ROTHAMSTED RESEARCH

Yields of the Field Experiments 2000

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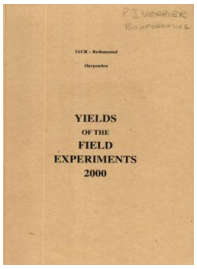

00/R/RN/22 Crop Rotations - W. Oats, W. Wheat, W. Rape, W. Linseed, W. Beans, Lupins

Rothamsted Research

Rothamsted Research (2001) *00/R/RN/22 Crop Rotations - W. Oats, W. Wheat, W. Rape, W. Linseed, W. Beans, Lupins ;* Yields Of The Field Experiments 2000, pp 49 - 53 **- DOI: https://doi.org/10.23637/ERADOC-1-55**

00/R/RN/22

CROP ROTATIONS

Object: To test combinable break crops and their effect on following wheat crops. New crop species and winter sown varients of established species are tested to determine optimal break crop selection for rotations that maximise first wheat yields and minimise inputs - Great Field I/II.

Sponsor: I.F. Shield, M.V. Hewitt, R.W. Payne.

The third year, w. oats, w. wheat, w. rape, w. linseed, w. beans, lupins.

Design: 2 blocks of 42 plots, some split into 4 sub-plots.

Whole plot dimensions: 9.0 x 23.0.
Sub-plot dimensions: 4.5 x 10.0.

Treatments:

Whole plots:

ROTATION Cropping and years

Rotation no. and cropping sequence	Phase	1998	1999	2000	2001	2002	2003	2004
1	A	O	RA	W	W	RA	W	W
RA, W, W	B	O	O	RA	W	W	RA	W
	C	O	RA	O	RA	W	W	RA
2	A	O	LN	W	W	LN	W	W
LN, W, W	B	O	O	LN	W	W	LN	W
	C	O	RA	O	LN	W	W	LN
3	A	O	LP	W	W	LP	W	W
LP, W, W	B	O	O	LP	W	W	LP	W
	C	O	RA	O	LP	W	W	LP
4	A	O	BE	W	W	BE	W	W
BE, W, W	B	O	O	BE	W	W	BE	W
	C	O	RA	O	BE	W	W	BE
5	A	O	PE	W	W	PE	W	W
PE, W, W	B	O	O	PE	W	W	PE	W
	C	O	RA	O	PE	W	W	PE
6	A	O	W	W	W	W	W	W
W, W, W	B	O	O	W	W	W	W	W
	C	O	RA	O	W	W	W	W
7	A	O	BE	W	LP	W	PE	W
BE, W,	B	O	O	BE	W	LP	W	PE
LP, W,	C	O	RA	O	BE	W	LP	W
PE, W	D	O	O	RA	O	BE	W	LP
	E	O	RA	O	RA	O	BE	W
	F	O	O	RA	O	RA	O	BE
8	A	O	RA	W	LN	W	RA	W
RA, W,	B	O	O	RA	W	LN	W	RA
LN, W	C	O	RA	O	RA	W	LN	W
	D	O	O	RA	O	RA	W	LN
9	A	O	RA	W	BE	W	RA	W
RA, W,	B	O	O	RA	W	BE	W	RA
BE, W	C	O	RA	O	RA	W	BE	W
	D	O	O	RA	O	RA	W	BE
10	A	O	O	W	W	O	W	W
O, W, W	B	O	RA	O	W	W	O	W
	C	O	O	RA	O	W	W	O

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ROTATION Cropping and years: (continued)

Rotation no. and cropping sequence	Phase	1998	1999	2000	2001	2002	2003	2004
11		O	W	W	W	W	W	W
12		O	W	W	W	W	W	W
13		O	W	W	W	W	W	W
14		O	W	W	W	W	W	W
15		O	W	W	W	W	W	W
16		O	W	W	W	W	W	W
17		O	W	W	W	W	W	W

W = w. wheat, O = w. oats, RA = w. rape, LN = w. linseed, BE = w. beans, PE = w. peas, LP = lupins.

Sub-plots: **ROTATION** 1 to 10, Phase A: (w. wheat plots were split for four levels of nitrogen).

NITROGEN	Kg N
N0	None
N1	120
N2	170
N2	220

For winter wheat plots split for N

PREVCROP	Crop in 1999
(RA)	**ROTATION** sequence 1A,8A,9A
(LN)	**ROTATION** sequence 2A
(LP)	**ROTATION** sequence 3A
(BE)	**ROTATION** sequence 4A,7A
(PE)	**ROTATION** sequence 5A
(W)	**ROTATION** sequence 6A
(O)	**ROTATION** sequence 10A

NOTE: The diary entries are by crop not by treatment.

Experimental diary:
All crops:
24-Aug-99 : B : Muriate of potash at 600 kg and triple superphosphate at 290 kg.
28-Aug-99 : B : Ploughed.
31-Aug-99 : B : Ploughing completed.
02-Sep-99 : B : Rolled (except w. rape).
21-Aug-00 : B : Azural at 4.0 l in 200 l (except lupin plots)
W. wheat:
15-Sep-99 : **T** : Combination drilled Hereward, tr. Sibutol, at 300 seeds/m^2 with the Accord drill. Genesis at 8.0 kg.
23-Sep-99 : **T** : Genesis at 8.0 kg.
04-Nov-99 : **T** : tm) Lexus Class WSB at 60 g in 200 l.
: **T** : tm) Cyperkill 10 at 250 ml in 200 l.
10-Mar-00 : **T** : 34.5% N at 145 kg (except N0 sub-plots).
17-Mar-00 : **T** : Eagle at 30 g in 200 l.
20-Mar-00 : **T** : tm)Hawk at 2.5 l in 200 l.
: **T** : tm)Cropoil at 1.0 l in 200 l.
27-Apr-00 : B : tm)Opus at 0.5 l in 200 l.
: B : tm)Unix at 0.5 kg in 200 l.
04-May-00 : **T** : 34.5% N at 435 kg (except **ROTATION** 1 - 10, Phase A).
: **T** : **ROTATION** 1 to 10, Phase A, N1 : 34.5% N at 203 kg.
: **T** : **ROTATION** 1 to 10, Phase A, N2 : 34.5% N at 348 kg.

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Experimental diary:

W. wheat:

04-May-00	: **T** :	**ROTATION** 1 to 10, Phase A, N3 : 34.5% N at 493 kg.
07-May-00	: **T** :	tm) Sypex at 1.0 l in 200 l.
	: **T** :	tm) Enhance Low Foam at 80 ml in 200 l.
16-May-00	: **T** :	Starane 2 at 0.5 l in 200 l.
29-May-00	: **T** :	tm) Amistar at 0.8 l in 200 l.
	: **T** :	tm) Folicur at 0.5 l in 200 l.
27-Jun-00	: **T** :	Folicur at 0.25 l in 200 l.
06-Aug-00	: **T** :	Combine harvested and chopped straw.

W. oats:

29-Sep-99	: **T** :	Combination drilled, Gerald, tr. Sibutol, at 350 seeds/m^2 with the Accord drill.
04-Nov-99	: **T** :	tm) Lexus Class WSB at 60 g in 200 l.
	: **T** :	tm) Cyperkill 10 at 250 ml in 200 l.
20-Mar-00	: **T** :	Orka at 0.5 l in 200 l.
10-Apr-00	: **T** :	34.5% N at 145 kg.
05-May-00	: **T** :	34.5% N at 203 kg.
16-May-00	: **T** :	Starane 2 at 0.5 l in 200 l.
09-Jun-00	: **T** :	Folicur at 0.5 l in 200 l.
02-Aug-00	: **T** :	Combine harvested and chopped straw.
05-Aug-00	: **T** :	Combine harvesting completed.

W. rape:

02-Sep-99	: **T** :	Combination drilled, Pronto, tr. Rovral Liquid FS at 60 seeds/m^2 with the Accord drill.
03-Sep-99	: **T** :	tm) Katamaran at 2.0 l in 200 l.
	: **T** :	tm) Alpha Trifluralin 48 EC at 1.0 l in 200 l.
15-Sep-99	: **T** :	Genesis at 8.0 kg.
23-Sep-99	: **T** :	Genesis at 8.0 kg.
14-Oct-99	: **T** :	tm) Punch C at 0.4 l in 200 l.
	: **T** :	tm) Hallmark at 100 ml in 200 l.
19-Oct-99	: **T** :	34.5% N at 87 kg.
02-Dec-99	: **T** :	Punch C at 0.4 l in 200 l.
09-Feb-00	: **T** :	Sulphan 30% N, 7.6% S at 166 kg.
15-Mar-00	: **T** :	34.5% N at 377 kg.
16-Mar-00	: **T** :	tm) Laser at 1.0 l in 200 l.
	: **T** :	tm) Cropoil at 2.0 l in 200 l
17-Mar-00	: **T** :	tm) Bavistin DF at 1.0 kg in 100 l.
	: **T** :	tm) Hallmark with Zeon Technology at 75 ml in 100 l.
12-Jul-00	: **T** :	tm) Reglone at 3.0 l in 400 l.
	: **T** :	tm) Enhance Low Foam at 400 ml in 400 l.
19-Jul-00	: **T** :	Combine harvested and chopped straw.

W. linseed:

06-Oct-99	: **T** :	Combination drilled Oliver, tr. Prelude 20 LF, at 950 seeds/m^2 with the Nordsten drill.
10-Mar-00	: **T** :	34.5% N at 145 kg.
16-Mar-00	: **T** :	tm) Laser at 1.0 l in 200 l.
	: **T** :	tm) Cropoil at 2.0 l in 200 l.
17-Mar-00	: **T** :	Eagle at 30 g in 200 l.
31-Mar-00	: **T** :	34.5% N at 116 kg.
26-Jul-00	: **T** :	tm) Reglone at 3.0 l in 400 l.
	: **T** :	tm) Enhance Low Foam at 400 ml in 400 l.
01-Aug-00	: **T** :	Combine harvested and chopped straw.

W. beans:

28-Oct-99	: **T** :	Drilled Clipper, recleaned, at 40 seeds/m^2 with the Carrier drill.
08-Nov-99	: **T** :	tm) Alpha Simazine 50 SC at 2.0 l in 200 l.
	: **T** :	tm) Kerb 50 W at 1.5 kg in 200 l.
20-May-00	: **T** :	tm) Bravo 500 at 1.0 l in 200 l.
	: **T** :	tm) Folicur at 0.5 l in 200 l.
17-Aug-00	: **T** :	Combine harvested and chopped straw.

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Experimental diary:

W. peas:

29-Oct-99	: **T** :	Drilled Victor, tr. Wakil, at 100 seeds/m^2 with the Carrier drill.
22-Nov-99	: **T** :	PDQ at 3.0 l in 220 l.
22-May-00	: **T** :	tm) Bravo 500 at 2.0 l in 220 l.
	: **T** :	tm) Ronilan FL at 0.75 l in 220 l.
16-Jun-00	: **T** :	tm) Compass at 3.0 l in 200 l.
	: **T** :	tm) Aphox at 280 g in 200 l.
31-Jul-00	: **T** :	Combine harvested and chopped straw.

W. lupins:

15-Sep-99	: **T** :	Genesis at 8.0 kg.
16-Sep-99	: **T** :	Combination drilled, DTN 20, tr. Germipro and Promet, at 40 seeds/m^2 with the Accord drill.
21-Sep-99	: **T** :	Stomp 400 SC at 5.0 l in 200 l.
23-Sep-99	: **T** :	Genesis at 8.0 kg.
14-Oct-99	: **T** :	Cyperkill 10 at 250 ml in 200 l.
12-Nov-99	: **T** :	tm) Alpha Simazine 50 SC at 2.3 l in 220 l.
	: **T** :	tm) Carbetamex at 3.0 kg in 200 l.
28-Apr-00	: **T** :	tm) Bravo 500 at 1.5 l in 200 l.
	: **T** :	tm) Folicur at 0.5 l in 200 l.
04-Jul-00	: **T** :	tm) Aphox at 280 g in 200 l.
	: **T** :	tm) Folicur at 0.5 l in 200 l.
	: **T** :	tm) Enhance Low Foam at 50 ml in 200 l.
14-Sep-00	: **T** :	Combine harvested and chopped straw.

NOTE: Peas were netted from 24-Nov-99 to 31-Jul-00. Soil was sampled on wheat plots for nitrogen content on 27-28-Jan-00. Wheat plots were assessed for lodging before harvest.

NOTE: Yields are presented by crop not by **ROTATION**.

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

CROPS OTHER THAN WINTER WHEAT

WINTER CROP	GRAIN TONNES/ HECTARE	GRAIN MEAN DM%
RAPE	3.42	85.3
LINSEED	0.59	90.9
LUPINS	3.72	54.4
BEANS	3.73	80.7
PEAS	3.24	80.7
WHEAT*	8.28	83.0
OATS	9.31	86.2

* FROM WHEAT PLOTS NOT SPLIT FOR **NITROGEN**

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WINTER WHEAT

NITROGEN	0	120	170	220	Mean
PREVCROP					
(RA)	5.18	6.99	7.23	6.31	6.43
(LN)	3.99	7.11	7.07	6.71	6.22
(LP)	4.44	7.37	8.32	7.36	6.87
(BE)	3.96	5.79	5.45	5.60	5.20
(PE)	5.82	6.13	6.05	7.00	6.25
(W)	3.26	6.95	6.80	6.98	6.00
(O)	3.55	7.39	8.61	9.24	7.20
Mean	4.45	6.75	6.94	6.74	6.22

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

PREVCROP	**NITROGEN**	**PREVCROP NITROGEN**	
0.929		1.266	A v A
0.805		1.097	A v B
0.759	0.314	1.034	A v C
0.600		0.817	B v C

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

0.993	A v A
0.860	A v B
0.811	A v C
0.641	B v C
0.702	B v B
0.573	C v C

For comparing means

A is any of (LN), (LP), (PE), (W), (O)
B is (BE)
C is (RA)

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	0.929	14.9
BLOCK.WP.SP	39	0.993	16.0

GRAIN MEAN DM% (WHEAT) 83.6

SUB-PLOT AREA 0.00240 (BEANS 0.00150)

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