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# Yields of the Field Experiments

*Full Table of Content*

# Results of the Classical and Other Long-term Experiments

## Rothamsted Research

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ROTHAMSTED RESEARCH

# Results of the

# Classical and other

# Long-term Experiments

# 2016

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## List of Experiments in the 2016 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 |
| W/RN/3 | Ley Arable |
| W/RN/12 | Organic Manuring |
| R/CS/326 & W/CS/326 | Amounts of Straw |
| R/CS/477 & W/CS/478 | Continuous Maize (Revision to Yields 2009-2015) |



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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 |
|---|---|---|
| Ally Max SX | h | metsulfuron-methyl + tribenuron-methyl (14.3:14.3 % w/w) |
| Atlantis | h | iodosulfuron-methyl-sodium + mesosulfuron-methyl (0.6:3.0 % w/w) |
| Balear 720 | f | chlorothalonil (720 g/l) |
| BASF 3C | gr | chlormequat (750 g/l) |
| Bassoon EC | f | epoxiconazole (83 g/l) |
| BioPower | adj | 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) |
| Cello | f | prothioconazole + spiroxamine + tebuconazole (100:250:100 g/l) |
| Chex | water conditioner | A soluble liquid concentrate containing water conditioning and acidifying agents, humectant, pH buffer and an anti-foam. |
| Clayton Spigot | f | fenpropimorph (750 g/l) |
| Compitox plus | h | mecoprop-P (600 g/l) |



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| | | |
|---|---|---|
| Corbel | f | fenpropimorph (750 g/l) |
| Cortez | f | epoxiconazole (125 g/l) |
| Cyflamid | f | cyflufenamid (50 g/l) |
| Excalibur | h | diflufenican + flupyrsulfuron-methyl (44.4:5.6 % w/w) |
| Firebrand | adj | ammonium sulphate (500 g/l) |
| Folicur | f | tebuconazole (250g/l) |
| Hallmark with zeon tech | i | lambda-cyhalothrin (100 g/l) |
| Hatchet xtra | h | fluroxypyr (200 g/l) |
| Hunter | h | florasulam + fluroxypyr (2.5:100 g/l) |
| Hurler | h | fluroxypyr (200 g/l) |
| Keystone | f | epoxiconazole + isopyrazam (99:125 g/l) |
| Kingdom | f | boscalid + epoxiconazole (140:50 g/l) |
| Kinto | f | prochloraz + triticonazole (60:20 g/l) |
| Laser | h | cycloxydim (200 g/l) |
| Liberator | h | difluenican + flufenacet (100:400 g/l) |
| Mesurol | i | methiocarb (500g/l) |
| Mirage 40 EC | f | prochloraz (400 g/l) |
| Moddus | gr | trinexapac-ethyl (250 g/l) |
| Odin | f | tebuconazole (250g/l) |
| Pacifica | h | iodosulfuron-methyl-sodium + mesosulfuron-methyl (1.0:3.0% w/w) |
| Proline | f | prothioconazole (275 g/l) |
| Raxil star | f | fluopyram + prothioconazole + tebuconazole (20.8:103.1:63.2 g/l) |
| Redigo | f | prothioconazole (100 g/l) |
| Redigo Deter | f | prothioconazole + clothiandin (50:250 g/l) |
| Redigo Pro | f | prothioconazole + tebuconazole (15:20 g/l) |
| Refine Max | h | metsulfuron-methyl + thifensulfuron-methyl (6.7:33.3 w/w) |
| Samurai | h | glyphosate (360 g/l) |
| San 703 | f | chlorothalonil + cyproconazole (375:40 g/l) |
| Simba SX | h | metsulfuron-methyl (20 % w/w) |
| Sprinter-K | foliar feed | $K_2$0, 30% w/w (44,4% w/v) |
| Stomp Aqua | h | pendimethalin (455 g/l) |
| Supasect | i | cypermethrin |
| TDS Major | m | metaldehyde (4% w/w) |
| Toledo | f | tebuconazole (430 g/l) |
| Troy 480 | h | bentazone (480 g/l) |
| Vortex | f | epoxiconazole + fluxapyroxad + pyraclostrobin (41.6:41.6:61 g/l) |
| Zarado | adj | 70% w/w oil (rapeseed oil fatty acid esters) as emulsifiable concentrate |



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**16/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 173rd 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 74-15/R/BK/1.

**Areas harvested[a]:**

| | Section | |
|---|---|---|
| Wheat: | 0 | 0.00320 |
| | 1 | 0.00589 |
| | 2,4,7 and 6 | 0.00487 |
| | 9 | 0.00512 |
| Oats: | 3 | 0.00487 |
| Maize: | 5 | 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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(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<br>Year | 1 | 9 | 0* | 8+ | 6** | 5 | 3 | 7 | 4 | 2 |
|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| 2016 | W | W | W | F | W | M | O | W | W | 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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**16/R/BK/1**

**Experimental Diary:**

| Date | | Application | Rate | Units |
|---|---|---|---|---|
| **All Sections** | | | | |
| 01/10/2015 | f | Applied MOP Fertiliser - Strip 14; All Sections | 181 | kg/ha |
| 01/10/2015 | f | Applied FYM - Strips 2.2 and 2.1; All Sections except Section 3 | 35 | t/ha |
| 01/10/2015 | a | Ploughed (Thrown Southwards) | - | - |
| 01/10/2015 | f | Applied TSP - To strips 11, 13, 14, 17 + 18; All Sections | 171 | kg/ha |
| 02/10/2015 | a | Started Ploughing all field (Thrown Northwards) | - | - |
| 04/10/2015 | a | Cultipressed | - | - |
| 12/10/2015 | a | Powerharrowed | - | - |
| 15/10/2015 | a | Ring Rolled | - | - |
| 11/11/2015 | a | Hedge Cutting | - | - |
| 12/11/2015 | a | Hedge Cutting | - | - |
| 07/01/2016 | a | Erected Electric Fence (West end to stop rabbits) | - | - |
| 11/04/2016 | f | Applied SOP - Strips 5, 6, 7, 8, 9, 12, 13, 15, 16, 17, 18, 19 + 20; All Sections | 217 | kg/ha |
| 13/04/2016 | f | Applied Kieserite Fertiliser - Strips 5, 6, 7, 8, 9, 11, 12, 15, 16, 17, 18, 19 + 20; All Sections | 80 | kg/ha |
| 20/04/2016 | a | Marked out and Mowed all paths | - | - |
| 24/05/2016 | a | Mowed All Paths | - | - |
| 06/06/2016 | a | Cut Cross Paths | - | - |
| 25/07/2016 | a | Cut Cross Paths | - | - |
| 09/08/2016 | a | Combined the immediate surrounds of trials | - | - |
| 12/08/2016 | a | Completed Straw Weights | - | - |
| 19/08/2016 | a | Started to mop up leftover wheat with Claas | - | - |
| 19/08/2016 | a | Baled and removed all swaths from Claas | - | - |
| 23/08/2016 | a | Mopped Up remaining crop | - | - |
| 27/08/2016 | a | Removed Bales | - | - |
| **W Wheat** | | | | |
| 14/10/2015 | s | Drilled Crusoe trt Redigo Deter - Sections 0, 1, 2, 4, 6, 7 + 9 | 350 | seed/m$^2$ |
| 19/10/2015 | p | Sprayed WW - Liberator - Sections 0, 1, 2, 4, 6, 7 + 9 | 0.6 | lt/ha |
| 19/10/2015 | p | Sprayed WW -Stomp Aqua - Sections 0, 1, 2, 4, 6, 7 + 9 | 1.75 | lt/ha |
| 12/11/2015 | p | Applied TDS Major - Sections 0, 1, 2, 4, 6, 7 + 9 | 5 | kg/ha |
| 21/03/2016 | f | Applied Nitram @34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strips 12, 17, 18 + 19 | 139 | kg/ha |
| 07/04/2016 | f | Applied Nitram @34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strips 6, 19 | 139 | kg/ha |



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| | | | | |
|---|---|---|---|---|
| 07/04/2016 | f | Applied Nitram @34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strips 7, 18 | 278 | kg/ha |
| 07/04/2016 | f | Applied Nitram @34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strips 2.1, 8, 12 | 417 | kg/ha |
| 07/04/2016 | f | Applied Nitram @34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strips 1, 9, 10, 11, 13, 14, 17 | 556 | kg/ha |
| 07/04/2016 | f | Applied Nitram @34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strip 15 | 696 | kg/ha |
| 07/04/2016 | f | Applied Nitram @34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strip 16 | 835 | kg/ha |
| 13/04/2016 | p | Sprayed Moddus - Sections 0, 1, 2, 4, 7, + 9 | 150 | ml/ha |
| 13/04/2016 | p | Sprayed 3C Chlormequat750 - Sections 0, 1, 2, 4, 7 + 9 | 1.25 | lt/ha |
| 13/04/2016 | p | Sprayed Odin - Sections 0, 1, 2, 4, 7 + 9 | 500 | ml/ha |
| 13/04/2016 | p | Sprayed Mirage 40ec - Sections 0, 1, 2, 4, 7 + 9 | 500 | ml/ha |
| 13/04/2016 | p | Sprayed Bravo500 - Sections 0, 1, 2, 4, 7 + 9 | 1 | lt/ha |
| 13/04/2016 | p | Sprayed Moddus - Section 6 only | 150 | ml/ha |
| 13/04/2016 | p | Sprayed 3C Chlormequat750 - Section 6 only | 1.25 | lt/ha |
| 30/04/2016 | p | Sprayed Chex - Sections 0, 1, 2, 4, 6, 7 + 9 | 250 | ml/ha |
| 30/04/2016 | p | Sprayed Pacifica - Sections 0, 1, 2, 4, 6, 7 + 9 | 500 | ml/ha |
| 30/04/2016 | p | Sprayed Bio Power - Sections 0, 1, 2, 4, 6, 7 + 9 | 1 | lt/ha |
| 05/05/2016 | f | Applied Nitram @ 34.5%N - Sections 0, 1, 2, 4, 6, 7 + 9; Strips 12, 17, 18 + 19 | 139 | kg/ha |
| 12/05/2016 | p | Sprayed Keystone - Sections 0, 1, 2, 4, 7 + 9 | 800 | ml/ha |
| 12/05/2016 | p | Sprayed Balear720 - Sections 0, 1, 2, 4, 7 + 9 | 700 | ml/ha |
| 03/06/2016 | p | Sprayed Vortex - Sections 0, 1, 2, 4, 7 + 9 | 909 | ml/ha |
| 03/06/2016 | p | Sprayed Bassoon - Sections 0, 1, 2, 4, 7 + 9 | 600 | ml/ha |
| 10/07/2016 | p | Sprayed Cello - Sections 0, 1, 2, 4, 7 + 9 | 550 | ml/ha |
| 10/08/2016 | a | Combined All Plots for yield - Sections 0, 1, 2, 4, 6, 7 + 9 | - | - |

**W Oats**

| | | | | |
|---|---|---|---|---|
| 14/10/2015 | s | Drilled Mascani Oats, trt Kinto - Section 3 only | 350 | seed/m$^2$ |
| 12/11/2015 | p | Applied TDS Major - Sections 3 | 5 | kg/ha |
| 21/12/2015 | p | Sprayed Oats with Excalibur and Hallmark | 180 | g/ha |
| 21/12/2015 | p | Sprayed Oats with Excalibur and Hallmark | 40 | ml/ha |
| 27/04/2016 | p | Sprayed Ally Max | 30 | g/ha |
| 27/04/2016 | p | Sprayed BASF 3C Chlormequat750 | 2 | lt/ha |
| 27/04/2016 | p | Sprayed Cello | 800 | ml/ha |
| 27/04/2016 | p | Sprayed Hurler | 1 | lt/ha |
| 06/06/2016 | p | Sprayed Folicur - Sections 3 only | 750 | ml/ha |
| 08/08/2016 | a | Combined all Plots on Section 3 | - | - |
| 08/08/2016 | a | Completed Straw Weights on Section 3 | - | - |
| 09/08/2016 | a | Completed Straw weight on section 3 | - | - |
| 14/10/2015 | s | Drilled Mascani, trt Kinto - Section 3 only | 350 | seeds/m$^2$ |
| 12/11/2015 | p | Applied TDS Major - Sections 3 | 5 | kg/ha |

**Maize**

| | | | | |
|---|---|---|---|---|
| 19/04/2016 | p | Sprayed Firebrand - Section 5 only | 1 | lt/ha |
| 19/04/2016 | p | Sprayed Samurai - Section 5 only | 3 | lt/ha |



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| | | | | |
|---|---|---|---|---|
| 22/04/2016 | a | Springtined - Section 5 | - | - |
| 03/05/2016 | a | Flexitined - Section 5 only | - | - |
| 05/05/2016 | s | Drilled Severus Maize - trt Mesurol - Section 5 only | 10.2 | seed/m$^2$ |
| 05/05/2016 | a | Powerharrow - Section 5 only - Prior to Drilling | - | - |
| 17/05/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 065 | 139 | kg/ha |
| 17/05/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 075, 125, 175, 185, 195 | 278 | kg/ha |
| 17/05/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 085, 215 (plot 215 applied by hand) | 417 | kg/ha |
| 17/05/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 095, 105, 115, 135, 145 | 556 | kg/ha |
| 17/05/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 155 | 696 | kg/ha |
| 17/05/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 165 | 835 | kg/ha |
| 07/06/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 195 | 139 | kg/ha |
| 07/06/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 185 | 278 | kg/ha |
| 07/06/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 175 | 556 | kg/ha |
| 07/06/2016 | f | Applied Nitram @34.5%N - Section 5 only - Plot 125 | 417 | kg/ha |
| 19/07/2016 | a | Hand Rotavated inter-row - Section 5 only | - | - |
| 21/09/2016 | a | Harvested Maize plots for yield - Section 5 only | - | - |

**Fallows**

| | | |
|---|---|---|
| 27/10/2015 | a | Flexitined bare fallow - Section 8 only |
| 23/03/2016 | a | Powerharrowed - Section 8 only |
| 17/05/2016 | a | Topped Weeds - Section 8 only |
| 19/05/2016 | a | Ploughed - Section 8 |
| 06/06/2016 | a | Powerharrowed - Section 8 only |
| 19/07/2016 | a | Power harrowed all fallows |
| 20/07/2016 | a | Power Harrow - Section 8 only |
| 25/07/2016 | a | Flexitined Section 8 |
| 05/08/2016 | a | Ploughed (thrown Northwards) - Section 8 only |
| 05/08/2016 | a | Ring Rolled - Section 8 |

**Wilderness**

| | | |
|---|---|---|
| 04/01/2016 | a | Cleared fallen tree |
| 27/10/2016 | a | Topped Grass |

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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## 16/R/BK/1

**WHEAT**

**GRAIN TONNES/HECTARE**

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

| SECTION<br>PLOT | 4/W1 | 7/W2 | 2/W3 | 6/W39 | 0/W12 | 1/W50 | 9/W58 | Mean |
|---|---|---|---|---|---|---|---|---|
| 01(FYM)N4 | 11.58 | 9.38 | 6.73 | 4.87 | * | * | * | 8.14 |
| 21FYMN3 | 12.15 | 10.61 | 9.83 | 6.30 | 7.01 | 8.91 | 9.84 | 9.23 |
| 22FYM | 6.45 | 4.97 | 5.01 | 4.48 | 3.42 | 3.89 | 5.65 | 4.84 |
| 03Nil | 1.75 | 0.42 | 0.43 | 0.40 | 0.63 | 0.90 | 0.74 | 0.75 |
| 05(P)KMg | 2.06 | 0.34 | 0.35 | 0.51 | 0.78 | 0.97 | 0.80 | 0.83 |
| 06N1(P)KMg | 4.94 | 2.54 | 2.90 | 2.24 | 2.63 | 2.85 | 2.59 | 2.95 |
| 07N2(P)KMg | 7.71 | 3.50 | 3.83 | 3.20 | 4.20 | 4.55 | 4.48 | 4.50 |
| 08N3(P)KMg | 9.31 | 5.54 | 6.71 | 3.81 | 6.09 | 5.66 | 6.70 | 6.26 |
| 09N4(P)KMg | 10.20 | 6.30 | 9.05 | 4.92 | 6.52 | 7.10 | 7.16 | 7.32 |
| 10N4 | 7.45 | 1.00 | 3.71 | 1.36 | 0.75 | 1.43 | 0.99 | 2.38 |
| 11N4PMg | 6.69 | 7.69 | 6.57 | 3.77 | 6.11 | 5.71 | 6.36 | 6.13 |
| 12N1+3+1(P)KMg | 11.48 | 8.85 | 10.36 | 4.73 | 7.53 | 8.79 | 9.81 | 8.79 |
| 13N4PK | 10.09 | 6.62 | 8.28 | 4.21 | 6.37 | 7.73 | 8.21 | 7.36 |
| 14N4PK*(Mg*) | 9.36 | 6.31 | 5.65 | 3.83 | 4.22 | 4.90 | 7.62 | 5.98 |
| 15N5(P)KMg | 11.09 | 5.65 | 7.54 | 3.84 | 6.02 | 7.79 | 9.67 | 7.37 |
| 16N6(P)KMg | 11.66 | 7.74 | 8.73 | 4.45 | 7.00 | 7.55 | 9.63 | 8.11 |
| 17N1+4+1PKMg | 12.62 | 9.86 | 10.95 | 4.82 | 8.67 | 8.25 | 9.90 | 9.30 |
| 18N1+2+1PKMg | 10.33 | 8.97 | 9.20 | 5.33 | 7.66 | 7.48 | 8.99 | 8.28 |
| 19N1+1+1KMg | 8.81 | 3.46 | 6.76 | 4.05 | 6.54 | 6.07 | 6.97 | 6.10 |
| 20N4KMg | * | * | * | * | 1.55 | 0.74 | * | 1.15 |
| Mean | 8.72 | 5.78 | 6.45 | 3.74 | 4.93 | 5.33 | 6.45 | 5.91 |

**GRAIN MEAN DM% 87.5**

**STRAW TONNES/HECTARE**

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

| SECTION<br>PLOT | 4/W1 | 7/W2 | 2/W3 | 6/W39 | 0/W12 | 1/W50 | 9/W58 | Mean |
|---|---|---|---|---|---|---|---|---|
| 01(FYM)N4 | 4.82 | * | * | * | * | * | * | 4.82 |
| 21FYMN3 | 5.95 | * | * | * | * | 4.75 | * | 5.35 |
| 22FYM | 2.30 | * | * | * | * | 2.25 | * | 2.27 |
| 03Nil | 0.13 | * | * | * | * | 0.18 | * | 0.16 |
| 05(P)KMg | 0.19 | * | * | * | * | 0.17 | * | 0.18 |
| 06N1(P)KMg | 1.91 | * | * | * | * | 1.33 | * | 1.62 |
| 07N2(P)KMg | 2.93 | * | * | * | * | 2.29 | * | 2.61 |
| 08N3(P)KMg | 3.60 | * | * | * | * | 2.52 | * | 3.06 |
| 09N4(P)KMg | 4.16 | * | * | * | * | 3.40 | * | 3.78 |
| 10N4 | 2.00 | * | * | * | * | 0.68 | * | 1.34 |
| 11N4PMg | 2.21 | * | * | * | * | 2.56 | * | 2.38 |
| 12N1+3+1(P)KMg | 4.58 | * | * | * | * | 4.30 | * | 4.44 |
| 13N4PK | 3.78 | * | * | * | * | 3.50 | * | 3.64 |
| 14N4PK*(Mg*) | 2.85 | * | * | * | * | 2.27 | * | 2.56 |
| 15N5(P)KMg | 4.33 | * | * | * | * | 3.51 | * | 3.92 |
| 16N6(P)KMg | 5.07 | * | * | * | * | 3.36 | * | 4.22 |
| 17N1+4+1PKMg | 6.24 | * | * | * | * | 3.81 | * | 5.03 |
| 18N1+2+1PKMg | 4.35 | * | * | * | * | 3.10 | * | 3.72 |
| 19N1+1+1KMg | 3.97 | * | * | * | * | 2.94 | * | 3.46 |
| 20N4KMg | * | * | * | * | * | 0.35 | * | 0.35 |
| Mean | 3.44 | * | * | * | * | 2.49 | * | 2.96 |

**STRAW MEAN DM% 84.5**

Note: No yields are reported on section 8 in 2015 and 2016 because it was left in bare fallow to control weeds.



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## 16/R/BK/1

OATS

TONNES/HECTARE (85% DM)

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

| Plot | Treatment | GRAIN | STRAW |
|---|---|---|---|
| 13 | 01(FYM)[N4] | 4.12 | 2.42 |
| 213 | 21[FYMN3] | 5.82 | 4.53 |
| 223 | 22[FYM] | 5.23 | 3.42 |
| 33 | 03Nil | 1.17 | 0.54 |
| 53 | 05(P)KMg | 1.62 | 0.67 |
| 63 | 06[N1](P)KMg | 1.90 | 0.92 |
| 73 | 07[N2](P)KMg | 2.30 | 1.10 |
| 83 | 08[N3](P)KMg | 2.34 | 1.11 |
| 93 | 09[N4](P)KMg | 2.72 | 1.34 |
| 103 | 10[N4] | 3.84 | 2.03 |
| 113 | 11[N4]PMg | 3.81 | 2.02 |
| 123 | 12[N1+3+1](P)KMg | 2.49 | 1.10 |
| 133 | 13[N4]PK | 2.50 | 1.15 |
| 143 | 14[N4]PK*(Mg*) | 1.85 | 0.81 |
| 153 | 15[N5](P)KMg | 2.90 | 1.40 |
| 163 | 16[N6](P)KMg | 3.24 | 1.67 |
| 173 | 17[N1+4+1]PKMg | 3.58 | 2.13 |
| 183 | 18[N1+2+1]PKMg | 2.42 | 1.26 |
| 193 | 19[N1+1+1]KMg | 2.45 | 1.18 |
| | MEAN | 2.96 | 1.62 |

PLOT AREA HARVESTED 0.00487

MAIZE

TONNES/HECTARE (100% DM)

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

| Plot | Treatment | Whole Crop |
|---|---|---|
| 15 | 01(FYM)N4 | 12.57 |
| 215 | 21FYMN3 | 9.43 |
| 225 | 22FYM | 8.66 |
| 35 | 03Nil | 0.80 |
| 55 | 05(P)KMg | 2.33 |
| 65 | 06N1(P)KMg | 4.36 |
| 75 | 07N2(P)KMg | 4.95 |
| 85 | 08N3(P)KMg | 5.47 |
| 95 | 09N4(P)KMg | 5.40 |
| 105 | 10N4 | 3.80 |
| 115 | 11N4PMg | 3.15 |
| 125 | 12N2+3(P)KMg | 5.74 |
| 135 | 13N4PK | 6.82 |
| 145 | 14N4PK*(Mg*) | 7.29 |
| 155 | 15N5(P)KMg | 5.77 |
| 165 | 16N6(P)KMg | 6.02 |
| 175 | 17N2+4PKMg | 4.92 |
| 185 | 18N2+2PKMg | 7.89 |
| 195 | 19N2+1KMg | 4.68 |
| | MEAN | 5.79 |

PLOT AREA HARVESTED 0.00189

Mean DM% 29.7



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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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## 16/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 165th year, s. barley.

For previous years see 'Details' 1967 and 1973, Station Report for 1966 and Yield Books for 74-15/R/HB/2.

**Main plots**

**Treatments:**
Whole plots

| **1. MANURE** | Plot | Fertilizers and Organic Manures<br>Form of N<br>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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**16/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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**16/R/HB/2**

**Experimental Diary**

| Date | | Application | Rate | Units |
|---|---|---|---|---|
| 28/10/2015 | f | Applied TSP onto plots 634 - 631 | 215 | kg/ha |
| 28/10/2015 | f | Applied Kieserite onto plots 634 - 631 | 233 | kg/ha |
| 29/10/2015 | f | Applied SOP onto plots 634-631, 561-311, 551-411, 571-241 and 581-141 | 217 | kg/ha |
| 23/11/2015 | p | Sprayed Firebrand | 1 | lt/ha |
| 23/11/2015 | p | Sprayed Samurai | 3 | lt/ha |
| 26/11/2015 | f | Applied FYM onto plots 721-724 & 731-734 | 35 | t/ha |
| 26/11/2015 | f | Applied Silicate of Soda onto plots 433, 432, 333, 332, 233, 232, 133 + 132 | 450 | kg/ha |
| 03/12/2015 | a | Ploughed; thrown south | - | - |
| 17/02/2016 | a | Combination Harrowed all Site and surrounds | - | - |
| 29/02/2016 | s | Drilled KWS Irina - trt Raxial Star | 350 | seed/$m^2$ |
| 19/04/2016 | p | Sprayed Hallmark with Zeon Technology | 50 | ml/ha |
| 21/04/2016 | a | Marked out and rotavated all paths | - | - |
| 05/05/2016 | f | Applied Nitram @ 34.5%N to Old Series 5, Series C and Series AA (except plots 6 and 7) | 417 | kg/ha |
| 09/05/2016 | f | Applied Nitrochalk to plots 114, 122, 213, 224, 312, 323, 411, 424, 612, 622, 632, 714, 723, 733 | 0 | kg/ha |
| 09/05/2016 | f | Applied Nitrochalk to plots 111, 121, 214, 221, 311, 322, 413, 423, 614, 623, 633, 713, 724, 734 | 48 | kg/ha |
| 09/05/2016 | f | Applied Nitrochalk to plots 113, 124, 211,222, 313, 321, 412, 421, 611, 621, 631, 712, 721, 732 | 96 | kg/ha |
| 09/05/2016 | f | Applied Nitrochalk to plots 112, 123, 212, 223, 314, 324, 414, 422, 613, 624, 634, 711, 722, 731 | 144 | kg/ha |
| 23/05/2016 | p | Sprayed Refine Max | 75 | g/ha |
| 23/05/2016 | p | Sprayed Hatchet Xtra | 750 | ml/ha |
| 23/05/2016 | p | Sprayed Kingdom | 1.25 | lt/ha |
| 24/05/2016 | a | Rotavated Paths | - | - |
| 26/07/2016 | a | pulled wild oats from plots (36) and surrounds | - | - |
| 23/08/2016 | a | Mopped Up remaining crop | - | - |
| 24/08/2016 | a | Sampo Harvested All Plots | - | - |
| 25/08/2016 | a | Combined with Tucano Harvester all leftover crop | - | - |



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## 16/R/HB/2

MAIN PLOTS

Grain tonnes/hectare

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

| N | 0 | 48 | 96 | 144 | Mean |
|---|---|---|---|---|---|
| MANURE | | | | | |
| --- | 0.78 | 1.92 | 1.20 | 0.77 | 1.17 |
| -P- | 1.57 | 2.71 | 4.70 | 4.93 | 3.48 |
| --K | 0.39 | 1.54 | 1.65 | 1.88 | 1.36 |
| -PK | 1.92 | 3.76 | 5.07 | 5.55 | 4.08 |
| A-- | 0.62 | 0.79 | 1.10 | 0.76 | 0.82 |
| AP- | 2.17 | 3.25 | 3.55 | 3.70 | 3.17 |
| A-K | 0.43 | 0.78 | 1.34 | 1.14 | 0.92 |
| APK | 1.72 | 3.62 | 4.80 | 5.61 | 3.94 |
| FYM1852onwards | 5.98 | 7.03 | 7.38 | 7.84 | 7.06 |
| FYM1852-1871 | 1.87 | 2.21 | 2.59 | 2.75 | 2.35 |
| (A) | 0.61 | 0.97 | 1.73 | 2.84 | 1.54 |
| - | 0.55 | 0.54 | 1.14 | 0.82 | 0.76 |
| FYM2001onwards | 4.02 | 5.94 | 6.16 | 7.51 | 5.91 |
| P2K | 1.98 | 3.42 | 4.71 | 5.30 | 3.85 |
| Mean | 1.76 | 2.75 | 3.37 | 3.67 | 2.89 |

Grain Mean DM% 87.4

Straw tonnes/hectare

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

| N | 0 | 48 | 96 | 144 | Mean |
|---|---|---|---|---|---|
| MANURE | | | | | |
| --- | 0.08 | 0.50 | 0.37 | 0.09 | 0.26 |
| -P- | 0.39 | 0.78 | 1.59 | 1.81 | 1.14 |
| --K | 0.11 | 0.34 | 0.47 | 0.45 | 0.34 |
| -PK | 0.53 | 1.30 | 1.75 | 2.57 | 1.54 |
| A-- | 0.03 | 0.19 | 0.24 | 0.22 | 0.17 |
| AP- | 0.46 | 1.10 | 1.42 | 1.18 | 1.04 |
| A-K | 0.10 | 0.09 | 0.29 | 0.17 | 0.16 |
| APK | 0.36 | 1.38 | 1.74 | 2.68 | 1.54 |
| FYM1852onwards | 2.04 | 3.23 | 3.09 | 3.80 | 3.04 |
| FYM1852-1871 | 0.35 | 0.46 | 0.70 | 0.90 | 0.60 |
| (A) | 0.09 | 0.19 | 0.46 | 0.97 | 0.43 |
| - | 0.15 | 0.11 | 0.41 | 0.12 | 0.20 |
| FYM2001onwards | 0.94 | 2.39 | 2.33 | 3.24 | 2.22 |
| P2K | 0.65 | 1.22 | 1.57 | 2.59 | 1.51 |
| Mean | 0.45 | 0.95 | 1.17 | 1.49 | 1.01 |

Straw Mean DM% 89.1

Plot area harvested 0.0192, 0.00256



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## 16/R/HB/2

PHOSPHATE PLOTS

Grain tonnes/hectare

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

PLOTS

| | |
|---|---|
| 142 | 2.42 |
| 143 | 2.03 |
| 144 | 1.76 |
| 242 | 6.51 |
| 243 | 6.55 |
| 244 | 6.27 |
| 341 | 2.21 |
| 342 | 2.58 |
| 343 | 4.15 |
| 344 | 5.62 |
| 441 | 6.05 |
| 442 | 6.10 |
| 443 | 6.13 |
| 444 | 6.72 |
| 551 | 6.44 |
| 552 | 6.41 |
| 561 | 6.35 |
| 562 | 6.19 |
| 571 | 3.25 |
| 572 | 4.74 |
| 581 | 0.52 |
| 582 | 1.00 |
| Mean | 4.54 |

Grain Mean DM% 88.9

Plot area harvested 0.00256

SILICATE PLOTS

Grain tonnes/hectare

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

| PK<br>Silicate | N3-- | N3P- | N3-K | N3PK | Mean |
|---|---|---|---|---|---|
| (-)- | 1.08 | 5.04 | 1.08 | 5.89 | 3.27 |
| (Si)- | 1.23 | 4.88 | 1.80 | 6.60 | 3.63 |
| (-)Si | 1.92 | 4.74 | 2.09 | 6.67 | 3.86 |
| (Si)Si | 2.17 | 4.63 | 2.59 | 6.56 | 3.99 |
| Mean | 1.60 | 4.82 | 1.89 | 6.43 | 3.69 |

Grain Mean DM% 89.4

Plot area harvested 0.00256



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## 16/R/WF/3

## WHEAT AND FALLOW

**Object**: To maintain a low plant available P site – Hoosfield.

**Whole plot dimensions:** 9 x 211

**Treatments:**
Two plots, one sown to w. wheat, one fallow; alternating in successive years. From 2016 this experiment was converted to continuous wheat on both plots, with no yields or samples taken at harvest. For previous years see 'Details' 1967, 1973 and Yield Books for 74-14/R/WF/3.

**Experimental Diary**

| Date | | Application | Rate | Units |
|---|---|---|---|---|
| 09/10/2015 | a | Ploughed - thrown south | - | - |
| 09/10/2015 | a | Topped all field and experiment - Batwing | - | - |
| 15/10/2015 | a | Powerharrowed - seed bed preparation | - | - |
| 15/10/2015 | s | Drilled Winter Wheat var. Crusoe trt Redigo | 350 | seed/$m^2$ |
| 18/10/2015 | a | Ring Rolled all new drilling | - | - |
| 19/10/2015 | p | Sprayed Liberater - wheat only | 0.6 | lt/ha |
| 19/10/2015 | p | Sprayed Stomp Aqua - wheat only | 1.75 | lt/ha |
| 12/11/2015 | p | Sprayed Hallmark | 40 | ml/ha |
| 03/12/2015 | p | Applied TDS Major | 5 | kg/ha |
| 12/12/2015 | p | Sprayed Hallmark | 40 | ml/ha |
| 08/04/2016 | p | Sprayed Moddus | 150 | ml/ha |
| 08/04/2016 | p | Sprayed BASF 3C Chlormequat750 | 1.25 | lt/ha |
| 08/04/2016 | p | Sprayed Odin | 500 | ml/ha |
| 08/04/2016 | p | Sprayed Mirage 40ec | 500 | ml/ha |
| 09/04/2016 | p | Sprayed Bravo500 | 1 | lt/ha |
| 05/05/2016 | p | Sprayed Keystone - wheat only | 800 | ml/ha |
| 05/05/2016 | p | Sprayed Balear720 - wheat only | 700 | ml/ha |
| 25/05/2016 | p | Sprayed Simba SX - wheat only | 20 | gms/ha |
| 25/05/2016 | p | Sprayed Vortex - wheat only | 1.5 | lt/ha |
| 25/05/2016 | p | Sprayed Spiggot - wheat only | 250 | ml/ha |
| 09/07/2016 | p | Sprayed Cello | 550 | ml/ha |
| 09/07/2016 | p | Sprayed Hallmark | 50 | ml/ha |
| 23/08/2016 | a | Mopped Up remaining crop (Harvest) | - | - |
| 26/08/2016 | a | Round Baled and removed straw | - | - |



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## 16/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 161st 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 |
|---|---|---|---|---|
| 25/08/2015 | p | Sprayed Firebrand | 1 | lt/ha |
| 25/08/2015 | p | Sprayed Samurai | 4 | lt/ha |
| 01/10/2015 | f | Applied MOP - Plots 103, 83, 63, 43 + 23 | 125 | kg/ha |
| 01/10/2015 | f | Applied MOP - Plots 094-014, 092-012, 104-024, 093-013, 091-011 | 250 | kg/ha |
| 01/10/2015 | f | Applied TSP - plots 101-021, 102-022, 103-023, 104-024, 091-011 + 092-012 | 75 | kg/ha |
| 09/10/2015 | a | Ploughed; thrown south | - | - |
| 09/10/2015 | a | Topped all field and exp - Batwing | - | - |
| 15/10/2015 | a | Power harrowed - Seed bed preparation | - | - |
| 15/10/2015 | s | Drilled Crusoe trt Redigo | 350 | seed/$m^2$ |
| 18/10/2015 | a | Ring Rolled all new drilling | - | - |
| 19/10/2015 | p | Sprayed WW - Liberater | 0.6 | lt/ha |
| 19/10/2015 | p | Sprayed WW - Stomp Aqua | 1.75 | lt/ha |
| 12/11/2015 | p | Sprayed Hallmark | 40 | ml/ha |
| 03/12/2015 | p | Applied TDS Major | 5 | kg/ha |
| 12/12/2015 | p | Sprayed Hallmark | 40 | ml/ha |
| 21/03/2016 | f | Applied Sulphate of Ammonia | 238 | kg/ha |
| 04/04/2016 | f | Applied Nitram @ 34.5%N | 840 | kg/ha |
| 08/04/2016 | p | Sprayed Moddus | 150 | ml/ha |
| 08/04/2016 | p | Sprayed BASF 3C Chlormequat750 | 1.25 | lt/ha |
| 08/04/2016 | p | Sprayed Odin | 500 | ml/ha |
| 08/04/2016 | p | Sprayed Mirage 40ec | 500 | ml/ha |
| 08/04/2016 | p | Sprayed Bravo500 | 1 | lt/ha |
| 13/04/2016 | f | Applied Kieserite - all plots | 80 | kg/ha |
| 05/05/2016 | p | Sprayed Keystone - wheat only | 800 | ml/ha |
| 05/05/2016 | p | Sprayed Keystone - wheat only | 700 | ml/ha |
| 24/05/2016 | p | Sprayed Vortex | 1.5 | lt/ha |
| 24/05/2016 | p | Sprayed VortexCorbel | 250 | ml/ha |
| 09/07/2016 | p | Sprayed Cello | 550 | ml/ha |
| 09/07/2016 | p | Sprayed Hallmark | 50 | ml/ha |
| 22/08/2016 | a | Cut Paths using Iseki and Mower | - | - |
| 23/08/2016 | a | Mopped Up remaining crop | - | - |
| 25/08/2016 | a | Harvested All Plots | - | - |



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| | | | | |
|---|---|---|---|---|
| 26/08/2016 | a | Combined all crop using Tucano | - | - |
| 25/08/2015 | p | Sprayed Firebrand | 1 | lt/ha |

Note: Samples of grain and straw were taken for chemical analysis. The yield strips on plots 031-034, 071- 074, 091- 094 (12 plots in total) were made smaller this year to avoid areas where the crop had already been sampled by S. McGrath et al.

**16/R/EX/4**

**P TEST**

**Grain tonnes/hectare**

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

| P_RES | O | P1 | P2 | P3 | Mean |
|---|---|---|---|---|---|
| OLD_RES | | | | | |
| O | 2.48 | 7.72 | 8.51 | 9.12 | 6.96 |
| D | 5.66 | 10.35 | 10.85 | 11.49 | 9.59 |
| N | 2.33 | 8.07 | 9.90 | 9.59 | 7.47 |
| P | 4.23 | 9.89 | 10.93 | 11.27 | 9.08 |
| NPKNAMG | 3.96 | 7.98 | 11.11 | 11.83 | 8.72 |
| Mean | 3.73 | 8.80 | 10.26 | 10.66 | 8.36 |

**Grain mean DM% 85.2**

**Straw tonnes/hectare**

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

| P_RES | O | P1 | P2 | P3 | Mean |
|---|---|---|---|---|---|
| OLD_RES | | | | | |
| O | 2.49 | 6.84 | 7.76 | 7.49 | 6.14 |
| D | 5.33 | 9.5 | 9.49 | 8.94 | 8.32 |
| N | 1.90 | 7.56 | 8.45 | 7.68 | 6.40 |
| P | 3.59 | 7.56 | 8.47 | 8.05 | 6.92 |
| NPKNAMG | 3.92 | 7.22 | 9.13 | 8.80 | 7.27 |
| Mean | 3.45 | 7.74 | 8.66 | 8.19 | 7.01 |

**Straw mean DM% 92.1**

**Plot area harvested 0.00538, 0.00252.**

**K TEST**

**Grain tonnes/hectare**

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



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## 16/R/EX/4

| K_Test | K0 | K1 | K2 | Mean |
|---|---|---|---|---|
| OLD_RES | | | | |
| O | 9.14 | 10.50 | 10.48 | 9.82 |
| D | 8.76 | 10.92 | 10.86 | 9.83 |
| N* | 9.44 | 10.52 | 9.84 | 9.81 |
| PK | 10.54 | 10.51 | 10.18 | 10.44 |
| N*PK | 9.56 | 10.75 | 11.14 | 10.25 |
| Mean | 9.49 | 10.64 | 10.50 | 10.03 |

Grain mean DM% 85.5

Straw tonnes/hectare

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

| K_Test | K0 | K1 | K2 | Mean |
|---|---|---|---|---|
| OLD_RES | | | | |
| O | 6.70 | 8.34 | 8.40 | 7.53 |
| D | 6.55 | 8.05 | 8.12 | 7.32 |
| N* | 6.08 | 7.53 | 7.64 | 6.83 |
| PK | 7.22 | 7.08 | 7.19 | 7.18 |
| N*PK | 6.31 | 7.10 | 7.40 | 6.78 |
| Mean | 6.57 | 7.62 | 7.75 | 7.13 |

Straw mean DM% 96.6  Plot area harvested 0.00538



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**16/R/PG/5**

**PARK GRASS**

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

The 161st year, hay.
For previous years see 'Details' 1977 and 1973 and Yield Books for 74-15/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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**16/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 |
|---|---|---|---|---|
| 23/10/2015 | a | Mowed all discards and leftover grass. | - | - |
| 23/10/2015 | a | Rowed up all mowing across field | - | - |
| 23/10/2015 | a | Baled and removed all grass on field | - | - |
| 02/12/2015 | 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 |
| 02/12/2015 | f | Applied TSP Fertilizer - plot 20 | 73 | kg/ha |
| 20/01/2016 | f | Started to apply Fertilizer Powders to designated plots | - | - |
| 21/01/2016 | 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 |
| 21/01/2016 | 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 |
| 21/01/2016 | 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 |



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| | | | | |
|---|---|---|---|---|
| 21/01/2016 | f | Completed applying Fertilizer Powders - Silicate of Soda - plot 11-2 | 450 | kg/ha |
| 9/04/2016 | f | Applied Ammonium Sulphate 21%N - plot 1, 6a, 6b | 229 | kg/ha |
| 19/04/2016 | f | Applied Ammonium Sulphate 21%N - plots 4-2, 9-2, 10, 18 | 457 | kg/ha |
| 19/04/2016 | f | Applied Ammonium Sulphate 21%N - plots 11-1, 11-2 | 686 | kg/ha |
| 19/04/2016 | f | Applied Sodium Nitrate 16%N - plots 16, 17 | 300 | kg/ha |
| 19/04/2016 | f | Applied Sodium Nitrate 16%N - plot 14/2 | 600 | kg/ha |
| 19/04/2016 | f | Applied Sodium Nitrate 16%N - plot 15 | 900 | kg/ha |
| 20/04/2016 | f | Applied Sodium Nitrate 16%N - plot 20 | 188 | kg/ha |
| 10/05/2016 | a | Cut paths in and around experiment using Iseki and mower | - | - |
| 03/06/2016 | a | Cut Paths within Trial | - | - |
| 16/06/2016 | a | Cut Paths. | - | - |
| 04/07/2016 | a | Started Harvest Yields to be completed (1st Cut) | - | - |
| 04/07/2016 | a | Cut Paths Before starting yields Iseki and Mower | - | - |
| 05/07/2016 | a | Completed plots yields (1st Cut). | - | - |
| 05/07/2016 | a | Cut discards and surrounds. | - | - |
| 06/07/2016 | a | Teddered all mowed grass on field | - | - |
| 07/07/2016 | a | Rowed up all grass on field | - | - |
| 19/10/2016 | a | Started cutting plots for Yield (2nd Cut) | - | - |
| 20/10/2016 | a | Completed grass yields (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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## 16/R/PG/5

***** TABLES OF MEANS

1ST CUT (04-05/07/2016) DRY MATTER TONNES/HECTARE

Grand mean 4.44

| Manure | Lime | a | b | c | d | Mean |
|---|---|---|---|---|---|---|
| N1 | 1 | 3.48 | 2.88 | 2.23 | 1.74 | 2.58 |
| K | 2/1 | 3.24 | 3.88 | 3.02 | 2.50 | 3.16 |
| None(FYM) | 2/2 | 3.88 | 3.69 | 2.53 | 3.09 | 3.30 |
| None | 3 | 3.22 | 3.35 | 2.10 | 3.02 | 2.92 |
| P | 4/1 | 4.12 | 4.71 | 4.09 | 3.53 | 4.11 |
| N2P | 4/2 | 3.21 | 3.62 | 3.85 | 2.16 | 3.21 |
| N1PKNaMg | 6 | 5.43 | 5.40 | | | 5.42 |
| (P)KNaMg | 7/1 | 5.59 | 6.34 | 5.57 | 4.21 | 5.43 |
| PKNaMg | 7/2 | 5.67 | 5.57 | 5.68 | 4.75 | 5.42 |
| PNaMg | 8 | 4.37 | 4.45 | 4.06 | 3.92 | 4.20 |
| PKNaMg(N2) | 9/1 | 5.19 | 5.82 | 5.19 | 2.50 | 4.68 |
| N2PKNaMg | 9/2 | 6.00 | 6.22 | 5.66 | 4.60 | 5.62 |
| N2PNaMg | 10 | 4.95 | 5.20 | 5.17 | 3.39 | 4.68 |
| N3PKNaMg | 11/1 | 5.79 | 5.90 | 5.93 | 4.99 | 5.65 |
| N3PKNaMgSi | 11/2 | 6.22 | 6.09 | 6.26 | 5.38 | 5.99 |
| None | 12 | 3.41 | 3.03 | 2.55 | 2.66 | 2.91 |
| (FYM/F) | 13/1 | 4.43 | 4.61 | 4.44 | 4.24 | 4.43 |
| FYM/PM | 13/2 | 4.05 | 4.31 | 5.04 | 5.13 | 4.63 |
| PKNaMg(N2*) | 14/1 | 5.55 | 5.19 | 5.13 | 5.31 | 5.30 |
| N2*PKNaMg | 14/2 | 4.90 | 4.53 | 4.48 | 4.49 | 4.60 |
| N3*PKNaMg(N2*) | 15 | 5.79 | 5.70 | 5.95 | 5.35 | 5.70 |
| N1*PKNaMg | 16 | 5.52 | 4.80 | 4.93 | 4.57 | 4.96 |
| N1* | 17 | 3.51 | 3.42 | 2.52 | 2.89 | 3.08 |
| N2KNaMg | 18 | 3.48 | 4.01 | 4.09 | 3.62 | 3.80 |
| N2KNaMg | 18/2 | | | | | 4.73 |
| FYM | 19/1 | | | | | 5.27 |
| FYM | 19/2 | | | | | 5.47 |
| FYM | 19/3 | | | | | 4.73 |
| FYM/N*PK | 20/1 | | | | | 5.40 |
| FYM/N*PK | 20/2 | | | | | 5.50 |
| FYM/N*PK | 20/3 | | | | | 5.47 |

1ST CUT MEAN DM% 26.5



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## 16/R/PG/5

***** Tables of means

2ND CUT (19-20/10/2016) DRY MATTER TONNES/HECTARE

Grand mean 1.34

| Manure | Lime | a | b | c | d | Mean |
|---|---|---|---|---|---|---|
| N1 | 1 | 0.97 | 0.73 | 0.50 | 0.52 | 0.68 |
| K | 2/1 | 0.83 | 1.09 | 0.63 | 0.55 | 0.77 |
| None(FYM) | 2/2 | 1.27 | 1.21 | 0.87 | 0.69 | 1.01 |
| None | 3 | 0.77 | 0.93 | 0.56 | 0.56 | 0.71 |
| P | 4/1 | 1.29 | 1.67 | 1.25 | 0.87 | 1.27 |
| N2P | 4/2 | 0.75 | 0.86 | 0.63 | 0.48 | 0.68 |
| N1PKNaMg | 6 | 1.92 | 1.53 | | | 1.73 |
| (P)KNaMg | 7/1 | 1.87 | 2.05 | 1.41 | 0.74 | 1.52 |
| PKNaMg | 7/2 | 1.76 | 1.87 | 1.57 | 0.75 | 1.49 |
| PNaMg | 8 | 1.20 | 1.29 | 0.96 | 0.94 | 1.10 |
| PKNaMg(N2) | 9/1 | 1.69 | 1.79 | 1.38 | 0.26 | 1.28 |
| N2PKNaMg | 9/2 | 1.66 | 1.86 | 1.15 | 0.71 | 1.34 |
| N2PNaMg | 10 | 0.80 | 0.97 | 1.05 | 0.62 | 0.86 |
| N3PKNaMg | 11/1 | 1.63 | 1.67 | 1.35 | 1.45 | 1.53 |
| N3PKNaMgSi | 11/2 | 2.55 | 2.10 | 1.72 | 1.55 | 1.98 |
| None | 12 | 1.21 | 0.88 | 0.73 | 0.52 | 0.84 |
| (FYM/F) | 13/1 | 1.58 | 1.46 | 1.26 | 0.92 | 1.31 |
| FYM/PM | 13/2 | 1.64 | 2.40 | 2.27 | 1.75 | 2.02 |
| PKNaMg(N2*) | 14/1 | 2.28 | 3.12 | 2.71 | 2.62 | 2.68 |
| N2*PKNaMg | 14/2 | 1.62 | 1.89 | 1.85 | 2.17 | 1.88 |
| N3*PKNaMg(N2*) | 15 | 1.70 | 1.98 | 1.88 | 1.55 | 1.78 |
| N1*PKNaMg | 16 | 1.81 | 2.12 | 1.52 | 1.30 | 1.69 |
| N1* | 17 | 0.99 | 1.03 | 0.75 | 1.01 | 0.95 |
| N2KNaMg | 18 | 0.78 | 0.91 | 0.87 | 0.33 | 0.72 |
| N2KNaMg | 18/2 | | | | | 1.22 |
| FYM | 19/1 | | | | | 1.44 |
| FYM | 19/2 | | | | | 2.53 |
| FYM | 19/3 | | | | | 1.86 |
| FYM/N*PK | 20/1 | | | | | 1.85 |
| FYM/N*PK | 20/2 | | | | | 2.07 |
| FYM/N*PK | 20/3 | | | | | 1.57 |

2ND CUT MEAN DM% 28.97



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## 16/R/PG/5

***** Tables of means

TOTAL OF 2 CUTS DRY MATTER TONNES/HECTARE

Grand mean 5.78

| Manure | Lime | a | b | c | d | Mean |
|---|---|---|---|---|---|---|
| N1 | 1 | 4.45 | 3.61 | 2.73 | 2.26 | 3.26 |
| K | 2/1 | 4.07 | 4.96 | 3.65 | 3.05 | 3.93 |
| None(FYM) | 2/2 | 5.15 | 4.90 | 3.40 | 3.78 | 4.31 |
| None | 3 | 3.99 | 4.28 | 2.66 | 3.58 | 3.63 |
| P | 4/1 | 5.41 | 6.39 | 5.34 | 4.40 | 5.39 |
| N2P | 4/2 | 3.96 | 4.48 | 4.47 | 2.64 | 3.89 |
| N1PKNaMg | 6 | 7.35 | 6.93 | | | 7.14 |
| (P)KNaMg | 7/1 | 7.46 | 8.39 | 6.98 | 4.95 | 6.94 |
| PKNaMg | 7/2 | 7.43 | 7.43 | 7.25 | 5.50 | 6.90 |
| PNaMg | 8 | 5.57 | 5.75 | 5.02 | 4.87 | 5.30 |
| PKNaMg(N2) | 9/1 | 6.88 | 7.61 | 6.57 | 2.76 | 5.95 |
| N2PKNaMg | 9/2 | 7.66 | 8.08 | 6.82 | 5.31 | 6.97 |
| N2PNaMg | 10 | 5.76 | 6.18 | 6.22 | 4.00 | 5.54 |
| N3PKNaMg | 11/1 | 7.42 | 7.57 | 7.28 | 6.45 | 7.18 |
| N3PKNaMgSi | 11/2 | 8.77 | 8.19 | 7.98 | 6.93 | 7.97 |
| None | 12 | 4.62 | 3.91 | 3.27 | 3.18 | 3.75 |
| (FYM/F) | 13/1 | 6.02 | 6.07 | 5.70 | 5.16 | 5.74 |
| FYM/PM | 13/2 | 5.69 | 6.71 | 7.31 | 6.88 | 6.65 |
| PKNaMg(N2*) | 14/1 | 7.84 | 8.31 | 7.84 | 7.93 | 7.98 |
| N2*PKNaMg | 14/2 | 6.51 | 6.42 | 6.33 | 6.66 | 6.48 |
| N3*PKNaMg(N2*) | 15 | 7.50 | 7.68 | 7.83 | 6.90 | 7.48 |
| N1*PKNaMg | 16 | 7.33 | 6.92 | 6.44 | 5.87 | 6.64 |
| N1* | 17 | 4.50 | 4.45 | 3.27 | 3.91 | 4.03 |
| N2KNaMg | 18 | 4.26 | 4.92 | 4.95 | 3.95 | 4.52 |
| N2KNaMg | 18/2 | | | | | 5.95 |
| FYM | 19/1 | | | | | 6.71 |
| FYM | 19/2 | | | | | 8.00 |
| FYM | 19/3 | | | | | 6.60 |
| FYM/N*PK | 20/1 | | | | | 7.25 |
| FYM/N*PK | 20/2 | | | | | 7.58 |
| FYM/N*PK | 20/3 | | | | | 7.05 |

TOTAL OF 2 CUTS MEAN DM% 27.73



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## 16/R/GC/8

## GARDEN CLOVER

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

The 163rd year, red clover.

For previous years see `Details' 1967 and 1973, and Yield books for 74-15/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 | | Application | Rate | Units |
|---|---|---|---|---|
| 10/12/2015 | f | Applied Sulphate of Soda | 50 | kg/ha |
| 10/12/2015 | f | Applied TSP | 75 | kg/ha |
| 10/12/2015 | f | Applied Potassium Sulphate | 150 | kg/ha |
| 10/12/2015 | f | Applied Chalk | 1.25 | t/ha |
| 06/06/2016 | a | First cut | - | - |
| 20/07/2016 | a | Second cut | - | - |
| 19/09/2016 | a | Third cut | - | - |

```
1ST CUT (06/06/2016) DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 2.03

FUNG_RES      NONE   BENOMYL
               2.11     1.94

1st CUT MEAN DM% 19.1


2nd CUT (20/07/2016) DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 3.23

FUNG_RES      NONE   BENOMYL
               3.23     3.23

2ND CUT MEAN DM% 20.9
```



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## 16/R/GC/8

```
3rd CUT (19/09/2016) DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 1.80

FUNG_RES      NONE    BENOMYL
               1.77      1.83

3RD CUT MEAN DM% 25.4


TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

***** Tables of means

Grand mean 7.06

 FUNG_RES      NONE    BENOMYL
               7.12       7.00


 TOTAL OF 3 CUTS MEAN DM% 21.8
```



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**16/W/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 79th year, leys, w. beans, w. wheat, w. rye

For previous years see 'Details' 1967 & 1973 and Yield Books for 74-15/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 every 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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**16/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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**16/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 | 380 | 310 |
| AO/O | 370 | 350 |
| LLn/AO | 130 | 230 |
| LLn/ABe | 120 | 150 |
| LLn/Ln3 | 20 | 50 |
| Ln3 | 50 | - |
| None to other plots. | | |



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**16/W/RN/3**

**Experimental Diary**

| Date | | Application | Rate | Units |
|---|---|---|---|---|
| **ALL** | | | | |
| 11/11/2015 | a | Ploughed; Thrown South-East | - | - |
| 12/11/2015 | a | Power harrowed | - | - |
| 26/05/2016 | a | Cut paths | - | - |
| 11/07/2016 | a | Cut paths | - | - |
| 12/07/2016 | a | Cut paths | - | - |
| 15/08/2016 | a | Combined; Commercial combine swathed rest of the plots | - | - |
| 19/08/2016 | a | Removed all bales | - | - |
| 08/09/2016 | a | Baled Straw | - | - |
| 12/09/2016 | a | Removed bales | - | - |
| **Grass ley and clover/grass leys (first year leys)** | | | | |
| 27/10/2015 | f | Applied Nitro Chalk; Plots 23,24,29,30. (Grass/clover leys) | 92 | kg/ha |
| 27/10/2015 | f | Applied Nitro Chalk; Plots 25,26,31,32. (Grass Leys) | 185 | kg/ha |
| 27/10/2015 | f | Applied Sulphate of Potash; All ley plots | 140 | kg/ha |
| 27/10/2015 | f | Applied TSP Fertilizer; All ley plots | 213 | kg/ha |
| 19/11/2015 | s | Drilled Grass and Clover plots | 30 | kg/ha |
| 19/11/2015 | s | Drilled Grass only plots | 30 | kg/ha |
| 02/03/2016 | f | Applied MOP Fertiliser; All ley plots | 167 | kg/ha |
| 14/04/2016 | f | Applied Nitram (34.5% N) Fertiliser; Plots 25,26,31,32 (Grass leys only) | 217 | kg/ha |
| 13/07/2016 | a | Cut grass plots for yield | - | - |
| 14/07/2016 | a | Mowed all grass plots | - | - |
| 14/07/2016 | a | Turned grass | - | - |
| 18/07/2016 | a | Turned hay | - | - |
| 18/07/2016 | a | Rowed up and baled hay; Grass plots only | - | - |
| 21/07/2016 | f | Applied MOP Fertiliser; All ley plots | 83 | kg/ha |
| 10/11/2016 | a | Cut grass plots for yield (2nd Cut) | - | - |
| **Grass ley and clover/grass leys (2nd and 3rd year leys)** | | | | |
| 27/10/2015 | f | Applied Sulphate of Potash; All ley plots | 140 | kg/ha |
| 27/10/2015 | f | Applied TSP Fertilizer; All ley plots | 213 | kg/ha |
| 19/11/2015 | a | Drilled Grass and Clover plots | 30 | kg/ha |
| 19/11/2015 | a | Drilled Grass only plots | 30 | kg/ha |
| 02/03/2016 | f | Applied MOP Fertiliser; All ley plots | 167 | kg/ha |
| 14/04/2016 | f | Applied Nitram (34.5% N) Fertiliser; Plots 57,58,61,62,65,66,69 and 70 (Grass Ley only) | 217 | kg/ha |
| 13/07/2016 | a | Cut grass plots for yield | - | - |
| 14/07/2016 | a | Mowed all grass plots | - | - |
| 14/07/2016 | a | Turned grass | - | - |
| 18/07/2016 | a | Turned hay | - | - |
| 18/07/2016 | a | Rowed up and baled hay; Grass plots only | - | - |



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| | | | | |
|---|---|---|---|---|
| 21/07/2016 | a | Applied MOP Fertiliser; All ley plots | 83 | kg/ha |
| 10/11/2016 | a | Cut grass plots for yield (2nd Cut) | - | - |

**W Beans**

| | | | | |
|---|---|---|---|---|
| 27/10/2015 | f | Applied TSP Fertilizer | 127 | kg/ha |
| 19/11/2015 | s | Drilled Wizzard Winter beans | 42 | seeds/m$^2$ |
| 23/02/2016 | p | Sprayed Chex (in 200 lt/ha water volume) | 0.25 | lt/ha |
| 23/02/2016 | p | Sprayed Laser (in 200 lt/ha water volume) | 1.25 | lt/ha |
| 23/02/2016 | p | Sprayed Zarado (in 200 lt/ha water volume) | 1 | lt/ha |
| 29/02/2016 | f | Applied SOP | 150 | kg/ha |
| 05/04/2016 | p | Sprayed Troy 480 (in 241 lt/ha water volume) | 3 | lt/ha |
| 23/05/2016 | p | Sprayed Sprinter (in 200 lt/ha water volume) | 2 | lt/ha |
| 23/05/2016 | p | Sprayed San 703 (in 200 lt/ha water volume) | 2 | lt/ha |
| 23/05/2016 | p | Sprayed Hallmark (in 200 lt/ha water volume) | 75 | ml/ha |
| 10/06/2016 | p | Sprayed SAN 703 (in 200 lt/ha water volume) | 2 | lt/ha |
| 30/06/2016 | p | Sprayed Toledo (in 200 lt/ha water volume) | 0.6 | lt/ha |
| 13/08/2016 | a | Combined plots for yield | - | - |

**W Wheat**

| | | | | |
|---|---|---|---|---|
| 27/10/2015 | f | Applied TSP Fertilizer | 127 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 37 | 0.6 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plots 38 and 43 | 1.5 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 47 | 3.6 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 36 | 3.9 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 48 | 4.5 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 35 | 6.9 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 45 | 9.2 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 39 | 10.4 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 40 | 11.0 | kg/ha |
| 10/11/2015 | f | Applied corrective K; Plot 46 | 11.3 | kg/ha |
| 19/11/2015 | s | Drilled Solstice tr Redigo Deter | 400 | seeds/m$^2$ |
| 29/02/2016 | f | Applied SOP | 150 | kg/ha |
| 31/03/2016 | p | Sprayed Atlantis (in 150 lt/ha water volume) | 0.4 | kg/ha |
| 31/03/2016 | p | Sprayed Compitox Plus (in 150 lt/ha water volume) | 1.0 | lt/ha |
| 31/03/2016 | p | Sprayed Biopower (in 150 lt/ha water volume) | 1.0 | lt/ha |
| 05/04/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume) | 2.0 | lt/ha |
| 05/04/2016 | p | Sprayed Toledo (in 150 lt/ha water volume) | 0.3 | lt/ha |
| 11/04/2016 | f | Applied 1st Nitro-chalk 27%N by hand (first of 2 doses); All Wheat Plots | 148 | kg/ha |
| 27/04/2016 | f | Applied 2nd Nitro-chalk 27%N by hand; Plots 332, 342, 353, 363, 372, 383, 392, 403, 412, 424, 441, 434, 452, 461, 472, 483 | 148 | kg/ha |
| 27/04/2016 | f | Applied 2nd Nitro-chalk 27%N by hand; Plots 331, 351, 361, 343, 384, 373, 394, 401, 414, 422, 432, 444, 453, 462, 471, 484 | 444 | kg/ha |
| 27/04/2016 | f | Applied 2nd Nitro-chalk 27%N by hand; Plots 334, 341, 354, 364, 374, 381, 393, 404, 411, 423, 431, 443, 454, 463, 474, 482 | 741 | kg/ha |
| 30/04/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume) | 2 | lt/ha |



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| | | | | |
|---|---|---|---|---|
| 30/04/2016 | p | Sprayed Simba (in 150 lt/ha water volume) | 20 | g/ha |
| 30/04/2016 | p | Sprayed Cortez (in 150 lt/ha water volume) | 0.75 | lt/ha |
| 30/04/2016 | p | Sprayed Bravo 500 (in 150 lt/ha water volume) | 1 | lt/ha |
| 23/05/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume) | 2 | lt/ha |
| 23/05/2016 | p | Sprayed Vortex (in 150 lt/ha water volume) | 1.5 | lt/ha |
| 23/05/2016 | p | Sprayed Hunter (in 150 lt/ha water volume) | 1.5 | lt/ha |
| 09/06/2016 | p | Sprayed Cello (in 150 lt/ha water volume) | 0.6 | lt/ha |
| 09/06/2016 | p | Sprayed Cyflamid (in 150 lt/ha water volume) | 0.15 | lt/ha |
| 09/06/2016 | p | Sprayed Hallmark (in 150 lt/ha water volume) | 50 | lt/ha |
| 12/08/2016 | a | Combined plots for yield; Block 3 only with Sampo | - | - |
| **W Rye** | | | | |
| 10/11/2015 | f | Applied Chalk; Block 1 only (originally noted against W/RN/12, but considered to be in error). | 5.00 | t/ha |
| 27/10/2015 | f | Applied TSP Fertilizer | 127 | kg/ha |
| 19/11/2015 | s | Drilled Phoenix tr Kinto | 300 | seeds/m$^2$ |
| 29/02/2016 | f | Applied SOP | 150 | kg/ha |
| 14/04/2016 | f | Applied Nitram (34.5% N) Fertiliser; Plots 17,18,19,20,21,22,27 and 28. | 290 | kg/ha |
| 27/04/2016 | f | Applied Nitram (34.5% N) Fertiliser by hand; Plots 012, 022, 032, 041, 052, 064, 071, 082, 092, 104, 112, 122, 131, 141, 154, 161 | 145 | kg/ha |
| 27/04/2016 | f | Applied Nitram (34.5% N) Fertiliser by hand; Plots 014, 024, 034, 043, 054, 061, 074, 084, 094, 102, 113, 123, 134, 143, 152, 163 | 290 | kg/ha |
| 27/04/2016 | f | Applied Nitram (34.5% N) Fertiliser by hand; Plots 011, 021, 031, 042, 051, 063, 072, 081, 091, 103, 111, 121, 132, 142, 153, 162 | 435 | kg/ha |
| 28/04/2016 | p | Sprayed Sprinter (in 200 lt/ha water volume) | 2 | lt/ha |
| 28/04/2016 | p | Sprayed Ally Max (in 200 lt/ha water volume) | 30 | g/ha |
| 28/04/2016 | p | Sprayed Chlormequat (in 200 lt/ha water volume) | 2 | lt/ha |
| 28/04/2016 | p | Sprayed Cello (in 200 lt/ha water volume) | 0.8 | lt/ha |
| 23/05/2016 | p | Sprayed Sprinter (in 200 lt/ha water volume) | 2 | lt/ha |
| 23/05/2016 | p | Sprayed Keystone (in 200 lt/ha water volume) | 1 | lt/ha |
| 13/08/2016 | a | Combined plots for yield | - | - |
| **W Oats** | | | | |
| 27/10/2015 | f | Applied TSP Fertilizer | 127 | kg/ha |
| 19/11/2015 | s | Drilled Mascani tr Kinto | 400 | seeds/m$^2$ |
| 29/02/2016 | f | Applied SOP | 150 | kg/ha |
| 14/04/2016 | f | Applied Nitram (34.5% N) Fertiliser; Plots 49,50,53,54,71,72,73 and 74. | 290 | kg/ha |
| 28/04/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume) | 2 | lt/ha |
| 28/04/2016 | p | Sprayed Simba (in 150 lt/ha water volume) | 30 | g/ha |
| 28/04/2016 | p | Sprayed Chlormequat (in 150lt/ha water volume) | 2 | lt/ha |
| 28/04/2016 | p | Sprayed Cello (in 150 lt/ha water volume) | 0.8 | lt/ha |
| 28/04/2016 | p | Sprayed Hatchet Extra (in 150lt/ha water volume) | 0.75 | lt/ha. |
| 09/06/2016 | p | Sprayed Cello (in 150 lt/ha water volume) | 0.6 | lt/ha |
| 09/06/2016 | p | Sprayed Cyflamid (in 150 lt/ha water volume) | 0.15 | lt/ha |
| 13/08/2016 | a | Combined plots for yield | - | - |



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

**LEYS**

1ST CUT (09-Dec-15) DRY MATTER TONNES/HECTARE

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

| FYM_RES LEY | NONE | FYM | MEAN |
|---|---|---|---|
| LC1 | 3.73 | 2.20 | 2.96 |
| LC2 | 5.24 | 4.87 | 5.06 |
| LC3 | 7.04 | 6.34 | 6.69 |
| LN1 | 3.02 | 4.02 | 3.52 |
| LN2 | 5.34 | 6.05 | 5.70 |
| LN3 | 5.48 | 5.52 | 5.50 |
| (LLC/LC) LC1 | 1.84 | 2.21 | 2.03 |
| (LLC/LC) LC2 | 4.97 | 5.05 | 5.01 |
| (LLC/LC) LC3 | 5.52 | 5.53 | 5.52 |
| (LLN/LN) LN1 | 3.99 | 3.69 | 3.84 |
| (LLN/LN) LN2 | 6.51 | 6.42 | 6.46 |
| (LLN/LN) LN3 | 5.70 | 5.38 | 5.54 |
| MEAN | 4.87 | 4.77 | 4.82 |

1ST CUT MEAN DM% 32.5

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

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

| FYM_RES LEY | NONE | FYM | MEAN |
|---|---|---|---|
| LC1 | 0.28 | 0.35 | 0.32 |
| LC2 | 0.12 | 0.10 | 0.11 |
| LC3 | 0.00 | 0.00 | 0.00 |
| LN1 | 0.89 | 2.22 | 1.56 |
| LN2 | 0.11 | 0.26 | 0.19 |
| LN3 | 0.00 | 0.00 | 0.00 |
| (LLC/LC) LC1 | 0.09 | 0.24 | 0.17 |
| (LLC/LC) LC2 | 2.49 | 1.71 | 2.10 |
| (LLC/LC) LC3 | 0.00 | 0.00 | 0.00 |
| (LLN/LN) LN1 | 0.09 | 0.15 | 0.12 |
| (LLN/LN) LN2 | 0.52 | 0.62 | 0.57 |
| (LLN/LN) LN3 | 0.00 | 0.00 | 0.00 |
| MEAN | 0.38 | 0.47 | 0.43 |

2ND CUT MEAN DM% 39.7

Note: For several years the LN1-3 plots do not appear to have been receiving N after the first cut (as stipulated in the plan. This is being discussed with the farm.



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## 16/W/RN/3

## ARABLE TREATMENT CROPS

### WINTER BEANS

GRAIN (85% DRY MATTER) TONNES/HECTARE

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

| FYMRES<br>ROTATION | NONE | FYM | Mean |
|---|---|---|---|
| (AO)Be | 1.73 | 1.58 | 1.66 |
| (LLn/AO)Be | 1.17 | 1.28 | 1.22 |
| (LLc/ABe)Be | 2.02 | 2.32 | 2.17 |
| (ABe)Be | 2.17 | 2.04 | 2.11 |
| Mean | 1.77 | 1.81 | 1.79 |

GRAIN MEAN DM% 83.1

PLOT AREA HARVESTED 0.00413

### OATS

GRAIN (85% DRY MATTER) TONNES/HECTARE

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

| FYMRES<br>ROTATION | NONE | FYM | Mean |
|---|---|---|---|
| ABe | 6.61 | 6.71 | 6.66 |
| AO | 7.01 | 6.95 | 6.98 |
| LLc/ABe | 6.50 | 6.45 | 6.48 |
| LLn/AO | 7.39 | 7.62 | 7.50 |
| Mean | 6.88 | 6.93 | 6.91 |

GRAIN MEAN DM% 84.8

PLOT AREA HARVESTED 0.00413

### RYE (Extra)

GRAIN (85% DRY MATTER) TONNES/HECTARE

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

| FYMRES<br>ROTATION | NONE | FYM | Mean |
|---|---|---|---|
| (ABe)R | 5.41 | 5.85 | 5.63 |
| (AO)R | 6.21 | 5.64 | 5.93 |
| (LLn/AO)R | 6.73 | 7.09 | 6.91 |
| (LLc/ABe)R | 6.35 | 6.50 | 6.43 |
| Mean | 6.17 | 6.27 | 6.22 |

GRAIN MEAN DM% 85.5



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PLOT AREA HARVESTED 0.00413

**16/W/RN/3**

**W. WHEAT**

Grain tonnes/hectare

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

| FYMRES | none | FYM | Mean |
|---|---|---|---|
| ROTATION | | | |
| (AO)W | 4.72 | 5.69 | 5.20 |
| (ABe)W | 5.84 | 6.06 | 5.95 |
| (LLn/AO)W | 4.04 | 5.15 | 4.59 |
| (LLc/ABe)W | 5.75 | 4.54 | 5.14 |
| (LN)W | 6.43 | 3.81 | 5.12 |
| (LLN/Ln)W | 6.56 | 7.16 | 6.86 |
| (LC)W | 6.58 | 5.60 | 6.09 |
| (LLc/Lc)W | 6.39 | 7.11 | 6.75 |
| Mean | 5.79 | 5.64 | 5.71 |

| N | 0 | 80 | 160 | 240 | Mean |
|---|---|---|---|---|---|
| ROTATION | | | | | |
| (AO)W | 0.63 | 5.60 | 7.51 | 7.08 | 5.20 |
| (ABe)W | 1.52 | 7.07 | 6.36 | 8.85 | 5.95 |
| (LLn/AO)W | 0.35 | 6.14 | 5.82 | 6.06 | 4.59 |
| (LLc/ABe)W | 1.15 | 6.85 | 7.16 | 5.42 | 5.14 |
| (LN)W | 1.99 | 6.12 | 5.59 | 6.77 | 5.12 |
| (LLN/Ln)W | 3.32 | 7.50 | 8.07 | 8.54 | 6.86 |
| (LC)W | 4.79 | 6.94 | 6.58 | 6.05 | 6.09 |
| (LLc/Lc)W | 5.26 | 7.36 | 6.89 | 7.49 | 6.75 |
| Mean | 2.38 | 6.70 | 6.75 | 7.03 | 5.71 |

| N | 0 | 80 | 160 | 240 | Mean |
|---|---|---|---|---|---|
| FYMRES | | | | | |
| none | 2.49 | 6.67 | 6.50 | 7.49 | 5.79 |
| FYM | 2.26 | 6.73 | 6.99 | 6.57 | 5.64 |
| Mean | 2.38 | 6.70 | 6.75 | 7.03 | 5.71 |

| N | 0 | 80 | 160 | 240 |
|---|---|---|---|---|
| ROTATION FYMRES | | | | |
| (AO)W none | 0.49 | 5.06 | 7.14 | 6.19 |
| FYM | 0.78 | 6.15 | 7.88 | 7.97 |
| (ABe)W none | 1.74 | 6.61 | 4.65 | 10.36 |
| FYM | 1.30 | 7.53 | 8.08 | 7.34 |
| (LLn/AO)W none | 0.28 | 5.72 | 4.06 | 6.08 |
| FYM | 0.42 | 6.56 | 7.57 | 6.03 |
| (LLc/ABe)W none | 0.72 | 7.00 | 8.04 | 7.23 |
| FYM | 1.57 | 6.71 | 6.27 | 3.60 |
| (LN)W none | 3.23 | 6.57 | 7.93 | 8.01 |
| FYM | 0.76 | 5.68 | 3.25 | 5.54 |
| (LLN/Ln)W none | 3.45 | 7.13 | 7.37 | 8.27 |
| FYM | 3.19 | 7.86 | 8.77 | 8.82 |
| (LC)W none | 4.81 | 7.41 | 7.88 | 6.23 |
| FYM | 4.77 | 6.46 | 5.29 | 5.88 |
| (LLc/Lc)W none | 5.22 | 7.84 | 4.92 | 7.58 |
| FYM | 5.31 | 6.89 | 8.85 | 7.39 |

Grain mean DM% 86.2

Plot area harvested 0.00192



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## 16/W/RN/3

**W. RYE**

Grain tonnes/hectare

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

| FYMRES | none | FYM | Mean |
|---|---|---|---|
| ROTATION | | | |
| (AO)R | 5.24 | 5.09 | 5.16 |
| (ABe)R | 6.09 | 5.56 | 5.83 |
| (LLn/AO)R | 5.53 | 6.09 | 5.81 |
| (LLc/ABe)R | 6.97 | 5.81 | 6.39 |
| (Ln)R | 6.31 | 6.55 | 6.43 |
| (LLn/Ln)R | 6.42 | 7.77 | 7.10 |
| (Lc)R | 6.89 | 5.94 | 6.41 |
| (LLc/Lc)R | 7.61 | 6.92 | 7.26 |
| Mean | 6.38 | 6.22 | 6.30 |

| N | 0 | 50 | 100 | 150 | Mean |
|---|---|---|---|---|---|
| ROTATION | | | | | |
| (AO)R | 1.84 | 5.11 | 6.70 | 7.00 | 5.16 |
| (ABe)R | 1.95 | 5.46 | 8.53 | 7.35 | 5.83 |
| (LLn/AO)R | 2.44 | 5.93 | 6.86 | 7.99 | 5.81 |
| (LLc/ABe)R | 2.87 | 6.48 | 7.89 | 8.33 | 6.39 |
| (Ln)R | 3.37 | 6.13 | 7.51 | 8.72 | 6.43 |
| (LLn/Ln)R | 4.22 | 6.92 | 8.66 | 8.60 | 7.10 |
| (Lc)R | 3.38 | 6.71 | 8.08 | 7.48 | 6.41 |
| (LLc/Lc)R | 4.74 | 6.53 | 9.14 | 8.65 | 7.26 |
| Mean | 3.10 | 6.16 | 7.92 | 8.01 | 6.30 |

| N | 0 | 50 | 100 | 150 | Mean |
|---|---|---|---|---|---|
| FYMRES | | | | | |
| none | 3.16 | 6.15 | 7.79 | 8.42 | 6.38 |
| FYM | 3.04 | 6.17 | 8.05 | 7.60 | 6.22 |
| Mean | 3.10 | 6.16 | 7.92 | 8.01 | 6.30 |

| | N | 0 | 50 | 100 | 150 |
|---|---|---|---|---|---|
| ROTATION | FYMRES | | | | |
| (AO)R | none | 1.89 | 5.02 | 6.41 | 7.63 |
| | FYM | 1.79 | 5.21 | 6.99 | 6.37 |
| (ABe)R | none | 2.30 | 6.04 | 8.43 | 7.60 |
| | FYM | 1.61 | 4.89 | 8.64 | 7.11 |
| (LLn/AO)R | none | 2.16 | 5.89 | 5.81 | 8.26 |
| | FYM | 2.73 | 5.98 | 7.92 | 7.72 |
| (LLc/ABe)R | none | 3.61 | 6.62 | 8.48 | 9.17 |
| | FYM | 2.13 | 6.34 | 7.30 | 7.48 |
| (Ln)R | none | 3.54 | 5.83 | 7.03 | 8.86 |
| | FYM | 3.21 | 6.43 | 7.98 | 8.58 |
| (LLn/Ln)R | none | 3.54 | 5.91 | 7.97 | 8.27 |
| | FYM | 4.89 | 7.92 | 9.35 | 8.93 |
| (Lc)R | none | 3.64 | 6.72 | 8.48 | 8.72 |
| | FYM | 3.12 | 6.70 | 7.69 | 6.25 |
| (LLc/Lc)R | none | 4.64 | 7.19 | 9.72 | 8.89 |
| | FYM | 4.84 | 5.87 | 8.56 | 8.40 |

Grain mean DM% 82.5

Plot area harvested 0.00192



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**16/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 51st year, Winter Wheat

For previous years see 'Details' 1973 and Yield Books for 74-15/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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**16/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)

For 2015 Winter beans – No Nitrogen Applied

**Experimental Diary**

| Date | | Application | Rate | Units |
|---|---|---|---|---|
| 29/10/2015 | f | Applied FYM; Plots 5,11,23,26 | 25.00 | t/ha |
| 29/10/2015 | f | Applied FYM; Plots 8,14,18,28 | 10.00 | t/ha |
| 30/10/2015 | f | Applied compost; Plots 7 and 21 | 40.00 | t/ha |
| 02/11/2015 | f | Applied compost; Plots 12 and 27 | 40.00 | t/ha |
| 02/11/2015 | f | Applied straw; Plots 3,15,17,31 | 7.50 | t/ha |
| 09/11/2015 | f | Topped straw plots; Plots 3,15,17,31. | - | - |
| 10/11/2015 | a | Ploughed; Thrown west | - | - |
| 12/11/2015 | a | Power harrowed | - | - |
| 16/11/2015 | s | Drilled Gallant, tr Redigo Pro; 4m tine drill | 400.00 | seeds/m$^2$ |
| 29/02/2016 | f | Applied SOP; all plots except plots 5,11,23 and 26 (Dg25) | 200.00 | kg/ha |
| 04/03/2016 | f | Applied TSP Fertilizer; all plots including grass except plots 5,11,23 and 26 (Dg25) | 97.50 | kg/ha |
| 31/03/2016 | p | Sprayed Atlantis (in 150 lt/ha water volume); wheat only | 0.40 | kg/ha |
| 31/03/2016 | p | Sprayed Compitox Plus (in 150 lt/ha water volume); wheat only | 1.00 | lt/ha |
| 31/03/2016 | p | Sprayed Biopower (in 150 lt/ha water volume); wheat only | 1.00 | lt/ha |
| 11/04/2016 | f | Applied Nitro-chalk (27% N); 1$^{st}$ nitrogen treatment; by hand to wheat only | 185.00 | kg/ha |
| 27/04/2016 | f | Applied Nitro-chalk (27% N); 2nd nitrogen treatment; by hand to wheat only | 185.00 | kg/ha |



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| | | | | |
|---|---|---|---|---|
| 27/04/2016 | f | Applied Nitro-chalk (27% N); 2nd nitrogen treatment; by hand to wheat only | 370.00 | kg/ha |
| 27/04/2016 | f | Applied Nitro-chalk (27% N); 2nd nitrogen treatment; by hand to wheat only | 556.00 | kg/ha |
| 27/04/2016 | f | Applied Nitro-chalk (27% N); 2nd nitrogen treatment; by hand to wheat only | 741.00 | kg/ha |
| 30/04/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume); wheat only | 2.00 | lt/ha |
| 30/04/2016 | p | Sprayed Simba (in 150 lt/ha water volume); wheat only | 20.00 | g/ha |
| 30/04/2016 | p | Sprayed Cortez (in 150 lt/ha water volume); wheat only | 0.75 | lt/ha |
| 30/04/2016 | p | Sprayed Bravo 500 (in 150 lt/ha water volume); wheat only | 1.00 | lt/ha |
| 23/05/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume); wheat only | 2.00 | lt/ha |
| 23/05/2016 | p | Sprayed Vortex (in 150 lt/ha water volume); wheat only | 1.50 | lt/ha |
| 23/05/2016 | p | Sprayed Hunter (in 150 lt/ha water volume); wheat only | 1.50 | lt/ha |
| 26/05/2016 | a | Cut paths | | |
| 09/06/2016 | p | Sprayed Cello (in 150 lt/ha water volume); wheat only | 0.60 | lt/ha |
| 09/06/2016 | p | Sprayed Cyflamid (in 150 lt/ha water volume); wheat only | 0.15 | lt/ha |
| 09/06/2016 | p | Sprayed Hallmark (in 150 lt/ha water volume); wheat only | 50.00 | ml/ha |
| 11/07/2016 | a | Cut paths | - | - |
| 12/07/2016 | a | Cut paths | - | - |
| 13/07/2016 | a | Cut grass plots for yield | - | - |
| 14/07/2016 | a | Mowed all grass plots | - | - |
| 14/07/2016 | a | Turned grass | - | - |
| 18/07/2016 | a | Turned hay | - | - |
| 18/07/2016 | a | Rowed up and baled hay; Grass plots only | - | - |
| 13/08/2016 | a | Combined plots for yield; All wheat plots | - | - |
| 15/08/2016 | a | Combined; Commercial combine swathed rest of the plots | - | - |
| 19/08/2016 | a | Removed all bales | - | - |
| 08/09/2016 | a | Baled Straw | - | - |
| 12/09/2016 | a | Removed bales | - | - |
| 10/11/2016 | a | Cut grass plots for yield (2nd Cut) | - | - |



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## 16/W/RN/12

WINTER WHEAT

GRAIN TONNES/HECTARE (85%DM)

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

| Nitrogen | 0 | 50 | 100 | 150 | 200 | 250 | Mean |
|---|---|---|---|---|---|---|---|
| Treatment | | | | | | | |
| F(Fd) | 0.91 | 3.69 | 6.13 | 6.83 | 7.93 | 7.91 | 5.57 |
| F(Ln,Lc6) | 2.38 | 3.64 | 5.95 | 7.13 | 7.31 | 6.94 | 5.56 |
| St(St) | 1.17 | 3.85 | 5.63 | 6.98 | 6.92 | 7.70 | 5.37 |
| CC(Gm,Lc8) | 0.84 | 3.92 | 5.65 | 6.76 | 7.52 | 7.72 | 5.40 |
| Co(Pt,Lc8) | 1.92 | 3.67 | 7.19 | 7.09 | 6.82 | 7.23 | 5.65 |
| Dg10(Fs) | 1.15 | 4.31 | 6.28 | 7.37 | 8.5 | 8.39 | 6.00 |
| Dg25(Dg) | 2.33 | 4.93 | 7.4 | 8.16 | 7.83 | 9.15 | 6.63 |
| Mean | 1.53 | 4 | 6.32 | 7.19 | 7.55 | 7.86 | 5.74 |

Standard errors of differences of means
---

| Table | Treatment | Nitrogen | Treatment Nitrogen |
|---|---|---|---|
| rep. | 24 | 28 | 4 |
| s.e.d. | 0.518 | 0.246 | 0.788 |
| d.f. | 18 | 105 | 74.46 |

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

| | |
|---|---|
| Treatment | 0.651 |
| d.f. | 105 |

Grain Mean Dm (%) 86.8

Plot area harvested (ha)
0.001566 0.001766

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 | - |
| 2016 | 3.97 | 0.56 | 4.53 |

Cut dry matter t/ha (13-Jul-2016 & 10-Nov-2016)

*Note: Herbage and grain samples were taken for chemical analysis.



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## 16/R/CS/326 and 16/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 30th year, w. wheat (no yields taken).

**Notes:** Both experiments will finish in autumn 2017. No yields were taken in 2016. Only farm diary details are shown below. For previous years see Yield Books for 87-15/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 | 4.70 | 3.39 |
| 2 NORMAL | Twice normal | 9.40 | 6.78 |
| 4 NORMAL | Four times normal | 18.80 | 13.56 |

**Experimental Diary**

**Great Knott III (R)**

| Date | | Application | Rate | Units |
|---|---|---|---|---|
| 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 | - | - |
| 06/09/2015 | p | Sprayed Samurai | 1.00 | lt/ha |
| 06/09/2015 | p | Sprayed Firebrand | 2.00 | lt/ha |
| 15/09/2015 | a | Ploughed; Thrown West | | |
| 28/09/2015 | a | Cultipressed | | |
| 05/10/2015 | s | Drilled Crusoe dr Redigo | 350.00 | seeds/m$^2$ |
| 05/10/2015 | a | Ring Rolled | | |
| 09/10/2015 | p | Sprayed Liberator | 600.00 | ml/ha |
| 12/11/2015 | p | Sprayed Hallmark | 40.00 | ml/ha |
| 08/03/2016 | f | Applied Double Top Fertilizer (27% N); Applied with Kuhn Aerospreader | 148.00 | kg/ha |
| 01/04/2016 | f | Applied Nitram (34.5% N) | 260.00 | kg/ha |
| 05/04/2016 | p | Sprayed 3C Chlormequat 750 | 1.25 | lt/ha |
| 05/04/2016 | p | Sprayed Moddus | 200.00 | ml/ha |
| 05/04/2016 | p | SprayedSavannah | 500.00 | ml/ha |
| 05/04/2016 | p | Sprayed Mirage40ec | 500.00 | ml/ha |



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| | | | | |
|---|---|---|---|---|
| 05/04/2016 | p | Sprayed Bravo 500 | 1.00 | lt/ha |
| 08/04/2016 | p | Sprayed Moddus | 150.00 | ml/ha |
| 08/04/2016 | p | Sprayed 3C Chlormequat750, | 1.25 | lt/ha |
| 08/04/2016 | p | Sprayed Odin | 500.00 | ml/ha |
| 08/04/2016 | p | Sprayed Mirage 40ec | 500.00 | ml/ha |
| 08/04/2016 | p | Sprayed Bravo500 | 1.00 | lt/ha |
| 14/04/2016 | f | Applied MOP; Applied to wheat only | 250.00 | kg/ha |
| 14/04/2016 | f | Applied TSP | 298.00 | kg/ha |
| 25/04/2016 | f | Applied Nitram (34.5% N) | 260.00 | kg/ha |
| 04/05/2016 | p | Sprayed Ally Max | 20.00 | g/ha |
| 04/05/2016 | p | Sprayed Keystone | 800.00 | ml/ha |
| 04/05/2016 | p | Sprayed Balear 720 | 700.00 | ml/ha |
| 25/05/2016 | p | Sprayed Vortex | 1.50 | lt/ha |
| 25/05/2016 | p | Sprayed Spiggot | 250.00 | ml/ha |
| 25/05/2016 | p | Sprayed Hatchet Xtra | 750.00 | ml/ha |
| 08/07/2016 | p | Sprayed Cello | 550.00 | ml/ha |
| 08/07/2016 | p | Sprayed Hallmark | 50.00 | ml/ha |

**Far Field I (W)**

| Date | | Application | Rate | Unit |
|---|---|---|---|---|
| 05/10/2015 | a | Topped straw | | |
| 07/10/2015 | a | Ploughed; Thrown north west | | |
| 08/10/2015 | a | Springtyne | | |
| 16/10/2015 | s | Drilled Crusoe dr Redigo Deter | 375.00 | Seeds/m2 |
| 17/10/2015 | a | Rolled | | |
| 31/10/2015 | p | Sprayed Liberator (in 200 lt/ha water volume.) | 0.60 | lt/ha |
| 03/11/2015 | p | Sprayed Sprinter (in 200 lt/ha water volume.) | 2.00 | lt/ha |
| 03/11/2015 | p | Sprayed Hallmark (in 200 lt/ha water volume.) | 40.00 | ml/ha |
| 26/02/2016 | f | Applied Double Top Fertilizer | 148.00 | kg/ha |
| 31/03/2016 | p | Sprayed Chex (in 150 lt/ha water volume.) | 0.25 | lt/ha |
| 31/03/2016 | p | Sprayed Pacifica (in 150 lt/ha water volume.) | 0.50 | kg/ha |
| 31/03/2016 | p | Sprayed Bio Power (in 150 lt/ha water volume.) | 1.00 | lt/ha |
| 04/04/2016 | f | Applied Nitram (34.5% N) Fertiliser | 203.00 | kg/ha |
| 05/04/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume.) | 2.00 | lt/ha |
| 05/04/2016 | p | Sprayed Toledo (in 150 lt/ha water volume.) | 0.30 | lt/ha |
| 05/04/2016 | p | Sprayed Bravo 500 (in 150 lt/ha water volume.) | 1.00 | lt/ha |
| 05/04/2016 | p | Sprayed Moddu (in 150 lt/ha water volume.) | 0.10 | lt/ha |
| 05/04/2016 | p | Sprayed Chlormequat (in 150 lt/ha water volume.) | 1.25 | lt/ha |
| 29/04/2016 | f | Applied Nitram (34.5% N) Fertiliser | 203.00 | kg/ha |
| 04/05/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume.) | 2.00 | lt/ha |
| 04/05/2016 | p | Sprayed Keystone (in 150 lt/ha water volume.) | 0.80 | lt/ha |
| 04/05/2016 | p | Sprayed Balear 720 (in 150 lt/ha water volume.) | 0.70 | lt/ha |
| 24/05/2016 | p | Sprayed Sprinter (in 150 lt/ha water volume.) | 2.00 | lt/ha |
| 24/05/2016 | p | Sprayed Vortex (in 150 lt/ha water volume.) | 1.50 | lt/ha |
| 09/06/2016 | p | Sprayed Cello (in 150 lt/ha water volume.) | 0.60 | lt/ha |
| 09/06/2016 | p | Sprayed Cyflamid (in 150 lt/ha water volume.) | 0.15 | lt/ha |
| 09/06/2016 | p | Sprayed Hallmark (in 150 lt/ha water volume.) | 50.00 | ml/ha |
| 13/08/2016 | a | Combined | | |
| 18/08/2016 | a | Baled Straw | | |



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## R/CS/477 and W/CS/478
## CONTINUOUS MAIZE

Experimental details are given on page 56 of the 2015 yield book. 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 experiments ceased after harvest 2015. No yields were taken for 2016 onwards

The corrected yields for 2009-2015 are given below:

### WHOLE CROP TONNES/HECTARE (100% DM)

**Table of Means**

R/CS/477

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Treatment | | | | | | | |
| M | 8.87 | 9.44 | 6.12 | 6.11 | 2.00 | 9.18 | 1.48 |
| MT | 8.63 | 8.84 | 5.66 | 6.87 | 2.33 | 9.64 | 2.14 |
| (B)M | 9.45 | | | 7.63 | 1.60 | 12.71 | 3.30 |
| M(B) | | | | | 2.52 | 12.03 | 2.25 |
| Mean | 8.98 | 9.14 | 5.89 | 6.87 | 2.11 | 10.89 | 2.29 |
| Plot Area Harvested | 0.00126 | | | | | | |
| Mean DM% | 21.4 | 31.4 | 18.4 | 24.7 | 23.7 | 30.8 | 25.1 |

W/CS/478

| Year | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Treatment | | | | | | | |
| M | 9.80 | 6.05 | 8.5 | 5.76 | 2.39 | 2.30 | - |
| MT | 9.64 | 4.74 | 9.19 | 5.79 | 3.62 | 4.73 | - |
| (B)M | 9.57 | | | | 2.86 | 4.86 | - |
| M(B) | | | | 4.87 | 2.67 | 3.03 | - |
| Mean | 9.67 | 5.39 | 8.84 | 5.47 | 2.88 | 3.73 | - |
| Plot Area Harvested | 0.00126 | | | | | | |
| Mean DM% | 23.8 | 39.7 | 32.7 | 24.5 | 26.5 | 34.6 | - |

In 2015 no yields for were taken on W/CS/478 because of crop failure



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## Rothamsted Research

## The Weather : Monthly Summary : 2016

(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** | 64.5 | (+2.46) | 8.1 | (+1.36) | 1.8 | (+0.63) | 3.17 | 16 | 6.5 | 8.6 | 92.3 | (+22.34) | 25 | 153.1 | 9.7 |
| **February** | 111.5 | (+31.19) | 8.0 | (+1.09) | 1.6 | (+0.67) | 2.29 | 18 | 5.9 | 7.5 | 46.9 | (-3.27) | 18 | 22.9 | 11.2 |
| **March** | 133.4 | (+18.45) | 9.2 | (-0.65) | 1.8 | (-0.92) | 3.03 | 18 | 6.2 | 7.0 | 84.3 | (+33.52) | 16 | 82.5 | 9.3 |
| **April** | 167.6 | (+6.37) | 11.9 | (-0.73) | 3.5 | (-0.52) | 4.09 | 12 | 8.8 | 8.5 | 62.0 | (+6.96) | 24 | 26.1 | 8.4 |
| **May** | 197.0 | (+2.40) | 17.4 | (+1.34) | 7.9 | (+0.99) | 8.51 | 7 | 12.4 | 10.5 | 39.4 | (-15.30) | 11 | 0.6 | 8.6 |
| **June** | 141.0 | (-57.17) | 19.0 | (-0.11) | 11.2 | (+1.45) | 12.07 | 0 | 15.5 | 13.2 | 84.8 | (+31.58) | 22 | 22.8 | 5.9 |
| **July** | 210.3 | (+5.09) | 22.2 | (+0.43) | 12.8 | (+0.89) | 12.82 | 0 | 17.3 | 15.1 | 27.1 | (-22.80) | 16 | 1.8 | 6.8 |
| **August** | 217.6 | (+21.38) | 22.7 | (+1.17) | 12.9 | (+1.02) | 13.0 | 0 | 17.1 | 15.9 | 30.1 | (-33.58) | 12 | 0.1 | 7.7 |
| **September** | 128.0 | (-15.44) | 20.4 | (+2.10) | 12.2 | (+2.29) | 14.0 | 0 | 16.5 | 16.0 | 70.3 | (+12.68) | 16 | 17.8 | 6.3 |
| **October** | 104.0 | (-7.73) | 14.2 | (+0.18) | 7.4 | (+0.30) | 9.4 | 4 | 12.4 | 13.8 | 30.1 | (-51.55) | 22 | 2.3 | 6.6 |
| **November** | 91.1 | (+20.40) | 8.8 | (-0.94) | 2.6 | (-1.24) | 4.4 | 11 | 8.6 | 11.0 | 85.7 | (+9.04) | 21 | 56.2 | 8.0 |
| **December** | 68.7 | (+14.91) | 8.7 | (+1.77) | 2.1 | (+0.40) | 4.3 | 18 | 6.7 | 8.8 | 26.2 | (-43.28) | 24 | 12.9 | 6.0 |
| **Year** | 1634.6 | (+42.31) | 14.2 | (+0.58) | 6.5 | (+0.50) | 7.6 | 104.0 | 11.1 | 11.3 | 679.3 | (-53.66) | 227.0 | 399.0 | 7.9 |

* Number of nights grass minimum was below 0.0 °C

** Number of days rain was 0.2 mm or more

*** At 2 metres above the ground



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## Woburn Experimental Farm

## The Weather : Monthly Summary : 2016

(Departure from 30-year means (1981 - 2010) in brackets)

| | Sunshine | | Mean temperatures oC | | | | | | | | Rain | | | Wind |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Maximum | | Minimum | | Dew | Ground | In ground under grass | | Total mm | | Rain | *** |
| | Hours | ( ) | | ( ) | | ( ) | point | frosts * | 30 cm | 100 cm | Tipping bucket | | days ** | km/hr |
| | | | | | | | | | | | | ( ) | | |
| **January** | 59.2 | (-0.86) | 8.5 | (+1.43) | 2.3 | (+0.99) | 3.1 | 19 | 6.6 | 9.3 | 73.6 | (+19.10) | 21 | 10.3 |
| **February** | 110.0 | (+35.12) | 8.5 | (+1.15) | 1.3 | (+0.41) | 2.1 | 20 | 6.0 | 8.0 | 37.8 | (-4.36) | 12 | 10.5 |
| **March** | 119.6 | (+6.18) | 9.6 | (-0.75) | 1.0 | (-1.65) | 2.8 | 19 | 6.3 | 7.2 | 73.0 | (+27.12) | 13 | 8.3 |
| **April** | 168.7 | (+17.81) | 12.5 | (-0.53) | 3.0 | (-0.75) | 4.0 | 17 | 9.3 | 8.6 | 51.5 | (-0.68) | 19 | 7.6 |
| **May** | 203.5 | (+16.28) | 17.7 | (+1.12) | 6.8 | (+0.27) | 8.5 | 9 | 13.3 | 10.6 | 56.1 | (+2.85) | 12 | 7.5 |
| **June** | - | - | 19.7 | (+0.10) | 11.1 | (+1.71) | 12.0 | 0 | 16.9 | 13.4 | 141.9 | (+91.85) | 18 | - |
| **July** | - | - | 22.6 | (+0.46) | 12.6 | (+0.96) | 13.1 | 0 | 18.9 | 15.6 | 22.2 | (-27.67) | 9 | - |
| **August** | 216.8 | (+28.00) | 23.2 | (+1.28) | 12.1 | (+0.54) | 13.3 | 0 | 18.6 | 16.6 | 43.1 | (-14.75) | 13 | 7.9 |
| **September** | 134.3 | (-2.75) | 20.8 | (+2.10) | 12.3 | (+2.75) | 14.0 | 0 | 17.4 | 16.6 | 56.5 | (-0.62) | 16 | 7.2 |
| **October** | 106.5 | (-5.29) | 14.9 | (+0.50) | 6.3 | (-0.61) | 9.6 | 9 | 12.7 | 14.6 | 21.6 | (-49.20) | 16 | 5.3 |
| **November** | 78.8 | (+12.56) | 9.1 | (-0.86) | 2.1 | (-1.66) | 4.5 | 17 | 8.4 | 11.8 | 78.3 | (+15.86) | 22 | 6.9 |
| **December** | 59.7 | (+14.06) | 9.3 | (+2.12) | 1.7 | (+0.26) | 4.4 | 18 | 6.3 | 9.4 | 34.4 | (-21.31) | 20 | 6.1 |
| **Year** | - | - | 14.7 | (+0.68) | 6.1 | (+0.26) | 7.7 | 128.0 | 11.8 | 11.8 | 690.2 | (+38.21) | 191.0 | - |

* Number of nights grass minimum was below 0.0 oC

** Number of days rain was 0.2 mm or more

*** At 2 metres above ground

Due to an electrical Storm on 07/06/2016 sensors and data were compromised - RAIN DATA from 16/06/2016 to 20/07/2016 was provided by Met Office © Crown Copyright Met Office 2016



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