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Yields of the Field Experiments 2015

Full Table of Content

Results of the Classical and Other Long-term Experiments 2015

Rothamsted Research

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Results of the

Classical and other

Long-term Experiments

2015

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List of Experiments in the 2015 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

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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 calcium ammonium nitrate or ammonium nitrate.

Anhydrous Sulphate of Soda	
Chalk	
Compost	
Double Top	27% nitrogen and 30% SO_3
FYM	Farmyard manure (from bullocks)
Headland Manganese 500	500 g/l 27.5% w/w manganese carbonate
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% magnesium and 23.3% sulphur
Muriate of potash (MOP)	60% K_2O as Potassium Chloride (KCl)
Nitram	34.5% N
Nitraprill	34.5% N
Nitrate of soda	$NaNO_3$ 16% nitrogen and 27% sodium

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Nitro-Chalk	Calcium Ammonium Nitrate 27% N
Silicate of soda	Na_2SiO_3 37% sodium and 23% silica
Sodium Sulphate	35% Sodium
Sulphate of ammonia	$(NH_4)_2SO_4$ 21% nitrogen 24% sulphur
Sulphate of potash (SOP)	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 Referred to in the Diary Notes

Cultivations			
	Manufacturer	**Width**	**Description**
Plough	Kverneland	1.5 m	5 Furrow, 25 cm Furrows.
Cultipress	Simba	3.3 m	Used after Ploughing.
Flexitine	Bunford	3.3 m	Used for lifting Worked ground.
Powerharrow	Kverneland	3.0 m	Used for creating seed bed.
Rotavator	Howard	1.3 m	Mainly used for BK/1 Paths.
Rotavator	Concept	1.2 m	Mainly Used for HB/2 Paths.
Drills			
	Manufacturer	**Width**	**Description**
Accord Combination Drill	Kverneland	3.0 m	Power-harrow Mounted Pneumatic drill with Suffolk coulters 12.5 cm apart.
Maize Drill	Nodet Pneumasem 2	5 Rows	Rows spaced at 70 cm.
Chemical Applications			
	Manufacturer	**Width**	**Description**
Aero-spreader	Kuhn	12 m	Tractor Mounted - General Fert Applications.

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Muck Spreader	International	1.5 m	Trailed - FYM Applications.
Exacto-matic	Ransome, Nordsten	3.8 m	Tractor Mounted - Fert Applications.
Sprayer	Knight	24 m	Tractor Mounted - Chemical Application.
Quickpass	Yr-Crop	1.5 m	Trailed - Fert Applications.
Lowspread	Lowspread	2.76 m	Tractor Mounted - Fert Applications.
Harvesters			
	Manufacturer	**Width**	**Description**
Rosenlew SR2010	Sampo	(Cut) 2m	Cereal Combine Harvester with a Continuous Weighing System.
3760	John Deere	2 Row	Maize Harvester, Cut and Mulch. Trailed Machine used after plot yields.
Tucano	Claas	6 m	Commercial Combine used for harvesting discards after plot yields.
Box Mower	Wilder	1.1 m	Box Mower Mainly used for yields on PG/5.
Mower	Unifarm	1.83 m	Commercial Mower used to mow discards on PG/5.
Other			
	Manufacturer	**Width**	**Description**
Ring Rolls	Cousins	3.3 m	Ring rolls for covering seed post drilling.
Topper 9	McConnell	2.72 m	Topper used for topping stubbles and grass areas.
Small Topper	Kilworth	1.1 m	Topper used with Iseki Tractor - Used for cutting Paths.
945 Conventional Baler	New Holland	-	Traditional Baler Used for baling straw samples.
Round Baler	Claas	-	Used for clearing unwanted leftover straw/grass from experiments.
Tractors			
	Manufacturer	**Weight**	**Description**
T7210	New Holland	8.1 t	Main cultivations tractor.
TL6030 Elite	New Holland	5.5 t	Sprayer tractor.
6830	John Deere	5.6 t	Drill and fertiliser application tractor.
TH4335	Iseki	1.1 t	Paths cutting tractor.

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T503	Tym	2.0 t	Fertiliser applications and Rotovating.

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 DM%: 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.

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
Adigor	ad	47% w/w methylated rapeseed oil
Absolute	h	diflufenican + flupyrsulfuron-methyl (41.7:8.3% w/w)
Ally Max SX	h	metsulfuron-methyl + tribenuron-methyl (14.3:14.3 % w/w)
Anthem	h	pendimethalin (400 g/l)
Artemis	f	fenpropidin + prochloraz + tebuconazole (150:200:150 g/l)
Axial	h	pinoxaden (100 g/l)
Balear 720	f	chlorothalonil (720 g/l)
BASF 3C	gr	Chloremquat (750 g/l)
Bassoon EC	f	epoxiconazole (83 g/l)
Beret Multi	f	fludioxonil + flutriafol (25:25 g/l)
BioPower	ad	6.7% w/w 3,6-dioxaeicosylsulphate sodium salt and 20.2% w/w 3,6-dioxaoctadecylsulphate sodium salt.
Bravo 500	f	chlorothalonil (500 g/l)
Broadway star	h	florasulam + pyroxsulam (1.42:7.08% w/w)
Callisto	h	mesotrione (100 g/l)
Capalo	f	epoxiconazole + fenpropimorph + metrafenone (62.5:200:75 g/l)
Cello	f	prothioconazole + spiroxamine + tebuconazole (100:250:100 g/l)

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Cherokee	f	chlorothalonil + cyproconazole + propiconazole (375:50:62.5 g/l)
Chex	ad	pH buffer and anti-foam
Cogent	ad	32.67% w/w alkoxylated alcohols and 1.0% w/w trisiloxane organosilicone copolymers
Compitox plus	h	mecoprop-P (600 g/l)
Crawler	h	carbetamide (60 % w/w)
Crescent	h	fluroxypyr (200 g/l)
Crystal	h	flufenacet + pendimethalin (60:300 g/l)
Envoy	f	epoxiconazole + pyraclostrobin (62.5:85 g/l)
Firebrand	ad	ammonium sulphate (500 g/l)
Folicur	f	tebuconazole (250g/l)
Foundation	h	dicamba + mecoprop-P (84:600 g/l)
Gemstone	f	epoxiconazole + pyraclostrobin (62.5:80 g/l)
Hallmark + zeon tech	i	lambda-cyhalothrin (100 g/l)
Jenton	f	fenpropimorph + pyraclostrobin (375:100 g/l)
Kingdom	f	boscalid + epoxiconazole (140:50 g/l)
Kinto	f	prochloraz + triticonazole (60:20 g/l)
Liberator	h	diflufenican + flufenacet (100:400 g/l)
Linzone	h	clomazone + linuron (45:250g/l)
Mesurol	i	methiocarb (500g/l)
Mobius	f	prothioconazole + trifloxystrobin (175:150 g/l)
Moddus	gr	trinexapac-ethyl (250 g/l)
Movon	h	diflufenican + flufenacet + flurtamone (90:240:120 g/l)
Pacifica	h	iodosulfuron-methyl-sodium + mesosulfuron-methyl (1.0:3.0% w/w)
Pixie	h	mecoprop-p + diflufenican (500:33.3 g/l)
Proline	f	prothioconazole (275 g/l)
Redigo	f	prothioconazole (100 g/l)
Redigo Deter	f	prothioconazole + clothiandin (50:250 g/l)
Refine Max	h	metsulfuron-methyl + thifensulfuron-methyl (6.7:33.3 w/w)
Samson Extra	h	nicosulfuron (60 g/l)
Samurai	h	glyphosate (360 g/l)
San 703	f	chlorothalonil + cyproconazole (375:40 g/l)
Sienna	h	pendimethalin + picolinafen (300:7.5 g/l)
Simba SX	h	metsulfuron-methyl (20 % w/w)
Sprinter-K	f	K20, 30% w/w (44,4% w/v)
Stomp aqua	h	pendimethalin (455 g/l)
TDS Major	m	metaldehyde (4% w/w)
Troy 480	h	bentazone (480 g/l)
Weedazole-TL	h	amitrole (225 g/l)

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15/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 172nd 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 74-14/R/BK/1.

Areas harvested[a]:

	Section	
Wheat:	0	0.00320
	1	0.00589
	2,3,7 and 6	0.00487
	9	0.00512
Oats:	5	0.00487
Maize:	4	0.00162

[a] Harvest areas in the 2007-2010 yield books were incorrectly assigned, but yields were correct.

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

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15/R/BK/1

(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 since 2001), to be reviewed in 2015/16.
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 since 2001), to be reviewed in 2015/16
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

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+ 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
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

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Section	1	9	0*	8+	6**	5	3	7	4	2
Year										
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
2009	W	W	W	W	W	W	W	M	O	W
2010	W	W	W	W	W	O	W	W	M	W
2011	W	W	W	W	W	M	O	W	W	W
2012	W	W	W	W	W	W	M	W	W	O
2013	W	W	W	W	W	W	W	O	W	M
2014	W	W	W	W	W	W	W	M	O	W
2015[++]	W	W	W	F	W	O	W	W	M	W

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.
[++] Spring Wheat in 2015

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 (omitted). No chalk was applied after autumn 1991 until autumn 2007 when differential amounts were applied to selected plots (see "Results 2008").

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

(4) In 2013 the wheat variety changed from Hereward to Crusoe, but it was sown very late (22nd February 2013) because of the very wet autumn and winter of 2012-13.

(5) Spring wheat (var Mulika) and winter oats (var Gerald) were sown in March 2015, instead of in autumn/winter 2014, because the very wet soil conditions in autumn 2014 prevented sowing of a winter crop. The whole site was spring-tine cultivated in March 2015 instead of being ploughed. Section 8 was left in bare fallow and had two in-season cultivations (inversion ploughing) to control weeds.

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15/R/BK/1

Experimental Diary:

Date		Application	Rate	Units
All Sections				
05-Sep-14	p	Sprayed Weedazol to sections 1, 2, 3, 4, 5, 6 + 9 only	20	l/ha
02-Oct-14	f	Applied TSP - strips 11, 13, 14, 17 + 18 all sections	171	kg/ha
02-Oct-14	f	Applied MOP Fertiliser - strip 14, all sections	181	kg/ha
03-Oct-14	f	Applied FYM to plots 2.20-2.29 and 2.10-2.19 - Not Section 5	35	t/ha
06-Nov-14	p	Sprayed Firebrand - strips 2.20 + 2.10 only	1	l/ha
06-Nov-14	p	Sprayed Samurai - strips 2.20 + 2.10 only	3	l/ha
05-Mar-15	p	Sprayed Samurai - not section 8	2.5	l/ha
05-Mar-15	p	Sprayed Firebrand - not section 8	1	l/ha
06-Mar-15	a	Spring-tine Cultivated all site		
16-Apr-15	f	Applied Kieserite Fertiliser - to strips 5, 6, 7, 8, 9, 11, 12, 15, 16, 17, 18, 19 + 20, all sections	80	kg/ha
16-Apr-15	f	Applied SOP - to strips 5, 6, 7, 8, 9, 12, 13, 15, 16, 17, 18, 19 + 20, all sections	217	kg/ha
13-May-15	p	Sprayed BASF Chloremquat 750 - all sections - not sections 4, 6 or 8	2	l/ha
13-May-15	p	Sprayed Kingdom - all sections - not sections 4, 6 or 8	1.5	l/ha
13-May-15	p	Sprayed Foundation - all sections - not sections 4, 6 or 8	1.25	l/ha
13-May-15	a	Topped commercial Grass	-	-
01-Jun-15	a	topping all grass	-	-
11-Jun-15	a	Cut Paths across plots.	-	-
12-Jun-15	a	Rotavated Strip Paths	-	-
15-Jun-15	a	Rotavating paths and fallows around trials	-	-
16-Jun-15	a	Rotavated Paths up strip paths only	-	-
16-Jul-15	a	Pulled 91 wild oats from plots and surrounds	-	-
28-Jul-15	a	Cut cross paths	-	-
13-Aug-15	a	Cut Cross Paths	-	-
S Wheat				
09/03/2015	s	Drilled all wheat plots with Spring Wheat var. Mulika trt Redigo - Sections 0, 1, 2, 3, 6, 7, + 9 only	350	seeds/m^2
09/03/2015	a	Rolled all new drilling on site		
09/04/2015	f	applied Nitram @ 35%N - To strips 12, 17, 18, 19 but not in sections in 4, 5 or 8	139	kg/ha
17/04/2015	f	Applied Nitram @ 34.5%N - To strips 6 and 19 - not sections in 4, 5 or 8	139	kg/ha
17/04/2015	f	Applied Nitram @ 34.5%N - To strips 7 and 18 - not sections in 4, 5 or 8	278	kg/ha
17/04/2015	f	Applied Nitram @ 34.5%N - To strips 8 and 12 - not sections in 4, 5 or 8	417	kg/ha

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17/04/2015	f	Applied Nitram @ 34.5%N - To strips 1, 9, 10, 11, 13, 14, 17, 20 - not sections in 4, 5 or 8	556	kg/ha
17/04/2015	f	Applied Nitram @ 34.5%N - To strip 15 - not sections in 4, 5 or 8	696	kg/ha
17/04/2015	f	Applied Nitram @ 34.5%N - To strip 16 - not sections in 4, 5 or 8	835	kg/ha
08/05/2015	f	Applied Nitram @34.5%N - strips 12, 17, 18 + 19 - not sections 4, 5 or 8	139	kg/ha
13/05/2015	p	Sprayed BASF Chloremquat 750 - section 6 only	2	l/ha
13/05/2015	p	Sprayed Foundation - section 6 only	1.25	l/ha
13/05/2015	p	Sprayed BASF Chloromquat 750 - sections 0, 1, 2, 3, 5, 7 + 9	2	l/ha
13/05/2015	p	Sprayed Kingdom - sections 0, 1, 2, 3, 5, 7 + 9	1.25	l/ha
13/05/2015	p	Sprayed Foundation - sections 0, 1, 2, 3, 5, 7 + 9	1.25	l/ha
13/05/2015	p	Sprayed BASF Chlormequat 750 - section 6 only	2	l/ha
13/05/2015	p	Sprayed Foundation - section 6 only	1.25	l/ha
21/05/2015	p	Sprayed BASF 3C Chlormequat 750 - Western End of plot 109	2	l/ha
21/05/2015	p	Sprayed Kingdom - Western End of plot 109	1.5	l/ha
16/06/2015	p	Sprayed Ally Max - sections, 0, 1, 2, 3, 5, 7 + 9	30	gms/ha
16/06/2015	p	Sprayed Capalo - sections, 0, 1, 2, 3, 5, 7 + 9	1	l/ha
16/06/2015	p	Sprayed Gemstone - sections, 0, 1, 2, 3, 5, 7 + 9	120	ml/ha
16/06/2015	p	Sprayed Jenton - sections, 0, 1, 2, 3, 5, 7 + 9	100	ml/ha
16/06/2015	p	Sprayed Ally Max - section 6 only	30	gms/ha
07/09/2015	a	Harvested All Commercial WW	-	-
09/09/2015	a	Removed Bales from commercial area	-	-
17/09/2015	a	removed round bales from field	-	-
26/09/2015	a	Harvested all WW Plots	-	-
26/09/2015	a	Sampled Baled and Weighed and removed	-	-
26/09/2015	a	Harvested ALL left over Wheat - Swathed all straw to be removed, only Section 0 Chopped Straw onto plots	-	-
28/09/2015	a	Baled and removed all straw swaths	-	-

S Oats

09/03/2015	s	Combination Drilled Winter Oats var. Gerald trt Beret Multi - Section 5 only	350	seeds/m^2
09/03/2015	a	Rolled all new drilling on site	-	-
25/09/2015	a	Harvested all Oat plots	-	-

Maize

14/04/2015	a	Powerharrow Cultivated - Section 4 only		
15/04/2015	s	Drilled Maize var. Severus trt measural - Section 4 only	10.2	seeds/m^2
08/05/2015	f	Applied Nitram @ 34.5%N - To strips 6 and 19 - section 4 only	139	kg/ha
08/05/2015	f	Applied Nitram @ 34.5%N - To strips 7 and 18 - section 4 only	278	kg/ha
08/05/2015	f	Applied Nitram @ 34.5%N - To strips 8 and 12 - section 4 only	417	kg/ha
08/05/2015	f	Applied Nitram @ 34.5%N - To strips 1, 9, 10, 11, 13, 14, 17, 20 - section 4 only	556	kg/ha

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08/05/2015	f	Applied Nitram @ 34.5%N - To strip 15 - section 4 only	696	kg/ha
08/05/2015	f	Applied Nitram @ 34.5%N - To strip 16 - section 4 only	835	kg/ha
22/05/2015	f	Applied Nitram @ 34.5%N - plot 194	139	kg/ha
22/05/2015	f	Applied Nitram @ 34.5%N - plot 184	278	kg/ha
22/05/2015	f	Applied Nitram @ 34.5%N - plot 174	556	kg/ha
22/05/2015	f	Applied Nitram @ 34.5%N - plot 124	417	kg/ha
17/06/2015	a	Sprayed Samson Extra - section 4 only	500	ml/ha
17/06/2015	a	Sprayed Samson Callisto - section 4 only	750	ml/ha
21/09/2015	a	Harvested all Maize Plots for yield by Hand	-	-
29/09/2015	a	Harvested all maize and removed	-	-
29/09/2015	a	removed bales from field - all bales	-	-
30-Sep-14	a	Harvested and removed all leftover Maize - from maize plots only.	-	-

Fallows

21/04/2015	a	Powerharrow Cultivated - Section 8 only
13/05/2015	a	Ploughed - section 8 only (thrown northwards)
17/06/2015	a	Rotavated all Fallows
10/07/2015	a	Ploughed - section 8 only (thrown southwards)
31/07/2015	a	Powerharrowed - section 8 only

Wilderness

19/03/2015	a	Cut back field edge side of south block to make room for tractors on Broadbalk
13/05/2015	a	Topped commercial Grass
28/05/2015	a	Cut middle grass section
26/06/2015	a	topped all short grass
27/07/2015	a	Tidied fallen tree all cuttings placed back into section.
25/08/2015	a	Cut centre plot
21/12/2015	a	Topped All

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

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15/R/BK/1

WHEAT

GRAIN TONNES/HECTARE

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

SECTION PLOT	7/W1	2/W2	3/W3	6/W38	0/W11	1/W49	9/W57	Mean
01(FYM)N4	7.41	8.02	7.94	6.39	*	*	*	7.44
21FYMN3	8.14	8.15	7.71	6.95	6.10	6.75	5.48	7.04
22FYM	6.59	7.30	6.89	7.46	4.86	6.55	6.19	6.55
03Nil	1.76	0.92	0.93	1.60	1.27	1.45	0.97	1.27
05(P)KMg	1.23	1.00	1.13	1.73	1.34	1.58	1.35	1.34
06N1(P)KMg	3.37	3.25	3.05	3.30	3.07	3.47	3.30	3.26
07N2(P)KMg	5.40	4.96	4.62	4.95	4.67	5.08	4.62	4.90
08N3(P)KMg	6.97	6.59	6.05	6.37	5.26	6.05	5.46	6.11
09N4(P)KMg	7.46	6.59	6.42	7.32	5.70	6.34	6.38	6.60
10N4	5.44	4.61	3.91	3.34	2.84	4.11	2.62	3.84
11N4PMg	4.86	4.99	3.74	4.59	5.53	4.90	3.48	4.59
12N1+3+1(P)KMg	7.77	7.58	7.42	7.23	6.22	6.59	6.20	7.00
13N4PK	7.36	6.94	6.36	7.14	5.47	5.41	5.46	6.30
14N4PK*(Mg*)	7.87	6.88	7.07	7.79	6.16	7.01	5.85	6.95
15N5(P)KMg	7.75	6.87	6.42	6.66	5.50	5.81	4.65	6.24
16N6(P)KMg	7.31	7.17	7.14	7.55	6.27	5.45	5.61	6.64
17N1+4+1PKMg	7.71	7.53	7.26	7.78	6.10	6.63	6.11	7.02
18N1+2+1PKMg	7.94	7.37	6.56	7.41	6.62	6.79	5.05	6.82
19N1+1+1KMg	7.47	6.07	5.21	6.10	5.90	5.91	4.90	5.94
20N4KMg	*	*	*	*	2.93	1.24	*	2.08
Mean	6.31	5.94	5.57	5.88	4.83	5.11	4.65	5.48

GRAIN MEAN DM% 83.0

STRAW TONNES/HECTARE

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

SECTION PLOT	7/W1	2/W2	3/W3	6/W38	0/W11	1/W49	9/W57	Mean
01(FYM)N4	3.66	*	*	*	*	*	*	3.66
21FYMN3	4.73	*	*	*	*	4.22	*	4.48
22FYM	3.47	*	*	*	*	3.11	*	3.29
03Nil	0.47	*	*	*	*	0.69	*	0.58
05(P)KMg	0.11	*	*	*	*	0.60	*	0.36
06N1(P)KMg	1.25	*	*	*	*	1.56	*	1.41
07N2(P)KMg	2.09	*	*	*	*	2.50	*	2.29
08N3(P)KMg	3.09	*	*	*	*	3.33	*	3.21
09N4(P)KMg	3.81	*	*	*	*	3.53	*	3.67
10N4	1.64	*	*	*	*	1.38	*	1.51
11N4PMg	1.60	*	*	*	*	1.82	*	1.71
12N1+3+1(P)KMg	3.97	*	*	*	*	3.40	*	3.68
13N4PK	3.61	*	*	*	*	3.36	*	3.48
14N4PK*(Mg*)	3.70	*	*	*	*	2.91	*	3.31
15N5(P)KMg	3.82	*	*	*	*	2.76	*	3.29
16N6(P)KMg	3.45	*	*	*	*	2.93	*	3.19
17N1+4+1PKMg	3.84	*	*	*	*	3.29	*	3.56
18N1+2+1PKMg	4.37	*	*	*	*	3.67	*	4.02
19N1+1+1KMg	3.16	*	*	*	*	2.70	*	2.93
20N4KMg	*	*	*	*	*	0.54	*	0.54
Mean	2.94	*	*	*	*	2.54	*	2.74

STRAW MEAN DM% 88.1

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15/R/BK/1

OATS

TONNES/HECTARE (85% DM)

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

Plot	Treatment	GRAIN	STRAW
15	01(FYM)[N4]	5.74	3.27
215	21[FYMN3]	7.55	4.03
225	22[FYM]	7.82	3.98
35	03Nil	2.20	1.09
55	05(P)KMg	2.38	1.22
65	06[N1](P)KMg	2.76	1.10
75	07[N2](P)KMg	2.40	1.17
85	08[N3](P)KMg	3.03	1.32
95	09[N4](P)KMg	3.61	1.89
105	10[N4]	4.10	2.15
115	11[N4]PMg	3.98	2.02
125	12[N1+3+1](P)KMg	4.29	1.77
135	13[N4]PK	4.03	1.83
145	14[N4]PK*(Mg*)	4.75	1.78
155	15[N5](P)KMg	4.77	2.10
165	16[N6](P)KMg	5.27	2.38
175	17[N1+4+1]PKMg	4.70	2.53
185	18[N1+2+1]PKMg	3.82	1.82
195	19[N1+1+1]KMg	3.56	1.71
	MEAN	4.25	2.06

PLOT AREA HARVESTED 0.00487

MAIZE

TONNES/HECTARE (100% DM)

ERRATUM
see 2016 page16 (supplied)

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

Plot	Treatment	Whole Crop
14	01(FYM)N4	16.69
214	21FYMN3	19.38
224	22FYM	14.14
34	03Nil	3.06
54	05(P)KMg	4.73
64	06N1(P)KMg	8.31
74	07N2(P)KMg	10.36
84	08N3(P)KMg	12.66
94	09N4(P)KMg	11.80
104	10N4	3.31
114	11N4PMg	9.00
124	12N2+3(P)KMg	17.08
134	13N4PK	17.49
144	14N4PK*(Mg*)	16.88
154	15N5(P)KMg	15.34
164	16N6(P)KMg	16.54
174	17N2+4PKMg	14.41
184	18N2+2PKMg	13.93
194	19N2+1KMg	5.95
	MEAN	12.16

PLOT AREA HARVESTED 0.00162

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Maize Yields (100% DM) shown in previous yield books (2009-2015) were found to be in error because an increase in the crop row spacing from 0.6m to 0.7m was not accounted for.
The corrected yields are given below:

Year	***2009***	***2010***	***2011***	***2012***	***2013***	***2014***	***2015***
Treatment/ Section	***7***	***4***	***5***	***3***	***2***	***7***	***4***
01(FYM)N4	11.81	14.37	8.67	14.32	3.51	13.30	14.31
21FYMN3	13.84	15.32	9.26	18.24	6.65	15.46	16.61
22FYM	12.37	12.78	11.95	11.21	8.75	15.87	12.12
03Nil	0.58	1.73	1.49	1.65	1.34	1.45	2.63
05(P)KMg	5.20	3.82	2.86	3.56	3.32	4.25	4.05
06N1(P)KMg	7.12	6.82	5.05	5.75	5.90	7.77	7.13
07N2(P)KMg	8.51	9.67	7.90	8.85	4.48	9.87	8.88
08N3(P)KMg	8.25	10.15	5.27	10.85	6.14	8.57	10.85
09N4(P)KMg	8.34	10.10	5.83	10.16	4.52	8.96	10.12
10N4	0.94	2.15	1.09	0.96	2.07	2.79	2.83
11N4PMg	5.19	6.97	3.88	5.44	4.36	4.36	7.71
12N2+3(P)KMg	8.55	12.42	7.32	9.33	6.52	11.11	14.64
13N4PK	8.89	11.21	7.20	10.72	8.80	9.58	15.00
14N4PK*(Mg*)	8.76	11.69	7.01	9.82	9.52	11.33	14.47
15N5(P)KMg	7.82	12.19	5.63	9.94	7.03	10.06	13.15
16N6(P)KMg	7.40	10.93	4.33	9.13	6.57	8.59	14.18
17N2+4PKMg	8.18	10.52	5.19	9.13	3.46	8.99	12.35
18N2+2PKMg	8.45	9.85	5.88	11.46	5.95	8.98	11.94
19N2+1KMg	3.49	4.28	2.56	5.43	3.10	4.53	5.10
Mean	7.56	9.31	5.70	8.73	5.37	8.73	10.42
Mean DM%	20.90	29.50	18.80	25.90	25.10	29.80	23.20
Plot Area Harvested	0.00189						

Note: In 2013 herbicide was applied accidentally to maize. Consequently, the maize yields given above for 2013 are unreliable.

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15/R/BK/1

SECTION 8: CLEAN GRAIN (2-3.5mm), TONNES/HA AFTER REMOVING WEED SEEDS.

YEAR	2012	2013	2014
SECTION	8/W4	8/W5	8/W6
PLOT			
2.1 FYMN3	0.63	3.28	2.85
2.2 FYM	0.59	2.71	1.76
03 Nil	0.71	1.53	0.87
05 (P)KMg	0.46	2.42	0.84
06 N1(P)KMg	0.52	3.29	0.83
07 N2(P)KMg	1.08	3.44	0.81
08 N3(P)KMg	1.28	3.40	0.71
09 N4(P)KMg	1.46	3.14	0.65
10 N4	0.46	1.33	1.42
11 N4PMg	0.43	2.27	1.48
12 N1+3+1(P)K2Mg2	0.85	3.38	1.57
13 N4PK	1.43	1.72	1.37
14 N4PK*(Mg*)	1.02	2.36	3.10
15 N5(P)KMg	0.63	4.40	1.22
16 N6(P)KMg	0.34	3.50	2.41
17 N1+4+1PKMg	0.63	4.40	0.85
18 N1+2+1PKMg	0.70	3.14	1.91
19 N1+1+1KMg	1.10	1.03	0.72

Note: Clean grain yields reported here for 2012 & 2013 are about 5% less than those reported in the 2013 yield book because they exclude small (<2mm) grains. In future, all clean grain yields for section 8 will be reported for the 2-3.5mm grain size fraction, excluding grain <2mm, as was the practice prior to 2012. No yields are reported in 2015 because Section 8 was left in bare fallow to control weeds.

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15/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 on parts of the experiment. The rotation was discontinued in 1979 and the whole experiment reverted to continuous 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 164th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and Yield Books for 74-14/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 2017
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 2017

D1852: Farmyard manure at 35t since 1852

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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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15/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 was reviewed for 2015.

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 all of the P test plots reverted to K dressings of 90 kg K/ha/year.

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15/R/HB/2

Experimental Diary

Date		Application	Rate	Units
10/11/2014	p	Sprayed Samurai - total kill, volunteers and weeds	3.0	l/ha
10/11/2014	p	Sprayed Fire Brand -total kill, volunteers and weeds	1.0	l/ha
25/11/2014	f	Applied Kieserite onto plots 631, 632, 633 + 634	233.0	kg/ha
25/11/2014	f	Applied TSP onto plots 631, 632, 633 + 634	215.0	kg/ha
09/12/2014	f	Applied SOP onto all series C, strip 5 and plots 311 - 334 411 - 434 631 - 634	217.0	kg/ha
16/12/2014	f	Applied silicate of soda onto plots 432 - 132 and 433 - 133	450.0	kg/ha
16/12/2014	f	Applied FYM onto plots 734 - 731 + 724 - 721	35.0	t/ha
18/12/2014	a	Ploughed (thrown North)	-	-
05/03/2015	a	Spring tyned all ground	-	-
05/03/2015	p	Sprayed Samurai	2.5	l/ha
05/03/2015	p	Sprayed Fire Brand	1.0	l/ha
06/03/2015	s	Drilled Tipple Barley	350.0	seeds/m^2
06/03/2015	a	Rolled All Site	-	-
12/05/2015	a	Rotavated paths	-	-
13/05/2015	f	Applied N treatments (34.5%N) to Old Series 5, Series C and Series AA plots (except plots 6 and 7)	144.0	kg/ha
13/05/2015	f	Applied Nitrochalk (27% N) by hand to plots 112,123,212,23,314,324,414,422,613,624,634,711,722,731	0	kg/ha
13/05/2015	f	Applied Nitrochalk (27% N) by hand to plots 114,122,213,224,312,323,411,424,612,622,632,714,723,733	48.0	kg/ha
13/05/2015	f	Applied Nitrochalk (27% N) by hand to plots 111,121,214,221,311,322,413,423,614,623,633,713,724,734	96.0	kg/ha
13/05/2015	f	Applied Nitrochalk (27% N) by hand to plots 113,124,211,222,313,321,412,421,611,621,631,712,721,732	144.0	kg/ha
13/05/2015	p	Sprayed Kingdom onto Barley	1.5	l/ha
13/05/2015	p	Sprayed Bravo 500 onto Barley	1.25	l/ha
03/06/2015	a	Rotavated paths	-	-
15/06/2015	p	Sprayed Kingdom onto Barley only	1.25	l/ha
17/06/2015	a	Rotavated all paths	-	-
19/06/2015	p	Sprayed Axial onto Barley	460.0	ml/ha
19/06/2015	p	Sprayed Adigor onto Barley	460.0	ml/ha
22/07/2015	a	pulled 2 wild oats from plots and surrounds	-	-
02/09/2015	a	Harvested commercial OEs	-	-
07/09/2015	a	Harvested All Barley Plots for Grain Yield	-	-
08/09/2015	a	Baled all swath on field	-	-
09/09/2015	a	Removed Bales from commercial area	-	-
09/09/2015	a	Sampled Baled and Weighed all Plots	-	-
17/09/2015	a	removed round bales from field		

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15/R/HB/2

MAIN PLOTS

Grain tonnes/hectare

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

N	0	48	96	144	Mean
MANURE					
---	1.42	2.27	2.91	2.61	2.30
-P-	1.32	2.35	2.84	4.42	2.73
--K	0.80	1.54	2.40	1.81	1.64
-PK	1.15	2.62	3.83	4.27	2.97
A--	1.14	1.99	2.22	2.50	1.96
AP-	1.64	3.06	3.02	3.42	2.78
A-K	0.98	1.79	2.25	2.31	1.83
APK	1.25	2.86	4.58	4.65	3.33
FYM1852onwards	7.35	8.33	8.06	8.02	7.94
FYM1852-1871	1.02	3.54	2.94	2.83	2.58
(A)	1.47	1.78	2.45	2.40	2.02
-	0.61	1.45	2.00	1.80	1.46
FYM2001onwards	4.98	6.21	6.30	6.43	5.98
P2K	1.12	3.35	4.20	5.81	3.62
Mean	1.87	3.08	3.57	3.80	3.08

Grain Mean DM% 83.7

Straw tonnes/hectare

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

N	0	48	96	144	Mean
MANURE					
---	0.44	0.89	1.02	0.84	0.80
-P-	0.25	0.71	1.03	1.43	0.85
--K	0.09	0.51	0.86	0.77	0.56
-PK	0.13	1.03	1.52	1.76	1.11
A--	0.32	0.60	0.80	0.71	0.61
AP-	0.47	0.94	1.03	1.15	0.90
A-K	0.10	0.56	0.79	0.88	0.59
APK	0.32	0.95	1.97	1.92	1.29
FYM1852onwards	2.74	3.26	3.26	3.50	3.19
FYM1852-1871	0.28	1.09	0.92	1.05	0.83
(A)	0.17	0.53	0.71	0.48	0.47
-	0.11	0.46	0.57	0.56	0.43
FYM2001onwards	1.59	2.15	2.57	3.02	2.33
P2K	0.14	0.96	1.41	2.03	1.13
Mean	0.51	1.05	1.32	1.44	1.08

Straw Mean DM% 84.6

Plot area harvested 0.0192, 0.00256

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15/R/HB/2

PHOSPHATE PLOTS

Grain tonnes/hectare

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

PLOTS	
142	2.83
143	2.86
144	1.99
242	5.47
243	5.64
244	4.98
341	2.94
342	3.16
343	3.68
344	4.22
441	5.38
442	5.79
443	5.78
444	5.44
551	5.03
552	4.67
561	5.01
562	4.82
571	2.41
572	2.86
581	0.80
582	0.97
Mean	3.94

Grain Mean DM% 85.0

Plot area harvested 0.00256

SILICATE PLOTS

Grain tonnes/hectare

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

PK Silicate	N3--	N3P-	N3-K	N3PK	Mean
(-)-	2.42	3.55	1.80	5.85	3.40
(Si)-	2.03	3.56	3.25	5.69	3.64
(-)Si	2.90	3.25	3.25	6.09	3.87
(Si)Si	2.84	2.96	3.85	6.30	3.99
Mean	2.55	3.33	3.04	5.98	3.72

Grain Mean DM% 84.8

Plot area harvested 0.00256

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15/R/WF/3

WHEAT AND FALLOW

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

The 160th and final year, w. wheat.
For previous years see 'Details' 1967, 1973 and Yield Books for 74-14/R/WF/3.

Whole plot dimensions: 9 x 211

Treatments:
Two plots, one sown to w. wheat, one fallow; alternating in successive years. From 2016 this experiment will be converted to continuous wheat on both plots, with no yields or samples taken at harvest.

Experimental Diary

Date		Application	Rate	Units
08/10/2014	a	Ploughed (thrown North)	-	-
28/10/2014	a	Drilled WW Crusoe dr Redgio	350	seeds/m2
10/11/2014	p	Sprayed Crystal	4	lt/ha
04/12/2014	p	Sprayed Hallmark	50	lt/ha
05/04/2015	p	Sprayed Artemis	1	lt/ha
05/04/2015	p	Sprayed Bravo 500	1	lt/ha
05/04/2015	p	Sprayed Chlormequat 750	1.25	lt/ha
05/04/2015	p	Sprayed Moddus	150	ml/ha
20/04/2015	a	Powerharrowed Fallow	-	-
27/04/2015	p	Sprayed Kingdom	1.25	lt/ha
27/04/2015	p	Sprayed Balear720	700	ml/ha
11/05/2015	a	Powerharrowed all fallow ground	-	-
27/05/2015	p	Sprayed Ally Max	30	gm/ha
27/05/2015	p	Sprayed Bassoon	750	ml/ha
27/05/2015	p	Sprayed Gemstone	1	lt/ha
27/05/2015	p	Sprayed Bravo500	-	-
15/06/2015	p	Sprayed Proline onto WW	500	ml/ha
16/06/2015	a	Rotavated Fallows	-	-
13/09/2015	a	Harvested All Plots for Grain Yield	-	-
13/09/2015	a	Sampled Baled and Weighed	-	-
17/09/2015	a	removed round bales from field	-	-

Grain and straw tonnes/hectare

	Grain	Straw
Yield	2.19	0.86
DM%	83.9	87.6

Plot area harvested 0.04431

Note: Unground grain and straw was archived.

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15/R/EX/4

EXHAUSTION LAND

Object: To study the residual effects of manures applied 1856 - 1901, and of additional phosphate applied since 1986 (P test) and of additional potassium since 2007 (K test); on the yield of continuous s. barley up to 1991, w. wheat since – Hoosfield.

The 160th year, w. wheat.

For previous years see 'Details' 1977, 1973 and Yield Books for 74-14/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. In 2009 maintenance P applications were changed from 20 kg P/ha to 15 kg P/ha. This was not recorded in the yield books for 2009-13. (P1) (P2) and (P3) are residues of P applied annually 1986–1992:

	2009-Present	2000-08	1986-92
O	None	None	None
P (P1)	15 kg P	20 kg P	44 kg P
P (P2)	15 kg P	20 kg P	87 kg P
P (P3)	15 kg P	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

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

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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

Date		Application	Rate	Units
02/10/2014	f	Applied TSP	75	kg/ha
02/10/2014	f	Applied MOP onto plots 103 83 63 43 + 23	125	kg/ha
02/10/2014	f	Applied MOP onto plots 104-24, 91-11, 92-12, 93-13, 94-14.	250	kg/ha
08/10/2014	a	Ploughed ground (thrown North)	-	-
28/10/2014	s	Drilled Crusoe trt Redigo Deter	400	seeds/m^2
01/11/2014	a	Ring rolled all new drilling	-	-
10/11/2014	p	Sprayed Crystal	4	l/ha
04/12/2014	p	Sprayed Hallmark	50	ml/ha
23/03/2015	f	Applied Ammonia Sulphate (21%N) onto plots	238	kg/ha
05/04/2015	p	Sprayed Artemis	1	l/ha
05/04/2015	p	Sprayed Bravo 500	1	l/ha
05/04/2015	p	Sprayed Chlormequat 750	1.25	l/ha
05/04/2015	p	Sprayed Moddus	150	ml/ha
09/04/2015	f	Applied Nitram fertiliser (34.5%N) to Winter Wheat Plots	580	kg/ha
16/04/2015	f	Applied Kieserite to Winter Wheat Plots	80	kg/ha
27/04/2015	p	Sprayed Kingdom	1.25	l/ha
27/04/2015	p	Sprayed Balear720	700	ml/ha
30/04/2015	f	Applied Nitram fertiliser (34.5%N) to Winter Wheat Plots	145	kg/ha
27/05/2015	p	Sprayed Ally Max	30	gm/ha
27/05/2015	p	Sprayed Bassoon	750	ml/ha
27/05/2015	p	Sprayed Gemstone	1	l/ha
27/05/2015	p	Sprayed Bravo500	1	l/ha
15/06/2015	p	Sprayed Proline onto WW	500	ml/ha
06/08/2015	a	Topped Paths	-	-
07/09/2015	a	Harvested All Commercial WW; Swathed Straw	-	-
13/09/2015	a	Harvested All Plots for Grain Yield	-	-
13/09/2015	a	Sampled Baled and Weighed	-	-
17/09/2015	a	removed round bales from field	-	-

Note: Samples of grain and straw were taken for chemical analysis. The yield strips on plots 031, 034, 071, 074, 091 & 094 were made smaller this year to avoid areas where the crop had already been sampled by S. McGrath et al.

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15/R/EX/4

P TEST

Grain tonnes/hectare

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

P_RES	O	P1	P2	P3	Mean
OLD_RES					
O	3.56	8.59	8.38	8.18	7.18
D	5.58	9.77	9.80	9.62	8.69
N	3.08	7.98	8.95	8.98	7.25
P	*7.31	*12.03	*10.62	*10.85	*10.20
NPKNAMG	5.15	9.37	10.07	10.86	8.86
Mean	4.94	9.56	9.57	9.65	8.43

Grain mean DM% 85.1
***Note: Yields estimated using grain/straw ratios for plots 072,073 & 074, because of a problem with the combine when harvesting.**

Straw tonnes/hectare

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

P_RES	O	P1	P2	P3	Mean
OLD_RES					
O	1.91	3.99	4.17	4.17	3.56
D	2.21	4.59	4.78	4.71	4.07
N	2.05	4.29	4.55	3.94	3.71
P	3.18	6.33	5.59	5.71	5.20
NPKNAMG	2.24	4.82	5.41	5.52	4.50
Mean	2.32	4.80	4.90	4.81	4.21

Straw mean DM% 88.3

Plot area harvested 0.00538, 0.00252.

K TEST

Grain tonnes/hectare

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

K_Test	K0	K1	K2	Mean
OLD_RES				
O	7.61	8.90	9.14	8.31
D	7.57	9.77	9.90	8.70
N*	8.03	8.60	8.87	8.38
PK	9.70	9.96	10.13	9.87
N*PK	8.54	10.08	10.27	9.36
Mean	8.29	9.46	9.66	8.93

Grain mean DM% 85.0

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15/R/EX/4

Straw tonnes/hectare

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

K_Test OLD_RES	K0	K1	K2	Mean
O	3.80	4.69	5.13	4.35
D	3.37	4.37	4.39	3.88
N*	3.98	4.34	4.34	4.16
PK	5.40	5.40	5.53	5.44
N*PK	4.36	5.13	5.2	4.76
Mean	4.18	4.78	4.92	4.52

Straw mean DM% 87.4 Plot area harvested 0.00538

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15/R/PG/5

PARK GRASS

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

The 160th year, hay.
For previous years see 'Details' 1977 and 1973 and Yield Books for 74-14/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
(P)KNaMg	Plot 7/1	K Na Mg (+P until 2012)
PKNaMg	Plot 7/2	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	Plot 11/1	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
N3*PKNaMg (N2*)	Plot 15	N3*P K Na Mg (N2* until 1875; P K Na Mg 1876-2012)
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*, N3*:	48, 96, 144 kg N as nitrate of soda (30 kg N to plot 20 in years with no farmyard manure). In 2013 plot 15 started to receive 144 kg N/ha as nitrate of soda to provide a comparison with plot 11/1, which receives 144 kg N/ha as sulphate of ammonia.
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
(P):	In 2013 plot 7 was split into 7/1 & 7/2. P was withheld from plot 7/1 to evaluate the effect of withholding P on plant biodiversity in 2013-2015. 7/2 continues to receive P as above.

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15/R/PG/5

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
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 2014-2015; the eighth 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.]

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.]

Experimental Diary

Date		Application	Rate	Units
10/11/2014	a	Topped surrounding paths	-	-
19/01/2015	f	Applied TSP Fertilizer - plots 11/2, 11/1, 10, 9/2, 9/1, 8, 7/2, 6, 4/2, 4/1, 14/2, 14/1, 15 + 16	171	kg/ha
19/01/2015	f	Applied TSP Fertilizer - plot 20	73	kg/ha
23/01/2015	f	Completed applying Fertilizer Powders	-	-
23/01/2015	f	Completed applying Fertilizer Powders - Sulphate of Potash - plots 2-1, 6, 7-1, 7-2, 9-1, 9-2, 11-1, 11-2, 14-1, 14-2, 15, 16, 18, 20…	542	kg/ha
23/01/2015	f	Completed applying Fertilizer Powders - Sulphate of Magnesia - plots 6, 7-1, 7-2, 8, 9-1, 9-2, 10, 11-1, 11-2, 14-1, 14-2, 15, 16, 18	111	kg/ha
23/01/2015	f	Completed applying Fertilizer Powders - Sulphate of Soda - plots 6, 7-1, 7-2, 8, 9-1, 9-2, 10, 11-1, 11-2, 14-1, 14-2, 15, 16, 18	43	kg/ha
23/01/2015	f	Completed applying Fertilizer Powders - Silicate of Soda - plot 11-2	450	kg/ha
27/01/2015	f	Applied Poultry manure - plot 13-2	2	t/ha

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09/02/2015	f	Applied Chalk including paths - ALL Plots in Section d + Plots 2/2c, 3c, 4/1c, 8c, 12c, 13/2c, 14/1c, 14/2b, 14/2c, 16b, 16c, 17b, 17c, 18/2, 19/1, 19/2, 19/3, 20/1, 20/2, 20/3	0	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 2/1c, 2/2a, 2/2b, 3b, 4/1b, 7/1c, 7/2c, 13/1c, 13/2b, 15c	0.3	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 3a, 4/2c, 7/1b, 7/2b, 8b, 9/1b, 9/1c, 14/1b, 15b	0.5	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 1b, 1c, 2/1b, 10c, 12b, 13/1b, 18c	0.75	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 2/1a, 4/2b, 10b	1	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 9/1a, 9/2b, 11/1b, 11/1c, 11/2c, 18b	1.5	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 12a, 13/1a, 17a	1.75	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 1a, 4/1a, 9/2c, 11/2b, 13/2a, 14/1a, 14/2a	2	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 6b, 7/1a, 7/2a, 8a, 9/2a, 10a, 15a, 16a	2.5	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 11/2a	3	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 6a, 11/1a, 18a	3.5	t/ha
09/02/2015	f	Applied Chalk including paths - Plots 4/2a	4	t/ha
22/04/2015	f	Applied Sodium Nitrate 16%N -plot 20	188	kg/ha
22/04/2015	f	Applied Sodium Nitrate 16%N -plots 16, 17	300	kg/ha
22/04/2015	f	Applied Sodium Nitrate 16%N -plot 14/2	600	kg/ha
22/04/2015	f	Applied Sodium Nitrate 16%N -plot 15	900	kg/ha
22/04/2015	f	Applied Ammonia Sulphate 21%N - plot 1	229	kg/ha
22/04/2015	f	Applied Ammonia Sulphate 21%N - plots 6a, 6b	229	kg/ha
22/04/2015	f	Applied Ammonia Sulphate 21%N - plots 4-2, 9-2, 10, 18	457	kg/ha
22/04/2015	f	Applied Ammonia Sulphate 21%N - plots 11-1, 11-2	686	kg/ha
28/04/2015	a	Cut Paths	-	-
26/05/2015	a	Cut Paths between and surrounding plots	-	-
28/05/2015	a	Cut paths around plots 19 + 20	-	-
16/06/2015	a	Mowed all Paths	-	-
23/06/2015	a	Cut plots for yield (1st Cut)	-	-
24/06/2015	a	Completed cutting all plots for yield (1st Cut)	-	-
25/06/2015	a	Completed mowing all discards all grass on field, trial and surrounds	-	-
25/06/2015	a	Turned/spread all cuttings went over all field twice.	-	-
26/06/2015	a	Rowed up all grass cuttings	-	-
26/06/2015	a	Baled and moved all grass on field	-	-
20/10/2015	a	Harvested all Plots for Yield - Cut, Weighed and Sampled (2nd Cut)	-	-

NOTE: Samples of herbage (1st and 2nd Cut) were taken for chemical analysis. Unground herbage samples from all plots were archived.

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15/R/PG/5

***** TABLES OF MEANS

1ST CUT (23-24/6-15) DRY MATTER TONNES/HECTARE

Grand mean 3.56

Manure	Lime	a	b	c	d	Mean
N1	1	2.08	1.61	1.28	0.86	1.46
K	2/1	2.20	2.44	1.13	1.27	1.76
None(FYM)	2/2	2.40	2.38	1.85	2.04	2.17
None	3	2.00	2.28	0.96	2.12	1.84
P	4/1	3.13	3.57	2.65	2.28	2.91
N2P	4/2	3.15	3.54	3.63	2.23	3.14
N1PKNaMg	6	4.85	5.47			5.16
(P)KNaMg	7/1	4.49	4.89	4.62	2.99	4.25
PKNaMg	7/2	4.51	4.74	4.46	3.34	4.26
PNaMg	8	2.79	2.90	2.41	2.37	2.61
PKNaMg(N2)	9/1	5.03	4.89	3.92	0.91	3.69
N2PKNaMg	9/2	5.24	5.69	4.65	4.46	5.01
N2PNaMg	10	3.78	4.12	4.11	3.19	3.80
N3PKNaMg	11/1	5.91	5.04	5.69	5.40	5.51
N3PKNaMgSi	11/2	5.86	5.52	4.71	5.55	5.41
None	12	2.51	1.82	1.45	1.34	1.78
(FYM/F)	13/1	3.59	3.32	3.30	2.94	3.29
FYM/PM	13/2	4.04	4.63	5.03	4.61	4.58
PKNaMg(N2*)	14/1	4.66	4.52	4.45	3.60	4.31
N2*PKNaMg	14/2	4.38	4.11	3.98	3.95	4.11
N3*PKNaMg(N2*)	15	5.64	5.17	4.95	4.82	5.14
N1*PKNaMg	16	5.15	4.97	4.79	3.62	4.63
N1*	17	2.16	2.33	1.83	1.84	2.04
N2KNaMg	18	2.41	2.67	2.49	1.03	2.15
N2KNaMg	18/2					3.20
FYM	19/1					4.34
FYM	19/2					4.69
FYM	19/3					4.06
FYM/N*PK	20/1					4.91
FYM/N*PK	20/2					5.18
FYM/N*PK	20/3					4.32

1ST CUT MEAN DM% 26.9

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15/R/PG/5

***** Tables of means

2ND CUT (22/10/2015) DRY MATTER TONNES/HECTARE

Grand mean 0.89

Manure	Lime	a	b	c	d	Mean
N1	1	1.27	0.94	1.02	0.51	0.93
K	2/1	1.39	1.50	0.89	0.85	1.15
None(FYM)	2/2	1.64	1.63	1.45	0.99	1.43
None	3	1.20	1.47	0.74	1.65	1.26
P	4/1	1.85	2.12	1.72	1.93	1.90
N2P	4/2	1.15	1.57	1.33	0.91	1.24
N1PKNaMg	6	2.81	3.06			2.94
(P)KNaMg	7/1	2.89	3.15	2.33	1.59	2.49
PKNaMg	7/2	2.96	3.03	2.51	1.81	2.58
PNaMg	8	2.01	1.96	1.51	2.12	1.90
PKNaMg(N2)	9/1	3.13	3.12	2.43	0.30	2.24
N2PKNaMg	9/2	3.27	3.13	2.65	1.42	2.62
N2PNaMg	10	1.76	1.66	2.15	1.22	1.70
N3PKNaMg	11/1	2.61	2.24	2.27	3.43	2.64
N3PKNaMgSi	11/2	3.08	3.36	2.50	3.48	3.11
None	12	1.94	1.58	1.29	1.46	1.57
(FYM/F)	13/1	2.57	2.60	1.96	1.51	2.16
FYM/PM	13/2	2.13	2.96	3.09	2.90	2.77
PKNaMg(N2*)	14/1	2.69	3.01	2.76	3.03	2.87
N2*PKNaMg	14/2	2.71	2.76	2.70	2.89	2.77
N3*PKNaMg(N2*)	15	3.06	2.91	3.17	2.96	3.03
N1*PKNaMg	16	2.89	3.09	2.78	2.09	2.71
N1*	17	1.04	1.71	1.14	1.26	1.29
N2KNaMg	18	1.46	1.58	1.31	0.25	1.15
N2KNaMg	18/2					1.93
FYM	19/1					3.15
FYM	19/2					3.39
FYM	19/3					2.75
FYM/N*PK	20/1					3.21
FYM/N*PK	20/2					3.17
FYM/N*PK	20/3					2.63

2ND CUT MEAN DM% 22.82

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15/R/PG/5

***** Tables of means

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

Grand mean 5.70

Manure	Lime	a	b	c	d	Mean
N1	1	3.35	2.54	2.30	1.37	2.39
K	2/1	3.59	3.94	2.02	2.12	2.92
None(FYM)	2/2	4.05	4.01	3.30	3.03	3.60
None	3	3.19	3.75	1.70	3.77	3.10
P	4/1	4.98	5.68	4.37	4.22	4.81
N2P	4/2	4.31	5.11	4.96	3.15	4.38
N1PKNaMg	6	7.66	8.52			8.09
(P)KNaMg	7/1	7.38	8.04	6.95	4.59	6.74
PKNaMg	7/2	7.47	7.76	6.98	5.14	6.84
PNaMg	8	4.80	4.86	3.92	4.48	4.51
PKNaMg(N2)	9/1	8.16	8.01	6.34	1.21	5.93
N2PKNaMg	9/2	8.52	8.82	7.30	5.88	7.63
N2PNaMg	10	5.55	5.78	6.26	4.41	5.50
N3PKNaMg	11/1	8.52	7.29	7.95	8.83	8.15
N3PKNaMgSi	11/2	8.95	8.88	7.20	9.03	8.51
None	12	4.45	3.40	2.74	2.81	3.35
(FYM/F)	13/1	6.16	5.92	5.26	4.46	5.45
FYM/PM	13/2	6.17	7.59	8.12	7.51	7.35
PKNaMg(N2*)	14/1	7.35	7.53	7.21	6.63	7.18
N2*PKNaMg	14/2	7.09	6.87	6.68	6.84	6.87
N3*PKNaMg(N2*)	15	8.70	8.07	8.12	7.78	8.17
N1*PKNaMg	16	8.04	8.06	7.57	5.71	7.34
N1*	17	3.20	4.05	2.97	3.10	3.33
N2KNaMg	18	3.86	4.25	3.80	1.28	3.30
N2KNaMg	18/2					5.14
FYM	19/1					7.49
FYM	19/2					8.08
FYM	19/3					6.81
FYM/N*PK	20/1					8.12
FYM/N*PK	20/2					8.35
FYM/N*PK	20/3					6.95

TOTAL OF 2 CUTS MEAN DM% 24.84

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15/R/GC/8

GARDEN CLOVER

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

The 162nd year, red clover.

For previous years see `Details' 1967 and 1973, and Yield books for 74-14/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:

Date				
24/11/2014	f	Epsom Salts applied @ 50 kg Mg/ha	50	kg/ha
24/11/2014	f	TSP applied @ 75 kg P2O5/ha	75	kg/ha
24/11/2014	f	Potassium Sulphate applied @ 150 kg K2)'ha	150	kg/ha
24/11/2014	f	Applied - Chalk	1.25	t/ha
27/05/2015	a	First cut	-	-
02/07/2015	a	Second cut	-	-
17/08/2015	a	Third cut	-	-
03/11/2015	a	Fourth cut	-	-

```
1ST CUT (27/05/15) DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 6.02

FUNG_RES      NONE    BENOMYL
               5.90      6.14

1st CUT MEAN DM% 16.6


2nd CUT (02/07/2015) DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 2.99

FUNG_RES      NONE    BENOMYL
               3.01      2.97

2ND CUT MEAN DM% 19.1
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15/R/GC/8

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3rd CUT (17/08/15) DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 4.05

FUNG_RES      NONE    BENOMYL
               4.09      4.01

3RD CUT MEAN DM% 19.8


4th CUT (03/11/15) DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 0.74

FUNG_RES      NONE    BENOMYL
               0.75      0.73

4TH CUT MEAN DM% 20.5


TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 13.80

 FUNG_RES      NONE    BENOMYL
              13.74     13.86


 TOTAL OF 4 CUTS MEAN DM% 19.0
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15W/RN/3

LEY/ARABLE

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

Sponsors: A. J. Macdonald

The 78th year, leys, w. beans, w. wheat, w. rye

For previous years see 'Details' 1967 & 1973 and Yield Books for 74-14/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

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15/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).

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.

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. From 2008 the second cycle 8-yr grass and grass/clover leys changed to 3-yr grass or grass/clover leys respectively. They were phased in between 2008 and 2012.
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
LLC/LC3 (Previously 2nd cycle, 8-yr grass ley) Lc 1, Lc 2, Lc 3, W, R
LLN/LN3 (Previously 2nd cycle, 8-yr grass/clover ley) Ln 1, Ln 2, Ln 3, W, R

From 2009 W oats (O) replaced forage maize (M) in the AM and ABe rotations on block III and were phased in on blocks V, IV, II and I in subsequent years. The AM treatment was re-named AM/AO.

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

Whole plots:

1. **ROTATION** Rotations before wheat:

   LLN 8
   LN 3
   LLC 8
   LC 3
   LLC/LC3 not yet in phase
   LLN/LN3 not yet in phase
   LLN/AO not yet in phase
   LLC/ABe not yet in phase
   AM/AO
   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:

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15/W/RN/3

3. **N** Nitrogen fertilizer as split dressings in spring 2015 (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

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
   LLC/LC3 not yet in phase
   LLN/LN3 not yet in phase
   LLN/AO not yet in phase
   LLC/ABe not yet in phase
   AM/AO
   ABe

1/ 2 plots:

2. **NSPLIT (FYM res)** Farmyard manure residues, last applied 1960s:
   N split to wheat (no FYM)
   N single to wheat (FYM)

   1/8 plots:

3. **N** Nitrogen fertilizer in spring 2013 (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 ha^{-1}) as muriate of potash, applied where necessary to first test crop w. wheat and long-term leys in the wheat block, applied 2015 (see date below).

Continuous rotations	No FYM	FYM Res
Before wheat	Half plots	Half plots
ABe/Be	420	500
AO/O	390	480
LLn/AO	310	290
LLn/ABe	190	150
None to other plots.		

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15/W/RN/3

Experimental Diary

Date		Application	Rate	Units
ALL			-	-
20/05/2015	a	Cut paths	-	-
27/05/2015	a	Cut paths	-	-
07/07/2015	a	Cut paths	-	-
23/07/2015	a	Cut paths	-	-
03/09/2015	a	Cut paths	-	-
Grass ley and clover/grass leys (first year leys)				
22/10/2014	f	Applied SOP to all leys	140	kg/ha
22/10/2014	f	Applied TSP to all ley plots	213	kg/ha
23/10/2014	f	Applied Nitram - Plots 55,56,59 and 60.	72.5	kg/ha
21/11/2014	s	Drilled Grass	30	kg/ha
21/11/2014	s	Drilled Grass and Clover plots	30	kg/ha
17/04/2015	f	Applied MOP to all leys	167	kg/ha
17/04/2015	f	Applied Nitro-chalk to Grass only plots 57,58,61,62	278	kg/ha
08/07/2015	a	Cut grass plots for yield	-	-
09/07/2015	a	Mowed grass plots	-	-
09/07/2015	a	Turned grass	-	-
10/07/2015	a	Turned grass	-	-
16/07/2015	a	Turned hay	-	-
17/07/2015	a	Rowed up hay	-	-
17/07/2015	a	Baled hay	-	-
09/12/2015	a	Cut grass plots for yield - 2nd and Final Cut	-	-
Grass ley and clover/grass leys (2nd and 3rd year leys)				
22/10/2014	f	Applied SOP to all leys	140	kg/ha
22/10/2014	f	Applied TSP to all ley plots	213	kg/ha
17/04/2015	f	Applied MOP to all leys	167	kg/ha
17/04/2015	f	Applied Nitro-chalk to Grass only plots 37,38,43,44,65,66,69,70	278	kg/ha
08/07/2015	a	Cut grass plots for yield	-	-
09/07/2015	a	Mowed grass plots	-	-
09/07/2015	a	Turned grass	-	-
10/07/2015	a	Turned grass	-	-
16/07/2015	a	Turned hay	-	-
17/07/2015	a	Rowed up hay	-	-
17/07/2015	a	Baled hay	-	-
09/12/2015	a	Cut grass plots for yield - 2nd and Final Cut	-	-
W Beans				
22/10/2014	f	Applied TSP to all arable plots	127	kg/ha
30/10/2014	a	Ploughed	-	-

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19/11/2014	s	Drilled Winter Beans cv. Wizzard	35	seeds/m^2
01/12/2014	p	Sprayed Linzone in 250 l/ha of water - Bean Plots only	2	l/ha
01/12/2014	p	Sprayed Stomp Aqua in 250 l/ha of water - Bean Plots only	1.7	l/ha
18/02/2015	p	Sprayed Crawler in 200 l/ha of water - Bean plots only	3.5	l/ha
16/04/2015	p	Sprayed Troy 480 in 200 l/ha water - Bean Plots only	3	l/ha
17/04/2015	f	Applied SOP to all arable crops	150	kg/ha
30/05/2015	p	Sprayed San 703 in 131 l/ha water - Beans Only	1.5	l/ha
30/05/2015	p	Sprayed Hallmark with Zeon Technology in 131 l/ha water - Beans Only	75	ml/ha
11/09/2015	a	Combined plots for yield	-	-
11/09/2015	a	Combined O+Es	-	-
25/09/2015	p	Sprayed Firebrand in 150 l/ha water - Arable and 3rd year Leys	1	l/ha
25/09/2015	p	Sprayed Samurai in 150 l/ha water - Arable and 3rd year Leys	4	l/ha
W Wheat				
22/10/2014	f	Applied TSP to all arable plots	127	kg/ha
30/10/2014	a	Ploughed	-	-
24/10/2014	f	Applied MOP as corrective K - Plot 1	500	kg/ha
24/10/2014	f	Applied MOP as corrective K - Plot 2	420	kg/ha
24/10/2014	f	Applied MOP as corrective K - Plot 5	480	kg/ha
24/10/2014	f	Applied MOP as corrective K - Plot 6	390	kg/ha
24/10/2014	f	Applied MOP as corrective K - Plot 9	310	kg/ha
24/10/2014	f	Applied MOP as corrective K - Plot 10	290	kg/ha
24/10/2014	f	Applied MOP as corrective K - Plot 15	190	kg/ha
24/10/2014	f	Applied MOP as corrective K - Plot 16	150	kg/ha
19/11/2014	s	Drilled Winter Wheat cv. Solstice tr Redigo Deter	400	seeds/m^2
16/03/2015	p	Sprayed Samurai to spray off failed wheat plots, Block 1	1.5	l/ha
17/03/2015	s	Drilled Spring Wheat cv Mulika trt Redigo	350	seeds/m^2
17/04/2015	f	Applied SOP to all arable crops	150	kg/ha
20/04/2015	p	Sprayed Hallmark in 200 l/ha water - Wheat Plots only	40	ml/ha
20/04/2015	p	Sprayed Compitox Plus in 200 l/ha water - Wheat Plots only	1	l/ha
28/04/2015	f	Applied Nitro-chalk to ALL Plots in Block 1 Wheat except 013, 023, 033, 044, 053, 062, 073, 083, 093, 101, 114, 124, 133, 144, 151, 164	148	kg/ha
21/05/2015	f	Applied Nitrochalk by hand - Plots in Block 1 Wheat 012, 022, 032, 041, 052, 064, 071, 082, 092, 104, 112, 122, 131, 141, 161, 154	148	kg/ha
26/05/2015	f	Applied Nitrochalk by hand - Plots in Block 1 WHEAT 014, 024, 034, 043, 054, 061, 074, 084, 094, 102, 113, 123, 134, 143, 152, 163	444	kg/ha
27/05/2015	f	Applied Nitrochalk by hand - Plots in Block 1 WHEAT 011, 021, 031, 042, 051, 063, 072, 081, 091, 103, 111, 121, 132, 142, 153, 162	741	kg/ha
30/05/2015	p	Sprayed Refine Max in 200 l/ha water - Wheat Plots Only	75	g/ha

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30/05/2015	p	Sprayed Kingdom in 200 l/ha water - Wheat Plots Only	1.25	l/ha
30/05/2015	p	Sprayed BASF 3C Chlormequat 750 in 200 l/ha water - Wheat Plots Only	2	l/ha
30/05/2015	p	Sprayed Crescent in 200 l/ha water - Wheat Plots Only	0.75	l/ha
11/09/2015	a	Combined plots for yield	-	-
11/09/2015	a	Combined O+Es	-	-
25/09/2015	p	Sprayed Firebrand in 150 l/ha water - Arable and 3rd year Leys	1	l/ha
25/09/2015	p	Sprayed Samurai in 150 l/ha water - Arable and 3rd year Leys	4	l/ha
W Rye				
22/10/2014	f	Applied TSP to all arable plots	127	kg/ha
30/10/2014	a	Ploughed	-	-
19/12/2014	s	Drilled Rye cv. Mephisto trt Redigo Deter	280	seeds/m^2
17/04/2015	f	Applied Nitro-chalk to Rye plots 49,50,51,52,53,54,63 and 64.	370	kg/ha
17/04/2015	f	Applied SOP to all arable crops	150	kg/ha
23/04/2015	p	Sprayed Broadway Star in 200 l/ha water - Rye Plots Only	265	g/ha
23/04/2015	p	Sprayed Kingdom in 200 l/ha water - Rye Plots Only	1.25	l/ha
23/04/2015	p	Sprayed Bravo 500 in 200 l/ha water - Rye Plots Only	1	l/ha
23/04/2015	p	Sprayed BASF 3c in 200 l/ha water - Rye Plots Only	1	l/ha
23/04/2015	p	Sprayed Cogent in 200 l/ha water - Rye Plots Only	1	l/ha
28/04/2015	f	Applied Nitro-chalk - Plots in Block 2 RYE 174, 183, 193, 201, 212, 221, 231, 242, 252, 262, 274, 282, 292, 304, 311, 323	185	kg/ha
28/04/2015	f	Applied Nitro-chalk - Plots in Block 2 RYE 171, 182, 194, 204, 214, 223, 234, 241, 251, 263, 272, 283, 294, 303, 314, 321	370	kg/ha
28/04/2015	f	Applied Nitro-chalk - Plots in Block 2 RYE 172, 184, 191, 202, 211, 222, 232, 243, 254, 261, 273, 281, 291, 301, 313, 324	556	kg/ha
30/05/2015	p	Sprayed Folicur in 200 l/ha water - Rye only	1	l/ha
11/09/2015	a	Combined plots for yield	-	-
11/09/2015	a	Combined O+Es	-	-
25/09/2015	p	Sprayed Firebrand in 150 l/ha water - Arable and 3rd year Leys	1	l/ha
25/09/2015	p	Sprayed Samurai in 150 l/ha water - Arable and 3rd year Leys	4	l/ha
W Oats				
22/10/2014	f	Applied TSP to all arable plots	127	kg/ha
30/10/2014	a	Ploughed	-	-
21/11/2014	s	Drilled Oats cv. Gerald trt Redigo	375	seeds/m^2
13/04/2015	p	Sprayed Absolute in 200 l/ha water - Oat Plots only	0.12	kg/ha
13/04/2015	p	Sprayed Hallmark with Zeon Tec. in 200 l/ha water - Oat Plots only	40	ml/ha

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17/04/2015	f	Applied Nitro-chalk to Oat plots 35,36,39,40,67,68,75 and 76.	370	kg/ha
17/04/2015	f	Applied SOP to all arable crops	150	kg/ha
11/09/2015	a	Combined plots for yield	-	-
11/09/2015	a	Combined O+Es	-	-
25/09/2015	p	Sprayed Firebrand in 150 l/ha water - Arable and 3rd year Leys	1	l/ha
25/09/2015	p	Sprayed Samurai in 150 l/ha water - Arable and 3rd year Leys	4	l/ha

NOTE: Herbage and grain samples were taken for chemical analyses.

LEYS

1ST CUT DRY MATTER TONNES/HECTARE – Plots were cut on 26-June-15.Yield data is missing, presumed lost (Rodger White Pers Comm), but Mean DM% was 29.4.

2ND CUT (09-Dec-15) DRY MATTER TONNES/HECTARE

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

FYM_RES LEY	NONE	FYM	MEAN
LC1	0.77	0.73	0.75
LC2	1.10	0.57	0.83
LC3	0.00	0.00	0.00
LN1	0.05	0.07	0.06
LN2	0.07	0.10	0.09
LN3	0.00	0.00	0.00
(LLC/LC)LC1	0.08	0.52	0.30
(LLC/LC)LC2	1.13	0.77	0.95
(LLC/LC)LC3	0.00	0.00	0.00
(LLN/LN)LN1	0.14	0.15	0.15
(LLN/LN)LN2	0.13	0.13	0.13
(LLN/LN)LN3	0.00	0.00	0.00
MEAN	0.29	0.25	0.27

2ND CUT MEAN DM% 40.7

ARABLE TREATMENT CROPS

WINTER BEANS

GRAIN (85% DRY MATTER) TONNES/HECTARE

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

FYMRES ROTATION	NONE	FYM	Mean
(AO)Be	1.68	2.30	1.99
(LLn/AO)Be	3.53	2.02	2.77
(LLc/ABe)Be	0.90	0.49	0.70
(ABe)Be	0.42	1.09	0.76
Mean	1.63	1.47	1.55

GRAIN MEAN DM% 83.9

PLOT AREA HARVESTED 0.00413

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15/W/RN/3

OATS

GRAIN (85% DRY MATTER) TONNES/HECTARE

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

FYMRES	NONE	FYM	Mean
ROTATION			
ABe	5.70	5.35	5.53
AO	5.16	5.81	5.48
LLc/ABe	7.00	5.24	6.12
LLn/AO	6.00	5.68	5.84
Mean	5.97	5.52	5.74

GRAIN MEAN DM% 87.6

PLOT AREA HARVESTED 0.00413

RYE (Extra)

GRAIN (85% DRY MATTER) TONNES/HECTARE

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

FYMRES	NONE	FYM	Mean
ROTATION			
(ABe)R	5.50	5.63	5.56
(AO)R	4.72	4.65	4.69
(LLn/AO)R	7.31	7.22	7.27
(LLc/ABe)R	6.67	6.46	6.67
Mean	6.10	5.99	6.05

GRAIN MEAN DM% 84.1

PLOT AREA HARVESTED 0.00413

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15/W/RN/3

W. WHEAT

Grain tonnes/hectare

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

FYMRES	none	FYM	Mean
ROTATION			
(AO)W	3.26	2.84	3.05
(ABe)W	3.07	3.01	3.04
(LLn/AO)W	3.45	3.53	3.49
(LLc/ABe)W	3.01	2.76	2.88
(LN)W	3.93	3.71	3.82
(LLN/Ln)W	3.78	3.92	3.85
(LC)W	2.25	2.43	2.34
(LLc/Lc)W	3.32	3.81	3.57
Mean	3.26	3.25	3.25

N	0	80	160	240	Mean
ROTATION					
(AO)W	0.99	3.16	4.14	3.90	3.05
(ABe)W	1.17	3.11	4.35	3.51	3.04
(LLn/AO)W	1.66	3.88	4.12	4.29	3.49
(LLc/ABe)W	1.83	2.99	3.57	3.14	2.88
(LN)W	2.23	4.19	3.73	5.12	3.82
(LLN/Ln)W	3.05	3.56	4.12	4.65	3.85
(LC)W	2.97	2.45	2.18	1.75	2.34
(LLc/Lc)W	3.73	4.07	3.61	2.85	3.57
Mean	2.21	3.43	3.73	3.65	3.25

N	0	80	160	240	Mean
FYMRES					
None	2.29	3.52	3.58	3.65	3.26
FYM	2.12	3.34	3.88	3.66	3.25
Mean	2.21	3.43	3.73	3.65	3.25

N		0	80	160	240
ROTATION	FYMRES				
(AO)W	none	0.95	3.57	4.19	4.33
	FYM	1.03	2.75	4.10	3.47
(ABe)W	none	1.23	3.16	4.43	3.44
	FYM	1.12	3.06	4.26	3.58
(LLn/AO)W	none	1.15	3.89	4.01	4.75
	FYM	2.17	3.88	4.23	3.83
(LLc/ABe)W	none	2.23	2.66	4.36	2.78
	FYM	1.43	3.33	2.78	3.50
(LN)W	none	2.21	4.33	4.06	5.13
	FYM	2.25	4.06	3.40	5.12
(LLN/Ln)W	none	2.73	3.93	3.63	4.82
	FYM	3.37	3.20	4.61	4.48
(LC)W	none	3.77	2.31	1.26	1.65
	FYM	2.17	2.58	3.11	1.85
(LLc/Lc)W	none	4.02	4.30	2.68	2.27
	FYM	3.44	3.84	4.53	3.44

Grain mean DM% 85.38

Plot area harvested 0.00192

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15/W/RN/3

W. RYE

Grain tonnes/hectare

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

FYMRES	none	FYM	Mean
ROTATION			
(AO)R	3.39	2.33	2.86
(ABe)R	2.05	3.02	2.54
(LLn/AO)R	4.99	4.66	4.83
(LLc/ABe)R	3.99	3.77	3.88
(Ln)R	5.53	4.64	5.08
(LLn/Ln)R	4.86	5.06	4.96
(Lc)R	4.74	5.69	5.21
(LLc/Lc)R	6.51	5.86	6.19
Mean	4.51	4.38	4.44

N	0	50	100	150	Mean
ROTATION					
(AO)R	1.28	2.66	4.00	3.49	2.86
(ABe)R	0.82	2.68	2.41	4.23	2.54
(LLn/AO)R	1.83	4.65	5.94	6.89	4.83
(LLc/ABe)R	1.35	3.43	5.47	5.27	3.88
(Ln)R	2.71	5.17	5.61	6.85	5.08
(LLn/Ln)R	2.77	4.17	6.05	6.84	4.96
(Lc)R	2.64	5.25	6.42	6.54	5.21
(LLc/Lc)R	3.21	5.52	7.78	8.24	6.19
Mean	2.08	4.19	5.46	6.05	4.44

N	0	50	100	150	Mean
FYMRES					
none	2.13	4.35	5.27	6.28	4.51
FYM	2.02	4.03	5.65	5.82	4.38
Mean	2.08	4.19	5.46	6.05	4.44

N		0	50	100	150
ROTATION	FYMRES				
(AO)R	none	1.12	3.01	5.05	4.38
	FYM	1.44	2.31	2.96	2.60
(ABe)R	none	0.54	2.61	1.35	3.70
	FYM	1.10	2.75	3.48	4.75
(LLn/AO)R	none	1.83	5.92	4.34	7.87
	FYM	1.82	3.38	7.53	5.92
(LLc/ABe)R	none	1.61	3.43	5.69	5.22
	FYM	1.08	3.44	5.25	5.32
(Ln)R	none	3.23	5.03	5.75	8.11
	FYM	2.18	5.30	5.48	5.60
(LLn/Ln)R	none	2.86	3.92	6.35	6.29
	FYM	2.68	4.42	5.76	7.39
(Lc)R	none	2.41	5.13	5.58	5.82
	FYM	2.88	5.36	7.25	7.26
(LLc/Lc)R	none	3.45	5.73	8.07	8.81
	FYM	2.97	5.31	7.48	7.68

Grain mean DM% 84.54

Plot area harvested 0.00192

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15/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: A. J. Macdonald

The 50th year, Winter Beans

For previous years see 'Details' 1973 and Yield Books for 74-14/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

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15/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 2009 s. barley crop nitrogen rates (kg N/ha) were:
0, 35, 70, 105, 140, 175 as nitro-chalk (27% N).

No N was applied to the beans in 2010

For 2011 W. wheat nitrogen rates (kg N/ha) were:
0, 50, 100, 150, 200, 250 as nitro-chalk (27% N).

For 2012 Forage Maize nitrogen rates were 0, 50, 100, 150, 200, 250 & 250 kg N/ha as Nitro-chalk (27% N)

For 2013 Winter rye nitrogen rates were 0,30,60,90,120,150 kg N/ha as Nitro-chalk (27% N)

For 2014 S Barley nitrogen rates were 0, 35, 70,105,140,175 kg N/ha as Nitro-chalk (27% N)

Experimental Diary

Date		Application	Rate	Units
07/10/2014	a	Applied Compost to allocated plots 7, 12, 21, 27	40	t/ha
08/10/2014	a	Applied Straw to plots 3, 15, 17, 31	7.5	t/ha
08/10/2014	a	Topped straw		
09/10/2014	f	Applied FYM - plots 5, 11, 23, 26	25	t/ha
20/10/2014	a	Ploughed (thrown east)		
29/10/2014	a	Power harrowed		
05/11/2014	s	Drilled Wizzard Winter beans	35	seed/m^2
18/02/2015	p	Sprayed Crawler in 200 l/ha water volume	3.5	l/ha
26/05/2015	a	Cut paths		
27/05/2015	p	Sprayed San 703 in 131 l/ha water volume	1.5	lt/ha
27/05/2015	p	Sprayed Hallmark with Zeon Technology in 131 l/ha water volume	75	ml/ha
08/07/2015	a	Cut grass plots for yield	-	-
09/07/2015	a	Mowed grass plots	-	-
09/07/2015	a	Turned grass	-	-
10/07/2015	a	Turned grass	-	-
16/07/2015	a	Turned hay	-	-
17/07/2015	a	Rowed up hay	-	-
17/07/2015	a	Baled hay	-	-
23/07/2015	a	Cut paths	-	-
03/09/2015	a	Cut paths	-	-
11/09/2015	a	Combined plots for yield		

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11/09/2015	a	Combined O+Es		
25/09/2015	p	Sprayed Firebrand in 150 l/ha water volume - Bean stubble	1	l/ha
25/09/2015	p	Sprayed Samurai in 150 l/ha water volume - Bean stubble	4	l/ha
09/12/2015	a	Cut grass plots for yield - 2nd and final cut	-	-

WINTER BEANS

GRAIN TONNES/HECTARE (85%DM)

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

Nitrogen Treatment	0kg
F(Fd)	1.09
F(Ln,Lc6)	1.60
St(St)	1.50
CC(Gm,Lc8)	1.34
Co(Pt,Lc8)	2.17
Dg10(Fs)	1.61
Dg25(Dg)	2.33
MEAN	1.66

Standard errors of differences of means

Table rep.	Treatment
s.e.d.	0.341
d.f.	18

Plot area harvested (ha)	
0.0059	0.0053

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
2009	4.77	-	4.77
2010	4.41	-	4.41
2011	1.46	0.39	1.85
2012	4.11	0.64	4.75
2013	4.65	0.60	5.24
2014	4.09	0.91	5.01
2015	*	0.36	-

Cut dry matter t/ha (26-Jun-15 & 09-Dec-15)

***Note: The first ley cut was taken, but yield data are missing, presumed lost (Rodger White - Pers comm). Mean %DM for cut 1 and 2 were 38.1% and 27.7% respectively. See previous Yield Books (2004-14) for earlier cutting dates.**

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15/R/CS/326 and 15/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: A Macdonald and M. J. Glendining,

The 29th and final year, w. wheat.

Notes: Both experiments will finish in autumn 2017. No yields will be taken in 2016 or 2017. For previous years see Yield Books for 87-14/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	5.72	4.40
2 NORMAL	Twice normal	11.44	8.80
4 NORMAL	Four times normal	22.88	17.60

Experimental Diary

Great Knott III (R)

Date		Application	Rate	Units
11/09/2014	a	Loaded Straw by hand onto plots 4, 7, 11, 14	See above	
11/09/2014	a	Loaded Straw by hand onto plots 2, 6, 10, 13	See above	
11/09/2014	a	Loaded Straw by hand onto plots 3, 5, 9, 16	See above	
01/10/2014	s	Drilled Crusoe trt Redigo Deter	325	seeds/m^2
03/10/2014	p	Sprayed Liberator	0.6	l/ha
03/10/2014	p	Sprayed Anthem	2.4	l/ha
29/10/2014	p	Applied TDS Major Slug Pellets	5	kg/ha
25/11/2014	p	Sprayed Hallmark + Pixie	50	ml/ha
25/11/2014	p	Sprayed Hallmark + Pixie	1.25	l/ha
12/03/2015	f	Applied DoubleTop (27 %N) Fertilizer	148	kg/ha
23/03/2015	p	Sprayed Chex onto Winter Wheat	250	ml/ha
23/03/2015	p	Sprayed Pacifica onto Winter Wheat	500	ml/ha
23/03/2015	p	Sprayed Bio Power onto Winter Wheat	1	l/ha
27/03/2015	p	Sprayed Artemis	1	l/ha
27/03/2015	p	Sprayed Bravo 500	1	l/ha
27/03/2015	p	Sprayed BASF 3C, Chlormequat 750	1.25	l/ha
27/03/2015	p	Sprayed Moddus	150	ml/ha
31/03/2015	f	Applied Nitram (34.5 %N) Fertiliser to Winter Wheat	262	kg/ha
22/04/2015	p	Sprayed Kingdom	1.25	kg/ha
22/04/2015	p	Sprayed Balear720	700	kg/ha
30/04/2015	f	Applied Nitram (34.5 %N)	26	kg/ha
22/05/2015	p	Sprayed Ally Max	30	gm/ha
22/05/2015	p	Sprayed Bassoon	750	ml/ha

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22/05/2015	p	Sprayed Envoy	750	ml/ha
22/05/2015	p	Sprayed Bravo500	1	l/ha
12/06/2015	p	Sprayed Cello	550	ml/ha
04/08/2015	a	Harvested surrounds of trial area - Swathed Straw, ready to be removed.	-	-
05/08/2015	a	Harvested all plots for yield - Sampo - Swathed Straw to be baled	-	-
05/08/2015	a	Sampled, Baled and Weighed all plots on trial - conventional baled.	-	-
05/08/2015	a	Loaded Straw onto plots 4, 7, 11, 14	17.87	kg/ha
05/08/2015	a	Loaded Straw onto plots 2, 6, 10, 13	35.74	kg/ha
05/08/2015	a	Loaded Straw onto plots 3, 5, 9, 16	71.4	kg/ha
05/08/2015	a	Topped all plots with topper 9 to condition straw for ploughing	-	-

Far Field I (W)

Date		Application	Rate	Unit
20/10/2014	a	Ploughed (thrown east)	-	-
27/10/2014	a	Spring tined	-	-
28/10/2014	s	Drilled Crusoe trt Redigo Deter	400	seeds/m^2
28/10/2014	a	Rolled		
25/11/2014	p	Sprayed Hallmark in 200 l/ha water volume	50	ml/ha
25/11/2014	p	Sprayed Movon in 200 l/ha water volume	0.35	l/ha
25/11/2014	p	Sprayed Sienna in 200 l/ha water volume	2	l/ha
26/03/2015	f	Applied Double Top Fertilizer (27% N)	148	kg/ha
07/04/2015	p	Sprayed Chex in 200 l/ha water volume	0.25	l/ha
07/04/2015	p	Sprayed Pacifica in 200 l/ha water volume	5	l/ha
07/04/2015	p	Sprayed Bio Power in 200lt/ha water volume	1	l/ha
13/04/2015	p	Sprayed Artemis in 131 l/ha water volume	1	l/ha
13/04/2015	p	Sprayed Bravo 500 in 131 l/ha water volume	1	l/ha
13/04/2015	p	Sprayed BASF 3C, Chlormequat 750 in 131 l/ha water volume	1.25	l/ha
13/04/2015	p	Sprayed Moddus in 131 l/ha water volume	0.15	l/ha
13/04/2015	p	Sprayed Sprinter in 131 l/ha water volume	2	l/ha
14/04/2015	f	Applied Nitram (34.5% N)	203	kg/ha
01/05/2015	f	Applied Nitram (34.5% N)	203	kg/ha
11/05/2015	p	Sprayed Cello	0.9	l/ha
11/05/2015	p	Sprayed Balear 720 in 131 l/ha water volume	0.7	l/ha
20/05/2015	a	Cut paths		
30/05/2015	p	Sprayed Bassoon in 131 l/ha water volume	0.75	l/ha
30/05/2015	p	Sprayed Envoy in 131 l/ha water volume	0.75	l/ha
30/05/2015	p	Sprayed Crescent in 131 l/ha water volume	0.75	l/ha
11/09/2015	a	Combined plots for yield	-	-
28/09/2015	a	Straw weights + loaded	-	-

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15/R/CS/326

```
GRAIN TONNES/HECTARE

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

       Straw_
           -      10.58
           1      10.92
           2      10.76
           4      11.29

         Mean      10.89

Standard errors of differences of means
---------------------------------------
Table                Straw_
rep.                      4
d.f.                      9
s.e.d.                0.135

Stratum standard errors and coefficients of variation
=====================================================

Variate: Grain85% Grain (at 85% dry matter) tonnes/hectare

Stratum                   d.f.          s.e.         cv%

Blocks                       3         0.123         1.1
Blocks.Plots                 9         0.191         1.8

Grain mean DM% 87.2

STRAW TONNES/HECTARE

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

             Straw_
           -      6.32
           1      6.46
           2      6.60
           4      7.02

         Mean      6.60

Standard errors of differences of means
---------------------------------------

Table                Straw_
rep.                      4
d.f.                      9
s.e.d.                0.153

Stratum standard errors and coefficients of variation
=====================================================

Variate: Straw85% Straw (at 85% dry matter) tonnes/hectare

Stratum                   d.f.          s.e.         cv%

Blocks                       3         0.122         1.9
Blocks.Plots                 9         0.217         3.3


 Straw mean DM% 85.7


Plot area harvested 0.00284
```


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15/W/CS/326

```
GRAIN TONNES/HECTARE

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

       Straw_
           -      8.07
           1      8.33
           2      7.50
           4      6.78

        Mean      7.67

Standard errors of differences of means
---------------------------------------
Table               Straw_
rep.                     3
d.f.                     6
s.e.d.               0.393

Stratum standard errors and coefficients of variation
=====================================================

Variate: Grain85% Grain (at 85% dry matter) tonnes/hectare

Stratum                   d.f.          s.e.         cv%

Blocks                       2         1.126        14.7
Blocks.Plots                 6         0.481         6.3

Grain mean DM% 86.5

STRAW TONNES/HECTARE

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

        Straw_
           -      3.70
           1      3.99
           2      3.91
           4      4.10

        Mean      3.92

Standard errors of differences of means
---------------------------------------
Table               Straw_
rep.                     3
d.f.                     6
s.e.d.               0.371

Stratum standard errors and coefficients of variation
=====================================================

Variate: Straw85% Straw (at 85% dry matter) tonnes/hectare

Stratum                   d.f.          s.e.         cv%

Blocks                       2         0.919        23.4
Blocks.Plots                 6         0.455        11.6


Straw mean DM% 89.7


Plot area harvested 0.00305
```


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15/R/CS/477

CONTINUOUS MAIZE

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

Sponsors: A. J. Macdonald

The 19th and final year, forage maize and s. barley

Notes: This experiment was discontinued from harvest 2015. For previous years see Yield Books for 97-14/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) S. barley, after ten years of Maize, straw removed
BT Continuous spring barley, straw removed plus 10 t maize tops incorporated
B Continuous spring barley, straw removed
Note: Cropping was changed from Maize to S. barley on the BM treatment in 2010, but returned to maize again in 2013.

Experimental diary

Date		Application	Rate	Units
02/10/2014	f	Applied MOP	181	kg/ha
02/10/2014	f	Applied TSP	171	kg/ha
08/10/2014	f	Applied Maize tops to plots 3,6,9,12,16,18	10	t/ha
05/03/2015	p	Sprayed Samurai	2.5	l/ha
05/03/2015	p	Sprayed Fire Brand	1	l/ha
18/03/2015	s	Drilled Spring Barley, Tipple trt Beret Multi	350	seeds/m^2
18/03/2015	a	Rolled all new drilling	-	-
14/04/2015	a	Powerharrowed Maize Plots 1, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15 + 18		
15/04/2015	s	Drilled Maize cv Severus trt measurol - Plots 1, 3, 4, 5, 7, 8, 9, 11, 13, 14, 15 + 18	10	seeds/m^2
16/04/2015	f	Applied Doubletop Fertiliser onto all Plots	356	kg/ha
13/05/2015	p	Sprayed Kingdom onto Barley	1.5	l/ha
13/05/2015	p	Sprayed Bravo 500 onto Barley	1.3	l/ha
15/06/2015	p	Sprayed Kingdom onto Barley only	1.3	l/ha
17/06/2015	p	Sprayed Samson Extra - sprayed Maize ONLY	500	ml/ha
17/06/2015	p	Sprayed Callisto - sprayed Maize ONLY	750	ml/ha
19/06/2015	p	Sprayed Axial onto Barley	300	ml/ha
19/06/2015	p	Sprayed Adigor onto Barley	1	l/ha

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15/07/2015	p	Sprayed Samurai sprayed weeds between maize rows only - knapsack used with shroud.	5	l/ha
02/09/2015	a	Harvested commercial OEs	-	-
07/09/2015	a	Harvested All Barley Plots for grain yield	-	-
09/09/2015	a	Removed Bales from commercial area	-	-
17/09/2015	a	removed round bales from field	-	-
21/09/2015	a	Harvested all Maize Plots for yield by hand	-	-
29/09/2015	a	Harvested all maize and removed	-	-

NOTE: Samples of barley grain and maize (whole crop) were taken for chemical analyses.

```
MAIZE WHOLE CROP TONNES/HECTARE (100% DM)

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

    Treatment
            M      1.73
           MT      2.49
         M(B)      2.62
         (B)M      3.85

         Mean      2.67

Standard errors of differences of means
---------------------------------------

Table            Treatment
rep.                     3
d.f.                     6
s.e.d.               0.912

Stratum standard errors and coefficients of variation
=====================================================

Variate: TPlDm Total plant dry matter tonnes/hectare

Stratum                   d.f.          s.e.         cv%

Blocks                       2         0.254         9.5
Blocks.Plots                 6         1.117        41.8

MEAN DM% 30.8

Plot area harvested 0.00108
```

Note: Maize yields were very poor in 2015 because of problems with weed control.

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15/R/CS/477

```
SPRING BARLEY

WHOLE CROP TONNES/HECTARE (85% DM)

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

    Treatment
           BT      7.06
            B      6.46

         Mean      6.76

Standard errors of differences of means
---------------------------------------

Table            Treatment
rep.                     3
d.f.                     2
s.e.d.               0.159

Stratum standard errors and coefficients of variation
=====================================================

Variate: TPlDm Total plant dry matter tonnes/hectare

Stratum                  d.f.          s.e.         cv%

Blocks                      2         0.490         7.3
Blocks.Plots                2         0.195         2.9

MEAN DM% 30.8

Plot area harvested 0.00525
```


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15/W/CS/478

CONTINUOUS MAIZE

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

Sponsors: A. J. Macdonald

The 19th and final year, forage maize and s. barley

Notes: This experiment was discontinued from harvest 2015. For previous years see Yield Books for 97-14/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) S. barley, after ten years of maize, straw removed
BT Continuous spring barley, straw removed plus 10 t maize tops incorporated
B Continuous spring barley, straw removed

Cropping was changed from Maize to S. barley on the BM treatment in 2010, but returned again to maize in 2013.

NOTE: Samples of barley grain and maize (whole crop) were taken for chemical analyses.

Experimental diary

Date		Application	Rate	Units
21/10/2014	f	Applied Maize tops - Plots 2,4,12,13,16 and 17	10	t/ha
22/10/2014	f	Applied MOP Fertiliser	181	kg/ha
22/10/2014	f	Applied TSP	171	kg/ha
02/03/2015	a	Spring tined	-	-
13/03/2015	s	Drilled Spring Barley - Tipple dr Beret Multi - Plots 1,2,4,15,16,18	350	seeds/m^2
13/03/2015	a	Rolled barley plots	-	-
20/04/2015	p	Sprayed Hallmark in 200 l/ha water volume - Barley only	40	ml/ha
20/04/2015	p	Sprayed Compitox Plus in 200 l/ha water volume - Barley only	1	l/ha
20/04/2015	s	Drilled Maize plots - Severus dr Mesurol	10.2	seeds/m^2
24/04/2015	f	Applied Double Top Fertilizer - All plots	356	kg/ha
30/05/2015	p	Sprayed Sprinter in 131 l/ha water volume - Barley only	1.5	l/ha
30/05/2015	p	Sprayed Refine Max in 131 l/ha water volume - Barley only	75	g/ha
30/05/2015	p	Sprayed Mobius in 131 l/ha water volume - Barley only	0.6	l/ha
30/05/2015	p	Sprayed Crescent in 131 l/ha water volume - Barley only	0.75	l/ha
15/06/2015	p	Sprayed Samson Extra 6% in 200 l/ha water volume - Maize Only	0.5	l/ha
15/06/2015	p	Sprayed Callisto in 200 l/ha water volume - Maize Only	0.75	l/ha
07/07/2015	a	Cut paths	-	-
11/09/2015	a	Combined plots for yield - Sampo	-	-
11/09/2015	a	Combined O+Es - Claas	-	-

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15/W/CS/478

MAIZE WHOLE CROP TONNES/HECTARE (100% DM)

Note: No maize yields were taken due to poor crop performance, resulting from poor weed control. Samples were taken by hand for analysis and archiving only.

```
SPRING BARLEY

GRAIN TONNES/HECTARE

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

    Treatment
           BT      3.60
            B      3.14

         Mean      3.37

Standard errors of differences of means
---------------------------------------

Table            Treatment
rep.                     3
d.f.                     2
s.e.d.               0.130

Stratum standard errors and coefficients of variation
=====================================================

Stratum                  d.f.          s.e.         cv%

Blocks                      2         0.005         0.2
Blocks.Plots                2         0.160         4.7

Grain mean DM% 86.8

Plot area harvested 0.00525
```


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Rothamsted Research															
The Weather : Monthly Summary : 2015															
(Departure from the 30 year means (1981 - 2010) in brackets)															
	Sunshine		Mean temperatures °C								Rain		Rain	Drainage	Wind
			Maximum		Minimum		Dew point	Ground	In ground under grass		Tipping Bucket			20"	
	Hours	()	°C	()	°C	()	°C	frosts*	30 cm	100 cm	Total mm	()	days**	mm	km/hr***
January	90.6	(+28.51)	7.5	(+0.76)	0.9	(-0.32)	2.31	17	5.0	7.2	81.9	(+11.93)	25	61.5	11.5
February	85.6	(+5.31)	6.7	(-0.21)	0.8	(-0.17)	1.81	18	4.1	5.8	54.6	(+4.42)	21	36.1	8.9
March	158.9	(+43.99)	10.2	(+0.27)	2.9	(+0.27)	3.42	15	6.2	6.6	26.1	(-24.67)	16	1.6	11.1
April	231.7	(+70.50)	14.5	(+1.85)	4.0	(-0.04)	5.37	15	9.6	8.6	31.0	(-24.05)	14	2.5	8.1
May	203.4	(+8.79)	15.5	(-0.53)	7.0	(+0.12)	7.74	6	12.3	10.8	68.4	(+13.75)	19	13.4	8.7
June	227.9	(+29.77)	19.5	(+0.33)	9.2	(-0.58)	10.12	3	14.7	12.7	26.7	(-26.55)	12	0.2	7.8
July	210.4	(+5.20)	21.4	(-0.40)	11.7	(-0.15)	12.29	0	16.9	15.0	132.6	(+82.71)	17	51.4	7.6
August	141.2	(-55.00)	20.5	(-1.10)	12.1	(+0.29)	12.8	0	16.5	15.3	83.2	(+19.49)	15	28.4	6.3
September	154.4	(+10.96)	16.9	(-1.38)	8.5	(-1.47)	10.7	4	14.7	14.7	45.5	(-12.18)	20	12.7	6.3
October	94.2	(-17.50)	14.2	(+0.16)	7.8	(+0.71)	9.5	5	12.4	13.1	64.6	(-17.04)	21	27.1	6.3
November	46.4	(-24.30)	12.3	(+2.57)	6.6	(+2.79)	7.9	5	10.9	11.9	84.0	(+7.40)	26	49.8	10.9
December	48.2	(-5.60)	12.5	(+5.56)	7.3	(+5.66)	7.7	3	9.5	10.4	81.8	(+12.29)	24	92.8	11.6
Year	1692.9	(+100.64)	14.3	(+0.66)	6.6	(+0.59)	7.6	91.0	11.1	11.0	780.5	(+47.50)	230.0	377.5	8.8
* Number of nights grass minimum was below 0.0 oC															
** Number of days rain was 0.2 mm or more															
*** At 2 metres above the ground															

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Woburn Experimental Farm														
The Weather: Monthly Summary: 2015														
(Departure from 30-year means (1981 - 2010) 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	81.6	(+21.56)	7.7	(+0.65)	0.9	(-0.32)	2.3	18	5.1	8.0	65.3	(+10.73)	22	11.5
February	86.2	(+11.31)	6.9	(-0.41)	0.6	(-0.27)	2.0	19	4.2	6.5	49.9	(+7.77)	17	8.0
March	149.3	(+35.82)	10.8	(+0.43)	2.6	(-0.09)	3.1	15	6.6	6.9	25.2	(-20.73)	16	10.2
April	228.4	(+77.44)	15.0	(+1.99)	3.1	(-0.62)	5.3	17	9.9	8.5	35.3	(-16.96)	13	7.4
May	204.4	(+17.14)	16.0	(-0.59)	6.6	(+0.07)	7.5	8	12.8	10.5	64.2	(+10.91)	21	9.9
June	223.3	(+35.38)	20.2	(+0.62)	8.8	(-0.64)	9.6	3	15.8	12.6	38.7	(-11.39)	11	7.7
July	200.5	(+3.41)	22.2	(+0.13)	11.1	(-0.49)	11.8	1	18.0	15.1	83.2	(+33.34)	18	8.1
August	153.2	(-35.60)	21.2	(-0.67)	12.3	(+0.75)	12.4	0	17.4	15.5	59.1	(+1.31)	12	6.7
September	135.6	(-1.49)	18.0	(-0.71)	7.8	(-1.82)	10.7	5	14.9	15.1	52.9	(-4.18)	10	5.6
October	84.6	(-27.17)	14.9	(+0.47)	7.0	(+0.03)	9.5	12	12.5	13.7	50.3	(-20.49)	12	4.8
November	40.0	(-26.23)	12.6	(+2.58)	6.1	(+2.38)	7.6	7	10.7	12.3	73.8	(+11.36)	22	11.7
December	44.2	(-1.43)	12.9	(+5.69)	7.8	(+6.29)	7.3	1	9.7	10.8	71.8	(+16.09)	18	13.0
Year	1631.2	(+110.15)	14.9	(+0.86)	6.3	(+0.45)	7.5	106.0	11.5	11.3	669.8	(+17.77)	192.0	8.7

* 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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