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## Yields of the Field Experiments 1967

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### 67/W/WLA/B/4 Ley and Arable Rotations

#### Rothamsted Research

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67/B/4.1

LEY AND ARABLE ROTATIONS

(WLA)

Woburn Stackyard 1967 - the 30th year.

For history, treatments etc., see 'Details' 1962 and 'Results' 63/B/4, 64/B/4, 65/B/4 and 66/B/4.

Potatoes: Because of the poor appearance of the crop in June plots were split for a test of nitrogen and magnesium sulphate:-  
None (O), 1.84 lb N as 4% solution of urea per acre (U) and None (OMg), 0.5 lb Mg as 5% solution of MgSO<sub>4</sub>, 7 H<sub>2</sub>O (Mg) hand sprayed at 50 gal. The solutions contained 'Shellastol' wetter at 0.01%.

There was no apparent improvement in the appearance of the crop and yields taken of the sub plots were not taken separately.

Rye: The crop partially failed and was replaced with spring wheat, variety Kloka, which received a basal dressing of 0.6 cwt N as 'Nitro-Chalk' 21.

Corrective K dressings (in cwt K<sub>2</sub>O) as muriate of potash, and the K equivalent of FYM for Block 5 (sugar beet 1967)

Continuous rotations	No dung plots	Dung plots
Ley	2	1
Sainfoin	4	3
Arable with hay	5	4
Arable	2	2
Alternating rotations		
Last 2 rotations in order		
Ley/arable	2	0
Sainfoin/arable with hay	3	3
Arable with hay/sainfoin	4	4
Arable/ley	3	2

NOTE: K equivalent of dung: In 1967 plots not receiving dung received 1.9 cwt K<sub>2</sub>O as muriate of potash.

Cultivations, etc.:

Treatment crops.

Ley 1st year: Ploughed: Sept 29, 1966. Fertilisers applied: Mar 23, 1967. Seed sown at 40 lb: Mar 31. NK fertiliser applied: July 17, Aug 26. Grazed 4 circuits: July 5 - Oct 23.

Ley 2nd year: NK fertiliser applied to all plots: Mar 10, 1967, Aug 26. NK fertiliser applied to plots 31 and 32: June 28, and to plots 27 and 28: July 10. Grazed 9 circuits: Apr 18 - Oct 11.

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Ley 3rd year: NK fertiliser applied: Mar 10, 1967, June 20, Aug 26.  
Grazed 9 circuits: Apr 18 - Oct 11.

Sainfoin 1st year: Ploughed: Sept 29, 1966. Fertilisers applied:  
Mar 23, 1967. Seed drilled at 70 lb: Apr 3. Cut once: Aug 7.

Sainfoin 2nd year: Sprayed with paraquat at 1 lb ion in 33 gals:  
Feb 6, 1967. N and K fertilisers applied: Mar 10. Cut twice:  
June 13, Aug 7.

Sainfoin 3rd year: Sprayed with paraquat at 1 lb ion in 33 gals:  
Feb 6, 1967. N and K fertilisers applied: Mar 10. Cut twice:  
June 13, Aug 7.

#### Arable rotations.

Potatoes: Ploughed: Sept 29, 1966. Fertilisers applied and potatoes  
planted: Mar 22, 1967. Earthed up: May 10. Test urea and  
magnesium sulphate sprayed on by hand: June 23. Sprayed with  
mancozeb at 1.2 lb in 30 gals: July 1, July 26, Aug 8.  
Sprayed with undiluted BOV at 15 gals: Aug 18. Harvested:  
Sept 12.

Rye: Deep-tine cultivated: Oct 20, 1966. Seed combine drilled at  
150 lb: Oct 26. Crop partially failed, and sprayed with paraquat  
at 1 lb ion in 33 gals: Feb 7, 1967.

Spring wheat (replacing rye): Drilled at 170 lb: Mar 4, 1967.

'Nitro-Chalk' applied: Mar 20. Combine harvested: Aug 22.

Seeds hay: Seeds undersown in rye at 30 lb: Apr 26, 1966. NPK  
fertiliser applied: Mar 10, 1967. NK fertiliser applied:  
June 5. Cut twice: June 1, July 21.

Carrots: Ploughed: Sept 29, 1966. Deep-tine cultivated: Nov 16.  
Fertilisers applied, and seed drilled at 3.5 lb: Apr 3, 1967.  
Sprayed with linuron at 1 lb in 40 gals: May 31. Sprayed with  
demeton-s-methyl (Metasystox at 12 fluid oz in 35 gals):  
June 9, June 20, July 10. Lifted: Sept 29, Oct 2.

#### Test crops.

Sugar beet: Dung equivalent K, and half corrective K applied:  
Oct 28, 1966. Dung applied: Nov 2. Ploughed: Nov 2 - 3.  
Remaining corrective K, basal muriate of potash, and half  
basal superphosphate applied: Feb 14, 1967. Remaining basal  
superphosphate, basal magnesium sulphate, and test 'Nitro-  
Chalk' applied: Mar 29. Seed drilled at 5 lb: Mar 30.  
Singled: May 22 - 23. Sprayed with demeton-s-methyl  
(Metasystox at 12 fluid oz in 30 gals): June 9, July 10.  
Lifted: Oct 16.

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Barley: Ground chalk applied at 40 cwt: Nov 4, 1966. Ploughed:  
Nov 5. Balancing muriate of potash, basal superphosphate, and  
'Nitro-Chalk' applied: Mar 2, 1967. Seed drilled at 140 lb:  
Mar 4. Sprayed with ioxynil/mecoprop (Actril C at 5 pints in  
35 gals): May 9. Combine harvested: Aug 18 - 21.

Standard errors per plot.

Sugar beet 1/8 plot:

Roots: 0.878 or 4.7% (9 d.f.)

Total sugar: 2.63 or 4.5% (9 d.f.)

Tops: 1.109 or 7.2% (9 d.f.)

Barley, grain:

Whole plot: 1.34 or 3.1% (4 d.f.)

1/2 plot: 1.91 or 4.5% (4 d.f.)

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SUMMARY OF RESULTS

TREATMENT CROPS

LEY, SHEEP DAYS OF GRAZING

1st year	2nd year	3rd year
1168	2240	2168

SAINFOIN, DRY MATTER

	1st cut	2nd cut	Total
1ST YEAR			
1965			
DO	14.8		14.8
D1	15.7		15.7
Lu	12.9		12.9
AR	17.6		17.6
Mean	15.2		15.2
2ND YEAR			
1964			
DO	23.1	11.7	34.8
D1	22.2	10.0	32.2
Lu	23.2	9.3	32.5
AH	22.0	12.4	34.4
Mean	22.6	10.8	33.4

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SAINFOIN, DRY MATTER

	1st cut	2nd cut	Total
3RD YEAR			
1963			
DO	54.6	13.4	68.0
D1	50.6	13.1	63.7
Lu	50.8	11.6	62.4
AH	54.3	14.8	69.1
Mean	52.6	13.2	65.8

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TREATMENT CROPS

	POTATOES		SPRING WHEAT	
	TOTAL TUBERS	% WARE	GRAIN	STRAW
DO	5.38	79.2	28.5	26.4
D1*	6.66	83.8	30.6	27.9
Ley	8.20	81.6	37.4	37.3
Lu	9.64	89.4	31.0	25.4
AH	3.80	81.0	17.6	16.6
AR	2.43	74.0	32.1	29.4
Mean	6.02	81.5	29.6	27.2

HAY

DRY MATTER

	DRY MATTER		Total
	1st cut	2nd cut	
1963			
DO	60.9	26.6	87.5
D1*	61.7	24.7	86.4
Ley	62.4	26.7	89.1
AH	60.2	24.6	84.8
Mean	61.3	25.6	86.9

\* Dung applied: Potatoes - for test crop sugar beet in 1965  
 Rye - for test crop sugar beet in 1964  
 Hay - for test crop sugar beet in 1963

Mean D.M. %: Spring wheat, grain: 81.9  
 straw: 89.3

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CARROTS

	Roots	Tops
1963		
DO	33.18	10.33
D1*	35.68	9.32
Lu	36.00	9.57
AR	32.86	10.08
Mean	34.43	9.82

\* Dung applied for test crop sugar beet in 1963



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1ST TEST CROP

SUGAR BEET

ROOTS

	N1.	N2	N3	N4	N5	N6
	(±0.621)*					
DO Ley	17.22	19.66	18.60	19.95	-	-
Sa	17.89	17.30	18.60	18.10	-	-
AH	-	-	19.19	20.58	18.10	19.32
AR	-	16.67	16.92	16.12	17.55	-
D1 Ley	18.94	19.87	19.53	19.66	-	-
Sa	17.93	18.73	18.77	18.65	-	-
AH	-	-	19.99	18.86	20.20	20.84
AR	-	17.85	16.84	18.98	17.89	-
	Ley	Sa	AH	AR	Mean	
CON	19.65	17.65	19.93	17.67	18.72	
ALT	18.71	18.85	19.34	17.04	18.48	
Mean	19.18	18.25	19.64	17.35	18.60	

\* For use in horizontal and interaction comparisons only.

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1ST TEST CROP

SUGAR BEET

SUGAR %

	N1	N2	N3	N4	N5	N6
DO Ley	16.6	15.9	15.5	15.2	-	-
Sa	16.3	15.8	15.7	15.3	-	-
AH	-	-	16.7	16.4	15.8	15.8
AR	-	16.7	16.9	15.6	15.6	-
D1 Ley	15.9	15.4	15.1	15.0	-	-
Sa	16.1	15.6	15.4	15.2	-	-
AH	-	-	15.7	15.3	15.1	15.1
AR	-	16.3	15.5	15.5	15.3	-
	Ley	Sa	AH	AR	Mean	
CON	15.8	15.6	15.7	16.2	15.8	
ALT	15.4	15.8	15.8	15.6	15.7	
Mean	15.6	15.7	15.7	15.9	15.7	

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1ST TEST CROP

SUGAR BEET

TOTAL SUGAR

	N1	N2	N3	N4	N5	N6
	(±1.86)*					
DO Ley	57.1	62.7	57.8	60.6	-	-
Sa	58.4	54.6	58.4	55.3	-	-
AH	-	-	64.3	67.3	57.3	61.2
AR	-	55.8	57.2	50.4	54.8	-
D1 Ley	60.4	61.4	59.1	58.9	-	-
Sa	57.8	58.5	57.9	56.6	-	-
AH	-	-	62.6	57.7	61.1	62.7
AR	-	58.0	52.2	58.8	54.6	-
	Ley	Sa	AH	AR	Mean	
CON	61.8	55.0	62.4	57.1	59.1	
ALT	57.6	59.4	61.1	53.3	57.9	
Mean	59.7	57.2	61.8	55.2	58.5	

\* For use in horizontal and interaction comparisons only.

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1ST TEST CROP

SUGAR BEET

TOPS

	N1	N2	N3	N4	N5	N6
			( $\pm 0.785$ )*			
DO Ley	11.79	16.08	17.68	17.93	-	-
Sa	12.21	15.91	15.24	17.43	-	-
AH	-	-	11.87	16.42	16.16	16.25
AR	-	9.34	9.85	13.97	14.90	-
D1 Ley	14.65	16.16	16.75	17.26	-	-
Sa	14.82	16.16	17.85	18.69	-	-
AH	-	-	15.74	15.32	15.66	17.09
AR	-	13.64	16.16	17.68	18.52	-
	Ley	Sa	AH	AR	Mean	
CON	15.17	15.22	16.23	13.41	15.01	
ALT	16.90	16.86	14.90	15.11	15.94	
Mean	16.04	16.04	15.56	14.26	15.47	

\* For use in horizontal and interaction comparisons only.

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2ND TEST CROP

BARLEY

	Ley	Lu	AH	AR	Mean
1966	GRAIN				
	(1) and (2)				(±0.68)
DO	46.3	45.9	38.2	36.1	41.6
D1	44.4	43.7	43.5	42.5	43.5
Mean (±0.95)	45.3	44.8	40.9	39.2	42.6
1966	STRAW				
DO	45.3	45.0	31.1	35.0	39.1
D1	45.8	49.2	38.7	43.5	44.3
Mean	45.5	47.1	34.9	39.3	41.7

Mean D.M. %: Grain: 83.9  
 Straw: 89.2

- (1) (±1.35) For use in horizontal and diagonal comparisons only.  
 (2) (±1.35) For use in vertical and interaction comparisons only.