This work is licensed under a Creative Commons Attribution 4.0 International License.

Thank you for using eradoc, a platform to publish electronic copies of the Rothamsted Documents. Your requested document has been scanned from original documents. If you find this document is not readible, or you suspect there are some problems, please let us know and we will correct that.

Yields of the Field Experiments 2008

Full Table of Content

Results of the Classical and Other Long-term Experiments 2008

Rothamsted Research

Rothamsted Research (2009) *Results of the Classical and Other Long-term Experiments 2008 ;* Yields Of The Field Experiments 2008, pp 0 - 60 **- DOI: https://doi.org/10.23637/ERADOC-1-218**

This work is licensed under a Creative Commons Attribution 4.0 International License.

ROTHAMSTED RESEARCH

Results of the Classical and other Long-term Experiments

2008

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

List of Experiments in the 2008 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
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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

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

Chalk

Compost

Double Top	27% nitrogen and 30% SO_3
FYM	Farmyard manure (from bullocks)
Kieserite	$MgSO_4H_2O$ 17.7% magnesium and 23.3% sulphur
Maize Tops	
Manganese sulphate	$Mn_2 (SO_4)_3$ 27% manganese and 24% sulphur
Magnesium Sulphate	$MgSO_4$ H_2O 17.7%
Muriate of potash	60% K_2O
Nitraprill	34.5% N
Nitrate of soda	$NaNO_3$ 16% nitrogen and 27% sodium
Nitro-Chalk	Calcium Ammonium Nitrate 27% N

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

Silicate of soda	Na_2SiO_3 37% sodium and 23% silica
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 = fertilizer 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.

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

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

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
Acanto	f	250 g/l picoxystrobin
Acanto Prima	f	300 g/l & 80 g/l cyprodinil and Picoxystrobin
Activator 90	ad	750 g/l alkylphenyl hydroxypolyoxyethylene
Ally Max SX	h	143 g/l & 143 g/l metsulfuron-methyl + tribenuron-methyl
Alpha Trifluralin 48 EC	h	480 g/l trifluralin
Amistar	f	250 g/l azoxystrobin
Amistar Opti	f	100 g/l & 500 g/l azoxystrobin and chlorothalonil
Arelon 500	h	500 g/l isoproturon
Avadex Excel 15G	h	15% w/w tri-allate
Azural	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
Cleancrop Hoedown	h	360 g/l glyphosate
Clinic Ace	h	360 g/l glyphosate
Decoy Wetex	m	20 g/kg methiocarb
Deuce	f	233 + 67 g/l boscalid + epoxiconazole
Dow Agrosciences Glyphosate 360	h	360 g/l glyphosate
Duplosan KV	h	600 g/l mecoprop-P
Flexity	f	300 g/l metrafenone
Folicur	f	250 g/l tebuconazole
Glyphogan	h	360 g/l glyphosate
Glyphosate 360	h	360 g/l glyphosate
Hallmark with Zeon Technology	i	100 g/l lambda cyhalothrin
Harmony M SX	h	40 g/kg + 400 g/kg metsulfuron-methyl + thifensufuron-methyl
Huron	m	30 g/kg methiocarb
Icon	f	250 g/l tebuconazole
Lexus Class	h	33.3 + 16.7 % carfentrazone-ethyl + Flupyrsulfuron-methyl
Liberator	h	400 + 100 g/l diflufenican + flufenacet
Opus	f	125 g/l epoxyconazole
Opus Team	f	84 g/l + 250 g/l epoxiconzole and fenpropimorph
Pacifica	h	10 g/kg + 30 g/kg idosulfuron-methyl-sodium + mesosulfuron-methyl
Quantum SX	h	500 g/l tribenuron-methyl
Quaver Flo	h	400 g/l propyzamide
Samson	h	40 g/l nicosulfuron
Starane 2	h	200 g/l fluroxypyr
Stomp 400 SC	h	400 g/l pendimethalin
Unix	f	75% cyprodinil
Weedazol-TL	h	225 g/l amitrol

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 165th 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 1968, Part 2; Station Report for 1982, Part 2, pp 5-44 and Yield Books for 74-O7R//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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

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

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.(plus 60kg Mg, autumn 2000 only).
(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)+

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

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.
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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

Section Year	1	9	0*	8+	6**	5	3	7	4	2
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
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
2008	W	W	W	F	W	W	W	O	W	M

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 part of plots 2.2, 06, 09 and 14 on Section 4 were 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.

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

Experimental Diary:

All sections:			Rate	Unit
13-Sep-07	p	Weedazol-TL sections 0-3, 4-7, 9	20.00	l/200 l/ha
01-Oct-07	f	Muriate of Potash - strip 14	181.00	kg/ha
	f	Triple Superphosphate, strips 11, 13, 14, 17, 18	171.00	kg/ha
10-Oct-07	f	Farmyard manure, Strips 21 & 22, excluding section 7	35.00	t/ha
11-Oct-07	a	Plough / N, completed 12-Oct-2007		
15-Oct-07	a	Cultipressed		
26-Nov-07	a	Erect rabbit fence		
04-Apr-08	f	Sulphate of Potash - strips 5, 6, 7, 8, 9, 12, 13,15,16,17,18,19,20	217.00	kg/ha
	f	Kieserite - strips 5, 6, 7, 8, 9, 11, 12,15,16,17,18,19,20	80.00	kg/ha
12-May-08	a	Mow / Rotavate paths		
02-Jun-08	a	Power Harrowed Fallow discards		
	a	Mow / Rotavate paths		
05-Jun-08	a	Mow / Rotavate paths		
17-Jun-08	a	Mow / Rotavate paths		
25-Jul-08	a	Rogue wild oats/thistles/weeds - 4 wild oats found		
08-Sep-08	p	Weedazol-TL all except sections 3 & 8	20.00	l/290 l/ha

Selected plots:			Rate	unit
05-Oct-07	f	Chalk - Plots 080, 071, 161, 012, 082, 162, 134, 154, 115, 145, 126, 136, 196, 097, 167, 068, 108, 168, 198, 129, 169	2.00	t/ha
05-Oct-07	f	Chalk - Plots 150, 081, 125, 135, 155, 195, 076, 106, 116, 156, 067, 077, 107, 127, 078, 088, 118, 128, 079, 089, 109, 119, 139, 199	4.00	t/ha
05-Oct-07	f	Chalk - Plots 151, 152, 085, 105, 086, 087, 117, 137, 147, 157, 197, 138, 148, 158, 149, 159	6.00	t/ha

Cropped Sections:

Winter Wheat			Rate	unit
29-Aug-07	a	Chop straw , section 0		
15-Oct-07	a	Combination Drilled		
	s	Hereward tr redigo twin + deter	400.00	seeds/m^2
17-Oct-07	p	Decoy Wetex wheat plots	7.00	kg/ha
31-Oct-07	p	Liberator wheat sections	0.60	l/200 l/ha
	p	Alpha Trifluralin 48 EC, wheat sections	2.00	l/200 l/ha
16-Nov-07	p	Huron, wheat and oat plots	5.00	kg/ha
17-Nov-07	p	Stomp 400 SC wheat plots	3.30	l/200 l/ha
	p	Arelon 500 wheat plots	2.00	l/200 l/ha
	p	Hallmark with Zeon Technology wheat plots	50.00	ml/200 l/ha
18-Mar-08	f	Nitraprill Wheat strips 12, 17, 18, 19	139.00	kg/ha
17-Apr-08	f	Nitraprill - Wheat, strips 6,19	139.00	kg/ha
	f	Nitraprill - Wheat, strips 7, 18	278.00	kg/ha
	f	Nitraprill - Wheat, strips 2.1, 8, 12	417.00	kg/ha
	f	Nitraprill - Wheat, strips 1,9,10,11,13,14,20	556.00	kg/ha
	f	Nitraprill - Wheat, strip 15	696.00	kg/ha

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

			Rate	Unit
17-Apr-08	f	Nitraprill - Wheat, strip 16	835.00	kg/ha
08-May-08	p	Deuce wheat excluding section 6	1.00	l/150 l/ha
	p	Bravo 500 wheat excluding section 6	0.75	l/150 l/ha
	p	Flexity wheat excluding section 6	0.20	l/150 l/ha
	p	BASF 3C Chlormequat 720 - wheat excluding section 6	1.00	l/150 l/ha
15-May-08	f	Nitraprill - Wheat, strips 12, 17, 18, 19	139.00	kg/ha
21-May-08	p	Ally Max SX Wheat	42.00	g/200 l/ha
	p	Starane 2 wheat	0.75	l/200 l/ha
05-Jun-08	p	Amistar Opti Wheat excluding section 6	1.25	l/200 l/ha
	p	Opus Wheat excluding section 6	1.00	Q
23-Jun-08	p	Amistar - Wheat excluding section 6	0.50	l/200 l/ha
	p	Icon - wheat excluding section 6	0.50	l/200 l/ha
25-Aug-08	a	Combine harvest discards		
	a	Swath straw		
	a	Baled		
26-Aug-08	a	Combine harvest, plots for yield		
	a	Swath straw		
27-Aug-08	a	Sample, bale and weigh straw sections 1 and 3		
29-Aug-08	a	Combine harvest discards		
	a	Swath straw		
30-Aug-08	a	Baled		

W.Oats

			Rate	unit
19-Oct-07	a	Combination Drilled		
	s	Gerald tr sibutol secur	400.00	seeds/m^2
24-Oct-07	a	Rolled oat section		
16-Nov-07	p	Huron, wheat and oat plots	5.00	kg/ha
14-Dec-07	p	Lexus Class oats	60.00	g/200 l/ha
	p	Hallmark with Zeon Technology oats	50.00	ml/200 l/ha
21-May-08	p	Ally Max SX Oats	42.00	g/200 l/ha
	p	Duplosan KV oats	1.50	l/200 l/ha
14-Jun-08	p	Flexity Oats section 7	0.20	l/200 l/ha
16-Aug-08	a	Combine harvest, plots for yield - Oats		
	a	Swath straw - Oats		
	a	Combine harvest discards - Oats		
	a	Sample, bale and weigh straw - Oats		

Forage Maize

			Rate	Unit
15-Apr-08	p	Azural - maize plots	4.00	
08-May-08	f	Nitraprill maize, strip 6	139.00	kg/ha
	f	Nitraprill maize, strips 7,12,17,18,19	278.00	kg/ha
08-May-08	f	Nitraprill maize, strips 21,8	417.00	kg/ha
	f	Nitraprill maize, strips 1, 9,10,11,13,14	556.00	kg/ha
	f	Nitraprill maize, strip 15	696.00	kg/ha
	f	Nitraprill maize, strip 16	835.00	kg/ha
12-May-08	a	Flexitined maize and fallow sections		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

			Rate	unit
12-May-08	a	Power harrowed Maize		
	a	Nodet drilled maize		
	s	Hudson tr measurol	10.20	seeds/m2
13-May-08	a	Rolled Maize		
06-Jun-08	f	Nitraprill Maize plot 192	139.00	kg/ha
	f	Nitraprill Maize plot 182	278.00	kg/ha
	f	Nitraprill Maize plot 122	417.00	kg/ha
	f	Nitraprill Maize plot 172	556.00	kg/ha
24-Jun-08	p	Samson - maize	1.50	l/200 l/ha
29-Jun-08	p	Callisto - maize	1.00	l/200 l/ha
23-Sep-08	a	Cut harvest strips, weighed and sampled - Maize plots		
	a	Forage harvest maize discards		

Fallow: Section 8

22-Apr-08	a	Flexitined section 8
02-Jun-08	a	Plough, /S Section 8
14-Jul-08	a	Flexitined - Section 8, and fallow discards
16-Jul-08	a	Flexitined - Section 8, and fallow discards
21-Jul-08	a	Power harrowed - Section 8, and fallow discards
03-Sep-08	a	Plough section 8, /N

Wilderness

28-May-08	a	Topped wilderness, middle section
19-Jun-08	a	Topped wilderness, middle section
01-Aug-08	a	Topped wilderness, middle section
30-Sep-08	a	Topped wilderness, middle section

NOTE: Samples of wheat and oat grain and straw and forage maize were taken for chemical analysis. Unground wheat grain and straw from Section 1 and maize samples from Section 4 were archived

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

WHEAT

GRAIN TONNES/HECTARE

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

SECTION PLOT	3/W1	5/W2	4/W3	6/W31	0/W4	1/W42	9/W50	Mean
01(FYM)N4	11.04	9.79	9.90	8.17	*	*	*	9.72
21FYMN3	10.64	9.32	9.11	8.27	7.13	7.50	8.34	8.61
22FYM	6.94	4.85	4.90	5.93	5.45	5.02	5.69	5.54
03Nil	1.49	1.53	1.27	1.38	0.98	0.03	0.32	1.00
05(P)KMg	1.48	1.27	1.33	1.49	0.85	0.68	0.76	1.12
06N1(P)KMg	4.56	4.15	4.23	3.83	3.91	3.74	4.24	4.09
07N2(P)KMg	7.28	5.50	6.02	6.12	5.58	5.88	6.05	6.06
08N3(P)KMg	8.60	4.71	7.39	6.26	6.52	6.45	7.43	6.77
09N4(P)KMg	10.30	8.34	8.71	8.10	7.59	7.73	8.01	8.40
10N4	6.73	4.31	3.27	3.41	2.13	2.66	1.85	3.48
11N4PMg	4.60	5.72	4.47	4.40	4.99	3.39	3.87	4.49
12N1+3+1(P)K2Mg2	10.89	7.77	8.91	7.43	7.92	8.41	8.34	8.52
13N4PK	9.26	7.33	7.63	7.33	7.18	7.62	7.79	7.73
14N4PK*(Mg*)	9.03	6.91	7.23	7.02	7.84	7.74	7.06	7.55
15N5(P)KMg	10.99	7.10	8.06	7.35	8.15	7.65	8.33	8.23
16N6(P)KMg	10.66	9.32	9.14	7.25	7.89	8.29	8.34	8.70
17N1+4+1PKMg	10.81	9.54	9.13	7.34	7.76	7.87	7.35	8.54
18N1+2+1PKMg	10.23	9.32	9.04	7.54	7.49	7.06	4.58	7.89
19N1+1+1KMg	8.09	5.76	6.20	5.47	5.88	6.50	2.23	5.73
20N4KMg	*	*	*	*	1.87	0.82	*	1.35

GRAIN MEAN DM% 83.5

STRAW TONNES/HECTARE

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

SECTION PLOT	3/W1	5/W2	4/W3	6/W31	0/W4	1/W42	9/W50	Mean
01(FYM)N4	6.16	*	*	*	*	*	*	6.16
21FYMN3	7.11	*	*	*	*	4.12	*	5.62
22FYM	2.74	*	*	*	*	2.19	*	2.47
03Nil	0.24	*	*	*	*	0.01	*	0.12
05(P)KMg	0.38	*	*	*	*	0.07	*	0.23
06N1(P)KMg	2.02	*	*	*	*	1.63	*	1.82
07N2(P)KMg	3.21	*	*	*	*	2.49	*	2.85
08N3(P)KMg	3.75	*	*	*	*	2.81	*	3.28
09N4(P)KMg	5.20	*	*	*	*	3.88	*	4.54
10N4	2.64	*	*	*	*	1.20	*	1.92
11N4PMg	1.97	*	*	*	*	1.14	*	1.55
12N1+3+1(P)K2Mg2	5.41	*	*	*	*	4.08	*	4.75
13N4PK	4.76	*	*	*	*	3.55	*	4.16
14N4PK*(Mg*)	4.37	*	*	*	*	3.16	*	3.77
15N5(P)KMg	5.95	*	*	*	*	3.83	*	4.89
16N6(P)KMg	6.02	*	*	*	*	4.13	*	5.08
17N1+4+1PKMg	6.45	*	*	*	*	3.83	*	5.14
18N1+2+1PKMg	5.56	*	*	*	*	4.07	*	4.82
19N1+1+1KMg	3.96	*	*	*	*	2.74	*	3.35
20N4KMg	*	*	*	*	*	0.37	*	0.37

STRAW MEAN DM% 84.1

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/BK/1

W. OATS

TONNES/HECTARE

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

PLOT	GRAIN	STRAW
1(FYM)[N4]	5.07	1.60
21[FYMN2]	7.45	2.87
22[FYM]	4.80	2.79
03Nil	1.87	0.36
05(P)KMg	2.43	0.42
06[N1](P)KMg	2.03	0.41
08[N2](P)KMg	2.49	0.46
08[N3](P)KMg	2.80	0.53
09[N4](P)KMg	3.25	0.76
10[N4]	4.52	1.19
11[N4]PMg	3.39	1.27
12[N1+3+1](P)K2Mg2	2.91	0.68
13[N4]PK	2.85	0.55
14[N4]PK*(Mg*)	1.82	0.29
15[N5](P)KMg	3.13	0.73
16[N6](P)KMg	4.91	1.58
17[N1+4+1]PKMg	5.33	1.91
18[N1+2+1]PKMg	3.00	0.70
19[N1+1+1]KMg	1.50	0.17
MEAN DM%	83.7	66.5

FORAGE MAIZE
WHOLE CROP (100% DM) TONNES/HECTARE
***** Tables of means *****

PLOT	Whole Crop
01(FYM)N4	13.60
21FYMN3	16.56
22FYM	11.71
03Nil	3.03
05(P)KMg	3.98
06N1(P)KMg	6.10
07N2(P)KMg	8.93
08N3(P)KMg	9.28
09N4(P)KMg	9.99
10N4	2.31
11N4PMg	5.64
12N2+3(P)K2Mg2	10.07
13N4PK	8.87
14N4PK*(Mg*)	9.66
15N5(P)KMg	9.84
16N6(P)KMg	9.57
17N2+4PKMg	9.05
18N2+2PKMg	9.50
19N2+1KMg	5.86
MEAN	8.61
MEAN DM%	24.9

PLOT AREA HARVESTED 0.00162

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 157th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and Yield Books for 74-07/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 2013
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 2013

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/HB/2

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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/HB/2

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.

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/HB/2

Experimental Diary

			Rate	Unit
13-Sep-07	p	Weedazol-TL	20.00	l/200 l/ha
7-Oct-07	f	Chalk whole experiment excluding plots 11-13, 21-23	4.00	t/ha
26-Nov-07	f	Sulphate of Potash, Plots 31-34, 41-44, 55, 56, 63	217.00	kg/ha
	f	Sulphate of Potash, Plots 14, 24, 57, 58	434.00	kg/ha
	f	Kieserite, Plot 63	233.00	kg/ha
	f	Triple Superphosphate, Plot 63	215.00	kg/ha
29-Nov-07	f	Silicate of Soda, Plots 132, 133, 232, 233, 332, 333, 432, 433	450.00	kg/ha
	f	Farm Yard Manure Plots 72-73	35.00	t/ha
4-Dec 07	a	Plough/S		
4-Mar-08	a	Springtined		
	a	Combination Drilled		
	s	Tipple Tr Raxil Pro	350.00	seeds/m2
16-Apr-08	a	Mow / Rotavate paths		
28-Apr-08	f	Nitro-chalk, plots 111,121,214,221,311,322,413,423,614,623,633,713,724,734	175.00	kg/ha
	f	Nitro-Chalk, plots 113,124,211,222,313,321,412,421,611,621,631,712,721,732	349.00	kg/ha
	f	Nitro-Chalk, plots 112,123,212,223,314,324,414,422,613,624,634,711,722,731	524.00	kg/ha
	a	Mow / Rotavate paths		
6-May-08	f	Nitro-Chalk, plots 131-444, 551-582, all O&E's	537.00	kg/ha
20-May-08	p	Harmony M SX	100.00	g/200 l/ha
	p	Duplosan KV	1.00	l/200 l/ha
	p	Acanto Prima	1.25	l/200 l/ha
9-Jun-08	p	Acanto	0.50	l/200 l/ha
	p	Unix	0.50	kg/200 l/ha
25-Jul-08	a	Rogue wild oats/thistles/weeds, 610 plants pulled from plots		
4-Aug-08	a	Mow / Rotavate paths	1.00	
8-Aug-08	p	Glyphogan	3.00	l/200 l/ha
27-Aug-08	a	Combine harvest, plots for yield	1.00	
	a	Swath straw	1.00	
27-Aug-08	a	Sample, bale and weigh straw	1.00	
8-Sep-08	p	Weedazol-TL	20.00	l/290 l/ha

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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/HB/2

MAIN PLOTS

GRAIN TONNES/HECTARE

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

N	0	48	96	144	Mean
MANURE					
---	0.59	0.88	0.63	0.74	0.71
-P-	1.72	3.65	5.16	5.15	3.92
--K	0.75	1.27	1.34	1.38	1.19
-PK	1.81	4.20	5.75	7.19	4.74
A--	0.54	0.75	1.24	0.85	0.85
AP-	2.48	3.94	4.30	4.17	3.72
A-K	0.84	1.25	1.35	1.56	1.25
APK	1.80	3.98	6.22	7.03	4.76
FYM1852onwards	5.94	8.15	8.38	8.67	7.79
FYM1852-1871	2.03	1.72	1.61	2.00	1.84
(A)	1.20	1.69	2.11	3.06	2.01
-	0.39	1.28	0.81	0.96	0.86
FYM2001onwards	4.07	7.31	7.84	9.55	7.19
P2K	2.58	4.98	6.56	7.47	5.40
Mean	1.91	3.22	3.81	4.27	3.30

Grain Mean DM% 79.8

STRAW TONNES/HECTARE

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

N	0	48	96	144	Mean
MANURE					
---	0.19	0.08	0.23	0.29	0.20
-P-	0.39	1.21	2.07	2.24	1.48
--K	0.26	0.31	0.58	0.52	0.42
-PK	0.50	1.88	2.59	3.43	2.10
A--	0.16	0.44	0.35	0.51	0.36
AP-	0.57	1.40	1.86	1.57	1.35
A-K	0.27	0.50	0.48	0.57	0.46
APK	0.42	1.56	2.72	2.98	1.92
FYM1852onwards	2.29	3.97	4.47	4.26	3.75
FYM1852-1871	0.86	0.59	0.55	0.69	0.67
(A)	0.65	0.54	0.83	1.05	0.77
-	0.08	0.52	0.20	0.44	0.31
FYM2001onwards	1.22	2.94	3.49	4.41	3.02
P2K	0.59	1.82	2.47	3.29	2.04
Mean	0.60	1.27	1.64	1.88	1.35

Straw Mean DM% 84.7

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/HB/2

SILICATE PLOTS

GRAIN TONNES/HECTARE

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

PK	N3--	N3P-	N3-K	N3PK	Mean
Silicate					
(-)-	1.63	4.69	2.04	8.07	4.11
(Si)-	1.54	5.77	4.07	8.40	4.94
(-)Si	2.15	4.50	3.40	8.26	4.58
(Si)Si	2.56	4.37	4.22	8.38	4.88
Mean	1.97	4.83	3.43	8.28	4.63

GRAIN MEAN DM% 84.9

PHOSPHATE PLOTS

GRAIN TONNES/HECTARE

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

PLOTS	
142	3.15
143	3.27
144	2.75
242	8.24
243	8.04
244	7.92
341	4.09
342	4.71
343	5.01
344	5.55
441	7.77
442	8.38
443	7.86
444	7.76
551	7.54
552	7.27
561	6.92
562	6.04
571	3.13
572	4.57
581	0.94
582	0.81

GRAIN MEAN DM% 84.7

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/WF/3

WHEAT AND FALLOW

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

The 153rd year, w. wheat.

For previous years see 'Details' 1967, 1973 and Yield Books for 74-07/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

			Rate	Unit
30-Sep-07	p	Glyphosate 360	3.00	l/200 l/ha
10-Oct-07	a	Plough/S		
22-Oct-07	a	Combination drilled, Plot 1		
	s	Hereward tr redigo twin + deter, Plot 1	400.00	seeds/m^2
23-Oct-07	a	Rolled		
30-Oct-07	p	Huron	5.00	kg/ha
2-Nov-07	p	Liberator wheat plots	0.60	l/200 l/ha
	p	Alpha Trifluralin 48 EC wheat plot	2.00	l/200 l/ha
17-Nov-07	p	Stomp 400 SC	3.30	l/200 l/ha
	p	Arelon 500	2.00	l/200 l/ha
	p	Hallmark with Zeon Technology	50.00	ml/200 l/ha
8-May-08	p	Deuce	1.00	l/150 l/ha
	p	Bravo 500	0.75	l/150 l/ha
	p	Flexity	0.20	l/150 l/ha
	p	BASF 3C Chlormequat 720	1.00	l/150 l/ha
19-May-08	p	Ally Max SX wheat	42.00	g/200 l/ha
	p	Starane 2 wheat	0.75	l/200 l/ha
31-May-08	p	Amistar Opti	1.25	l/200 l/ha
	p	Opus Team	1.00	l/200 l/ha
2-Jun-08	a	Power harrowed fallow		
16-Jun-08	a	Mow / Rotavate paths		
14-Jul-08	a	Flexitined fallow plot		
15-Jul-08	a	Power harrowed fallow plot		
25-Jul-08	a	Rogue wild oats/thistles/weeds		
27-Aug-08	a	Combine harvest, plots for yield, swath straw Sample, bale and weigh straw		
30 Aug-08	a	Baled		

Note: Unground grain and straw was archived.

GRAIN AND STRAW YIELDS TONNES/HECTARE

	GRAIN	STRAW
YIELD	1.46	0.31
MEAN DM%	82.9	87.0

PLOT AREA HARVESTED 0.04431

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 153rd year, w. wheat.

For previous years see 'Details' 1977, 1973 and Yield Books for 74-07/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:

	2000-08	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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/EX/4

2. K Potassium applied annually from 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
1-Oct-07	f	Muriate of Potash, plots 023, 043, 063, 083 & 103	125.00	kg/ha
	f	Muriate of Potash, plots 024, 044, 064, 084 & 104	250.00	kg/ha
	f	Basal P (triplesuperphosphate) plots 02, 04, 06, 08 & 10	98.0	Kg/ha

P test:

1-Oct-07	f	Triple Superphosphate, plots except 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

Selected plots:

6-Oct-07	f	Chalk, Plots 021, 022, 024, 061, 062, 063, 083, 102, 103, 104	2.00	t/ha
	f	Chalk, Plots 011, 023, 042, 044, 054, 064, 071, 082, 084	4.00	t/ha
	f	Chalk, Plots 041, 043, 051, 081, 101	6.00	t/ha

All plots

30-Sep-07	p	Glyphosate 360	3.00	l/200 l/ha
10-Oct-07	a	Plough/ S, completed 11-Oct-2007		
22-Oct-07	a	Combination Drilled		
	s	XI19 tr Redigo Twin + Deter	350.00	seeds/m^2
23-Oct-07	a	Rolled		
30-Oct-07	p	Huron	5.00	kg/ha
2-Nov-07	p	Liberator	0.60	l/200 l/ha
	p	Alpha Trifluralin 48 EC	2.00	l/200 l/ha
17-Nov-07	p	Stomp 400 SC	3.30	l/200 l/ha
	p	Arelon 500	2.00	l/200 l/ha
	p	Hallmark with Zeon Technology	50.00	ml/200 l/ha
1-Apr-08	f	Sulphate of Ammonia	238.00	kg/ha
18-Apr-08	f	Nitraprill	580.00	kg/ha

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/EX/4

			Rate	Unit
8-May-08	p	Deuce	1.00	l/150 l/ha
	p	Bravo 500	0.75	l/150 l/ha
	p	Flexity	0.20	l/150 l/ha
	p	BASF 3C Chlormequat 720	1.00	l/150 l/ha
19-May 08	p	Ally Max SX	42.00	g/200 l/ha
	p	Starane 2	0.75	l/200 l/ha
21-May-08	f	Nitraprill	145.00	kg/ha
31-May-08	p	Amistar Opti	1.25	l/200 l/ha
	p	Opus Team	1.00	l/200 l/ha
6-Jun-08	a	Mow / Rotavate paths		
16-Jun-08	a	Mow / Rotavate paths		
25-Jul-08	a	Rogue wild oats/thistles/weeds		
27-Aug-08	a	Combine harvest, plots for yield		
	a	Swath straw		
	a	Sample, bale and weigh straw		
30-Aug-08	a	Baled		

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

P TEST

GRAIN TONNES/HECTARE

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

P_RES OLD_RES	O	P1	P2	P3	Mean
O	3.41	8.96	9.28	9.80	7.86
D	7.50	10.21	10.53	10.84	9.77
N	2.83	8.95	10.23	10.31	8.08
P	6.53	10.07	10.20	10.45	9.31
NPKNAMG	6.73	9.71	10.56	10.90	9.48
Mean	5.41	9.58	10.16	10.46	8.90

GRAIN MEAN DM% 84.1

STRAW TONNES/HECTARE

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

P_RES OLD_RES	O	P1	P2	P3	Mean
O	1.94	4.24	5.02	5.11	4.08
D	4.13	5.63	5.88	5.80	5.36
N	1.68	4.81	5.79	5.50	4.45
P	3.62	5.69	5.75	5.94	5.25
NPKNAMG	3.45	5.14	5.42	5.39	4.85
Mean	2.96	5.10	5.57	5.55	4.80

STRAW MEAN DM% 86.6

PLOT AREA HARVESTED 0.00538

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/EX/4

K TEST

GRAIN TONNES/HECTARE

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

K Test	K0	K1	K2	Mean
OLD_RES				
O	9.26	10.60	10.80	9.98
D	10.07	11.00	11.35	10.62
N*	9.56	9.99	10.40	9.88
PK	10.28	10.14	10.72	10.36
N*PK	9.64	10.09	11.18	10.14
Mean	9.76	10.36	10.89	10.20
Rep	10	5	5	

Standard errors of differences of means

Table	OLD_RES	K_Test	OLD_RES K_Test	
s.e.d.		0.326	0.728	min.rep
	0.364	0.282	0.631	max-min
		0.230X	0.515	max.rep

GRAIN MEAN DM% 83.9

STRAW TONNES/HECTARE

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

K_Test	K0	K1	K2	Mean
OLD_RES				
O	4.22	4.85	5.16	4.61
D	4.67	5.21	5.84	5.10
N*	4.82	4.63	4.84	4.78
PK	5.29	5.16	5.63	5.34
N*PK	4.59	4.76	5.52	4.86
Mean	4.72	4.92	5.40	4.94
Rep	10	5	5	

Standard errors of differences of means

Table	OLD_RES	K_Test	OLD_RES K_Test	
s.e.d.		0.181	0.405	min.rep
	0.203	0.157	0.351	max-min
		0.128X	0.286	max.rep

Stratum standard errors and coefficients of variation

Straw (at 85% dry matter) tonnes/hectare

Stratum	d.f.	s.e.	cv%
Blocks.Plots	4	0.286	5.8

Straw Mean DM% 86.8

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/PG/5

PARK GRASS

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

The 153rd year, hay.

For previous years see 'Details' 1977 and 1973 and Yield Books for 74-07/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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/PG/5

1. Manure, fertilisers 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 2007; the sixth 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.]

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/PG/5

Experimental diary

			Rate	Unit
03-Dec-07	f	Triple Superphosphate Plots 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
20-Dec-07	f	Sulphate of Potash Plots 2/1, 6, 7, 9/1, 9/2, 11/1, 11/2, 14-1/ 14/2, 15, 16, & 18	542.00	kg/ha
	f	Sulphate of potash Plot 20	108.00	kg/ha
	f	Anhydrous Sulphate of Soda Plots 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14-1/ 14/2, 15, 16, & 18	43.00	kg/ha
	f	Magnesium Sulphate Plots 6, 7, 8, 9/1, 9/2, 10, 11/1, 11/2, 14-1/ 14/2, 15, 16, & 18	111.00	kg/ha
	f	Silicate of Soda Plot 11/2	450.00	kg/ha
03-Apr-08	f	Sulphate of Ammonia Plot 6 (a 12' 6" pass applied to C and D plots in error)	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
	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
05-Jun-08	a	Mow paths		
23-Jun-08	a	Cut harvest strips, weighed and sampled completed 24-Jun-08		
	a	Mowed completed 24-Jun-08		
25-Jun-08	a	Turned hay		
	a	Row up		
	a	Baled by contractor, 34 round bales		
26-Jun-08	a	Topped to remove straggly grass		
29-Jul-08	a	Mow / Rotavate paths		
28-Oct-08	a	Cut harvest strips (2nd cut), weighed and sampled, completed 4-Nov-08		
04-Nov-08	a	Mowed		
	a	Baled		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/PG/5

1ST CUT (23-24/6/08) DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	3.23	2.78	2.40	1.96	2.59
K	2/1	2.86	2.77	1.23	1.31	2.04
None(FYM)	2/2	2.38	2.77	1.08	1.57	1.95
None	3	2.67	2.82	1.10	1.47	2.02
P	4/1	3.21	3.52	2.68	2.38	2.95
N2P	4/2	3.45	3.70	4.05	2.37	3.39
N1PKNaMg	6	6.01	5.93			5.97
PKNaMg	7	5.68	5.72	4.72	2.52	4.66
PNaMg	8	2.74	2.86	2.56	2.46	2.65
PKNaMg(N2)	9/1	5.51	5.58	4.98	0.98	4.26
N2PKNaMg	9/2	5.58	5.21	4.96	3.26	4.75
N2PNaMg	10	3.79	3.71	4.26	2.08	3.46
N3PKNaMg	11/1	6.42	5.60	5.04	3.71	5.20
N3PKNaMgSi	11/2	6.46	5.19	4.70	4.10	5.11
None	12	2.82	2.09	1.07	1.18	1.79
(FYM/F)	13/1	3.84	2.96	1.88	1.82	2.62
FYM/PM	13/2	3.19	3.19	3.26	3.17	3.20
PKNaMg(N2*)	14/1	5.40	5.43	5.62	4.85	5.33
N2*PKNaMg	14/2	7.24	5.52	5.25	5.02	5.76
PKNaMg(N2*)	15	5.59	5.97	5.06	2.75	4.84
N1*PKNaMg	16	5.67	5.80	4.77	4.55	5.20
N1*	17	3.12	3.08	2.44	2.81	2.86
N2KNaMg	18	3.17	3.68	3.22	1.77	2.96
N2KNaMg	18/2					4.08
FYM	19/1					3.58
FYM	19/2					3.83
FYM	19/3					4.41
FYM/N*PK	20/1					4.79
FYM/N*PK	20/2					4.55
FYM/N*PK	20/3					4.81

1ST CUT MEAN DM% 27.1

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/PG/5

2ND CUT (28/10/08 and 03/11/08) DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	1.72	1.52	1.29	0.93	1.36
K	2/1	1.60	1.41	0.89	0.88	1.19
None(FYM)	2/2	1.42	1.52	0.91	1.07	1.23
None	3	1.48	1.68	0.95	1.08	1.30
P	4/1	1.52	1.48	1.36	1.30	1.42
N2P	4/2	1.56	1.57	1.68	1.09	1.47
N1PKNaMg	6	2.90	3.16			3.03
PKNaMg	7	3.11	3.40	3.20	1.83	2.89
PNaMg	8	2.25	2.14	2.13	2.02	2.14
PKNaMg(N2)	9/1	3.30	3.48	3.11	0.50	2.60
N2PKNaMg	9/2	2.34	2.63	2.26	2.53	2.44
N2PNaMg	10	1.58	1.41	2.37	1.69	1.76
N3PKNaMg	11/1	2.78	2.65	2.76	3.05	2.81
N3PKNaMgSi	11/2	3.27	3.27	2.89	3.55	3.24
None	12	1.79	1.50	0.83	0.84	1.24
(FYM/F)	13/1	2.28	2.67	1.58	1.08	1.90
FYM/PM	13/2	2.50	3.02	2.78	2.59	2.72
PKNaMg(N2*)	14/1	1.99	2.54	2.49	2.12	2.29
N2*PKNaMg	14/2	1.83	2.40	2.27	2.04	2.13
PKNaMg(N2*)	15	2.54	2.35	2.51	1.32	2.18
N1*PKNaMg	16	2.77	2.87	2.38	2.05	2.52
N1*	17	2.19	2.02	1.53	1.33	1.77
N2KNaMg	18	1.66	1.86	2.59	0.97	1.77
N2KNaMg	18/2					2.16
FYM	19/1					2.97
FYM	19/2					3.27
FYM	19/3					3.16
FYM/N*PK	20/1					3.56
FYM/N*PK	20/2					3.60
FYM/N*PK	20/3					2.97

2ND CUT MEAN DM% 20.50

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/PG/5

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

Manure	Lime	a	b	c	d	Mean
N1	1	4.95	4.30	3.68	2.89	3.96
K	2/1	4.46	4.18	2.12	2.19	3.24
None(FYM)	2/2	3.80	4.29	1.98	2.64	3.18
None	3	4.16	4.50	2.06	2.55	3.32
P	4/1	4.73	5.00	4.04	3.68	4.36
N2P	4/2	5.00	5.26	5.73	3.46	4.86
N1PKNaMg	6	8.91	9.09			9.00
PKNaMg	7	8.78	9.12	7.93	4.35	7.54
PNaMg	8	4.99	5.01	4.69	4.48	4.79
PKNaMg(N2)	9/1	8.81	9.05	8.09	1.48	6.86
N2PKNaMg	9/2	7.91	7.84	7.22	5.79	7.19
N2PNaMg	10	5.37	5.12	6.63	3.77	5.22
N3PKNaMg	11/1	9.20	8.25	7.80	6.77	8.01
N3PKNaMgSi	11/2	9.73	8.46	7.59	7.65	8.36
None	12	4.61	3.58	1.90	2.01	3.02
(FYM/F)	13/1	6.12	5.63	3.46	2.90	4.53
FYM/PM	13/2	5.69	6.21	6.03	5.76	5.92
PKNaMg(N2*)	14/1	7.39	7.98	8.11	6.97	7.61
N2*PKNaMg	14/2	9.07	7.92	7.52	7.06	7.89
PKNaMg(N2*)	15	8.13	8.33	7.57	4.07	7.02
N1*PKNaMg	16	8.44	8.67	7.15	6.60	7.72
N1*	17	5.31	5.11	3.97	4.13	4.63
N2KNaMg	18	4.83	5.54	5.81	2.74	4.73
N2KNaMg	18/2					6.24
FYM	19/1					6.55
FYM	19/2					7.10
FYM	19/3					7.57
FYM/N*PK	20/1					8.34
FYM/N*PK	20/2					8.15
FYM/N*PK	20/3					7.78

TOTAL OF 2 CUTS MEAN DM% 23.80

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/GC/8

GARDEN CLOVER

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

The 155th year, red clover.

For previous years see `Details' 1967 and 1973, and Yield books for 74-07/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
12-May-08	a	First cut		
14-May-08	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
4-Jul-08	a	Second cut		
6-Aug-08	a	Third cut		
20-Nov-08	a	Fourth cut		

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

1ST CUT (12/05/08) DRY MATTER TONNES/HECTARE

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

```
Grand mean  3.26

 FUNG_RES     NONE    BENOMYL
              3.40       3.12


 1ST CUT MEAN DM%  14.6
```


https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/GC/8

SECOND CUT (04/07/08) DRY MATTER TONNES/HECTARE

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

```
Grand mean  3.65

 FUNG_RES     NONE    BENOMYL
              3.79       3.50

 2ND CUT MEAN DM%  21.4
```

THIRD CUT (06/08/08) DRY MATTER TONNES/HECTARE

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

```
Grand mean  2.53

 FUNG_RES     NONE    BENOMYL
              2.68       2.39

 3RD CUT MEAN DM%  16.0
```

FOURTH CUT (20/11/08) DRY MATTER TONNES/HECTARE

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

```
Grand mean  0.37

 FUNG_RES     NONE    BENOMYL
              0.34       0.39


 4TH CUT MEAN DM%  20.0
```

TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

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

```
Grand mean  9.80

 FUNG_RES     NONE    BENOMYL
             10.20       9.40


 TOTAL OF 4 CUTS MEAN DM%  18.0

PLOT AREA HARVESTED CUT 1,2,3 &4   0.00014
```


https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 71st year, leys, w. beans, w. wheat, w. rye, forage maize

For previous years see 'Details' 1967 & 1973 and Yield Books for 74-07/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 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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 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).

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) changed to a three-year arable rotation followed by two arable test crops. Plots were "phased in" but joined the relevant point in the rotation.
LLN/AO (Previously 1st cycle, 8-yr 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 2008
   (kg N) as 34.5% N:

0	0	
80	40 + 40	) to be applied
160	40 + 120	) late-February/early-March
240	40+ 200	) and mid-April

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

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

Whole plots:

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

   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 2008 (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 14 October 2007.

Continuous rotations	No FYM	FYM Res
Before wheat	Half plots	Half plots
ABe	190	220
AM	220	210

None to other plots.

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

Experimental Diary

Grass Ley and clover/grass ley (**ROTATION** LN1, LLN1, LC1 and LLC1)

			Rate	Unit
14-Oct-07	f	Triple Superphosphate plots 33, 34, 37, 38, & 41-44	213.00	kg/ha
	f	Sulphate of potash plots 33, 34, 37, 38, & 41-44	140.00	kg/ha
18-Oct-07	a	Plough plots for 1st year leys		
	a	Power harrowed plots for 1st year leys		
19-Oct-07	s	Laura fescue and Promesse timothy (50:50), Ln1 plots	30.00	kg/ha
	s	Laura fescue, Promesse timothy and Chieftain clover (44:44:12), Lc1 plots	30.00	kg/ha
20-Oct-07	a	Rolled wheat, rye, oat and new ley plots	1.00	
13-Dec-07	a	Ley plot 33/34 sprayed in error with Stomp		
15-Mar-08	f	Muriate of Potash plots 33, 34, 37, 38, 41- 44	167.00	kg/ha
18-Mar-08	f	Nitraprill plots 37, 38, 43, 44	217.00	kg/ha
25-Jun-08	a	Cut harvest strips, weighed and sampled ley plots		
	a	Mowed all grass discards		
26-Jun-08	a	Rowed up hay ley plots		
	a	Baled ley plots		
19-Nov-08	a	Cut harvest strips, weighed and sampled ley plots, 2nd cut		

Grass leys (**ROTATION** LN2-3 AND LLN2-8)

			Rate	Unit
14-Mar-08	f	Sulphate of Potash plots 3, 4, 7, 8, 11-14, 23-26, 29-32	140.00	kg/ha
15-Mar-08	f	Triple Superphosphate plots 3, 4, 7, 8, 11-14, 23-26, 29-32	213.00	kg/ha
	f	Muriate of Potash plots 3, 4, 7, 8, 11-14, 23-26, 29-32	167.00	kg/ha
18-Mar-08	f	Nitraprill plots 11-14, 25, 26, 31, 32	217.00	kg/ha
25-Jun-08	a	Cut harvest strips, weighed and sampled ley plots		
	a	Mowed all grass discards		
26-Jun-08	a	Rowed up hay ley plots		
	a	Baled ley plots		
27-Jun-08	p	Dow Agrosciences Glyphosate 360 grass plots 23, 24, 25, 26, 29, 30, 31, 32	4.00	l/200 l/ha
19-Nov-08	a	Cut harvest strips, weighed and sampled ley plots, 2nd cut		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

Clover/grass leys (**ROTATION** LC2-3 and LLC2-8)

			Rate	unit
14-Mar-08	f	Sulphate of Potash plots 3, 4, 7, 8, 11-14, 23-26, 29-32	140.00	kg/ha
15-Mar-08	f	Triple Superphosphate plots 3, 4, 7, 8, 11-14, 23-26, 29-32	213.00	kg/ha
	f	Muriate of Potash plots 3, 4, 7, 8, 11-14, 23-26, 29-32	167.00	kg/ha
25-Jun-08	a	Cut harvest strips, weighed and sampled ley plots		
	a	Mowed all grass discards		
26-Jun-08	a	Rowed up hay ley plots		
	a	Baled ley plots		
27-Jul-08	p	Dow Agrosciences Glyphosate 360 grass plots 23, 24, 25, 26, 29, 30, 31, 32	4.00	l/200 l/ha
19-Sep-08	a	Combine harvest discards all combinable crops, swath straw		
19-Nov-08	a	Cut harvest strips, weighed and sampled ley plots, 2nd cut		

W. beans (**ROTATION)**

			Rate	Unit
02-Oct-07	p	Azural stubbles	4.00	l/200 l/ha
14-Oct-07	f	Triple Superphosphate plots 5, 6, 9, 10, 17, 18, 21, 22	127.00	kg/ha
31-Oct-07	a	Broadcast bean plots	1.00	
	s	Wizzard bean plots	21.00	seeds/m^2
	a	Plough bean plots, / NW	1.00	
	a	Power harrowed bean plots, to level	1.00	
16-Nov-07	p	Quaver Flo beans	2.00	l/220 l/ha
	p	Arelon 500 beans	2.00	l/220 l/ha
14-Mar-08	f	Sulphate of Potash plots 5, 6, 9, 10, 17, 18, 21, 22	150.00	kg/ha
19-May-08	p	Hallmark with Zeon Technology - bean plots	75.00	ml/220
	p	Folicur - bean plots	0.50	l/220 l/ha
	p	Bravo 500 - bean plots	1.00	l/220 l/ha
18-Sep-08	a	Combine harvest, plots for yield bean plots		
	a	Swath straw bean plots		
19-Sep-08	a	Combine harvest discards all combinable crops, swath straw		
21-Sep-08	a	Baled straw from all crops		

Forage maize (**ROTATION**)

			Rate	Unit
14-Oct-07	f	Triple Superphosphate plots 1, 2, 19, 20	127.00	kg/ha
18-Oct-07	a	Plough plots for maize		
	a	Power harrowed plots for maize		
14-Mar-08	f	Sulphate of Potash plots 1, 2, 19, 20	150.00	kg/ha
12-May-08	f	Nitraprill maize plots	290.00	kg/ha
14-May-08	a	Power harrowed maize plots	1.00	
	a	Nodet drilled maize plots	1.00	
	s	Hudson tr measurol maize plots	10.20	seeds/m2
06-Jun-08	p	Samson - maize	1.50	l/200 l/ha
25-Jun-08	a	Hand sow gaps in maize rows, NE end.		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

25-Jun-08	s	Hudson tr measurol gaps in maize rows, NE end.		
01-Jul-08	p	Callisto maize plots	1.00	l/220 l/ha
19-Sep-08	a	Combine harvest discards all combinable crops, swath straw		
21-Sep-08	a	Baled straw from all crops		
26-Sep-08	a	Cut harvest strips, weighed and sampled maize plots		
15-Oct-08	a	Mowed maize discards		
	a	Baled maize discards		

W. wheat (1st TEST CROP)

			Rate	Unit
02-Oct-07	p	Azural stubbles	4.00	l/200 l/ha
14-Oct-07	f	Muriate of Potash plot 53	190.00	Kg/ha
	f	Muriate of Potash plots 54, 64	220.00	kg/ha
	f	Muriate of Potash plot 63	210.00	kg/ha
	f	Triple Superphosphate plots 49 - 64	127.00	kg/ha
18-Oct-07	a	Plough plots for wheat		
	a	Power harrowed plots for wheat		
19-Oct-07	a	Accord Drilled		
	s	Glasgow tr redigo Twin wheat plots	350.00	seeds/m^2
20-Oct-07	a	Rolled wheat, rye, oat and new ley plots	1.00	
26-Nov-07	p	Avadex Excel 15G wheat block 4	15.00	kg/ha
13-Dec-07	p	Stomp 400 SC wheat block 4	3.30	l/200 l/ha
	p	Arelon 500 wheat block 4	1.00	l/200 l/ha
	p	Hallmark with Zeon Technology wheat block 4	50.00	ml/200 l/ha
11-Mar-08	f	Nitraprill wheat, N1, N2, N3 plots	116.00	kg/ha
14-Mar-08	f	Sulphate of Potash plots 49 - 64	150.00	kg/ha
01-May-08	f	Nitraprill N1 plots	116.00	kg/ha
	f	Nitraprill N2 plots	348.00	kg/ha
	f	Nitraprill N3 plots	580.00	kg/ha
02-May-08	p	Deuce wheat	1.00	l/200 l/ha
	p	Bravo 500 wheat	1.00	l/200 l/ha
	p	Flexity wheat	0.20	l/200 l/ha
	p	BASF 3C Chlormequat 720 wheat	2.00	l/200 l/ha
05-May-08	p	Manganese Sulphate 32% Premium wheat	5.00	kg/200 l/ha
	p	Activator 90 wheat	25.00	ml/200 l/ha
05-Jun-08	p	Amistar Opti - wheat plots	1.25	l/200 l/ha
	p	Opus - wheat plots	1.00	l/200 l/ha
	f	Manganese Sulphate - wheat plots	5.00	kg/200 l/ha
06-Aug-08	a	It has been noticed that the higher rate nitrogen wheat plots have become laid. Plot numbers affected: 491,511,521,523,524,562,564,583,591,592,601,603,604, 611,622,623,643,644. Plots with lesser damage: 494,501,504,512,531,542,553,574,581,612,613,614, 624,641.		
17-Sep-08	a	Combine harvest, plots for yield wheat plots		
	a	Swath straw wheat plots		
19-Sep-08	a	Combine harvest discards all combinable crops, swath straw		
21-Sep-08	a	Baled straw from all crops		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

W. rye (2nd TEST CROP AND ROTATION)

			Rate	Unit
02-Oct-07	p	Azural stubbles	4.00	l/200 l/ha
06-Oct-07	f	Chalk Block 5	5.00	t/ha
14-Oct-07	f	Triple Superphosphate plots 35, 36, 39, 40, 45 – 48, 65- 80	127.00	kg/ha
18-Oct-07	a	Plough plots for rye		
	a	Power harrowed plots for rye		
19-Oct-07	s	Drilled Matador recleaned rye plots	350.00	seeds/m^2
20-Oct-07	a	Rolled rye plots	1.00	
13-Dec-07	p	Stomp 400 SC rye plots	3.30	l/200 l/ha
14-Mar-08	f	Sulphate of Potash plots 35, 36, 39, 40, 45 – 48 and 65 - 80	150.00	kg/ha
02-May-08	p	Quantum SX rye plots	30.00	g/200 l/ha
06-May-08	f	Nitraprill N1, Rye Test Block	145.00	kg/ha
	f	Nitraprill N2, Rye Test Block	290.00	kg/ha
	f	Nitraprill N3, Rye Test Block	435.00	kg/ha
12-May-08	f	Nitraprill rye treatment plots	290.00	kg/ha
17-Sep-08	a	Combine harvest, plots for yield rye plots		
	a	Swath Straw rye plots		
19-Sep-08	a	Combine harvest discards all combinable crops, swath straw		
21-Sep-08	a	Baled straw from all crops		

W. Oats (ROTATION)

			Rate	Unit
02-Oct-07	p	Azural stubbles	4.00	l/200 l/ha
14-Oct-07	f	Triple Superphosphate plots 15, 16, 27, 28	127.00	kg/ha
18-Oct-07	a	Plough plots for oats		
18-Oct-07	a	Power harrowed plots for oats		
19-Oct-07	s	Drilled Gerald recleaned oat plots	350.00	seeds/m^2
20-Oct-07	a	Rolled oat plots	1.00	
19-Dec-07	p	Lexus Class oats	60.00	g/200 l/ha
	p	Hallmark with Zeon Technology oats	50.00	ml/200 l/ha
14-Mar-08	f	Sulphate of Potash plots 15, 16, 27, 28	150.00	kg/ha
02-May-08	p	Amistar oats	0.80	l/200 l/ha
	p	Opus, oats	0.50	l/200 l/ha
	p	Flexity oats	0.20	l/200 l/ha
	p	BASF 3C Chlormequat 720 oats	2.00	l/200 l/ha
05-May-08	p	Manganese Sulphate 32% Premium oats	5.00	kg/200 l/ha
	p	Activator 90 oats	25.00	ml/200 l/ha
12-May-08	f	Nitraprill oat plots	290.00	kg/ha
29-May-08	p	Ally Max SX - oats	42.00	g/200 l/ha
	f	Manganese Sulphate - oats	5.00	kg/200 l/ha
18-Sep-08	a	Combine harvest, plots for yield oat plots		
	a	Swath straw oat plots		
19-Sep-08	a	Combine harvest discards all combinable crops, swath straw		
21-Sep-08	a	Baled straw from all crops		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

LEYS

1st CUT (25/6/08) DRY MATTER TONNES/HECTARE

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

FYM_RES	NONE	FYM	Mean
LEY			
LC1	2.67	2.30	2.48
LC2	5.34	6.47	5.91
LC3	5.47	5.84	5.65
LN1	6.28	6.33	6.30
LN2	7.48	7.65	7.56
LN3	7.36	6.82	7.09
(LLC/LC) LC1	3.23	3.18	3.20
LLC7	5.94	5.96	5.95
LLC8	5.32	5.63	5.47
(LLN/LN) LN1	5.38	5.87	5.63
LLN7	7.69	6.60	7.15
LLN8	6.01	6.64	6.32
Mean	5.68	5.77	5.73

1ST CUT MEAN DM% 29.9

1ST CUT AREA HARVESTED 0.00200

2ND CUT (19/11/08) DRY MATTER TONNES/HECTARE

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

FYM_RES	NONE	FYM	Mean
LEY			
LC1	0.63	1.02	0.83
LC2	1.45	1.58	1.51
LC3	-	-	-
LN1	2.22	2.44	2.33
LN2	3.03	1.51	2.27
LN3	-	-	-
(LLC/LC) LC1	0.93	1.18	1.05
LLC7	1.65	2.41	2.03
LLC8	-	-	-
(LLN/LN) LN1	2.94	2.42	2.68
LLN7	3.26	3.12	3.19
Mean	2.01	1.96	1.99

2ND CUT MEAN DM% 20.4

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

LEYS

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

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

FYM_RES	NONE	FYM	Mean
LEY			
LC1	3.30	3.32	3.31
LC2	6.80	8.05	7.42
LC3	5.47	5.84	5.65
LN1	8.50	8.77	8.63
LN2	10.51	9.15	9.83
LN3	7.36	6.82	7.09
(LLC/LC)LC1	4.16	4.36	4.26
LLC7	7.59	8.37	7.98
LLC8	5.32	5.63	5.47
(LLN/LN)LN1	8.32	8.29	8.30
LLN7	10.95	9.72	10.34
LLN8	6.01	6.64	6.32
Mean	7.02	7.08	7.05

TOTAL OF 2 CUTS MEAN DM% 26.8

Note: No second cuts taken for LC3, LN3, LLC8 & LLN8.

ARABLE TREATMENT CROPS

MAIZE

WHOLE CROP (100% DRY MATTER) TONNES/HECTARE

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

FYMRES	NONE	FYM	Mean
ROTATION			
AO	3.35	3.02	3.19
ABe	2.93	3.00	2.97
Mean	3.14	3.01	3.08

Grain mean DM% 26.9

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

BEANS

GRAIN TONNES/HECTARE

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

FYMRES ROTATION	None	FYM	Mean
AO	1.29	1.51	1.40
LLn/AO	1.20	1.75	1.48
LLc/ABe	1.40	1.77	1.59
ABe	1.21	0.79	1.00
Mean	1.28	1.45	1.37

Grain mean DM% 83.6

Plot area harvested 0.00413

OATS

GRAIN TONNES/HECTARE

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

FYMRES ROTATION	NONE	FYM	Mean
LLC/ABe	5.19	5.33	5.26
LLN/AO	5.59	6.15	5.87
Mean	5.39	5.74	5.56

Grain mean DM% 85.3

Plot area harvested 0.00413

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

W.WHEAT (1st TEST CROP)

GRAIN TONNES/HECTARE

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

FYMRES	none	FYM	Mean
ROTATION			
LLN	4.65	5.19	4.92
LN	7.45	7.52	7.49
LLc/ABe	7.01	7.17	7.09
LC	1.62	6.69	4.16
AM	2.94	5.24	4.09
ABe	6.14	6.12	6.13
LLn/AO	5.51	2.66	4.09
LLc	7.60	7.70	7.65
Mean	5.37	6.04	5.70

N	0	80	160	240	Mean
ROTATION					
LLN	4.72	6.83	3.95	4.18	4.92
LN	5.24	8.28	8.91	7.51	7.49
LLc/ABe	5.50	7.89	7.68	7.28	7.09
LC	4.24	5.76	5.37	1.26	4.16
AM	1.51	5.34	3.68	5.84	4.09
ABe	4.02	7.54	7.58	5.38	6.13
LLn/AO	4.86	3.60	4.13	3.77	4.09
LLc	5.97	8.24	8.57	7.82	7.65
Mean	4.51	6.69	6.24	5.38	5.70

N	0	80	160	240	Mean
FYMRES					
none	4.16	6.39	5.98	4.94	5.37
FYM	4.85	6.99	6.49	5.82	6.04
Mean	4.51	6.69	6.24	5.38	5.70

N	0	80	160	240
ROTATION **FYMRES**				
LLN none	3.86	6.56	3.90	4.29
LLN FYM	5.58	7.10	4.01	4.07
LN none	5.64	8.42	9.19	6.56
LN FYM	4.84	8.15	8.63	8.45
LLc/ABe none	5.90	8.22	6.80	7.10
LLc/ABe FYM	5.09	7.56	8.55	7.47
LC none	2.54	2.41	2.92	-1.37
LC FYM	5.94	9.10	7.82	3.90
AM none	0.34	4.68	2.17	4.59
AM FYM	2.67	6.01	5.20	7.10
ABe none	3.89	7.63	7.45	5.60
ABe FYM	4.15	7.45	7.71	5.17
LLn/AO none	4.91	5.26	6.80	5.09
LLn/AO FYM	4.81	1.93	1.46	2.45
LLc none	6.23	7.90	8.60	7.66
LLc FYM	5.71	8.58	8.55	7.97

Grain mean DM% 81.6

Plot area harvested 0.00192

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

RYE (TREATMENT CROP)

GRAIN TONNES/HECTARE

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

FYMRES	NONE	FYM	Mean
ROTATION			
(ABe)R	4.31	4.69	4.50
(AO)R	3.79	3.71	3.75
(LLn/AO)R	4.69	4.96	4.83
(LLc/ABe)R	5.78	5.23	5.50
Mean	4.64	4.65	4.65

Grain mean DM% 81.2

Plot area harvested 0.00413

RYE (2nd TEST CROP)

GRAIN TONNES/HECTARE

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

FYMRES	NONE	FYM	Mean
ROTATION			
LLn	4.70	4.76	4.73
Ln	4.74	4.64	4.69
LLc	4.21	4.60	4.40
Lc	4.54	5.11	4.82
AM	3.54	3.68	3.61
ABe	3.98	3.97	3.98
LLn/AO	5.13	4.87	5.00
LLc/ABe	4.35	4.77	4.56
Mean	4.40	4.55	4.47

N	0	50	100	150
ROTATION				
LLn	3.80	4.91	5.08	5.12
Ln	3.73	4.50	4.69	5.84
LLc	3.99	4.26	4.56	4.81
Lc	3.67	4.75	5.14	5.73
AM	2.05	4.00	4.14	4.25
ABe	2.63	3.82	5.13	4.33
LLn/AO	4.22	5.00	5.24	5.55
LLc/ABe	3.66	4.57	5.05	4.95
Mean	3.47	4.48	4.88	5.07

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/3

RYE (2nd TEST CROP) Cont'd

N	0	50	100	150
FYMRES				
none	3.43	4.55	4.69	4.92
FYM	3.50	4.40	5.07	5.23

FYMRES	none				FYM			
N	0	50	100	150	0	50	100	150
ROTATION								
LLn	4.04	4.63	5.01	5.10	3.55	5.20	5.14	5.15
Ln	3.52	5.03	4.94	5.46	3.93	3.97	4.45	6.23
LLc	3.87	4.61	4.23	4.15	4.10	3.90	4.90	5.48
Lc	3.42	4.56	4.89	5.29	3.92	4.94	5.40	6.18
AM	2.06	4.10	3.92	4.07	2.04	3.91	4.36	4.43
ABe	2.73	4.11	4.61	4.47	2.53	3.52	5.65	4.19
LLn/AO	4.42	4.87	5.36	5.90	4.01	5.13	5.12	5.20
LLc/ABe	3.40	4.51	4.58	4.91	3.92	4.63	5.52	4.99

Plot area harvested 0.00192

Grain mean DM% 81.2

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 44th year winter rye

For previous years see 'Details' 1973 and Yield Books for 74-07/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-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 2008 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 2008 rye crop nitrogen rates (kg N/ha) were:
0, 30, 60, 90, 120, 150 as nitro-chalk (27% N).

Experimental Diary

			Rate	Unit
2-Oct-07	p	Azural stubbles	4.00	l/200 l/ha
12-Oct-07	f	FYM, Dg 10 plots	10.00	t/ha
	f	FYM, Dg 25 plots	25.00	t/ha
	f	Compost, Co plots	40.00	t/ha
	f	Straw, St plots	7.50	t/ha
13-Oct-07	a	Topped to chop wheat straw		
	a	Plough / SE, completed 14-Oct-07 (Rye plots)		
18-Oct-07	a	Power harrowed rye plots		
23-Oct-07	a	Accord Drilled		
	s	Matador recleaned rye plots	350.00	seeds/m^2
	a	Rolled		
13-Dec-07	p	Stomp 400 SC Rye plots	3.30	l/200 l/ha
14-Mar-08	f	Sulphate of potash all except Dg 25 plots	200.00	kg/ha
15-Mar-08	f	Triple Superphosphate all except Dg 25 plots	97.50	kg/ha
2-May-08	p	Quantum SX rye plots	30.00	g/200 l/ha
8-May-08	f	Nitraprill N1 plots, completed 9-May-08	87.00	kg/ha
	f	Nitraprill N2 plots, completed 9-May-08	174.00	kg/ha
	f	Nitraprill N3 plots, completed 9-May-08	261.00	kg/ha
	f	Nitraprill N4 plots, completed 9-May-08	348.00	kg/ha
	f	Nitrprill N5 plots, completed 9-May-08	435.00	kg/ha
25-Jun-08	a	Cut harvest strips, weighed and sampled ley plots		
	a	Mowed all grass discards		
26-Jun-08	a	Rowed up hay Ley plots		
	a	Baled Ley plots		
14-Sep-08	a	Combine harvest discards		
	a	Swath straw		
18-Sep-08	a	Combine harvest, plots for yield		
	a	Swath straw		
19-Sep-08	a	Combine harvest discards		
	a	Swath straw		
21-Sep-08	a	Baled		
19-Nov-08	a	Cut harvest strips, weighed and sampled, ley plots, 2nd cut		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/RN/12

GRAIN TONNES/HECTARE

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

Nitrogen	0	30	60	90	120	150	Mean
Treatment							
F(Fd)	1.98	3.20	4.15	4.69	4.79	4.48	3.88
F(Ln,Lc6)	2.71	3.30	4.34	5.21	5.77	4.96	4.38
St(St)	1.44	2.88	3.92	4.84	5.05	4.27	3.73
CC(Gm,Lc8)	2.12	3.10	4.23	5.11	5.58	4.28	4.07
Co(Pt,Lc8)	2.93	3.98	4.91	5.56	5.80	5.23	4.73
Dg10(Fs)	2.59	3.54	4.80	5.68	5.67	4.74	4.50
Dg25(Dg)	3.16	4.19	5.28	5.98	6.15	5.75	5.08
Mean	2.42	3.45	4.52	5.30	5.54	4.81	4.34

Standard errors of differences of means

Table	**Treatment**	**Nitrogen**	**Treatment Nitrogen**
s.e.d.	0.307	0.127	0.434
Except when comparing means with the same level(s) of Treatment			0.336

Grain mean DM% 79.6

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
2008	5.72	1.65	7.37

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

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/CS/326 and 08/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 22nd year, w. wheat

For previous years see Yield Books for 87-07/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	2.64	2.76
2 NORMAL	Twice normal	5.27	5.52
4 NORMAL	Four times normal	10.55	11.03

Experimental Diary

Great Knott III (R)

			Rate	Unit
3-Sep-07	a	Load straw normal	10.68	kg/plot
	a	Load straw 2 x normal	21.36	kg/plot
	a	Load straw 4 x normal	42.72	kg/plot
	a	Baled - plots		
29-Sep-07	a	Plough/W		
13-Oct-07	a	Combination Drilled		
	s	Hereward tr beret gold	350.00	seeds/m^2
14-Oct-07	a	Rolled		
15-Oct-07	p	Decoy Wetex	7.00	kg/ha
18-Oct-07	p	Liberator	0.60	l/200 l/ha
	p	Alpha Trifluralin 48 EC	2.00	l/200 l/ha
17-Nov-07	p	Stomp 400 SC	3.30	l/200 l/ha
	p	Arelon 500	2.00	l/200 l/ha
	p	Hallmark with Zeon Technology	50.00	ml/200 l/ha
18-Mar-08	f	Double Top	148.00	kg/ha
18-Apr-08	f	Nitraprill	460.00	kg/ha
5-May-08	p	Manganese Sulphate 32% Premium	5.00	kg/200 l/ha
	p	Activator 90	25.00	ml/200 l/ha

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/CS/326 and 08/W/CS/326

			Rate	Unit
9-May-08	p	Deuce	1.00	l/150 l/ha
	p	Bravo 500	0.75	l/150 l/ha
	p	Flexity	0.20	l/150 l/ha
	p	BASF 3C Chlormequat 720	1.00	l/150 l/ha
19-May-08	p	Ally Max SX	42.00	g/200 l/ha
	p	Starane 2	0.75	l/200 l/ha
31-May-08	p	Amistar Opti	1.25	l/200 l/ha
	p	Opus Team	1.00	l/200 l/ha
17-Jun-08	a	Mow / Rotavate paths		
27-Aug-08	a	Combine harvest, plots for yield		
	a	Swath straw		
	a	Sample, bale and weigh straw		

Far Field I (W)

			Rate	Unit
7-Sep-07	a	Load straw, normal	12.00	kg/plot
	a	Load straw, 2 x normal	24.00	kg/plot
	a	Load straw, 4 x normal	48.00	kg/plot
1-Oct-07	p	Azural	2.00	l/200 l/ha
9-Oct-07	a	Plough/NW		
24-Oct-07	a	Power Harrowed		
26-Oct-07	a	Accord Drilled		
	s	Hereward tr beret gold	350.00	seeds/m^2
27-Oct-07	a	Rolled		
26-Nov-07	p	Avadex Excel 15G	15.00	kg/ha
13-Dec-07	p	Stomp 400 SC	3.30	l/200 l/ha
	p	Arelon 500	1.00	l/200 l/ha
	p	Hallmark with Zeon Technology	50.00	ml/200 l/ha
5-Mar-08	f	Double Top	133.00	kg/ha
2-May-08	p	Pacifica	0.50	kg/200 l/ha
	p	Biopower	1.00	l/200 l/ha
	p	Deuce	1.00	l/200 l/ha
	p	Bravo 500	1.00	l/200 l/ha
	p	Flexity	0.20	l/200 l/ha
10-May-08	f	Double Top	533.00	kg/ha
5-Jun-08	p	Amistar Opti	1.25	l/200 l/ha
	p	Opus	1.00	l/200 l/ha
	f	Manganese Sulphate	5.00	kg/200 l/ha
15-Sep-08	a	Combine harvest, plots for yield		
	a	Swath straw		
16-Sep-08	a	Sample, bale and weigh straw		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/CS/326

GRAIN TONNES/HECTARE

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

```
   Treatment
           -       9.91
           1       9.82
           2       9.91
           4       9.76

     Mean       9.85

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

Table                Treatment
s.e.d.                   0.115


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

Stratum                   d.f.          s.e.         cv%

Blocks.Plots                 9         0.162         1.6

GRAIN MEAN DM% 84.1
```

STRAW TONNES/HECTARE

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

```
   Treatment
           -         5.55
           1         5.68
           2         6.03
           4         5.95

     Mean         5.80

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

Table              Treatment
s.e.d.                 0.267

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

Straw (at 85% dry matter) tonnes/hectare

Stratum                         d.f.          s.e.         cv%

Blocks.Plots                       9         0.377         6.5

STRAW MEAN DM% 80.9

Plot area harvested   0.00284
```


https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/CS/326

GRAIN TONNES/HECTARE

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

```
    Treatment
            -      7.54
            1      7.41
            2      7.54
            4      7.64

     Mean      7.53

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

Table               Treatment
s.e.                    0.300

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

Stratum                       d.f.          s.e.         cv%

Blocks.Plots                     6         0.367         4.9


GRAIN MEAN DM% 82.7
```

STRAW TONNES/HECTARE

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

```
   Treatment
           -        4.05
           1        3.98
           2        4.39
           4        4.36

     Mean        4.19

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

Table              Treatment
s.e.                   0.237

STRAW MEAN DM% 89.9

PLOT AREA HARVESTED   0.00305
```


https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 12th year, forage maize and s. barley

For previous years see Yield Books for 97-07/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
27-Sep-07	a	Apply maize tops, plots 3, 6, 9, 12, 16, and 18 @ 300 kg/plot	10.00	t/ha
2-Oct-07	f	Muriate of Potash	181.00	kg/ha
	f	Triple Superphosphate	171.00	kg/ha
10-Oct-07	a	Plough/S		
2-Apr-08	a	Combination Drilled		
	s	Optic Tr Raxil Pro	350.00	seeds/m2
8-May-08	f	Double Top	356.00	kg/ha
12-May-08	a	Flexitined maize		
	a	Power harrowed maize		
	a	Nodet drilled maize		
	s	Hudson tr measurol maize	10.20	seeds/m2
13-May-08	a	Rolled barley and maize	1.00	
20-May-08	p	Harmony M SX, barley	100.00	g/200 l/ha
	p	Duplosan KV, barley	1.00	l/200 l/ha
	p	Acanto Prima, barley	1.25	l/200 l/ha
2-Jun-08	p	Decoy Wetex	5.00	kg/ha
5-Jun-08	p	Decoy Wetex, barley and maize	5.00	kg/ha
9-Jun-08	p	Acanto, barley	0.50	l/200 l/ha
	p	Unix, barley	0.50	kg/200 l/ha
16-Jun-08	a	Mow / Rotavate paths		

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/CS/477

			Rate	Unit
24-Jun-08	p	Samson, maize	1.50	l/200 l/ha
29-Jun-08	p	Callisto, maize	1.00	l/200 l/ha
25-Jul-08	a	Rogue wild oats/thistles/weeds		
6-Aug-08	a	Mow / Rotavate paths		
12-Sep-08	a	Combine harvest, plots for yield		
	a	Swath straw		
19-Sep-08	a	Combine harvest		
	a	Swath straw		
23-Sep-08	a	Cut harvest strips, weighed and sampled, maize plots		
	a	Forage harvest maize discards		
29-Sep-08	a	Forage harvest maize discards completed		
	a	Baled		

MAIZE

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

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

```
    Treatment
            M       6.79
         (B)M       8.63
           MT       7.21

         Mean       7.54

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

Table            Treatment
s.e.d.               1.062

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

Stratum                    d.f.          s.e.         cv%

Blocks.Plots                 4         1.301        17.2

MEAN DM%  23.1

PLOT AREA HARVESTED   0.00108
```


https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/R/CS/477

SPRING BARLEY

GRAIN TONNES/HECTARE

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

Treatment	
(M)B	3.75
BT	4.24
B	3.90
Mean	3.96

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

Table	Treatment
s.e.d.	0.263

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

Stratum	d.f.	s.e.	cv%
Blocks.Plots	4	0.322	8.1

GRAIN MEAN DM% 81.2

PLOT AREA HARVESTED 0.00525

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/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 12th year, forage maize and s. barley

For previous years see Yield Books for 97-07/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
26-Sep-07	a	Apply maize tops to MT and BT plots	10.00	t/ha
2-Oct-07	a	Spread maize tops		
	a	Topped		
14-Oct-07	f	Triple Superphosphate	171.00	kg/ha
	f	Muriate of Potash	181.00	kg/ha
22-Oct-07	a	Plough/SW	1.00	
9-Apr-08	a	Power Harrowed	1.00	
	a	Accord Drilled	1.00	
	s	Optic Raxil pro (awaiting seed sheet)	425.00	seeds/m2
	a	Rolled		
14-May-08	a	Power harrowed maize plots		
	a	Nodet drilled maize plots		
	s	Hudson tr measurol maize plots	10.20	seeds/m2
18-May-08	p	Acanto Prima Sp barley plots	1.25	kg/200 l/ha
	p	Harmony M SX Sp barley plots	100.00	g/200 l/ha
	p	Duplosan KV Sp barley plots	1.00	l/200 l/ha
6-Jun-08	p	Samson- maize	1.50	l/200 l/ha
1-Jul-08	p	Callisto maize plots	1.00	l/220 l/ha

https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/CS/478

18-Sep-08	a	Combine harvest plots for yield barley plots
	a	Swath straw barley plots
19-Sep-08	a	Combine harvest discards
	a	Swath straw
21-Sep-08	a	Baled
26-Sep-08	a	Cut harvest strips, weighed and sampled maize plots
2-Oct-08	a	Forage harvest maize discards

MAIZE

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

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

```
    Treatment
            M       7.43
           MT      10.15
         (B)M       6.76

         Mean       8.11

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

Table            Treatment
s.e.d.               0.570


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

Stratum                        d.f.          s.e.         cv%

Blocks.Plots                      4         0.699         8.6

MEAN DM%  29.7

PLOT AREA HARVESTED  0.00108
```


https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

08/W/CS/478

SPRING BARLEY

GRAIN TONNES/HECTARE

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

```
   Treatment
        (M)B        1.88
          BT        2.43
           B        1.85

        Mean        2.05

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

s.e.d.             0.282


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

Stratum                      d.f.          s.e.         cv%

Blocks.Plots                    4         0.345        16.8

GRAIN MEAN DM%  83.2

PLOT AREA HARVESTED   0.00525
```


https://doi.org/10.23637/ERADOC-1-218

This work is licensed under a Creative Commons Attribution 4.0 International License.

Rothamsted Experimental Station

The Weather : Monthly Summary : 2008

(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	73.3	(+18.3)	9.3	(+2.9)	3.5	(+2.6)	4.0	11	6.2	7.5	103.2	(+33.5)	24	76.3	13.8
February	145.5	(+74.8)	9.7	(+3.0)	1.1	(+0.4)	1.7	20	5.2	6.9	21.9	(-26.9)	13	8.5	10.3
March	122.4	(+15.2)	9.3	(-0.2)	2.5	(+0.2)	1.5	15	6.4	7.2	108.5	(+54.6)	22	53.6	13.3
April	160.0	(+13.2)	12.3	(+0.3)	3.8	(+0.1)	4.2	14	8.5	8.0	53.5	(+0.0)	22	8.1	10.1
May	193.2	(-1.7)	18.0	(+2.2)	8.8	(+2.4)	9.3	5	12.8	11.1	87.0	(+37.3)	14	48.7	9.3
June	229.0	(+38.7)	18.8	(+0.2)	10.2	(+1.0)	9.4	1	15.7	13.5	35.3	(-24.9)	13	10.0	8.4
July	194.7	(-8.6)	20.9	(-0.5)	12.2	(+0.9)	11.8	0	16.6	14.8	90.3	(+48.2)	17	38.0	8.2
August	121.2	(-75.6)	20.1	(-1.4)	13.1	(+1.7)	13.3	0	17.0	15.7	107.8	(+54.1)	25	20.6	8.8
September	127.4	(-14.9)	17.1	(-0.9)	9.9	(+0.5)	10.7	1	15.5	15.3	66.2	(+5.2)	18	32.4	7.8
October	139.6	(+27.5)	13.6	(-0.2)	5.3	(-1.3)	7.2	14	11.9	13.3	74.3	(-0.4)	24	27.8	8.8
November	53.9	(-16.2)	9.5	(+0.1)	4.2	(+0.8)	4.7	10	8.5	10.6	91.1	(+24.9)	24	62.4	10.6
December	76.3	(+28.2)	5.9	(-1.3)	0.8	(-1.1)	1.1	21	5.3	7.8	42.0	(-28.1)	15	34.6	9.5
Year	1636.5	(+98.8)	13.7	(+0.4)	6.3	(+0.7)		112			881.1	(+177.5)	231	420.9	

* 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

This work is licensed under a Creative Commons Attribution 4.0 International License.

Woburn Experimental Farm

The Weather : Monthly Summary : 2008

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

	Sunshine		Mean temperatures °C								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	70.0	(+21.50)	9.6	(+2.93)	3.7	(+2.65)	4.2	6	6.5	7.7	83.0	(+27.70)	20	14.4
February	141.2	(+77.20)	9.7	(+2.64)	0.4	(-0.40)	2.1	15	5.1	7.1	23.5	(-17.10)	12	9.1
March	120.1	(-101.30)	9.6	(-9.88)	2.5	(-2.39)	3.0	10	6.5	7.1	93.6	(+44.00)	22	11.6
April	162.1	(+26.30)	16.4	(+4.19)	4.9	(+1.51)	6.2	4	11.4	10.2	47.0	(-5.70)	21	7.9
May	184.7	(+1.60)	18.2	(+2.11)	8.1	(+2.02)	10.0	0	12.0	10.1	95.2	(+42.50)	12	5.1
June	221.0	(+44.10)	19.5	(+0.58)	9.8	(+0.75)	10.6	0	13.9	11.8	40.6	(-18.20)	11	7.3
July	183.8	(-9.80)	21.8	(+0.04)	12.1	(+0.91)	13.4	0	16.2	13.3	39.4	(-6.20)	15	7.4
August	126.6	(-58.00)	20.8	(-0.75)	13.2	(+2.12)	13.8	0	17.4	15.0	106.4	(+51.90)	21	9.8
September	112.5	(-18.70)	17.9	(-0.37)	9.2	(-0.05)	11.5	0	15.4	14.8	66.0	(+7.90)	21	6.9
October	132.9	(+29.10)	14.1	(+0.01)	6.1	(-0.39)	7.3	3	12.0	13.1	58.4	(-6.00)	17	9.7
November	48.9	(-14.50)	9.6	(-0.05)	4.4	(+1.00)	5.0	6	8.8	10.8	70.6	(+13.40)	20	9.4
December	69.0	(+27.40)	6.1	(-1.43)	0.8	(-1.08)	1.7	20	5.5	8.2	24.4	(-35.10)	13	8.5
Year	1572.8	(+145.00)	14.4	(+0.80)	6.3	(+0.76)	88.8	64	10.9	10.8	748.1	(+99.10)	205	107.0

* 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

https://doi.org/10.23637/ERADOC-1-218