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

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64/B/4.1

LEY AND ARABLE ROTATIONS

(WLA)

Woburn Stackyard 1964 - the 27th year.

For history, treatments etc., see 'Details 1962'.

Barley and carrots: The varieties are now respectively Maris Badger and Autumn King.

Lucerne: In view of the failure to control stem eelworm (*Ditylenchus dipsaci*) this crop is now replaced with common sainfoin (*Onobrychus sativa*), starting with the first year leys in 1964. Inoculated seed at 56 lb.

Corrective K dressings (in cwt K2O):-

Continuous rotations	Fertiliser plots	Dung plots
Rotation		
Arable	3	3
Arable with hay	4	3
Lucerne	3	3
Grazed ley	3	0

Alternating rotations

Last 2 rotations in order	Fertiliser plots	Dung plots
Arable with hay/ley	3	3
Ley/Arable with hay	3	2
Arable/Lucerne	3	2
Lucerne/Arable	3	2

Revised NPK dressings (in cwt except where stated)

	Fertilisers and time of application	N	P2O5	K2O
Grazed ley	'Nitro-Chalk', superphosphate and			
1st year	muriate of potash, all in seedbed	0.4	1.5	1.0
	16:0:16 as 2 equal dressings in			
	early and late summer*.	0.8		0.8
2nd and	16:0:16 as 3 equal dressings in			
3rd year	spring, early and late summer*	1.2		1.2

Sugar beet

Test fertilisers

Grazed ley	'Nitro-Chalk' and muriate of potash			
and lucerne	in seedbed, superphosphate to			
rotations	plough furrow.	0.35	0	0
		0.7	1.5	0.9
Arable and	As above for grazed ley etc.	0.7	0	0
Arable with		1.05	1.5	0.9
ley rotations				
Basal ferti-	As above for test fertilisers	0.7	0.9	0.9
lisers				

64/B/4.2

NOTES: (1) The basal fertilisers include 500 lb $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$.

(2) In 1964 plots not receiving dung received 3.7 cwt K_2O , the K equivalent of the dung used.

* Any dose may be omitted or reduced in wet seasons at the Farm's discretion.

Cultivations, etc.:

Treatment crops.

Ley 1st year. Ploughed twice: Sept 24, 1963 and Jan 3, 1964.

Seedbed fertilisers applied: Apr 1. Seed sown: Apr 8.

Sprayed with MCPB at 1.9 lb in 40 gals: May 15. Compound fertiliser applied: July 10 and Aug 27. Grazed 5 circuits: June 14 - Oct 16.

Ley 2nd year. Compound fertiliser applied: Mar 20, June 15 and Aug 28. Grazed 6 circuits: May 2 - Oct 24.

Ley 3rd year. Compound fertiliser applied: Mar 20, June 10 and Aug 27. Grazed 4 circuits: May 10 - Oct 20.

Sainfoin 1st year. Ploughed twice: Sept 24, 1963 and Jan 3, 1964.

Fertilisers applied: Apr 1. Seed drilled at 56 lb: Apr 8.

Sprayed with MCPB at 1.9 lb in 40 gals: May 27. Cut twice: July 23 and Oct 26.

Lucerne 2nd year. Sprayed with paraquat at 1.6 lb in 40 gals:

Feb 10, 1964. Fertilisers applied: Mar 20. Sprayed with diquat (Reglone at 4 pints in 60 gals): June 9. Cut 3 times: June 8, July 23, Sept 3.

Lucerne 3rd year. Sprayed with paraquat at 1.6 lb in 40 gals:

Feb 10, 1964. Fertilisers applied: Mar 20. Sprayed with diquat (Reglone at 4 pints in 60 gals): June 9. Cut 3 times: June 8, July 23, Sept 3.

Arable rotations.

Potatoes. Ploughed twice: Sept 24, 1963 and Jan 3, 1964.

Fertilisers applied: Apr 23. Potatoes machine planted: Apr 29.

Earthed up: June 12. Sprayed with mancozeb at 1.6 lb in 50 gals: June 25 and again at 1.2 lb in 40 gals: July 30. Sprayed with diquat (Reglone at 4 pints in 40 gals)*: Sept 2. Lifted: Sept 9.

* Plots 67 and 68 were not sprayed as the haulm was already dead.

Rye. Ploughed: Oct 8, 1963. Seed combine drilled at 3 bushels with PK compound: Oct 18. 'Nitro-Chalk' applied: Mar 26, 1964. Seeds hay mixture undersown on 4 plots: Apr 8. Combine harvested: Aug 25.

64/B/4.3

Seeds hay. Seeds undersown in rye at 30 lb: Apr 19, 1963.

'Nitro-Chalk' and PK compound applied: Mar 20, 1964.

Compound fertiliser applied: June 5. Cut twice: June 4 and July 28.

Carrots. Ploughed twice: Oct 3, 1963 and Jan 6, 1964.

Fertilisers applied: Apr 30. Seed drilled at 3 lb: May 4.

Sprayed with menazon at 0.5 lb in 60 gals: May 27 and again twice at 0.5 lb in 50 gals: June 24 and July 29. Lifted: Sept 24.

Test crops.

Sugar beet. Dung equivalent K and half corrective K applied:

Oct 2, 1963. Dung applied, all plots ploughed: Oct 4.

Half corrective K, basal superphosphate, muriate of potash and test superphosphate applied: Mar 9, 1964. Basal magnesium

sulphate, test 'Nitro-Chalk' and muriate of potash applied:

Apr 10. Seed drilled at 5 lb: Apr 14. Sprayed with DDT at

0.68 lb in 40 gals: May 21. Singled: May 27. Sprayed with

menazon at 0.25 lb in 50 gals: July 27. Lifted: Oct 26.

Barley. Ground chalk applied at 44 cwt: Dec 23, 1963. Ploughed:

Jan 3, 1964. Balancing muriate of potash, basal superphosphate

and 'Nitro-Chalk' applied: Feb 21. Seed drilled at 2.75

bushels: Mar 10. Sprayed with mecoprop/2,4-D (Methoxone Extra

at 6 pints in 40 gals): May 12. Combine harvested: Aug 20.

NOTES: (3) The 3rd year lucerne was infested with stem eelworm and grew poorly throughout the season. The yields are not included in the summary.

(4) Abbreviations for Rotation:

Ley = Grazed ley Lu = Lucerne AH = Arable with hay

AR = Arable with roots.

Standard errors per plot:

Sugar beet. Roots

Whole plot: 0.673 or 4.3% (4 d.f.)

1/2 plot: 1.136 or 7.3% (4 d.f.)

1/4 plot: 0.747 or 4.8% (24 d.f.)

1/16 plot: 1.590 or 10.2% (32 d.f.)

Total sugar

Whole plot: 3.04 or 4.9% (4 d.f.)

1/2 plot: 5.27 or 8.6% (4 d.f.)

1/4 plot: 3.18 or 5.2% (24 d.f.)

1/16 plot: 7.00 or 11.4% (32 d.f.)

Tops

Whole plot: 0.344 or 3.8% (4 d.f.)

1/2 plot: 0.376 or 4.2% (4 d.f.)

1/4 plot: 0.426 or 4.7% (24 d.f.)

1/16 plot: 0.949 or 10.5% (32 d.f.)

Barley. Grain

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

1/2 plot: 1.95 or 4.6% (4 d.f.)

64/B/4.4

SUMMARY OF RESULTS

TREATMENT CROPS

LEY, SHEEP DAYS OF GRAZING

	1st year	2nd year	3rd year	
	1253	1512	1012	
	1st cut	2nd cut	3rd cut	Total

SAINFOIN, DRY MATTER

1st year				
Dung in 1959				
-	22.2	10.4		32.6
D	24.6	8.6		33.2
Difference	+2.4	-1.8		+0.6
Lu	22.2	11.0		33.2
AH	24.8	8.0		32.8
Mean	23.5	9.5		33.0

LUCERNE, DRY MATTER

2nd year				
Dung in 1958				
-	9.2	12.2	8.8	30.2
D	13.0	14.4	11.2	38.6
Difference	+3.8	+2.2	+2.4	+8.4
Lu	9.1	9.7	8.0	26.8
AH	13.2	17.0	12.0	42.2
Mean	11.2	13.4	10.0	34.5

64/B/4.5

LUCERNE, DRY MATTER

	1st cut	2nd cut	3rd cut	Total
3rd year				
Dung in 1960				
-		10.5	6.6	17.1
D		6.9	5.4	12.3
Difference		-3.6	-1.2	-4.8
Lu		5.8	4.0	9.8
AH		11.6	8.0	19.6
Mean		8.7	6.0	14.7

64/B/4.6

TREATMENT CROPS				
	POTATOES		RYE	
	TOTAL TUBERS:	% WARE	GRAIN:	STRAW
Dung				
-	10.64	94.8	39.7	36.6
D*	11.36	94.0	43.0	39.6
Difference	+0.72	-0.8	+3.3	+3.0
Ley	12.34	94.0	42.2	38.8
Lu	11.87	96.4	40.0	37.4
AH	9.68	92.0	40.9	37.2
AR	10.12	95.3	42.3	38.8
Mean	11.00	94.4	41.4	38.1

HAY			
YIELD, DRY MATTER			
	1st cut	2nd cut	Total
Dung in 1960			
-	44.6	17.0	61.6
D	46.8	17.7	64.5
Difference	+2.2	+0.7	+2.9
Lu	43.6	15.9	59.5
AH	47.8	18.8	66.6
Mean	45.7	17.4	63.1

* Dung applied: Potatoes for test crop sugar beet in 1962
Rye for test crop sugar beet in 1961

Mean D.M. %: Rye, Grain: 84.7
Straw: 87.3

64/B/4.7

CARROTS

	Roots	Tops
Dung in 1960		
-	15.59	4.56
D	15.08	4.06
Difference	-0.51	-0.50
Ley	17.74	5.30
AR	12.93	3.33
Mean	15.34	4.31

64/B/4.8

1ST TEST CROP

SUGAR BEET

ROOTS

		Previous rotation				Mean
		Ley	Lu	AH	AR	
Mean	(± 0.476)	17.47	15.27	13.45	16.39	15.65
-	(± 0.741)*	17.79	14.92	13.04	15.92	15.42
D		17.15	15.63	13.86	16.86	15.87
Difference	(± 1.136)	-0.64	+0.71	+0.82	+0.94	+0.45
Response to additional N			(± 0.528)			(± 0.264)
-		+0.52	+0.46	+1.11	-1.13	+0.24
D		+0.45	-0.89	+0.84	+0.62	+0.25
Response to additional K ₂ O			(± 0.528)			(± 0.264)
-		+0.44	+0.98	-0.23	+0.79	+0.50
D		-0.31	+0.87	+0.60	-1.65	-0.12

* For use in horizontal and diagonal comparisons only

64/B/4.9

1ST TEST CROP

SUGAR BEET

SUGAR %

Previous rotation

	Ley	Lu	AH	AR	Mean
Mean	19.6	19.9	19.4	19.5	19.6
-	19.8	20.1	19.6	19.6	19.8
D	19.4	19.8	19.3	19.4	19.5
Difference	-0.4	-0.3	-0.3	-0.2	-0.3
Response to additional N					
-	-0.4	0.0	-0.5	-0.6	-0.3
D	-0.5	-0.4	-0.5	-0.6	-0.5
Response to additional K ₂ O					
-	+0.1	0.0	-0.1	0.0	-0.1
D	-0.4	+0.2	+0.4	+0.4	+0.1

64/B/4.10

1ST TEST CROP

SUGAR BEET

TOTAL SUGAR

Previous rotation

		Ley	Lu	AH	AR	Mean
Mean	(± 2.15)	68.5	60.9	52.2	63.9	61.4
-	(± 3.40)*	70.4	60.0	51.0	62.5	61.0
D		66.6	61.8	53.4	65.4	61.8
Difference	(± 5.27)	-3.8	+1.8	+2.4	+2.9	+0.8
Response to additional N						
			(± 2.25)			(± 1.13)
-		+0.6	+1.8	+3.3	-6.6	-0.2
D		0.0	-4.8	+1.6	+0.4	-0.6
Response to additional K ₂ O						
			(± 2.25)			(± 1.13)
-		+2.1	+4.0	-1.0	+2.8	+1.9
D		-2.3	+4.1	+3.6	-5.2	0.0

* For use in horizontal and diagonal comparisons only

64/B/4.11

1ST TEST CROP

SUGAR BEET

TOPS

Previous rotation

	Ley	Lu	AH	AR	Mean
Mean (± 0.243)	10.49	8.07	8.37	9.18	9.03
- (± 0.308)*	11.27	7.72	8.10	9.54	9.16
D	9.72	8.42	8.63	8.82	8.90
Difference (± 0.376)	-1.55	+0.70	+0.53	-0.72	-0.26
Response to additional N		(± 0.301)			(± 0.151)
-	+0.66	+0.91	+0.82	-0.40	+0.50
D	+0.38	+0.06	+0.74	+0.02	+0.30
Response to additional K ₂ O		(± 0.301)			(± 0.151)
-	+0.58	+1.04	+0.10	+0.52	+0.56
D	0.00	+0.62	+0.32	-0.56	+0.09

* For use in horizontal and diagonal comparisons only

64/B/4.12

1ST TEST CROP

SUGAR BEET

Plots receiving no additional N or K

Previous rotation

		Ley	Lu	AH	AR	Mean
ROOTS						
Mean	(± 0.696)	17.07	15.18	12.54	16.76	15.39
-	(± 0.984)*	16.73	14.63	12.55	15.95	14.96
D		17.41	15.73	12.54	17.56	15.81
Difference	(± 1.459)	+0.68	+1.10	-0.01	+1.61	+0.85
SUGAR PERCENTAGE						
Mean		19.8	20.0	19.6	19.6	19.7
-		19.8	20.1	19.9	19.7	19.9
D		19.8	19.9	19.3	19.4	19.6
Difference		0.0	-0.2	-0.6	-0.3	-0.3
TOTAL SUGAR						
Mean	(± 3.09)	67.7	60.6	49.1	65.6	60.8
-	(± 4.38)*	66.3	58.6	49.8	63.2	59.5
D		69.1	62.7	48.5	68.1	62.1
Difference	(± 6.56)	+2.8	+4.1	-1.3	+4.9	+2.6
TOPS						
Mean	(± 0.340)	10.03	7.29	7.80	9.36	8.62
-	(± 0.480)*	10.27	6.89	7.56	9.30	8.50
D		9.80	7.69	8.03	9.42	8.74
Difference	(± 0.643)	-0.47	+0.80	+0.47	+0.12	+0.24

* For use in horizontal and diagonal comparisons only

64/B/4.13

1ST TEST CROP

SUGAR BEET

Previous rotation

	Ley	Lu	AH	AR	Mean
ROOTS					
	$(\pm 1.546)^*$				
-	17.25	15.34	13.47	15.81	15.47
P	17.70	15.20	13.43	16.97	15.82
Difference (± 0.562)	+0.45	-0.14	-0.04	+1.16	+0.35 (± 0.281)
SUGAR PERCENTAGE					
-	19.6	20.0	19.4	19.5	19.6
P	19.6	19.9	19.4	19.5	19.6
Difference	0.0	-0.1	0.0	0.0	0.0
TOTAL SUGAR					
	$(\pm 7.13)^*$				
-	67.7	61.3	52.2	61.7	60.8
P	69.3	60.5	52.1	66.2	62.0
Difference (± 2.47)	+1.66	-0.8	-0.1	+4.5	+1.2 (± 1.24)
TOPS					
	$(\pm 0.575)^*$				
-	10.55	8.20	8.48	9.07	9.08
P	10.44	7.94	8.25	9.29	8.98
Difference (± 0.335)	-0.11	-0.26	-0.23	+0.22	-0.10 (± 0.168)

* For use in horizontal and diagonal comparisons only

64/B/4.14

2ND TEST CROP

BARLEY

Previous rotation

		Ley	Lu	AH	AR	Mean
		GRAIN				
-	(± 1.36)*	46.2	46.0	42.2	40.8	43.8
D		44.4	44.0	40.0	38.4	41.7
Mean	(± 0.95)	45.3	45.0	41.1	39.6	42.7
Difference	(± 1.95)	-1.8	-2.0	-2.2	-2.4	-2.1 (± 0.97)

STRAW

-		33.6	31.7	29.6	30.4	31.3
D		34.0	34.7	29.4	36.6	33.7
6						
Mean		33.8	33.2	29.5	33.5	32.5
Difference		+0.4	+3.0	-0.2	+6.2	+2.4

* For use in horizontal and diagonal comparisons only

Mean D.M.%: Grain 84.4
Straw 83.4