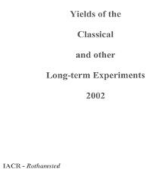
ROTHAMSTED RESEARCH

Yields of the Field Experiments 2002



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Rothamsted Research

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02/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.

Sponsor: P.R. Poulton.

The 38th year, w. wheat.

For previous years see 'Details' 1973 and 74-01/W/RN/12.

Design: 4 blocks of 8 plots split into 6.

Whole plot dimensions: 8.0 x 29.5.

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 in 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.

Whole blocks

1. **CROPSEQ** Crop sequence:

WHEAT A	W. wheat, after w. wheat 1988, potatoes 1989, w. wheat 1990, w. beans 1991, w. wheat 1992-6, w. rye 1997, w. wheat 1998-2000
WHEAT B	W. wheat, after w. wheat 1987, potatoes 1988, w. wheat 1989, w. beans 1990, w. wheat 1991-6, w. rye 1997, w. wheat 1998-2000

Whole plots

2. **TREATMNT** Previous treatments:

(LC 8 GM)	Eight-year clover/grass ley until 1987 (WHEAT A) or 1986 (WHEAT B), green manure in the preliminary period
(LC 8 PT)	As above, peat in the preliminary period
(LC 6 LC)	Six-year clover/grass ley until 1987 (WHEAT A) or 1986 (WHEAT B), clover/grass ley in the preliminary period
(LC 6 LN)	As above, grass ley with N in the preliminary period
(FYM)	Farmyard manure annually 1981 to 1986 (WHEAT A) or 1985 (WHEAT B) and in the preliminary period
(STRAW)	Straw in both periods

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2. **TREATMNT** Previous treatments: (continued)

(FERT-FYM) Fertilizers only in both periods, rates of P, K & Mg equivalent to amounts in FYM

(FERT-STR) Fertilizers only in both periods, rates of P, K & Mg equivalent to amounts in straw (+P)

3. **N** Nitrogen treatment to half plots

N1 160 kg N split 40 + 80 + 40) Applied first two weeks of March, GS31
N2 200 kg N split 40 + 120 + 40) or mid-April (whichever comes first)
) and GS37/mid-May.

Experimental diary:

20-Sep-01	B	Sulphate of potash at 200 kg. Triple superphosphate at 106 kg. Ploughed.
21-Sep-01	B	Rolled.
22-Sep-01	B	Drilled, Claire, tr. Sibutol + Aventis Manganese 500, at 300 seeds/m^2 with 4.0 m Accord drill.
13-Oct-01	**T**	Avadex Excel 15g at 15.0 kg.
16-Nov-01	B	tm) Stomp 400 SC at 4.0 l in 200 l.
	B	tm) Tolkan liquid at 2.5 l in 200 l.
12-Mar-02	**T**	1^{st} N split applied as 33.5% N.
09-Apr-02	**T**	2^{nd} N split applied as 33.5% N.
14-Apr-02	B	tm) Ally at 30 g in 200 l.
	B	tm) Opus at 0.5 l in 200 l.
	B	tm) BASF 3C Chlormequat 720 at 2.0 l in 200 l.
08-May-02	**T**	3^{rd} N split applied as 33.5% N.
27-May-02	B	tm) Amistar at 0.8 l in 200 l.
	B	tm) Opus at 0.5 l in 200 l.
22-Aug-02	**T**	Combine harvested, plots for yield.
24-Aug-02	P	Combine harvested all remaining wheat. Swathed straw. Baled and removed straw.

NOTE: Samples of grain were taken for chemical analysis.

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GRAIN TONNES/HECTARE

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

Cropseq Treatmnt	WHEAT A	WHEAT B	Mean
(LC 8 GM)	3.75	3.56	3.65
(LC 8 PT)	4.14	3.08	3.61
(LC 6 LC)	3.54	2.97	3.26
(LC 6 LN)	4.43	3.73	4.08
(FYM)	4.50	3.39	3.95
(STRAW)	4.91	2.64	3.78
(FERT-FYM)	3.13	2.39	2.76
(FERT-STR)	3.47	2.40	2.94
Mean	3.98	3.02	3.50

N Treatmnt	160	200	Mean
(LC 8 GM)	3.58	3.73	3.65
(LC 8 PT)	3.56	3.65	3.61
(LC 6 LC)	3.34	3.18	3.26
(LC 6 LN)	4.08	4.08	4.08
(FYM)	3.71	4.18	3.95
(STRAW)	3.83	3.73	3.78
(FERT-FYM)	2.71	2.81	2.76
(FERT-STR)	3.18	2.69	2.94
Mean	3.50	3.51	3.50

N Cropseq	160	200	Mean
WHEAT A	3.90	4.07	3.98
WHEAT B	3.10	2.95	3.02
Mean	3.50	3.51	3.50

Treatmnt	Cropseq	N 160	200
(LC 8 GM)	WHEAT A	3.56	3.94
	WHEAT B	3.59	3.52
(LC 8 PT)	WHEAT A	4.17	4.10
	WHEAT B	2.96	3.21
(LC 6 LC)	WHEAT A	3.62	3.47
	WHEAT B	3.06	2.89
(LC 6 LN)	WHEAT A	4.40	4.45
	WHEAT B	3.76	3.70
(FYM)	WHEAT A	3.97	5.04
	WHEAT B	3.46	3.32
(STRAW)	WHEAT A	4.77	5.06
	WHEAT B	2.89	2.40
(FERT-FYM)	WHEAT A	3.07	3.18
	WHEAT B	2.34	2.44
(FERT-STR)	WHEAT A	3.64	3.30
	WHEAT B	2.72	2.09

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GRAIN TONNES/HECTARE

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

Treatmnt	N	Cropseq* Treatmnt
0.424	0.060	0.599

Cropseq* N	Treatmnt N	Cropseq* Treatmnt N
0.085	0.441	0.623

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

Treatmnt	0.171
Cropseq.Treatmnt	0.242

* Within the same level of **Cropseq** only

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

Stratum	d.f.	s.e.	cv%
Blocks.Plots	14	0.599	17.1
Blocks.Plots.Subplots	16	0.242	6.9

GRAIN MEAN DM% 84.3

AVERAGE PLOT AREA HARVESTED 0.00602