ROTHAMSTED RESEARCH

Yields of the Field Experiments 2020

ROTHAMSTED RESEARCH

Results of the Classical and other Long-term Experiments 2020

Full Table of Content

20/W/RN/3 Ley/ARABLE (Stackyard D, Woburn Farm)

Rothamsted Research

Rothamsted Research (2022) *20/W/RN/3 Ley/ARABLE (Stackyard D, Woburn Farm) ;* Yields Of The Field Experiments 2020, pp 30 - 44 **- DOI: https://doi.org/10.23637/ERADOC-1-264**

20/W/RN/3 LEY/ARABLE (Stackyard D, Woburn Farm)

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

The 83rd year, leys, winter beans, winter wheat, winter rye

For previous years see 'Details' 1967 & 1973 and Yield Books for 74-19/W/RN/3.

Design: 5 series of 8 plots, split for treatments other than rotations.

Whole plot dimensions: 8.53 m × 40.7 m

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, WINTER
A	Arable with roots:	P, R, C, P, W until 1971 then P, B, B, P, WINTER
A H	Arable with hay:	P, R, H, P, W until 1971 then P, B, H, P, WINTER

P = potatoes, R = winter rye, C = carrots, W= winter wheat, B = spring 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 every 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:

Ln3	(Previous LEY) LN1, LN2, LN3, W, R
Lc3	(Previous CLO) LC1, LC2, LC3, W, R
AF	(Previous A) F, F, BE, W, R
AB	(Previous A H) B, B, BE, W, R
	From 1988 rotations AF and AB are replaced by AM and ABe respectively. Phased in at the beginning of each treatment crop sequence.
AM	R, BE, M, W, R
ABe	R, M, 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 (spring oats until 1980), F = fallow,
M = forage maize

	Plots hitherto in alternating rotations were changed to test eight-year leys and two test crops:
LLn	LLn1, LLn2, LLn3, LLn4, LLn5, LLn6, LLn7, LLn8, W, R
LLc	LLc1, LLc2, LLc3, LLc4, LLc5, LLc6, LLc7, LLc8, W, R

LLn1 to LLn8 = eight year grass leys with nitrogen, first year to eighth year, similarly for LLc – clover/grass ley, no nitrogen

https://doi.org/10.23637/ERADOC-1-264 *pp 2*

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 winter rye (R) replaced spring barley (B) as the second test crop. Yields are taken from the leys, arable treatment crops and the test crops.

From 2007 plots previously in the 1st cycle of testing eight-year leys followed by two arable test crops (i.e. those plots which were changed to eight-year ley treatments in 1976 or 1977) changed to a three-year arable rotation followed by two arable test crops. Plots were "phased in" but joined the relevant point in the rotation. From 2008 the second cycle 8-yr grass and grass/clover leys changed to 3-yr grass or grass/clover leys respectively. They were phased in between 2008 and 2012.
LLn/AO (Previously 1st cycle, 8-yr grass ley) R, Be, O, W, R
LLc/ABe (Previously 1st cycle, 8-yr grass/clover ley) R, O, Be, W, R
LLc/Lc3 (Previously 2nd cycle, 8-yr grass ley) Lc 1, Lc 2, Lc 3, W, R

LLn/Ln3 (Previously 2nd cycle, 8-yr grass/clover ley) Ln 1, Ln 2, Ln 3, W, R

From 2009 W oats (O) replaced forage maize (M) in the AM and ABe rotations on block III and were phased in on blocks V, IV, II and I in subsequent years. The AM treatment was re-named AO. The new rotations were fully in phase by 2016.

Treatments to first test crop winter wheat, all combinations of:

Whole plots:

1. **ROTATION** Rotations before wheat:
   LLn 8

   Ln 3

   LLc 8

   Lc 3

   LLc/Lc3

   LLn/Ln3

   LLn/AO

   LLc/ABe

   AM/AO

   ABe

   1/ 2 plots:

2. **NSPLIT (FYM res)** Farmyard manure residues, last applied 1960s:
   Split N v single N dressing to wheat, tested 2001-5

   Nsplit (noFYM)

   Nsingle (FYM)

https://doi.org/10.23637/ERADOC-1-264 *pp 3*

1/8 plots:

3. **N** Nitrogen fertilizer as split dressings in spring 2020 (kg N) as 34.5% N:

0	0	
80	40 + 40	) to be applied
160	40 + 120	) late-February/early-March
240	40 + 200	) and mid-April

Treatments to second test crop winter rye, all combinations of:

Whole plots:

1. **ROTATION** Rotations before first test crop:
LLn8

Ln 3

LLc 8

Lc 3

LLc/Lc3 not yet in phase

LLn/Ln3 not yet in phase

LLn/AO not yet in phase

LLc/ABe not yet in phase

AM/AO

ABe

1/ 2 plots:

2. **NSPLIT (FYM res)** Farmyard manure residues, last applied 1960s:
N split to wheat (no FYM)

N single to wheat (FYM)

1/8 plots:

3. **N** Nitrogen fertilizer in spring 2020 (kg N) as 34.5%:
0
50
100
150

Treatments to leys:

FYM RES Farmyard manure residues:
NONE
FYM 38 t on each occasion, last applied 1960s.

https://doi.org/10.23637/ERADOC-1-264 *pp 4*

NOTE: Corrective K dressings (kg K_2O ha^{-1}) as muriate of potash, applied where necessary to first test crop winter wheat and long-term leys in the wheat block, applied 2019 (see date below).

Continuous rotations	No FYM	FYM Res
Before wheat	Half plots	Half plots
ABe/Be	280	260
AO/O	260	380
LLn/AO	310	240
LLn/Ln3	-	60
Ln3	130	110
LLc/ABe	200	90

None to other plots.

Experimental Diary

Date		Application	Rate	Units
ALL				
10/10/2019	a	Power harrow; JD6620 with Kuhn Powerharrow 3m		
22/10/2019	s	Drilled winter oats, var: Miscani; JD6620 with Accord 4m Tyne Drill	350	seeds/m2
08/11/2019	a	Topped. Stackyard; Topper 9		
02/12/2019	p	Sprayed Hallmark with Zeon Technology; MF6150 with Knight Sprayer	50	ml/ha
02/12/2019	p	Sprayed Sprinter; MF6150 with Knight Sprayer	2	l/ha
02/07/2020	a	Mowed Grass Trails; JD6620 with Mower-Unifarm CM166	-	-
15/09/2020	a	Harvested all plots. No problems with harvest. No yields from bean plots as plots failed.; Haldrup C-85		
15/09/2020	a	Harvested odds and ends of plots. Harvested areas of plots left after taking yield cut.; Haldrup C-85		
Grass ley and clover/grass leys (first year leys)				
20/06/2019	p	Sprayed Cello; MF6150 with Knight Sprayer	1.25	l/ha
08/10/2019	p	Spreading SOP; JD6930 Cascade Spreader	140	kg/ha
31/03/2020	f	Applied Nitram (34.5 % N); Plots 57, 58, 61, 62; JD6620 with Cascade Spreader	25	kg/ha

https://doi.org/10.23637/ERADOC-1-264 *pp 5*

31/03/2020	f	Applied Nitram (34.5 % N); Plots 55, 56, 59, 60; JD6620 with Cascade Spreader	50	kg/ha
30/03/2020	a	Chisel plough - 1st year grass plots; JD6620 with Chisel Plough	-	-
17/04/2020	f	Applied TSP; Block 4 (Plots 55-62); JD6620 with Cascade Spreader	213	kg/ha
17/04/2020	f	Applied MOP; Blocks 4 (Plots 55-62); JD6620 with Cascade Spreader	167	kg/ha
17/04/2020	f	Applied Nitram (34.5 % N); Block 4 (57, 58, 61, 62); JD6620 with Cascade Spreader	217	kg/ha
20/04/2020	f	Applied SOP; Block 4 (Plots 55-62); Applied late due to late sowing of grass ; JD6620 with Cascade Spreader	140	kg/ha
30/06/2020	a	Grass Plots 1st Cut; JD6620 with Wilder Grass Box	-	-
02/07/2020	a	Row up grass. Grass plots; JD6620 with Tedder	-	-
03/07/2020	a	Baling Grass. Grass plots; JD6620 with Claas Baler	-	-
05/08/2020	f	Applied Nitram (34.5 % N); Plots 57, 58, 61, 62; JD6930 with Cascade Spreader	217	kg/ha

Grass ley and clover/grass leys (2nd and 3rd year leys)

08/10/2019	f	Spreading SOP; JD6930 Cascade Spreader	140	kg/ha
17/04/2020	f	Applied TSP; Block 3 (Plots 33, 34, 37, 38, 41, 42, 43, 44), Block 5 (Plots 65, 66, 69, 70, 77, 78, 79, 80); JD6620 with Cascade Spreader	213	kg/ha
17/04/2020	f	Applied MOP; Blocks 3 (Plots 33, 34, 37, 38, 41-44), Block 5 (Plots 65, 66, 69, 70, 77-80); JD6620 with Cascade Spreader	167	kg/ha
17/04/2020	f	Applied Nitram (34.5 % N); Block 3 (Plots 37, 38, 43, 44), Block 5 (65, 66, 69, 70); JD6620 with Cascade Spreader	217	kg/ha
20/04/2020	f	Applied SOP; Block 3 (Plots 33, 34, 37, 38, 41, 42, 43, 44), Block 5 (Plots 65, 66, 69, 70, 77, 78, 79, 80); JD6620 with Cascade Spreader	150	kg/ha

https://doi.org/10.23637/ERADOC-1-264

30/06/2020	a	Grass Plots 1st Cut; JD6620 with Wilder Grass Box	-	-
02/07/2020	a	Row up grass. Grass plots; JD6620 with Tedder	-	-
03/07/2020	a	Baling Grass. Grass plots; JD6620 with Claas Baler	-	-
05/08/2020	f	Applied Nitram (34.5 % N); Plots 37, 38, 43, 44, 65, 66, 69, 70; JD6930 with Cascade Spreader	217	kg/ha

W Wheat

29/05/2019	p	Sprayed Sprinter; MF6150 with Knight Sprayer	3	l/ha
08/10/2019	f	Spreading TSP; JD6930 Cascade Spreader	127	kg/ha
08/10/2019	f	Spreading SOP; JD6930 Cascade Spreader	150	kg/ha
09/10/2019	a	Ploughing; Thrown E; WES Dowdeswell 100 Series Five Furrow Plough	-	-
10/10/2019	a	Power harrow; JD6620 with Kuhn Power harrow 3m	-	-
22/10/2019	s	Drilled winter wheat, var: Crusoe; JD6620 with Accord 4m Tyne Drill	350	seeds/m2
02/12/2019	p	Sprayed Hallmark with Zeon Technology; MF6150 with Knight Sprayer	50	ml/ha
02/12/2019	p	Sprayed Liberator; MF6150 with Knight Sprayer	0.6	l/ha
02/12/2019	p	Sprayed Sprinter; MF6150 with Knight Sprayer	2	l/ha
25/03/2020	p	Sprayed Palio; MF6150 with Knight Sprayer	0.265	kg/ha
25/03/2020	p	Sprayed Sprinter; MF6150 with Knight Sprayer	3	l/ha
06/04/2020	f	Applied Nitro-chalk (27 % N); Block 1; By Hand	148	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 11	60	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 16	90	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 13	110	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 14	130	kg/ha

https://doi.org/10.23637/ERADOC-1-264

09/04/2020	f	Applied MOP as Corrective K; Plot 15	200	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 10	240	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plots 1, 6	260	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 2	280	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 9	310	kg/ha
09/04/2020	f	Applied MOP as Corrective K; Plot 5	380	kg/ha
16/04/2020	f	Applied Nitro-chalk (27 % N); Block 1 (Plots 014, 021, 034, 043, 054, 061, 074, 084, 094, 102, 113, 123, 134, 143, 152, 163); By Hand	148	kg/ha
16/04/2020	f	Applied Nitro-chalk (27 % N); Block 1 (Plots 011, 023, 031, 042, 051, 063, 072, 081, 091, 103, 111, 121, 132, 142, 153, 162) ; By Hand	444	kg/ha
16/04/2020	f	Applied Nitro-chalk (27 % N); Block 1 (Plots 013, 022, 033, 044, 053, 062, 073, 083, 093, 101, 114, 124, 133, 144, 151, 164); By Hand	741	kg/ha
17/04/2020	f	Applied TSP; Block 1	150	kg/ha
20/04/2020	f	Applied SOP; Blocks 1; JD6620 with Cascade Spreader	150	kg/ha
09/05/2020	p	Sprayed Sprinter; MF6150 with Knight Sprayer	1	l/ha
09/05/2020	p	Sprayed Stefes CCC 72; MF6150 with Knight Sprayer	1	l/ha
09/05/2020	p	Sprayed Vortex; MF6150 with Knight Sprayer	1.5	l/ha
01/06/2020	p	Sprayed Azoxystar; MF6150 with Knight Sprayer	0.5	l/ha
01/06/2020	p	Sprayed Cello; MF6150 with Knight Sprayer	1.075	l/ha
01/06/2020	p	Sprayed Sprinter; MF6150 with Knight Sprayer	3	l/ha

W Rye

07/10/2019	f	Spreading chalk; JD6620 (block 2, 2nd test crop only)	5	t/ha

https://doi.org/10.23637/ERADOC-1-264 *pp 8*

08/10/2019	f	Spreading SOP; JD6930 Cascade Spreader	127	kg/ha
08/10/2019	f	Spreading TSP; JD6930 Cascade Spreader		kg/ha
09/10/2019	a	Ploughing; Thrown E; WES Dowdeswell 100 Series Five Furrow Plough	-	-
10/10/2019	a	Power harrow; JD6620 with Kuhn Powerharrow 3m	-	-
22/10/2019	s	Drilled winter rye, var: Mephisto; JD6620 with Accord 4m Tyne Drill	350	Seeds/m2
02/12/2019	p	Sprayed Liberator; MF6150 with Knight Sprayer	0.6	l/ha
02/12/2019	p	Sprayed Sprinter; MF6150 with Knight Sprayer	2	l/ha
25/03/2020	p	Sprayed Palio; MF6150 with Knight Sprayer	0.265	kg/ha
25/03/2020	p	Sprayed Sprinter; MF6150 with Knight Sprayer	3	l/ha
31/03/2020	a	Rolled; JD6620 withFlexicoil Cambridge Roll		
16/04/2020	f	Applied Nitro-chalk (27% N); Block 2 (Plots 171, 182, 194, 204, 214, 223, 234, 241, 251, 263, 272, 283, 294, 303, 314, 321); By Hand	185	kg/ha
16/04/2020	f	Applied Nitro-chalk (27 % N); Block 2 (Plots 172, 184, 191, 202, 211, 222, 232, 243, 254 ,261, 273, 281, 291, 301, 313, 324); By Hand	370	kg/ha
16/04/2020	f	Applied Nitro-chalk (27 % N); Block 2 (Plots 173, 181, 192, 203, 213, 224, 233, 244, 253, 264, 271, 284, 293, 302, 312, 322); By Hand	556	kg/ha
17/04/2020	f	Applied Nitram (34.5 % N); Block 4 (Plots 49-52, 53-54, 63-64); JD6620 with Cascade Spreader	290	kg/ha
17/04/2020	f	Applied TSP; Block 2, Block4 (Plots 49-54, 63, 64); JD6620 with Cascade Spreader	150	kg/ha
17/04/2020	f	Applied MOP; Blocks 3, 4, 5 ; Plots 33, 34, 37, 38, 41-44, 55-60, 61, 62, 65, 66, 69, 70, 77-80; JD6620 with Cascade Spreader	167	kg/ha
20/04/2020	f	Applied SOP; Blocks 2; Block 4 (plots 49-54, 63, 64); JD6620 with Cascade Spreader	150	kg/ha

https://doi.org/10.23637/ERADOC-1-264

09/05/2020	p	Sprayed Vortex; MF6150 with Knight Sprayer	1.5	l/ha

W Oats

29/05/2019	p	Sprayed Cello; MF6150 with Knight Sprayer	1.25	l/ha
20/06/2019	p	Sprayed Sprinter; MF6150 with Knight Sprayer	2	l/ha
08/10/2019	f	Spreading SOP; JD6930 Cascade Spreader	150	kg/ha
08/10/2019	f	Spreading TSP; JD6930 Cascade Spreader	127	kg/ha
09/10/2019	a	Ploughing; Thrown E; WES Dowdeswell 100 Series Five Furrow Plough		
10/10/2019	a	Power harrow; JD6620 with Kuhn Powerharrow 3m		
22/10/2019	s	Drilled winter oats, var: Miscani; JD6620 with Accord 4m Tyne Drill	350	seeds/m2
02/12/2019	p	Sprayed Hallmark with Zeon Technology; MF6150 with Knight Sprayer	50	ml/ha
02/12/2019	p	Sprayed Sprinter; MF6150 with Knight Sprayer	2	l/ha
17/04/2020	f	Applied TSP; Block 3 (Plots 35, 36, 39, 40), Block 4 (67, 68, 75, 76); JD6620 with Cascade Spreader	150	kg/ha
17/04/2020	f	Applied Nitram (34.5 % N); Block 3 (Plots 35, 36, 39, 40), Block 5 (Plots 67, 68, 75, 76); JD6620 with Cascade Spreader	290	kg/ha
20/04/2020	f	Applied SOP; Block 3 (plots 35, 36, 39, 40), Block 5 (plots 67, 68, 75-76); JD6620 with Cascade Spreader	150	kg/ha
09/05/2020	p	Sprayed Presite SX; MF6150 with Knight Sprayer	60	g/ha
09/05/2020	p	Sprayed Sprinter; MF6150 with Knight Sprayer	1	l/ha
09/05/2020	p	Sprayed Vortex; MF6150 with Knight Sprayer	1	l/ha
01/06/2020	p	Sprayed Azoxystar; MF6150 with Knight Sprayer	0.8	l/ha

https://doi.org/10.23637/ERADOC-1-264 *pp 10*

01/06/2020	p	Sprayed Sprinter; MF6150 with Knight Sprayer	3	l/ha

Winter Beans

08/10/2019		Spreading SOP; JD6930 Cascade Spreader	150	kg/ha
08/10/2019		Spreading TSP; JD6930 Cascade Spreader	127	kg/ha
09/10/2019	a	Ploughing; Thrown E; WES Dowdeswell 100 Series Five Furrow Plough		
10/10/2019		Power harrow; JD6620 with Kuhn Powerharrow 3m		
22/10/2019	s	Drilled winter beans, var: Tundra; JD6620 with Accord 4m Tyne Drill	21	seeds/m2
25/03/2020	p	Sprayed Troy 48; MF6150 with Knight Sprayer	3	l/ha
15/04/2020	p	Sprayed Hallmark with Zeon Technology; MF6150 with Knight Sprayer	75	ml/ha
15/04/2020	p	Sprayed Laser; MF6150 with Knight Sprayer	1	l/ha
15/04/2020	p	Sprayed Sprinter; MF6150 with Knight Sprayer	2	l/ha
17/04/2020	f	Applied TSP; Block 3 (Plots 45-48), Block 4 (71-74); JD6620 with Cascade Spreader	150	kg/ha
20/04/2020	f	Applied SOP; Block 3 (Plots 45-48), Block 4 (71-74); JD6620 with Cascade Spreader	150	kg/ha

NOTE: Herbage and grain samples were taken for chemical analyses.

Yield Error Note: It was found that the FYM notation (dr) for some plots on Block 5 was incorrect in the 2020 field plan, and for several previous years (2003-2006, 2009). Consequently, the yield and plans for 2020 were corrected, but earlier yield books contain an error in some of the mean yields for FYM and NONE treatments.

LEYS

1ST CUT (30 JUN 2020) DRY MATTER TONNES/HECTARE

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

https://doi.org/10.23637/ERADOC-1-264 *pp 11*

FYM_RESLEY	NONE	FYM	MEAN
Lc1	1.05	1.08	1.07
Lc2	4.89	5.43	5.16
Lc3	0.81	0.94	0.87
Ln1	0.90	0.71	0.80
Ln2	4.87	5.13	5.00
Ln3	4.35	3.84	4.10
(LLc/Lc)Lc1	0.52	0.67	0.59
(LLc/Lc)Lc2	4.93	4.37	4.65
(LLc/Lc)Lc3	1.90	1.84	1.87
(LLn/Ln)Ln1	0.39	0.69	0.54
(LLn/Ln)Ln2	4.64	5.12	4.88
(LLn/Ln)Ln3	2.67	3.13	2.90
MEAN	2.66	2.75	2.70

1ST CUT MEAN DM% 33.50

NO SECOND CUT WAS TAKEN IN 2020

Note 1: No 2nd Cut of the first, second or third year leys (Lc3, Ln3, Lc3, (LLc/Lc)Lc3, (LLn/Ln)Ln3) was taken because the box mower was condemned on safety grounds.

Note 2: Since 2014 grass-only leys have not been receiving N after the first cut and in some years K has not been applied after the first cut on both grass-only and grass-clover leys.

ARABLE TREATMENT CROPS

WINTER BEANS – No yields due to very poor establishment and growth

RYE (EXTRA)

GRAIN (85% DRY MATTER) TONNES/HECTARE

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

FYMRES ROTATION	NONE	FYM	Mean
(ABe)R	1.94	2.51	2.22
(AO)R	3.05	3.53	3.29

https://doi.org/10.23637/ERADOC-1-264 *pp 12*

(LLn/AO)R	3.23	3.30	3.27
(LLc/ABe)R	2.72	0.97	1.84
Mean	2.73	2.58	2.66

Grain mean DM% 87.0
Plot area harvested (ha) 0.00393

WINTER WHEAT

Grain tonnes/hectare
***** *Tables of means* *****

FYMRES ROTATION	none	FYM	Mean
(AO)W	3.68	2.50	3.09
(ABe)W	2.94	1.75	2.34
(LLn/AO)W	2.33	3.33	2.83
(LLc/ABe)W	3.18	2.45	2.81
(Ln)W	2.30	1.84	2.07
(LLn/Ln)W	3.04	3.11	3.08
(Lc)W	2.69	3.35	3.02
(LLc/Lc)W	3.53	3.42	3.47
Mean	2.96	2.72	2.84

N ROTATION	0	80	160	240	Mean
(AO)W	2.76	3.26	2.91	3.44	3.09
(ABe)W	0.99	3.08	2.81	2.50	2.34
(LLn/AO)W	1.96	3.65	2.70	3.01	2.83
(LLc/ABe)W	1.10	3.44	3.73	2.99	2.81
(Ln)W	1.83	1.87	2.76	1.83	2.07
(LLn/Ln)W	2.40	3.87	4.09	1.95	3.08
(Lc)W	1.89	3.82	3.05	3.30	3.02
(LLc/Lc)W	1.87	3.72	4.26	4.05	3.47
Mean	1.85	3.34	3.29	2.88	2.84

N FYMRES	0	80	160	240	Mean
none	1.96	3.33	3.52	3.04	2.96
FYM	1.74	3.35	3.06	2.73	2.72

https://doi.org/10.23637/ERADOC-1-264

Mean	1.85	3.34	3.29	2.88	2.84
N		0	80	160	240
ROTATION	FYMRES				
(AO)W	none	2.96	3.71	3.47	4.59
	FYM	2.56	2.81	2.35	2.28
(ABe)W	none	1.30	3.23	4.28	2.93
	FYM	0.67	2.93	1.35	2.06
(LLn/AO)W	none	2.48	2.94	2.00	1.90
	FYM	1.45	4.36	3.40	4.13
(LLc/ABe)W	none	0.95	3.45	4.32	3.99
	FYM	1.24	3.44	3.15	1.98
(Ln)W	none	2.13	1.99	3.05	2.03
	FYM	1.52	1.74	2.47	1.62
(LLn/Ln)W	none	2.04	3.80	4.35	1.99
	FYM	2.76	3.95	3.83	1.92
(Lc)W	none	1.82	3.74	2.24	2.95
	FYM	1.97	3.90	3.87	3.64
(LLc/Lc)W	none	2.00	3.76	4.47	3.90
	FYM	1.74	3.67	4.04	4.21
Mean		1.85	3.34	3.29	2.88

Grain mean DM%	87.10
Plot area harvested (ha)	0.00183

Note: Wheat yield on plot 012 (ABe - FYM) were lower than expected, but the reason is not known.

WINTER RYE

Grain tonnes/hectare

Tables of means

FYMRES	none	FYM	Mean
ROTATION			
(AO)R	2.81	2.33	2.57
(ABe)R	1.79	2.52	2.15

https://doi.org/10.23637/ERADOC-1-264 *pp 14*

(LLn/AO)R	3.85	3.94	3.90	
(LLc/ABe)R	2.84	2.69	2.77	
(Ln)R	3.74	3.13	3.43	
(LLn/Ln)R	2.85	2.91	2.88	
(Lc)R	3.04	3.72	3.38	
(LLc/Lc)R	3.43	2.86	3.14	
Mean	3.04	3.01	3.03	

N	0	50	100	150	Mean
ROTATION					
(AO)R	1.21	2.67	2.92	3.47	2.57
(ABe)R	1.17	2.22	2.85	2.36	2.15
(LLn/AO)R	2.43	4.73	4.15	4.27	3.90
(LLc/ABe)R	1.48	3.32	2.80	3.47	2.77
(Ln)R	3.02	3.81	4.21	2.69	3.43
(LLn/Ln)R	2.67	3.28	3.14	2.44	2.88
(Lc)R	2.93	4.47	3.26	2.86	3.38
(LLc/Lc)R	2.47	3.74	3.60	2.76	3.14
Mean	2.17	3.53	3.37	3.04	3.03

N	0	50	100	150	Mean
FYMRES					
none	2.22	3.56	3.34	3.06	3.04
FYM	2.13	3.51	3.39	3.02	3.01
Mean	2.17	3.53	3.37	3.04	3.03

	N	0	50	100	150
ROTATION	FYMRES				
(AO)R	none	1.54	2.95	3.15	3.60
	FYM	0.88	2.39	2.69	3.34
(ABe)R	none	1.18	1.66	2.39	1.91
	FYM	1.15	2.79	3.32	2.81
(LLn/AO)R	none	2.74	4.67	3.95	4.03
	FYM	2.12	4.80	4.35	4.50

https://doi.org/10.23637/ERADOC-1-264 *pp 15*

(LLc/ABe)R	none	1.53	3.19	2.81	3.85
	FYM	1.43	3.46	2.79	3.09
(Ln)R	none	2.58	4.39	5.04	2.97
	FYM	3.46	3.24	3.39	2.41
(LLn/Ln)R	none	2.98	3.48	2.83	2.12
	FYM	2.36	3.07	3.45	2.75
(Lc)R	none	2.52	3.93	2.91	2.80
	FYM	3.34	5.01	3.62	2.91
(LLc/Lc)R	none	2.67	4.19	3.65	3.20
	FYM	2.27	3.29	3.55	2.32
	Mean	2.17	3.53	3.37	3.04

Grain mean DM%	87.20
Plot area harvested (ha)	0.00183

Note: The Rye yields on plots 49 (LLc/ABe -FYM) and 201 (AO - FYM) were lower than expected, but the reason is not known.

WINTER OATS

GRAIN (85% DRY MATTER) TONNES/HECTARE

Tables of means

FYMRES	NONE	FYM	Mean
ROTATION			
ABe	2.66	2.38	2.52
AO	1.87	1.93	1.90
LLc/ABe	3.23	3.12	3.18
LLn/AO	2.00	1.86	1.93
Mean	2.44	2.32	2.38

Grain mean DM%	85.2
Plot area harvested (ha)	0.00393

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