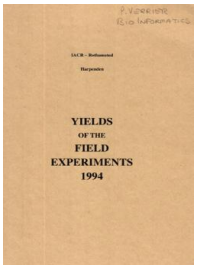
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1994

Full Table of Content



94/W/CS/347 Green Crops for Set-aside - Ryegrass, Clover, Tumbledown, W. Oats, W. Wheat

Rothamsted Research

Rothamsted Research (1995) *94/W/CS/347 Green Crops for Set-aside - Ryegrass, Clover, Tumbledown, W. Oats, W. Wheat ;* Yields Of The Field Experiments 1994, pp 72 - 76 **- DOI: https://doi.org/10.23637/ERADOC-1-49**

94/W/CS/347

GREEN CROPS FOR SET-ASIDE

Object: To obtain information on the establishment and maintenance of sown crops and unsown vegetation in three-year and five-year set-aside. Effects on soil nitrate and leaching after ploughing are also studied - Woburn, Horsepool Lane Close II.

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Design: Treatment phase: 3 randomised blocks of 6 plots.
Test phase: 3 randomised blocks of 6 plots split into 2 x 2 criss-cross.

Whole plot dimensions: 6.5 x 26.0.

The fifth year, ryegrass, clover, tumbledown, w. oats and w. wheat.

For previous years see 90-93/W/CS/347.

Treatments:

Treatment phase (5th year)

Whole plots

CROPS	Crops, cumulative since 1990:
RY LF	Ryegrass, cuttings left in situ
RY+CL LF	Ryegrass + clover, cuttings left in situ
RY+CL RE	Ryegrass + clover, cuttings removed
RY+N RE	Ryegrass given 100 kg N in spring, cuttings removed
TU LF	Tumbledown, natural regrowth, cuttings left in situ
ARABLE	W. oats, in arable sequence w. wheat, w. wheat, w. oats, w. wheat, w. oats

Test phase (2nd year, w. wheat):

Whole plots

1. **PREVCROP** Previous crops, cumulative 1990 to 1992 (as **CROPS** above):

   (RY LF)
   (RY+CL LF)
   (RY+CL RE)
   (RY+N RE)
   (TU LF)
   (ARABLE)

https://doi.org/10.23637/ERADOC-1-49

94/W/CS/347

Sub-plots (**N** criss-cross, **WHEAT** split-plots)

2. **N** Fertilizer nitrogen, cumulative to 1993, applied in spring:

NO	None
N OPT	Optimum

3. **WHEAT** Residual effects of time of ploughing and drilling w. wheat in autumn 1992 and spring 1993:

(W)	Winter
(S)	Spring

NOTES: (1) Among the three blocks still in the treatment phase, yields were taken from the w. oats plots and from the ley plots from which the cuttings were removed.
(2) The other three blocks were sown to winter-sown or spring-sown wheat in 1993 and were also split to test for nitrogen. These blocks were sown to a second wheat test crop in 1994.

Experimental diary:

Treatment phase:

02-Sep-93 : **T** : **CROPS** ARABLE: Sting CT at 8.0 l in 200 l.
08-Sep-93 : **T** : **CROPS** ARABLE: Ploughed.
20 Oct-93 : **T** : **CROPS** ARABLE: PK as (0:18:36) at 694 kg, spring-tine cultivated.
22-Oct-93 : **T** : **CROPS** ARABLE: Rotary harrowed, Image, dressed Rappor Plus, drilled at 425 seeds per m^2.
02-Nov-93 : **T** : **CROPS** ARABLE: Glytex at 2.25 l in 200 l.
12-Apr-94 : **T** : **CROPS** RY+CL RE: Triple superphosphate at 39 kg and muriate of potash at 137 kg.
: **T** : **CROPS** RY+N RE: Triple superphosphate at 26 kg, muriate of potash at 106 kg and 27% N at 370 kg.
20-Apr-94 : **T** : **CROPS** ARABLE: 27% N at 370 kg.
29-May-94 : **T** : **CROPS** ARABLE: Tilt 250 EC at 0.5 l in 200 l.
01-Jun-94 : **T** : **CROPS** RY LF, RY+CL LF, RY+CL RE, RY+N RE, TU LF: Cut.
: **T** : **CROPS** RY+CL RE, RY+N RE: Cuttings removed.
13-Jul-94 : **T** : **CROPS** RY LF, RY+CL LF, RY+CL RE, RY+N RE, TU LF: Cut.
: **T** : **CROPS** RY+CL RE, RY+N RE: Cuttings removed.
05-Aug-94 : **T** : **CROPS** ARABLE: Combine harvested.
22-Sep-94 : **T** : **CROPS** RY LF, RY+CL LF, RY+CL RE, RY+N RE, TU LF: Cut.
: **T** : **CROPS** RY+CL RE, RY+N RE: Cuttings removed.

Test phase:

02-Sep-93 : **T** : Sting CT at 8.0 l in 200 l.
08-Sep-93 : **T** : Ploughed.
19-Oct-93 : **T** : PK as (0:18:36) at 694 kg.
20-Oct-93 : **T** : Spring-tine cultivated.
23-Oct-93 : **T** : Rotary harrowed twice, Cadenza, dressed Cerevax, drilled at 325 seeds per m^2.
02-Nov-93 : **T** : Glytex at 2.25 l in 200 l.
21-Mar-94 : **T** : **N** N OPT: 27% N at 148 kg.
03-May-94 : **T** : **N** N OPT: 27% N at 592 kg.

https://doi.org/10.23637/ERADOC-1-49

94/W/CS/347

Experimental diary:

30-May-94 : **T** : Ally at 30 g with Starane 2 at 0.75 l in 200 l.
: **T** : Cyclone at 1.0 l with Mistral at 0.50 l in 200 l.
08-Jul-94 : **T** : Aphox at 280 g in 200 l.
20-Aug-94 : **T** : Combine harvested.

NOTES: (1) Soil nitrogen was measured in autumn 1993 and spring 1994. In all crops of the treatment phase, ground cover, plant numbers, plant height and growth stages were estimated in spring 1994 and again in autumn 1994 before sowing the first wheat test crop.
(2) The wheat was sampled in June to measure diseases affecting the stem bases and roots.

TREATMENT PHASE

GRASS

1ST CUT (1/6/94) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	4.32	3.05	3.68

1ST CUT MEAN DM% 20.9

PLOT AREA HARVESTED 0.00299

2ND CUT (13/7/94) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	2.28	1.62	1.95

2ND CUT MEAN DM% 28.3

PLOT AREA HARVESTED 0.00264

3RD CUT (22/9/94) DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	0.96	0.37	0.67

3RD CUT MEAN DM% 28.4

PLOT AREA HARVESTED 0.00264

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94/W/CS/347

TOTAL OF 3 CUTS DRY MATTER TONNES/HECTARE

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

CROPS	RY+CL RE	RY+N RE	Mean
	7.56	5.03	6.30

TOTAL OF 3 CUTS MEAN DM% 25.9

W. OATS

GRAIN TONNES/HECTARE 6.00

GRAIN MEAN DM% 87.7

PLOT AREA HARVESTED 0.00572

TEST PHASE

GRAIN TONNES/HECTARE

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

N	NO	N OPT	Mean
PREVCROP			
(RY LF)	3.40	7.35	5.38
(RY+CL LF)	2.97	7.26	5.11
(RY+CL RE)	3.02	7.37	5.19
(RY+N RE)	3.20	6.61	4.91
(TU LF)	2.56	7.39	4.97
(ARABLE)	2.20	5.86	4.03
Mean	2.89	6.97	4.93

WHEAT	(W)	(S)	Mean
PREVCROP			
(RY LF)	5.43	5.32	5.38
(RY+CL LF)	5.10	5.13	5.11
(RY+CL RE)	5.25	5.14	5.19
(RY+N RE)	4.81	5.01	4.91
(TU LF)	5.03	4.92	4.97
(ARABLE)	3.93	4.13	4.03
Mean	4.92	4.94	4.93

WHEAT	(W)	(S)	Mean
N			
NO	2.91	2.87	2.89
N OPT	6.93	7.01	6.97
Mean	4.92	4.94	4.93

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94/W/CS/347

TEST PHASE

GRAIN TONNES/HECTARE

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

	WHEAT	(W)		(S)	
PREVCROP	N	NO	N OPT	NO	N OPT
(RY LF)		3.65	7.20	3.15	7.50
(RY+CL LF)		2.89	7.30	3.04	7.23
(RY+CL RE)		3.13	7.37	2.91	7.36
(RY+N RE)		3.14	6.47	3.27	6.75
(TU LF)		2.60	7.46	2.53	7.31
(ARABLE)		2.07	5.80	2.34	5.93

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

	PREVCROP	WHEAT	PREVCROP WHEAT
.	0.443	0.106	0.480
Except when comparing means with the same level(s) of PREVCROP			0.258

	PREVCROP* N	WHEAT* N	PREVCROP* WHEAT N
	0.565	0.165	0.615
Except when comparing means with the same level(s) of PREVCROP	0.532		0.592
WHEAT		0.157	
PREVCROP.WHEAT			0.578
PREVCROP.N			0.343

* Within the same level of **N** only

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP1	10	0.543	11.0
BLOCK.WP1.SP	12	0.317	6.4
BLOCK.WP1.WP2	10	0.693	14.1
BLOCK.WP1.SP.WP2	12	0.391	7.9

GRAIN MEAN DM% 83.6

SUB PLOT AREA HARVESTED 0.00279 (AVERAGE)

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