

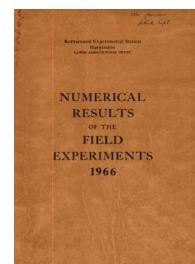
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66/W/WLA/B/4 Ley and Arable Rotations

Rothamsted Research

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66/B/4.1

LEY AND ARABLE ROTATIONS

(WLA)

Woburn Stackyard 1966 - the 29th year.

For history, treatments etc., see 'Details' 1962 and 'Results' 63/B/4, 64/B/4 and 65/B/4.

Potatoes: The variety is now Maris Piper.

Sainfoin: The third year sainfoin failed and was resown after receiving a basal dressing of 0.5 cwt P2O5 and 0.5 cwt K2O as (0:20:20) The normal spring dressings of N and K were not applied.

Corrective K dressings (in cwt K2O) as muriate of potash, and the K equivalent of FYM for Block 3 (sugar beet 1966).

Continuous rotations	No dung plots	Dung plots
Rotation		
Ley	2	0
Lucerne+	5	5
Arable with hay	6	6
Arable	5	5
Alternating rotations		
Last 2 rotations in order		
Arable*/ley	4	0
Arable with hay*/lucerne+	5	4
Ley/arable with hay	5	5
Lucerne/arable	6	5

* These are actual rotations - they should have been reversed.

+ 3 yr lucerne replaced by sainfoin in 1965.

K equivalent of dung: In 1966 plots not receiving dung received 4.8 cwt K2O as muriate of potash, the K equivalent of the dung used.

Cultivations, etc.:

Treatment crops.

Ley 1st year: Ground chalk applied at 35 cwt: Sept 14, 1965.
 Ploughed: Sept 27. Fertilisers applied: Mar 22, 1966. Seed sown at 40 lb: Mar 29. NK fertiliser applied: July 5.
 Grazed 12 circuits: June 22 - Oct 24.
 Ley 2nd year: NK fertiliser applied: Mar 17, 1966, June 17, Aug 5. Grazed 10 circuits: May 4 - Nov 1.
 Ley 3rd year: NK fertiliser applied: Mar 17, 1966, June 7, Aug 5. Grazed 11 circuits: Apr 13 - Oct 16.
 Sainfoin 1st year: Ground chalk applied at 35 cwt: Sept 14, 1965. Ploughed: Sept 27. Fertilisers applied: Mar 22, 1966. Seed drilled at 60 lb: May 10. Cut twice:

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Aug 12, Oct 24.

Sainfoin 2nd year: Sprayed with paraquat at 1 lb ion in 40 gals:
Feb 14, 1966. N and K fertilisers applied: Apr 13. Sprayed
with paraquat at 1 lb ion in 35 gals: June 10. Cut three times:
June 8, Aug 15, Oct 24.

Sainfoin 3rd year: Sprayed with MCPB at 2.5 lb a.e. in 40 gals:
Oct 11, 1965. Sprayed with paraquat at 1 lb ion in 40 gals:
Feb 14, 1966. PK fertiliser applied: May 2. Re-drilled at
60 lb: May 10. Cut twice: Aug 15, Oct 24.

Arable rotations.

Potatoes: Ground chalk applied at 35 cwt: Sept 14, 1965. Ploughed:
Sept 27. Fertiliser applied: Mar 23, 1966. Rotary cultivated
and machine planted: Mar 29. Earthed up: June 8. Sprayed with
mancozeb at 1.2 lb in 33 gals: June 29, July 15, Aug 4. Haulm
mechanically destroyed: Sept 3. Lifted: Sept 5.

Rye: Deep-tine cultivated: Sept 7, 1965. Seed combine drilled at
160 lb: Nov 2. 'Nitro-Chalk' applied: Apr 12, 1966. Combine
harvested: Aug 24.

Seeds hay: Seeds undersown in rye at 30 lb: Mar 31, 1965. 'Nitro-
Chalk', and PK compound applied: Mar 17, 1966. NK fertiliser
applied: June 2, cut twice: May 26, July 13.

Carrots: Ploughed: Oct 21, 1965. Fertilisers applied: May 2, 1966.
Seed drilled at 5.1 lb: May 10. Sprayed with linuron
at 1 lb in 35 gals: May 11. Sprayed with menazon (saphicol at
0.5 pints in 47 gals): June 16, July 15, and (saphicol at 0.5
pints in 50 gals): June 29. Lifted: Sept 29.

Test crops.

Sugar beet: Dung equivalent K and half corrective K, dung applied,
ploughed: Jan 10 - 26, 1966. Remaining corrective K, basal
muriate of potash, and half basal superphosphate applied:
Feb 7. Remaining basal superphosphate, basal magnesium
sulphate, and test 'Nitro-Chalk' and muriate of potash applied:
Mar 25. Seed drilled at 9 lb: Apr 1. Singled: May 23.
Sprayed demeton methyl at 12 fluid oz in 33 gals: June 14.
Lifted: Oct 12.

Barley: Ground chalk applied at 35 cwt: Dec 14, 1965. Ploughed:
Jan 7, 1966. Balancing muriate of potash, basal superphosphate,
'Nitro-Chalk' applied and seed drilled at 140 lb: Mar 9.
Sprayed with mecoprop/2,4-D (Methoxone Extra at 6 pints in
35 gals): May 11. Combine harvested: Aug 18.

NOTES: Chalk was applied in error to Block 2 (1st year treatment
crops 1966) as well as to Block 1 (Barley 1966).

Erratum to 'Results' 1965

p. 65/B/4.1. The K equivalent of dung for plots not receiving dung
was 3.3 cwt K₂O as muriate of potash and not 3.7 cwt K₂O as stated.

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Standard errors per plot.

Sugar beet 1/8 plot:

Roots: 1.042 or 4.4% (21 d.f.)
Total sugar: 3.54 or 4.7% (21 d.f.)
Tops: 2.039 or 9.2% (21 d.f.)

Barley grain:

Whole plot: 2.68 or 6.3% (4 d.f.)
1/2 plot: 2.31 or 5.4% (4 d.f.)

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SUMMARY OF RESULTS

TREATMENT CROPS

LEY, SHEEP DAYS OF GRAZING

1st year 2nd year 3rd year

1843 2650 2277

SAINFOIN, DRY MATTER

	1st cut	2nd cut	3rd cut	Total
1ST YEAR				
1964				
DO	13.8	8.6		22.4
DL	15.4	9.5		24.9
Lu	16.0	9.7		25.7
AH	13.2	8.4		21.6
Mean	14.6	9.0		23.6
2ND YEAR				
1963				
DO	43.4	17.8	2.2	63.4
DL	41.1	19.7	3.4	64.2
Lu	41.3	18.6	2.2	62.1
AH	43.2	18.9	3.3	65.4
Mean	42.2	18.8	2.8	63.8

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SAINFOIN, DRY MATTER

	1st cut	2nd cut	3rd cut	Total
3RD YEAR				
1962				
DO	25.0	9.9		34.9
DI	24.0	10.4		34.4
Lu	24.4	9.6		34.0
AH	24.6	10.8		35.4
Mean	24.5	10.2		34.7

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TREATMENT CROPS

	POTATOES		RYE	
	TOTAL TUBERS	% WARE	GRAIN	STRAW
DO	9.14	80.1	34.1	44.9
D1*	12.89	88.4	33.2	44.5
Ley	18.42	94.5	33.2	47.4
Lu	10.28	89.6	35.6	39.0
AH	7.78	72.2	32.0	48.2
AR	7.56	80.8	33.6	44.2
Mean	11.01	84.3	33.6	44.7

HAY

DRY MATTER

	1st cut	2nd cut	Total
1962			
DO	65.0	31.6	96.6
D1*	67.4	33.4	100.8
Lu	66.4	32.5	98.9
AH	66.0	32.4	98.4
Mean	66.2	32.5	98.7

* Dung applied: Potatoes - for test crop sugar beet in 1964
 Rye - for test crop sugar beet in 1963
 Hay - for test crop sugar beet in 1962

Mean D.M. %: Rye, grain: 80.8
 straw: 78.4

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CARROTS

	Roots	Tops
1962		
DO	17.80	11.11
D1*	21.34	12.88
Ley	19.26	13.00
AR	19.89	10.98
Mean	19.57	12.00

* Dung applied for test crop sugar beet in 1962

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1ST TEST CROP

SUGAR BEET

ROOTS

	N1	N2	N3	N4	N5	N6
			(1)			
DO Ley	20.79	21.68	22.52	22.58	-	-
DO Lu	21.38	23.77	24.95	24.91	-	-
DO AH	-	-	22.16	23.37	22.65	24.51
DO AR	-	18.17	20.45	22.90	22.63	-
D1 Ley	21.44	22.88	22.22	23.41	-	-
D1 Lu	24.84	25.73	26.37	25.63	-	-
D1 AH	-	-	24.70	25.01	25.37	24.95
D1 AR	-	23.39	25.58	26.15	25.50	-
	Ley	Lu	AH	AR	Mean	
CON	22.91	25.10	23.69	22.39	23.52	
ALT	21.47	24.29	24.49	23.80	23.51	
		(2)				
DO KD	21.91	23.90	23.89	20.61	22.58	
DO KI	21.88	23.60	22.45	21.46	22.35	
D1 KO	22.69	25.58	25.14	25.12	24.63	
D1 KI	22.29	25.70	24.88	25.19	24.51	
Mean	22.19	24.70	24.09	23.10	23.52	

(1) (± 0.521) For use in horizontal and interaction comparisons

(2) (± 0.368) For use in vertical and interaction comparisons

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1ST TEST CROP

SUGAR BEET

SUGAR %

	N1	N2	N3	N4	N5	N6
DO Ley	16.1	15.9	15.5	15.3	-	-
DO Lu	16.6	16.4	16.1	16.4	-	-
DO AH	-	-	16.8	16.6	16.2	15.8
DO AR	-	16.7	16.6	16.4	16.1	-
D1 Ley	15.8	15.4	15.3	15.4	-	-
D1 Lu	16.5	16.2	16.1	15.5	-	-
D1 AH	-	-	15.9	15.3	15.2	15.1
D1 AR	-	16.1	15.8	15.8	15.5	-
	Ley	Lu	AH	AR	Mean	
CON	15.6	16.6	15.8	16.1	16.0	
ALT	15.6	15.9	15.9	16.1	15.9	
DO KO	15.6	16.3	16.3	16.4	16.2	
DO KI	15.8	16.4	16.4	16.4	16.3	
D1 KO	15.4	16.1	15.4	15.9	15.7	
D1 KI	15.6	16.0	15.3	15.7	15.7	
Mean	15.6	16.2	15.9	16.1	15.9	

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LST TEST CROP

SUGAR BEET

TOTAL SUGAR

	N1	N2	N3	N4	N5	N6
			(1)			
Ley	66.8	68.8	69.8	69.3	-	-
DO Lu	71.0	78.0	80.4	81.3	-	-
AH	-	-	74.6	77.4	73.5	77.6
AR	-	60.6	67.8	75.0	72.8	-
Ley	67.5	70.5	67.8	72.3	-	-
D1 Lu	81.8	83.1	84.9	79.7	-	-
AH	-	-	78.6	76.8	77.0	75.3
AR	-	75.4	81.1	82.5	79.2	-
	Ley	Lu	AH	AR	Mean	
CON	71.3	83.2	74.9	72.0	75.3	
ALT	66.9	76.9	77.8	76.6	74.6	
		(2)				
DO KO	68.2	77.9	77.8	67.6	72.9	
DO KI	69.1	77.5	73.7	70.5	72.7	
D1 KO	69.7	82.3	77.5	79.9	77.3	
D1 KI	69.4	82.5	76.3	79.2	76.9	
Mean	69.1	80.0	76.3	74.3	74.9	

(1) (± 1.77) For use in horizontal and interaction comparisons

(2) (± 1.25) For use in vertical and interaction comparisons

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1ST TEST CROP

SUGAR BEET

TOPS

	N1	N2	N3	N4	N5	N6
			(1)			
DO Ley	20.83	21.97	25.39	26.11	-	-
DO Lu	13.56	18.17	20.70	21.08	-	-
AH	-	-	16.44	19.44	20.07	24.76
AR	-	11.75	15.04	19.44	19.65	-
D1 Ley	22.69	27.00	27.29	28.52	-	-
D1 Lu	18.21	21.04	23.58	24.93	-	-
AH	-	-	23.24	27.21	27.42	30.04
AR	-	18.25	22.90	24.76	26.75	-
	Ley	Lu	AH	AR	Mean	
CON	25.53	18.39	23.24	19.19	21.59	
ALT	24.42	21.93	23.91	20.44	22.68	
		(2)				
DO KO	22.82	18.68	21.10	15.68	19.57	
DO KI	24.34	18.08	19.25	17.26	19.73	
D1 KO	26.60	22.25	26.81	22.75	24.60	
D1 KI	26.15	21.63	27.15	23.58	24.63	
Mean	24.98	20.16	23.58	19.82	22.13	

(1) (± 1.020) For use in horizontal and interaction comparisons
 (2) (± 0.721) For use in vertical and interaction comparisons

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2ND TEST CROP

BARLEY

	Ley	Lu	AH	AR	Mean
GRAIN					
	(1) and (2)				(±0.82)
DO	44.6	45.0	40.3	39.1	42.2
D1	45.1	46.1	43.1	39.0	43.3
Mean (±1.90)	44.8	45.5	41.7	39.1	42.8
STRAW					
DO	30.2	30.7	23.9	26.7	27.9
D1	27.8	32.5	23.9	21.9	26.5
Mean	29.0	31.6	23.9	24.3	27.2

Mean D.M. %: Grain: 84.0
 Straw: 69.0

- (1) (±2.22) For use in horizontal and diagonal comparisons
 (2) (±1.63) For use in vertical and interaction comparisons