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## Fosters Ley Arable cropping systems supplementary information 1949 onwards

**DOI:** <https://doi.org/10.23637/rrn2-FLAsupinfo-01>

**Cite as:** Blyth, F.J.E., Perryman, S.A.M and Glendining, M.J. (2023) Fosters Ley Arable cropping systems supplementary information 1949 onwards, *Electronic Rothamsted Archive, Rothamsted Research, Harpenden, UK*.

**Published by:** Electronic Rothamsted Archive, Rothamsted Research, Harpenden, Herts, AL5 2JQ, UK.

**Date:** August 2023

**Description:** Details of cropping treatments, plot layout, and grass/clover seed mixtures for the Fosters Ley Arable experiment since 1949. The site was previously in arable cropping for several centuries.

- **Page 1:** Cover page
- **Page 2:** Ley-arable cropping systems treatment code summary, test crop summary
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- **Page 7:** Grass and grass/clover seed mixtures, 1973 onwards

**Site:** R/RN/2. Fosters Ley Arable experiment, Rothamsted Experimental Farm, Rothamsted Research, West Common, Harpenden, Hertfordshire, AL5 2JQ, UK. Latitude 51.812922, Longitude -0.379079

### Data sources:

- Rothamsted Experimental Station (1970) "Details of the Classical and Long-Term Experiments up to 1967", Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK, 128 pp  
<https://doi.org/10.23637/ERADOC-1-192>
- Rothamsted (1977) "Details of the Classical and Long-Term Experiments 1968-1973", Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK, 77pp  
<https://doi.org/10.23637/ERADOC-1-193>
- Yields of the Long-Term Experiments <https://www.era.rothamsted.ac.uk/eradoc/books/2>
- Fosters Ley-arable 1970-79, (1949-1990) Collection of Plans for the Fosters Ley-Arable Experiment - pp 22 – 31 <https://www.era.rothamsted.ac.uk/eradoc/article/PS-Fosters-Ley-Arable-22-31>
- Fosters Ley-arable 1980-90, (1949-1990) Collection of Plans for the Fosters Ley-Arable Experiment - pp 32 – 42 <https://www.era.rothamsted.ac.uk/eradoc/article/PS-Fosters-Ley-Arable-32-42>

**Funding:** The Rothamsted Long-Term Experiments - National Biosciences Research Infrastructure (RLTE-NBRI) is funded by the UK Research and Innovation – Biotechnology and Biological Sciences Research Council (UKRI-BBSRC) under award BBS/E/RH/23NB0007 (2023-2028). The RLTE-NBRI is also supported by the Lawes Agricultural Trust.

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## Fosters Ley-arable (R/RN/2) treatment codes summary

1949-1961	1962 <sup>1</sup> -1990	1991-2008	2009-	Rotation type
R	Rn	Rc	Rc	Reseeded grass
	Rc			
	Rpn	Rpc	Rpc	Reseeded grass
	Rpc			
Cg	Ln	Lc(Ln)	F	Ley-arable/fallow
L	Lc	Lc(Lc)	Lc(Lc)	Ley-arable
Lu	Lu	Lc(Lu)	Lc(Lu)	Ley-arable
A	A	A	A	Arable

<sup>1</sup>New rotations phased in between 1962 and 1967, at the end of the three year test cycles.

### 1949 - 1961

R	Reseeded grass: reseeded at the start of experiment, grass/clover, left unchanged, grazed by sheep
Cg	Three year cut grass/clover ley followed by three arable test crops
L	Three year grazed grass/clover ley followed by three arable test crops
Lu	Three year lucerne ley cut for hay followed by three arable test crops
A	Three year arable treatment crops (hay, potatoes, barley, 1949-54, hay, potatoes, oats, 1955-60) followed by three arable test crops

### 1962 - 1990

From 1968 onwards blocks 5-12 were turned over to continuous wheat to study soil-borne disease. The ley-arable experiment continued with blocks 1-4 only.

Rn	Reseeded grass (R) split into Rn and Rc in 1963. Grass with nitrogen, cut for silage (blocks 1 and 3)
Rc	Reseeded grass (R) split into Rn and Rc in 1963. Grass/clover, cut for silage (blocks 1 and 3)
Rpn	Reseeded grass ploughed in 1963, kept in arable rotation until 1973 when resown to grass plus nitrogen. Cut for silage (blocks 2 and 4)
Rpc	Reseeded grass ploughed in 1963, kept in arable rotation until 1973 when resown to grass/clover. Cut for silage (blocks 2 and 4)
Ln	Three year all-grass ley with nitrogen cut for silage, followed by three arable test crops
Lc	Three year grass/clover ley cut for silage, followed by three arable test crops
Lu	Three year lucerne ley cut for hay, followed by three arable test crops
A	Three year arable treatment crops (hay, sugar beet, oats), followed by three arable test crops

### 1991 - 2008

Rc	Grass/clover reseeded at start of experiment, cut for silage (blocks 1 and 3)
Rpc	Grass/clover reseeded at start of experiment, ploughed in 1963, arable until 1973 when resown, cut for silage (blocks 2 and 4)
Lc(Ln)	Three year grass/clover ley cut for silage, followed by three arable test crops, previously Ln
Lc(Lc)	Three year grass/clover ley cut for silage, followed by three arable test crops
Lc(Lu)	Three year grass/clover ley cut for silage, followed by three arable test crops, previously Lu
A	Three arable treatment crops (wheat, fallow, oats), followed by three arable test crops

### 2009 -

Rc	Reseeded grass/clover from before the start of the experiment, cut for silage
Rpc	Grass/clover reseeded at start of experiment, ploughed in 1963, arable until 1973 when resown, cut for silage
F	Permanent fallow (no crop) since autumn 2008. Previously Lc(Ln)
Lc(Lc)	Three year grass/clover ley cut for silage, followed by three arable test crops
A	Three arable treatment crops (wheat, fallow, oats), followed by three arable test crops
Lc(Lu)	Three year grass/clover ley cut for silage, followed by three arable test crops, previously Lu

## Fosters Ley-arable (R/RN/2) Test crop summary

Three years of Test crops grown after three years of Treatment crops in the arable and ley-arable rotations:

	1949-1967 <sup>1</sup>	1968-1974	1975-1982	1983 <sup>2</sup> -2008	2009-
<b>1st Test crop</b>	W Wheat	Potatoes	Potatoes	W Wheat	W Wheat
<b>2nd Test crop</b>	Potatoes	W Wheat	W Wheat	W Wheat	W Wheat
<b>3rd Test crop</b>	S Barley	S Barley	W Wheat	W Wheat	W Wheat

<sup>1</sup> The original sequence, if started before 1968, was completed.

<sup>2</sup> From 1983 the test crops were all W Wheat (except W Barley 2003-2005).

No yields were taken after 1990

Data from Yield Books and Field Plans

## Fosters (R/RN/2) Ley Arable Experiment

1949 - 1961

Note: Treatment cropping on the experiment was phased in over a period of 6 years, with the first treatment cropping occurring on blocks 2 and 4 in 1949.

91	93	95	97	99	101	103	105	107	109
Cg	Lu	L	A	R	L	A	Cg	Lu	R
92	94	96	98	100	102	104	106	108	110

Block 10

Block 11

111	113	115	117	119
L	Lu	R	A	Cg
112	114	116	118	120

Block 12

N →

51	53	55	57	59
Lu	R	L	Cg	A
52	54	56	58	60

Block 6

61	63	65	67	69	71	73	75	77	79	81	83	85	87	89
L	Cg	Lu	R	A	Cg	L	A	R	Lu	R	Cg	L	A	Lu
62	64	66	68	70	72	74	76	78	80	82	84	86	88	90

Block 7

Block 8

Block 9

01	03	05	07	09	11	13	15	17	19
L	A	Lu	R	Cg	Cg	R	A	L	Lu
02	04	06	08	10	12	14	16	18	20

Block 1

Block 2

21	23	25	27	29	31	33	35	37	39	41	43	45	47	49
Lu	Cg	A	L	R	Cg	Lu	L	R	A	Lu	L	Cg	R	A
22	24	26	28	30	32	34	36	38	40	42	44	46	48	50

Block 3

Block 4

Block 5

50.60m

6.0m sown, centred on 7.01m

## Fosters (R/RN/2) Ley Arable Experiment

1962 - 1967

Note: This new cropping sequence was introduced gradually over a period of 6 years as each experimental phase reached the end of its current cropping rotation.

91	93	95	97	99	101	103	105	107	109
Ln	Lu	Lc	A	R	Lc	A	Ln	Lu	R
92	94	96	98	100	102	104	106	108	110

Block 10 (sequence began in 1966)

Block 11 (sequence began in 1963)

N →

111	113	115	117	119
Lc	Lu	R	A	Ln
112	114	116	118	120

Block 12 (sequence began in 1966)

51	53	55	57	59
Lu	R	Lc	Ln	A
52	54	56	58	60

Block 6 (sequence began in 1963)

61	63	65	67	69	71	73	75	77	79	81	83	85	87	89
Lc	Ln	Lu	R	A	Ln	Lc	A	R	Lu	R	Ln	Lc	A	Lu
62	64	66	68	70	72	74	76	78	80	82	84	86	88	90

Block 7 (sequence began in 1962)

Block 8 (sequence began in 1965)

Block 9 (sequence began in 1965)

01	03	05	07	09	11	13	15	17	19
Lc	A	Lu	R	Ln	Ln	R	A	Lc	Lu
02	04	06	08	10	12	14	16	18	20

Block 1 (sequence began in 1964)

Block 2 (sequence began in 1967)

21	23	25	27	29	31	33	35	37	39	41	43	45	47	49
Lu	Ln	A	Lc	R	Ln	Lu	Lc	R	A	Lu	Lc	Ln	R	A
22	24	26	28	30	32	34	36	38	40	42	44	46	48	50

Block 3 (sequence began in 1964)

Block 4 (sequence began in 1967)

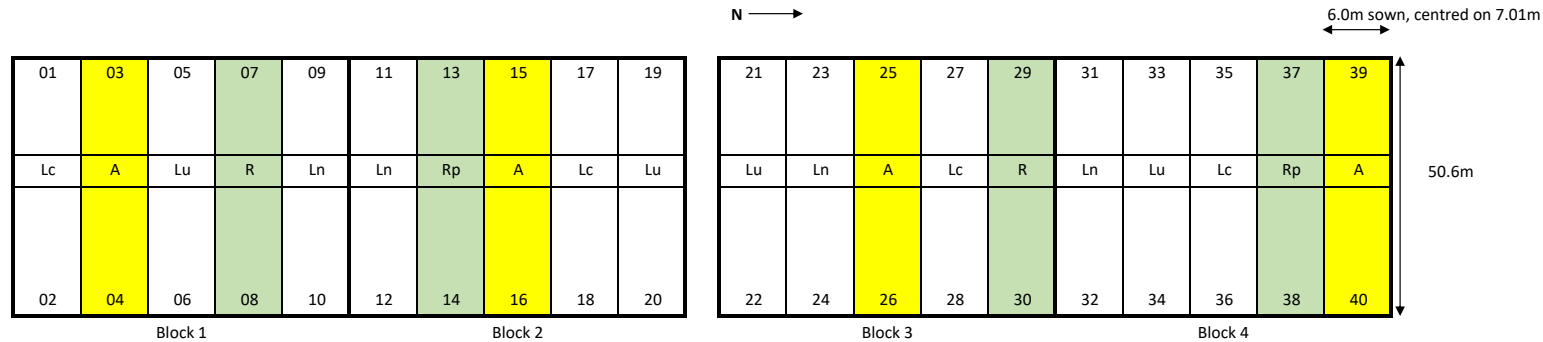
Block 5 (sequence began in 1962)

50.60m  
6.0m sown, centred on 7.01m

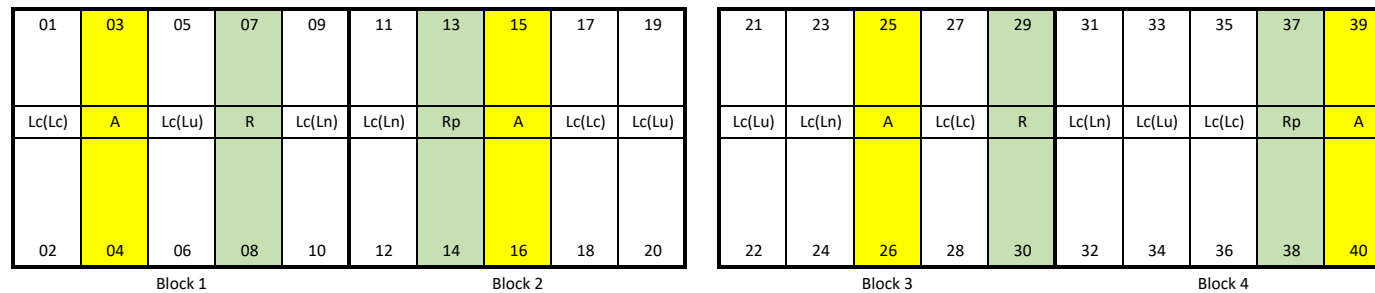
## Fosters R/RN/2 Ley-Arable Experiment

1968-1990

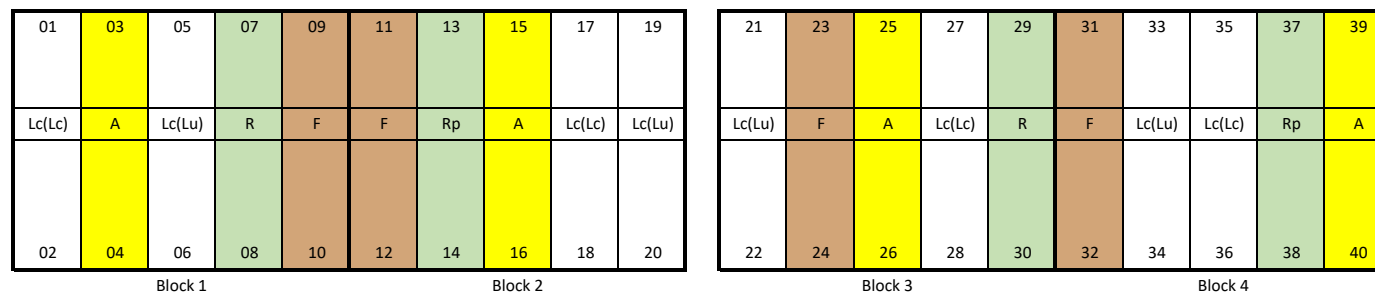
Note: Between 1968 and 1972, blocks 5-12 were allowed to finish their existing 6 year cycle, then were removed from the experiment.



1991-2008



2009-



### Fosters Ley-arable grass and grass/clover seed mixtures, 1949-1972

Ley	Symbol	Species	Proportion
Cut grass	Cg	Italian Ryegrass	21%
		Cocksfoot S.26	57%
		White Clover S.100	14%
		Alsike Clover	7%
Grazed ley	L	Italian Ryegrass	13%
		Perennial Ryegrass S.23	20%
		Perennial Ryegrass Kent Indigenous	20%
		Cocksfoot S.26	10%
		Cocksfoot S.143	10%
		Timothy S.48	5%
		Timothy S.50	5%
		Late Flowering Red Clover	15%
		New Zealand White Clover	1%
		Kent Indigenous White Clover	1%
Grass-clover	Lc	Timothy S.51	42%
		Meadow Fescue S.215	50%
		White Clover S.100	8%
All-grass	Ln	Timothy S.51	45%
		Meadow Fescue S.215	55%
One-year hay	H	Perennial ryegrass S.24	64%
		Red Clover S.123	29%
		Canadian Alsike	7%
Reseeded grass (only sown in 1949, 1950 and 1951)	R, Rh, RS	Italian Ryegrass	13%
		Perennial Ryegrass S.23	20%
		Perennial Ryegrass Kent Indigenous	20%
		Cocksfoot S.26	10%
		Cocksfoot S.143	10%
		Timothy S.48	5%
		Timothy S.50	5%
		Late Flowering Red Clover	15%
		New Zealand White Clover	1%
		Kent Indigenous White Clover	1%

#### Data sources:

Rothamsted Experimental Station (1970) "Details of the Classical and Long-Term Experiments up to 1967", Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK, 128 pp  
 DOI: <https://doi.org/10.23637/ERADOC-1-192>

Rothamsted Experimental Station (1977) "Details of the Classical and Long-Term Experiments 1968-1973", Rothamsted Experimental Station, Lawes Agricultural Trust, Harpenden UK, 77pp  
 DOI: <https://doi.org/10.23637/ERADOC-1-193>

### Fosters ley-arable grass and grass/clover seed mixtures, 1973-1990

Ley	Symbol	Species	Proportion	Years used
Grass-clover	Lc	Timothy S.51	42%	1973 - 1978
		Meadow Fescue S.215	50%	
		White Clover S.100	8%	
		Meadow Fescue S.215	50%	1979 - 1981
		Timothy Erecta RvP	40%	
		New Zealand White Clover Huia	10%	
		Meadow Fescue S.215	40%	1982 - 1987
		Timothy Climax	50%	
		New Zealand White Clover Huia	10%	
		Meadow Fescue	44%	1988 - 1990
All-grass	Ln	Timothy S.51	45%	
		Meadow Fescue S.215	55%	
		Meadow Fescue S.215	50%	1979 - 1981
		Timothy Erecta RvP	50%	
		Meadow Fescue S.215	50%	1982 - 1990
		Timothy Climax	50%	
One-year hay	H	Italian Ryegrass	100%	1973 - 1987
		Londras Westerwolths Ryegrass	100%	1988
Reseeded grass (only sown in 1973)	Rp	Timothy S.51	42%	1973
		Meadow Fescue S.215	50%	
		White Clover S.100	8%	

Note 1: All seed mixes were only planted in the following years: 1973, 1976, 1979, 1982, 1985, 1988. This was done to coincide with the beginning of a new treatment cycle.

Note 2: In 1988, the seed mix for clover grass is shown as being planted at 37kg despite the constituent seed quantities only adding up to 9kg. The proportions listed above are those from the constituent seed quantities.

Note 3: No data on grass/clover seed mixtures is available after 1990.

#### Data sources:

Yields of the Long Term Experiments

<https://www.era.rothamsted.ac.uk/eradoc/books/2>

Fosters Ley-arable 1970-79, (1949-1990) Collection of Plans for the Fosters Ley-Arable Experiment - pp 22 - 31

<https://www.era.rothamsted.ac.uk/eradoc/article/PS-Fosters-Ley-Arable-22-31>

Fosters Ley-arable 1980-90, (1949-1990) Collection of Plans for the Fosters Ley-Arable Experiment - pp 32 - 42

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