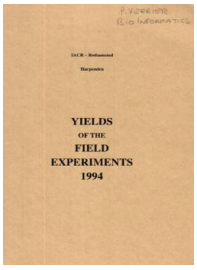
This work is licensed under a Creative Commons Attribution 4.0 International License.

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 1994

Full Table of Content



94/W/RN/3 Ley/ARABLE - Leys, W. Beans, W. Wheat, W. Rye, S. Barley

Rothamsted Research

Rothamsted Research (1995) *94/W/RN/3 Ley/ARABLE - Leys, W. Beans, W. Wheat, W. Rye, S. Barley ;* Yields Of The Field Experiments 1994, pp 37 - 46 **- DOI: https://doi.org/10.23637/ERADOC-1-49**

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

94/W/RN/3

LEY/ARABLE

Object: To compare the effects on soil fertility of rotations with or without leys - Woburn, Stackyard D.

Sponsor: P.R. Poulton.

The 57th year, leys, w. beans, w. wheat, w. rye, s. barley.

For previous years see 'Details' 1967 & 1973 and 74-93/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 each 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) LN, LN, LN, W, R
LC 3	(Previous CLO) LC, LC, LC, W, R
AF	(Previous A) F, F, BE, W, R
AB	(Previous A H) B, B, 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

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

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

94/W/RN/3

Plots hitherto in alternating rotations were changed to test eight-year leys:

LLN	LN, LN, LN, LN, LN, LN, LN, LN, W, R
LLC	LC, LC, LC, LC, LC, LC, LC, LC, W, R

LLN1 to LLN8 = eight year grass ley with N, first year to eighth year, similarly for LLC

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 only from the leys and the test crops.

Treatments to first test crop w. wheat, all combinations of:

Whole plots

1. **ROTATION** Rotations:

LN 8
LN 3
LC 8
LC 3
AF
AB

1/2 plots

2. **FYMRES63** Farmyard manure residues, last applied 1963:

NONE
FYM 38 tonnes on each occasion

1/8 plots

3. **N** Nitrogen fertilizer (kg N) as 'Nitro-Chalk':

0
70
140
210

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

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

94/W/RN/3

Treatments to second test crop w. rye, all combinations of:

Whole plots

1. **ROTATION** Rotations:

   LN 8
   LN 3
   LC 8
   LC 3
   AF
   AB

1/2 plots

2. **FYMRES62** Farmyard manure residues, last applied 1962:

   NONE
   FYM 38 tonnes on each occasion

1/8 plots

3. **N** Nitrogen fertilizer (kg N) as 'Nitro-Chalk':

   0
   30
   60
   90

Treatments to leys:

FYM RES Farmyard manure residues:

NONE
FYM 38 tonnes on each occasion, last applied 1966 to 1st and 6th year leys, 1965 to 2nd and 7th year leys, 1964 to 3rd and 8th year leys, 1963 to 4th year leys, 1962 to 5th year leys

Corrective K dressings (kg K_2O) as muriate of potash, applied to first test crop w. wheat and long-term leys in the wheat block, applied: 21 Oct, 1993:

Continuous rotations	No FYM half plots	FYM half plots
LN	0	0
LC	0	0
AF	315	280
AB	325	290

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

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

94/W/RN/3

Ex-alternating rotations		
LN 8 ploughed for w. wheat	0	0
LN 8 not ploughed	0	0
LC 8 ploughed for w. wheat	0	0
LC 8 not ploughed	0	0

Experimental diary:

Treatment crops:

Grass ley and clover/grass ley, 1st year (**ROTATION** LN1, LC1, LLN1 and LLC1):

19-Aug-93 : **T** : Roundup at 5.33 l in 200 l.
10-Sep-93 : **T** : Ploughed.
17-Sep-93 : **T** : LN1 and LLN1 only: 27% N at 280 kg.
: **T** : LC1 and LLC1 only: 27% N at 186 kg.
24-Sep-93 : **T** : Rotary harrowed.
: **T** : LN1 and LLN1 only: 50% Bundy meadow fescue and 50% Erecta timothy mixture drilled at 30 kg.
: **T** : LC1 and LLC1 only: 45% Bundy meadow fescue, 45% Erecta timothy and 10% Huia white clover mixture drilled at 30 kg.
18-Apr-94 : **T** : PK as (0:18:36) at 417 kg.
: **T** : LN1 and LLN1 only: NK as (25:0:16) at 300 kg.
: **T** : LC1 and LLC1 only: Muriate of potash at 80 kg.
08-Jun-94 : **T** : First cut.
10-Jun-94 : **T** : Produce removed.
14-Jun-94 : **T** : LN1 and LLN1 only: NK as (25:0:16) at 300 kg.
: **T** : LC1 and LLC1 only: Muriate of potash at 80 kg.
15-Jun-94 : **T** : Chain harrowed.
02-Sep-94 : **T** : Second cut.
03-Oct-94 : **T** : Remainder of plot cut.
04 Oct-94 : **T** : Produce removed.

Grass leys, 2nd to 8th years (**ROTATION** LN2-3, LLN2-8):

21-Oct-93 : **T** : LLN5 only: Dolomite at 5.0 t.
18-Apr-94 : **T** : PK as (0:18:36) at 417 kg, NK as (25:0:16) at 300 kg.
08-Jun-94 : **T** : First cut.
10-Jun-94 : **T** : Produce removed.
14-Jun-94 : **T** : NK as (25:0:16) at 300 kg.
15-Jun-94 : **T** : Chain harrowed.
02-Sep-94 : **T** : Second cut.
03-Oct-94 : **T** : Remainder of plot cut.
04-Oct-94 : **T** : Produce removed.

Clover/grass leys, 2nd to 8th years (**ROTATION** LC2-3 and LLC2-8):

21-Oct-93 : **T** : LLC5 only: Dolomite at 5.0 t.
18-Apr-94 : **T** : PK as (0:18:36) at 417 kg, muriate of potash at 80 kg.
08-Jun-94 : **T** : First cut.
10-Jun-94 : **T** : Produce removed.
14-Jun-94 : **T** : Muriate of potash at 80 kg.
15-Jun-94 : **T** : Chain harrowed.
02-Sep-94 : **T** : Second cut.
03-Oct-94 : **T** : Remainder of plot cut.
04-Oct-94 : **T** : Produce removed.

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

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

94/W/RN/3

Experimental diary:

S. barley, 1st and 2nd treatment crops (**ROTATION** AB):

15-Mar-94 : **T** : Ploughed.
18-Mar-94 : **T** : NPK as (20:10:10) at 400 kg.
21-Mar-94 : **T** : Rotary harrowed, Alexis dressed Panoctine Plus drilled at 325 seeds per m^2.
19-May-94 : **T** : Vindex at 1.1 l with Duplosan New System CMPP at 2.0 l in 200 l.
12-Jun-94 : **T** : Radar at 0.5 l in 200 l.
21-Aug-94 : **T** : Combine harvested.

W. beans, 3rd treatment crop (**ROTATION** AF and AB):

19-Aug-93 : **T** : AB only: Roundup at 5.33 l in 200 l.
21-Oct-93 : **T** : PK as (0:24:24) at 168 kg. Punch broadcast at 24 seeds per m^2, ploughed.
10-Feb-94 : **T** : Carbetamex at 3.0 kg in 200 l.
09-May-94 : **T** : Rovral Flo at 1.5 l with Bravo at 1.0 l in 200 l.
12-Jun-94 : **T** : Rovral Flo at 1.5 l with Bravo at 1.0 l in 300 l.
19-Aug-94 : **T** : Combine harvested.

Fallow, 1st and 2nd treatment years (**ROTATION** AF):

19-Aug-93 : **T** : After rye only: Roundup at 5.33 l in 200 l.
10-Sep-93 : **T** : After rye only: Ploughed.
24-Sep-93 : **T** : After rye only: Rotary harrowed with crumbler attached.
19-Apr-94 : **T** : Heavy spring-tine cultivated.
27-Jun-94 : **T** : Rotary cultivated.

W. wheat, 1st test crop (W):

21-Oct-93 : **T** : Ploughed.
22-Oct-93 : **T** : PK as (0:24:24) at 260 kg. Yaltox at 150 kg. Rotary harrowed, Mercia, dressed Panoctine, drilled at 325 seeds per m^2.
19-Apr-94 : **T** : **N** 70, 140 and 210: Applied as 27% N.
01-May-94 : **T** : Oxytril CM at 1.5 l with Duplosan New System CMPP at 2.0 l and Halo at 1.5 l in 200 l.
30-May-93 : **T** : Cyclone at 1.0 l with Mistral at 0.5 l in 200 l.
14-Jun-94 : **T** : Hostathion at 0.84 l in 200 l.
15-Aug-94 : **T** : Combine harvested.

W. rye, 2nd test crop (R):

19-Aug-93 : **T** : Roundup at 5.33 l in 200 l.
21-Oct-93 : **T** : Dolomite at 5 t. Ploughed.
22-Oct-93 : **T** : PK as (0:24:24) at 260 kg. Yaltox at 150 kg. Rotary harrowed, Amando, dressed Baytan, drilled at 350 seeds per m^2.
20-Apr-94 : **T** : **N** 30, 60 and 90: Applied as 27% N.
01-May-94 : **T** : Vindex at 1.4 l with Starane 2 at 0.5 l and New 5C Cycocel at 2.5 l in 200 l.
29-May-94 : **T** : Radar at 0.5 l in 200 l.
09-Aug-94 : **T** : Combine harvested.

NOTE: Samples of grass, clover/grass, wheat and rye grain were taken for chemical analysis.

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

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

94/W/RN/3

LEYS

1ST CUTTING OCCASION (8/6/94) DRY MATTER TONNES/HECTARE

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

FYM RES LEY	NONE	FYM	Mean
LC1	1.85	2.75	2.30
LC2	4.33	4.28	4.30
LC3	4.34	5.34	4.84
LN1	4.67	4.45	4.56
LN2	6.04	6.08	6.06
LN3	5.97	6.09	6.03
LLC1	2.12	2.54	2.33
LLC2	5.17	5.18	5.17
LLC3	5.29	4.93	5.11
LLC4	5.40	4.96	5.18
LLC5	5.50	5.71	5.60
LLC6	4.47	4.67	4.57
LLC7	4.46	4.33	4.40
LLC8	3.46	4.15	3.81
LLN1	4.80	4.77	4.79
LLN2	6.31	6.15	6.23
LLN3	6.25	6.31	6.28
LLN4	5.77	6.60	6.19
LLN5	5.70	5.92	5.81
LLN6	3.24	4.51	3.88
LLN7	5.12	4.68	4.90
LLN8	5.24	5.30	5.27
Mean	4.80	4.99	4.89

1ST CUT MEAN DM% 20.6

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

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

94/W/RN/3

LEYS

2ND CUTTING OCCASION (2/9/94) DRY MATTER TONNES/HECTARE

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

FYM RES	NONE	FYM	Mean
LEY			
LC1	1.87	2.41	2.14
LC2	0.60	0.77	0.68
LC3	0.69	0.68	0.68
LN1	3.94	3.12	3.53
LN2	1.54	2.09	1.82
LN3	0.74	0.71	0.72
LLC1	2.24	1.90	2.07
LLC2	0.74	1.04	0.89
LLC3	0.57	0.60	0.58
LLC4	0.72	0.69	0.71
LLC5	1.11	1.09	1.10
LLC6	0.68	0.39	0.53
LLC7	0.37	0.62	0.49
LLC8	0.65	0.70	0.67
LLN1	3.65	3.88	3.76
LLN2	1.18	1.27	1.22
LLN3	0.82	0.95	0.88
LLN4	1.28	1.06	1.17
LLN5	1.41	1.54	1.47
LLN6	1.05	1.32	1.18
LLN7	0.84	0.79	0.81
LLN8	1.10	1.03	1.06
Mean	1.26	1.30	1.28

2ND CUT MEAN DM% 33.3

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

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

94/W/RN/3

LEYS

TOTAL OF 2 CUTTING OCCASIONS DRY MATTER TONNES/HECTARE

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

FYM RES LEY	NONE	FYM	Mean
LC1	3.73	5.16	4.44
LC2	4.92	5.05	4.99
LC3	5.03	6.02	5.53
LN1	8.61	7.56	8.09
LN2	7.58	8.17	7.88
LN3	6.71	6.80	6.76
LLC1	4.36	4.44	4.40
LLC2	5.91	6.21	6.06
LLC3	5.85	5.53	5.69
LLC4	6.12	5.65	5.88
LLC5	6.61	6.80	6.70
LLC6	5.15	5.06	5.10
LLC7	4.83	4.95	4.89
LLC8	4.11	4.85	4.48
LLN1	8.45	8.65	8.55
LLN2	7.48	7.42	7.45
LLN3	7.07	7.26	7.17
LLN4	7.05	7.66	7.35
LLN5	7.11	7.46	7.28
LLN6	4.29	5.83	5.06
LLN7	5.95	5.47	5.71
LLN8	6.34	6.33	6.34
Mean	6.06	6.29	6.17

TOTAL OF 2 CUTS MEAN DM% 26.9

PLOT AREA HARVESTED 0.00200

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

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

94/W/RN/3

W. WHEAT 1ST TEST CROP

GRAIN TONNES/HECTARE

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

FYMRES63	NONE	FYM	Mean
ROTATION			
LN 8	5.51	4.92	5.21
LN 3	5.93	5.62	5.78
LC 8	5.59	5.11	5.35
LC 3	5.56	5.74	5.65
AF	5.28	5.51	5.40
AB	2.54	3.11	2.82
Mean	5.07	5.00	5.03

N	0	70	140	210	Mean
ROTATION					
LN 8	3.31	4.68	6.36	6.51	5.21
LN 3	4.33	5.60	6.68	6.49	5.78
LC 8	3.15	5.89	5.52	6.84	5.35
LC 3	4.60	5.46	5.71	6.82	5.65
AF	1.63	4.83	7.35	7.77	5.40
AB	0.84	3.59	3.67	3.19	2.82
Mean	2.98	5.01	5.88	6.27	5.03

N	0	70	140	210	Mean
FYMRES63					
NONE	3.11	5.27	5.91	5.99	5.07
FYM	2.85	4.75	5.85	6.55	5.00
Mean	2.98	5.01	5.88	6.27	5.03

N	0	70	140	210
ROTATION **FYMRES63**				
LN 8 NONE	3.32	4.87	7.51	6.33
FYM	3.30	4.48	5.21	6.69
LN 3 NONE	4.38	6.05	7.27	6.04
FYM	4.28	5.15	6.09	6.95
LC 8 NONE	3.85	6.22	5.65	6.64
FYM	2.45	5.56	5.38	7.05
LC 3 NONE	4.59	5.37	5.64	6.64
FYM	4.62	5.54	5.77	7.00
AF NONE	1.87	4.87	7.16	7.23
FYM	1.39	4.79	7.53	8.31
AB NONE	0.65	4.22	2.22	3.07
FYM	1.04	2.95	5.12	3.32

GRAIN MEAN DM% 86.1

PLOT AREA HARVESTED 0.00201

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

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

94/W/RN/3

W. RYE 2ND TEST CROP

GRAIN TONNES/HECTARE

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

FYMRES62	NONE	FYM	Mean
ROTATION			
LN 8	5.84	5.94	5.89
LN 3	6.38	6.08	6.23
LC 8	5.95	6.04	5.99
LC 3	6.50	6.40	6.45
AF	3.83	3.76	3.80
AB	5.15	4.94	5.05
Mean	5.61	5.52	5.57

N	0	30	60	90	Mean
ROTATION					
LN 8	3.52	5.53	6.73	7.77	5.89
LN 3	3.58	5.63	7.32	8.37	6.23
LC 8	3.56	5.08	7.37	7.96	5.99
LC 3	3.87	6.03	7.67	8.23	6.45
AF	1.23	2.99	4.82	6.14	3.80
AB	2.51	4.49	5.95	7.23	5.05
Mean	3.05	4.96	6.64	7.62	5.57

N	0	30	60	90	Mean
FYMRES62					
NONE	3.08	4.95	6.69	7.71	5.61
FYM	3.01	4.97	6.60	7.52	5.52
Mean	3.05	4.96	6.64	7.62	5.57

N	0	30	60	90
ROTATION **FYMRES62**				
LN 8 NONE	3.51	5.28	6.51	8.07
LN 8 FYM	3.54	5.79	6.95	7.47
LN 3 NONE	3.30	5.99	7.63	8.59
LN 3 FYM	3.87	5.28	7.01	8.15
LC 8 NONE	3.46	5.13	7.28	7.91
LC 8 FYM	3.66	5.02	7.46	8.00
LC 3 NONE	4.21	6.13	7.39	8.29
LC 3 FYM	3.52	5.94	7.94	8.18
AF NONE	1.41	2.72	5.35	5.87
AF FYM	1.06	3.27	4.30	6.41
AB NONE	2.61	4.48	5.95	7.55
AB FYM	2.41	4.50	5.95	6.91

GRAIN MEAN DM% 86.1

PLOT AREA HARVESTED 0.00201

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