
12-Mar-07	a		Springtined		
04-Apr-07	a	(M)B, BT,B	Combination Drilled		
	s		Optic tr Raxil Pro	350.00	seeds/m^2
	a	(M)B, BT,B	Rolled whole experiment		
25-Apr-07	f		Double Top	356.00	kg/ha
01-May-07	a	(B)M, MT, M	Flexitined maize plots		
02-May-07	a	(B)M, MT, M	Power harrowed maize plots		
	a	(B)M, MT, M	Nodet drilled maize plots		
	s		Hudson tr Mesurol	10.20	seeds/m^2
	a	(B)M, MT, M	Rolled maize plots		
17-May-07	p		Fandango	1.00	l/200 l/ha
	p		Flexity	0.30	l/200 l/ha
	p		Alpha Briotril Plus 19/19	1.50	l/200 l/ha
	p		Optica	2.00	l/200 l/ha
02-Jun-07	p	(M)B, BT,B	Amistar Opti - barley	1.00	l/200 l/ha
	p		Corbel - barley	0.50	l/200 l/ha
14-Jun-07	p	(B)M, MT, M	Samson - maize plots	1.50	l/200 l/ha
19-Jun-07	p	(B)M, MT, M	Callisto - maize plots	0.75	l/200 l/ha

https://doi.org/10.23637/ERADOC-1-217

07/R/CS/477

20-Jun-07	a		Mow / Rotavate paths
03-Sep-07	a	(M)B, BT, B	Combine harvest discards
	a		Swath straw
04-Sep-07	a	(M)B, BT, B	Combine harvest, plots for yield
	a		Swath straw
18-Sep-07	a	M, MT, (B) M	Cut harvest strips, weighed and sampled maize
25-Sep-07	a	M, MT, (B) M	Cut maize discards

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

MAIZE

WHOLE CROP (AT 100% DRY MATTER) TONNES/HECTARE

Treatment	
M	6.90
(B)M	8.30
MT	7.20
Mean	7.46

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

Treatment
1.342

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

Stratum	d.f.	s.e.	cv%
Blocks.Plots	4	1.643	22.0

Plot area harvested 0.00108

https://doi.org/10.23637/ERADOC-1-217

07/R/CS/477

SPRING BARLEY

GRAIN TONNES/HECTARE

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

Treatment	
(M)B	4.71
BT	5.48
B	5.33
Mean	5.17

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

Treatment
0.242

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

Stratum	d.f.	s.e.	cv%
Blocks.Plots	4	0.297	5.7

Grain mean dm% 83.1

Plot area harvested 0.00504

https://doi.org/10.23637/ERADOC-1-217 *pp 59*

07/W/CS/478

CONTINUOUS MAIZE

Object: To monitor the fate of organic carbon in the soil organic matter – Woburn, Stackyard AI

Sponsors: P. R. Poulton and A. J. Macdonald

The 11th year, forage maize and s. barley

For previous years see Yield Books for 97-06/W/CS/478

Design: 3 randomised blocks of 6 plots.

Plot dimensions: 9.0 x 25.00

Treatments:-

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

Experimental diary:

				Rate	Unit
16-Oct-06	a	BT, MT	Applied maize tops to plots 2, 4, 12, 13, 16, 17	10.00	t/ha
07-Nov-06	a		Topped		
	f		Triple Superphosphate	171.00	kg/ha
	f		Muriate of Potash	181.00	kg/ha
14-Nov-06	a		Plough/ NE		
03-Apr-07	a		Flexitined		
05-Apr-07	a		Power Harrowed		
	a		Combination Drilled		
	s		Optic tr Raxil Pro	350.00	seeds/m^2
	a		Rolled		
01-May-07	a		Nodet Drilled		
	s		Hudson tr Mesurol	10.20	seeds/m^2
02-May-07	f		Double Top	355.00	kg/ha
20-May-07	p		Fandango	1.00	l/200 l/ha
	p		Flexity	0.30	l/200 l/ha
	p		Alpha Briotril 24/16	1.50	l/200 l/ha
	p		Duplosan KV	2.00	l/200 l/ha
01-Jun-07	p	(B)M, MT, M	Callisto - maize	1.50	l/200 l/ha
19-Jun-07	p		Amistar Opti - barley	1.00	l/200 l/ha
	p		Standon Fenpropimorph 750 - barley	0.50	l/200 l/ha

https://doi.org/10.23637/ERADOC-1-217

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05-Sep-07	a	(M)B, BT, B	Combine harvest, plots for yield
	a		Swath straw
08-Sep-07	a	(B)M, MT, M	Baled
18-Sep-07	a		Cut harvest strips, weighed and sampled
25-Sep-07	a	(B)M, MT, M	Mowed and baled maize plots

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

MAIZE

WHOLE CROP (100% DM) TONNES/HECTARE

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

Treatment	
M	6.06
MT	8.61
(B)M	7.12
Mean	7.26

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

Treatment
0.903

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

TPlDm Total plant dry matter tonnes/hectare

Stratum	d.f.	s.e.	cv%
Blocks.Plots	4	1.106	15.2

MEAN DM% 27.4

PLOT AREA HARVESTED 0.00108

https://doi.org/10.23637/ERADOC-1-217

07/W/CS/478

SPRING BARLEY

GRAIN TONNES/HECTARE

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

Treatment	
(M)B	4.51
BT	5.59
B	4.82
Mean	4.97

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

Treatment
0.079

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

Stratum	d.f.	s.e.	cv%
Blocks.Plots	4	0.097	2.0

GRAIN MEAN DM% 84.7

PLOT AREA HARVESTED 0.00525

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Rothamsted Experimental Station

The Weather : Monthly Summary : 2007

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

	Sunshine		Mean temperatures °C								Rain			Drainage	Wind
			Maximum		Minimum		Dew	Ground	In ground under grass		Total mm		Rain	20 inch	***
	Hours	( )		( )		( )	point	frosts *	30 cm	100 cm	12cm(5") turf wall		days **	mm	km/hr
January	71.4	(+16.3)	9.47	(+3.13)	4.04	(+3.18)	5.06	9	6.87	8.50	91.6	(+21.9)	26	28.8	15.0
February	89.2	(+18.5)	8.62	(+1.91)	2.87	(+2.13)	3.76	11	5.87	7.32	97.4	(+48.6)	23	43.9	9.8
March	177.1	(+70.0)	11.09	(+1.60)	2.93	(+0.60)	3.32	15	7.31	7.99	57.6	(+3.7)	20	19.0	12.0
April	239.2	(+92.4)	16.63	(+4.69)	5.74	(+2.12)	6.65	9	10.42	9.44	2.8	(-50.7)	9	0.0	9.2
May	160.1	(-34.8)	16.02	(+0.27)	8.10	(+1.78)	8.64	2	13.00	11.81	135.8	(+86.1)	21	32.2	9.7
June	151.5	(-38.8)	19.18	(+0.58)	11.28	(+2.07)	11.60	0	15.97	13.87	72.4	(+12.2)	18	7.9	8.2
July	174.8	(-28.5)	19.67	(-1.75)	11.95	(+0.59)	13.20	0	16.80	15.14	86.8	(+42.2)	22	7.8	9.2
August	193.5	(-3.3)	20.00	(-1.43)	11.15	(-0.2)	12.50	0	16.83	15.70	64.4	(+10.7)	16	0.3	8.4
September	153.6	(+11.3)	18.04	(+0.05)	10.05	(+0.61)	10.40	0	15.61	15.39	29.2	(-31.8)	14	0.0	8.4
October	99.6	(-12.5)	14.05	(+0.31)	7.13	(+0.48)	8.92	0	12.52	13.63	57.1	(-17.6)	18	22.7	6.4
November	92.3	(+22.2)	10.07	(+1.32)	3.46	(+0.13)	4.34	12	8.73	10.97	80.0	(+13.8)	21	48.9	9.4
December	76.9	(+28.8)	7.60	(+0.41)	1.96	(+0.04)	2.04	12	6.05	8.47	67.1	(-3.0)	18	45.1	11.1
Year	**1679.2**	**(+141.5)**	**14.20**	**(+0.87)**	**6.72**	**(+1.13)**		**70**			**842.2**	**(+138.6)**	**226**	**256.5**	

* Number of nights grass minimum was below 0.0 °C

** Number of days rain was 0.2 mm or more

*** At 2 metres above ground

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Woburn Experimental Farm

The Weather : Monthly Summary : 2007

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

	Sunshine		Mean temperatures °C (See Note about missing data for June and July)								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	67.5	(+19.00)	9.70	(+2.95)	4.20	(+3.20)	4.2	6	6.8	8.9	63.6	(+8.30)	23	14.1
February	87.4	(+23.40)	9.00	(+1.87)	2.40	(+1.59)	3.6	11	5.5	7.5	63.0	(+22.40)	23	7.4
March	167.9	(-101.30)	11.40	(-9.88)	2.40	(-2.39)	3.9	13	7.0	7.9	35.4	(-14.20)	19	9.2
April	218.8	(+83.00)	16.90	(+4.61)	4.80	(+1.37)	7.5	4	10.0	8.8	2.0	(-50.70)	5	5.3
May	165.0	(-18.10)	16.50	(+0.46)	7.70	(+1.68)	9.0	0	12.3	10.6	120.6	(+67.90)	18	7.7
June	147.3	(-29.56)	20.10	(+1.14)	10.90	(+1.93)	12.5	0	14.7	12.0	46.2	(-12.60)	23	3.1
July	176.0	(-17.63)	20.90	(-0.84)	11.40	(+0.26)	11.6	0	16.8	14.3	94.6	(+49.00)	15	4.4
August	180.3	(-4.30)	20.70	(-0.91)	10.60	(-0.47)	11.8	0	17.0	15.2	49.2	(-5.30)	15	5.7
September	145.5	(+14.30)	18.20	(-0.03)	9.40	(+0.10)	11.8	0	15.4	15.0	21.2	(-36.90)	11	6.8
October	97.0	(-6.80)	14.60	(+0.56)	6.60	(+0.07)	9.2	6	12.2	13.4	78.4	(+14.00)	16	4.1
November	78.9	(+15.50)	10.30	(+0.71)	3.10	(-0.28)	4.6	9	8.5	11.1	53.1	(-4.10)	21	7.2
December	54.1	(+12.50)	7.70	(+0.23)	1.50	(-0.39)	2.3	12	6.1	8.8	52.5	(-7.00)	18	9.6
Year	**1585.7**	**(+157.91)**	**14.7**	**(+1.02)**	**6.3**	**(+0.75)**	**92.1**	**61**	**11.0**	**11.1**	**679.8**	**(+30.80)**	**207**	**84.6**

* Number of nights grass minimum was below 0.0 °C

** Number of days rain was 0.2 mm or more

*** At 2 metres above ground

Note about missing data for June: Due to a fault days 27 to 30 have missing values for temperature and dewpoint and so the average for these has been calculated over 26 days instead of 30.

Note about missing data for July: Due to a fault days 1 to 5 have missing values for temperature and dewpoint and so the average for these has been calculated over 26 days instead of 31, except for average max temp, which due to the throw back was calculated over 27 days.

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