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

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

Yields of the Field Experiments 2013

Full Table of Content

W/RN/12 Organic Manuring

Rothamsted Research

Rothamsted Research (2014) *W/RN/12 Organic Manuring ;* Yields Of The Field Experiments 2013, pp 44 - 47 **- DOI: https://doi.org/10.23637/ERADOC-1-223**

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

13/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 48th year, Winter Rye

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

Design: 4 blocks of 8 plots

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

Treatments: From 1966 to 1971 the experiment had a preliminary period designed to build up organic matter from different sources. An arable rotation was started on two blocks on 1972 and the remaining two blocks in 1973. After a period of testing the residues, a further period of accumulation was started; on two blocks (which included ley sown in 1979) in 1981 and on the other two (which included ley sown in 1980) in 1982. A second test phase began when leys on the first pair of blocks were ploughed for the 1st test crop in 1987 and on the second pair for the 1st test crop in 1988. From 1988 two blocks, and 1989 the other two, to 1994, plots were split into 6 sub-plots to test five levels of nitrogen and nil. From 1995 to 1997 residual effects of that nitrogen were measured. In 1998 to 2000 yields were taken from whole plots only. In 2001 plots were split into half-plots to test two rates of N.
For 2003 the experiment was modified to test further inputs of organic matter. An arable rotation (w. rye, s. barley, w. beans, w. wheat, forage maize) was started on seven plots within each block; the eighth was sown to a grass/clover ley.

Whole plots

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

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

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

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

https://doi.org/10.23637/ERADOC-1-223

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

13/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)

Experimental Diary

Date		Application	Rate	Units
20-Oct-12	p	Sprayed glyphosate, grass plots not sprayed.	4	l/ha
24-Oct-12	a	Applied compost, plots 7, 12, 21 and 27	40	t/ha
24-Oct-12	a	Applied straw, Plots 3, 15, 17, 31.	7.5	t/ha
06-Nov-12	a	Applied FYM -finished	—	—
06-Nov-12	a	Topped grass plots, unable to bale and remove, too little grass.	—	—
06-Nov-12	a	Ploughed - East	—	—
08-Nov-12	a	Ploughed- finished	—	—
10-Dec-12	a	Power harrowed- prep site	—	—
12-Dec-12	s	Drilled Kapitan, drilled as a solid block	450	seeds/m^2
13-Dec-12	s	Drilled Kapitan - finished	450	seeds/m^2
20-Apr-13	f	Applied Sulphate of Potash, applied to whole trial except plots 5, 11, 23 and 26.	200	kg/ha
20-Apr-13	f	Applied TSP- applied to all plots except 5, 11, 23 and 26	97.5	kg/ha
01-May-13	p	Sprayed Ally Max + Folicur + Amistar + Moddus + New 5C Cycocel - 200 lt/ha water. Sprayed all rye plots but not the grass.	Al@42 Fol@0.5 Am@0.5 Mo@0.25 Cyc1.5	g/ha l/ha l/ha l/ha l/ha
07-May-13	f	Applied Nitro-chalk, applied to treated plots.		
03-Jun-13	p	Sprayed Amistar and Folicur- Rye only	Am@0.5 Fol@0.5	l/ha l/ha
01-Jul-13	a	Cut grass plots, cut for yield	—	—

https://doi.org/10.23637/ERADOC-1-223

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

03-Jul-13	a	Mowed grass, mowed rest of grass plots	—	—
08-Jul-13	a	Rowed up grass, ley plots	—	—
08-Jul-13	a	Baled and removed, ley plots	—	—
31-Aug-13	a	Cut plots for yield	—	—
04-Sep-13	a	Combined	—	—
06-Sep-13	a	Baled	—	—
13-Nov-13	a	Cut and weighed grass plots for yield, plots 1,13,24 and 29	—	—
13-Nov-13	a	Topped grass plots, grass too short to bale and remove.	—	—

WINTER RYE

WHOLE CROP TONNES/HECTARE (100%DM)

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

Nitrogen Treatment	0kg	30kg	60kg	90kg	120kg	150kg	Mean
F(Fd)	1.98	3.67	4.90	5.59	5.61	6.08	4.64
F(Ln,Lc6)	2.68	4.22	5.05	6.05	6.12	6.20	5.05
St(St)	2.45	4.04	4.63	5.39	5.83	6.47	4.80
CC(Gm,Lc8)	2.09	4.19	5.22	5.61	6.53	5.83	4.91
Co(Pt,Lc8)	4.00	5.18	6.00	6.43	6.44	6.39	5.74
Dg10(Fs)	2.86	4.11	5.48	6.29	6.42	5.94	5.18
Dg25(Dg)	4.01	5.25	5.86	6.34	6.70	6.45	5.77
Mean	2.87	4.38	5.31	5.96	6.24	6.20	5.16

Standard errors of differences of means

Table	Treatment	Nitrogen	Treatment Nitrogen
s.e.d.	0.231	0.117	0.366
Except when comparing means with the same level(s) of Treatment			0.310

Grain Mean %DM 86.5

Plot area harvested (ha)
0.001766 0.001566

https://doi.org/10.23637/ERADOC-1-223

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

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

Cut dry matter t/ha (1/7/13 & 13/11/13)

Note: See previous Yield Books (2004-12) for cutting dates

https://doi.org/10.23637/ERADOC-1-223