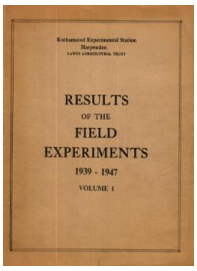
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1939-1947 Volume 1



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BF/1 Ley and Arable Rotations

Rothamsted Research

Rothamsted Research (1948) *BF/1 Ley and Arable Rotations ;* Yields Of The Field Experiments 1939-1947 Volume 1, pp 139 - 156 **- DOI: https://doi.org/10.23637/ERADOC-1-145**

LEY AND ARABLE ROTATIONS EXPERIMENT

Woburn, Stackyard, Series D (begun in 1938)

The purpose of the experiment is to test the value of a three year ley, three years of lucerne and an arable rotation with a one year ley, as means of building up soil fertility, in comparison with a rotation without leys. The effects of these crop sequences are measured by the yields of two following crops of potatoes and barley, which may be termed the indicator crops. Each rotation therefore has five courses. The rotations compared are:-

(1) Three year ley
(2) Three years of lucerne
(3) Potatoes, wheat, one year ley*
(4) Potatoes, wheat, kale

} Potatoes, barley

There are five series, one for each course of the five year rotation, so that all courses of every rotation are represented every year. Each series has eight main plots, on four of which the same rotation continues throughout the experiment. On the other four plots, ley and arable rotations alternate.

Each main plot is divided into two sub-plots, one of which receives dung at the rate of 15 tons per acre applied to the indicator crop of potatoes only. The same sub-plots receive dung throughout the experiment. All plots are liberally manured with inorganic fertilizers.

Details are as given in the 1938 Report pp. 135-137, except that owing to the unsatisfactory crops obtained on the kale plots in the years 1938-44 it was decided to substitute sugar beet for kale as from 1945.

Owing to an error in the chain used, the sub-plot area has been given previously as 0.0390 acre. The correct value is 0.0403 acre. Consequently the yields given in the Station Report for 1938 should be multiplied by 0.968. The correct values for 1938 are included in this Report.

* The one year ley will be referred to as "hay", to distinguish from the three year ley. The geological term "series" is used to denote the area under each crop in a rotation experiment. However, in this experiment the word "block" is used with the same meaning.

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Crop Notes

Bf/1.2

First three years of each Rotation

Previous crop - Barley

Rotation 1. Ley

Grass Mixture

	lb.per acre		lb.per acre
Perennial Ryegrass	14	Wild White Clover	2
Cocksfoot	8	Italian Ryegrass (1941 and onwards only)	10
Late Flowering Red Clover	4		

First year	Block		Sown	First year Grazed by sheep	Second year Grazed by sheep	Third year Grazed by sheep
1938	3	Cycle 1	May 20	Aug. 3 - Sept.14 2 grazings = 16 days	Apr. 13 - Oct. 17 9 grazings = 108 days	Apr. 27 - Oct. 16 4 grazings = 55 days
1939	5		May 4	Aug. 16 - Oct.20 3 grazings = 28 days	Apr. 17 - Oct. 25 5 grazings = 119 days	May 5 - Oct. 26 4 grazings = 94 days
1940	4		May 6	Aug. 26 - Nov. 2 2 grazings = 30 days	May 5 - Oct. 18 4 grazings = 65 days	May 27 - Sept. 19 4 grazings = 38 days
1941	2		May 14	No grazing[1]	May 19 - Sept. 14 4 grazings = 46 days	Aug. 31 - Oct. 1 3 grazings = 17 days[2]
1942	1		May 15	Aug. 24 - Sept.8 1 grazing, on half plots	Sept.8[3] - Oct. 20 3 grazings = 21 days	June 21[3] - Oct. 27 4 grazings = 46 days
1943	3	Cycle 2	Apr.28	Oct. 20 1 grazing[4]	July 12 - Nov. 5 4 grazings = 44 days	May 26 - Sept. 29 4 grazings = 70 days
1944	5		May 8	July 28 - Nov.13 4 grazings = 34 days	June 11 - Oct. 28 4 grazings = 62 days	May 9 - Nov. 19 6 grazings = 95 days
1945	4		May 7	Aug. 10 - Oct.15 2 grazings = 41 days	May 25 - Nov. 3 5 grazings = 85 days	May 21 - Oct. 19 4 grazings = 48 days
1946	2		May 1	Aug. 15 - Nov.10 3 grazings = 24 days	May 5 - Oct. 15 4 grazings = 51 days	
1947	1		May 1	Oct. 3 - 11 1 grazing = 9 days		

1. Owing to an unfavourable season, and because the wrong quantity of manure was applied.
2. Prior to the grazings there was one cut of hay on June 22.
3. The sheep were put on late owing to war conditions.
4. There was one cut, on July 15, to get rid of annual weeds.

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Ley and Arable Rotations Experiment

Rotation 2. Lucerne

Variety: Provence 1939-1944, Grim 1945, Argentine 1946.

First year	Block	First year: Sown	First year: 1st cut	First year: 2nd cut	Second year: 1st cut	Second year: 2nd cut	Second year: 3rd cut	Third year: 1st cut	Third year: 2nd cut	Third year: 3rd cut
1938	3 (1st cycle)	May 20	Sept.14	-	July 6	Aug.18	Nov.13	July 10	Sept. 4	Dec. 22
1939	5 (1st cycle)	May 4	Aug. 19	Nov.13	July 10	Sept.4	-	June 17	Aug. 12	Dec. 22
1940	4 (1st cycle)	May 6*	Sept.4	-	June 24	Aug.12	Dec.22	June 26	Sept.16	-
1941	2 (1st cycle)	May 14	Aug. 12	-	June 26	Sept.16	-	June 7	Aug. 31	-
1942	1 (1st cycle)	May 15	Sept.16	-	June 7	Aug.31	-	June 6	Aug. 8	-
1943	3 (2nd cycle)	May 6	-	-	June 6	Sept.4	-	June 8	Aug. 13	Nov. 12
1944	5 (2nd cycle)	May 9	Sept.12	-	June 8	Aug.13	Nov.12	June 25	Sept.16	Dec. 10
1945	4 (2nd cycle)	May 7	Aug. 13	Nov.12	June 26	Sept.16	-	June 11	July 31	Oct. 3
1946	2 (2nd cycle)	May 1	Sept.16	-	June 26	July 31	-			
1947	1 (2nd cycle)	May 7	Oct. 3	-						

*Bad patches reseeded June 11.

Rotations 3 and 4. First year - Potatoes, second year - Wheat, third year - Hay (Rot.3) and Kale or Sugar Beet (Rot.4).

Varieties:

Potatoes - Majestic
Wheat - Red Standard
Grass mixture - 16 lb. Italian Ryegrass and 10 lb. Broad Red Clover, 1940-44.
24 lb. " " " 12 lb. " " " 1945.
24 lb. " " " 12 lb. Montgomery Red Clover, 1946.
Kale - Thousand Head
Sugar Beet- Kleinwanzleben E.

First year	Block	1st year Potatoes: Sown	Potatoes: Harvested	Second year Wheat: Sown	Wheat: Harvested	Third year Hay (Rot.3): Sown	Hay (Rot.3): 1st cut	Hay (Rot.3): 2nd cut	Kale (Rot.4): Sown	Kale (Rot.4): Harvested
1938	3 (1st cycle)	Apr.23	Sept.22	31.10.38	Aug. 14	27.4.39	June 20		May 6	Dec.30
1939	5 (1st cycle)	Apr.25	Sept.12	2.11.39	Aug. 12	3.5.40	June 17	Aug. 12	Apr.29	Dec.16
1940	4 (1st cycle)	Apr.26	Sept.20	16.10.40	Aug. 14	5.5.41	June 25	Sept.16	Apr.22	Dec.29
1941	2 (1st cycle)	Apr.24	Oct. 15	24.3.42*	Sept.15	20.5.42	1 cut, date unknown		Crop failed	
1942	1 (1st cycle)	Apr.21	Oct. 5	(Eaten by rats)		16.4.43	June 6	Sept.12	May 9*	7.2.45
1943	3 (2nd cycle)	May 13	Sept.22	11.10.43	Aug. 10	9.5.44	June 8	Aug. 13	Sugar beet May 3	Nov.26
1944	5 (2nd cycle)	Apr.28	Sept.20	May 10*	Aug. 10	10.5.45	June 24	Sept.16	May 2	Oct.12
1945	4 (2nd cycle)	Apr.27	Oct. 2	2.10.45	Aug. 22	19,5.46	June 11	July 31	May 2	Oct.17
1946	2 (2nd cycle)	Apr.26	Oct. 8	6.11.46	Aug. 6					
1947	1 (2nd cycle)	May 12	Oct.10							

*Second sowing, first sowing failed.

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Bf/1.4

Indicator Crops - Potatoes and Barley

Fourth and fifth years of rotations

Varieties: Potatoes - Majestic; Barley - Plumage Archer

Year	Block	Potatoes	Sown	Harvested	Block	Barley	Sown	Harvested
1938	4	Prior to	Apr. 22	Sept.30	5		Mar. 19	Aug.25
1939	2	rotations	Apr. 24	Sept.20	4		Mar. 2	Aug.30
1940	1		Apr. 12	Sept.25	2	Prior to	Mar.21	Aug.30
1941	3	Fourth year	Apr. 18	Nov. 7	1	rotations	Mar.17	Aug.27
1942	5	of Cycle 1	Apr. 17	Oct. 9	3	Fifth year	Apr.13	Aug.19
1943	4	of	Apr. 14	Sept.23	5	of Cycle 1	Mar. 4	Aug.25
1944	2	rotations	Apr. 27	Oct. 2	4	of	Mar.14	Aug.30
1945	1		Apr. 26	Oct.11	2	rotations	Mar. 2	Aug.10
1946	3	Fourth year	Apr. 29	Oct. 6	1		Mar.20	Aug.23
1947	5	of Cycle 2	Apr. 12	Oct. 2	3	Fifth year of Cycle 2	Apr.17	Aug.12

Rotation 1. Ley

Sheep-days of grazing per acre

First Cycle

Block 3			Block 5			Block 4		
1938	1939	1940	1939	1940	1941	1940	1941	1942
596	3667	2103	1135	1898	2062	645	1347	1344
Block 2			Block 1					
1941	1942	1943	1942	1943	1944			
None	1833	453	721	429	1050			

Second Cycle

Block 3			Block 5			Block 4		
1943	1944	1945	1944	1945	1946	1945	1946	1947
143	955	1910	764	1695	3101	1146	2787	1840
Block 2			Block 1					
1946	1947		1947					
811	1840		387					

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Ley and Arable Rotations Experiment

Rotation 2. Lucerne

Yields obtained during first three years of each rotation

Hay (85% dry matter), tons per acre

First Cycle

First year	Block	First year			Second year				Third year			
Crops:		1st	2nd	Total	1st	2nd	3rd	Total	1st	2nd	3rd	Total
1938	3	0.61	–	0.61	0.81	0.54	0.14	1.49	1.86	0.78	–	2.64
1939	5	0.34	0.08	0.42	1.36	0.73	–	2.09	1.48	1.26	0.12	2.87
1940	4	1.05	–	1.05	1.51	0.97	0.11	2.59	2.03	0.83	–	2.86
1941	2	0.39	–	0.39	2.05	0.53	–	2.58	1.67	0.64	–	2.31
1942	1	0.32	–	0.32	1.29	0.77	–	2.06	1.96	1.58	–	3.54

Second Cycle

First year	Block	First year			Second year				Third year			
1943	3	1st	2nd	Total	1st	2nd	3rd	Total	1st	2nd	3rd	Total
No dung		Not cut		–	1.58	0.86	–	2.44	1.84	1.36	0.10	3.30
Dung (1941)				–	1.48	0.87	–	2.35	1.76	1.10	0.06	2.92
Mean				–	1.53	0.86	–	2.39	1.80	1.23	0.08	3.11
Increase				–	–0.10	0.01	–	–0.09	–0.08	–0.26	–0.04	–0.38
Previous rotation:												
Lucerne				–	1.42	0.77	–	2.19	1.68	1.22	0.09	2.99
Arable				–	1.64	0.96	–	2.60	1.92	1.23	0.07	3.22
1944	5											
No dung		0.94	–	0.94	1.43	1.24	0.20	2.87	2.26	2.08	0.04	4.38
Dung (1942)		1.00	–	1.00	1.50	1.28	0.24	3.02	2.54	1.90	0.10	4.54
Mean		0.97	–	0.97	1.46	1.26	0.22	2.94	2.40	1.99	0.07	4.46
Increase		0.06	–	0.06	0.07	0.04	0.04	0.15	0.28	–0.18	0.06	0.16
Previous rotation:												
Lucerne		1.08	–	1.08	1.87	1.38	0.26	3.51	2.28	2.04	0.06	4.38
Arable		0.85	–	0.85	1.06	1.14	0.18	2.38	2.52	1.94	0.08	4.54
1945	4											
No dung		0.74	0.05	0.79	1.44	1.18	–	2.62	1.96	0.77	0.06	2.78
Dung (1943)		0.70	0.04	0.74	1.76	1.25	–	3.01	2.04	1.02	0.04	3.10
Mean		0.72	0.04	0.76	1.60	1.22	–	2.82	2.00	0.89	0.05	2.94
Increase		–0.04	–0.01	–0.05	0.32	0.07	–	0.39	0.08	0.26	–0.02	0.32
Previous rotation:												
Lucerne		0.84	0.04	0.88	1.76	1.20	–	2.96	2.12	0.96	0.05	3.13
Arable		0.60	0.06	0.66	1.44	1.24	–	2.68	1.87	0.83	0.06	2.75

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Lucerne Hay, tons per acre

First year	Block	First year			Second Cycle (continued) Second year				Third year			
		1st	2nd	Total	1st	2nd	3rd	Total	1st	2nd	3rd	Total
1946	2											
	No dung	0.53	-	0.53	0.64	0.25	-	0.89				
	Dung (1944)	0.51	-	0.51	0.72	0.34	-	1.06				
	Mean	0.52	-	0.52	0.68	0.29	-	0.97				
	Increase	-0.02	-	-0.02	0.08	0.09	-	0.17				
	Previous rotation:											
	Lurcerne	0.62	-	0.62	0.48	0.31	-	0.79				
	Arable	0.42	-	0.42	0.88	0.28	-	1.16				
1947	1											
	No dung	0.10	-	0.10								
	Dung (1945)	0.07	-	0.07								
	Mean	0.09	-	0.09								
	Increase	-0.03	-	-0.03								
	Previous rotation:											
	Lucerne	0.09	-	0.09								
	Arable	0.08	-	0.08								

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Ley and Arable Rotations Experiment

Rotations 3 and 4

First year - Potatoes, total tubers in tons per acre; percentage ware

	Total tubers	% ware	Total tubers	% ware	Total tubers	% ware	Total tubers	% ware
	1938 - Block 3		1939 - Block 5		1940 - Block 4		1941 - Block 2	
No dung					9.71	87.0	12.06	82.3
Dung*					11.50	89.1	12.19	80.6
Mean	12.77	92.2	11.13	85.4	10.61	88.0	12.12	81.4
Increase	-	-	-	-	1.79	2.1	0.13	-1.7
			(Second cycle)					
	1942 - Block 1		1943 - Block 3		1944 - Block 5		1945 - Block 4	
No dung	9.24	75.8	7.76	75.7	12.18	86.0	11.71	86.4
Dung*	9.59	75.5	9.53	80.7	13.33	86.0	13.28	88.9
Mean	9.41	75.6	8.64	78.2	12.75	86.0	12.50	87.6
Increase	0.35	-0.3	1.77	5.0	1.15	0.0	1.57	2.5
Previous rotation:								
Ley			10.48	82.6	12.54	86.8	11.66	88.6
Lucerne			8.28	76.8	13.26	86.1	13.82	87.6
Arable with hay			8.74	82.4	12.75	85.1	12.56	89.5
Arable with kale			7.08	70.9	12.46	86.2	11.94	85.2
	1946 - Block 2		1947 - Block 1					
No dung	8.04	87.2	6.11	91.9				
Dung*	9.13	87.6	6.24	90.4				
Mean	8.58	87.4	6.18	91.2				
Increase	1.09	0.4	0.13	-1.5				
Previous rotation:								
Ley	10.21	89.2	6.90	91.6				
Lucerne	8.69	89.2	6.67	92.0				
Arable with hay	7.32	86.8	5.32	91.0				
Arable with kale	8.12	84.3	5.81	90.1				

*Dung was applied two years previously, e.g. in 1938 on Block 4.

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Rotations 3 and 4

Second year - Wheat, grain and straw in cwt. per acre

	Grain	Straw	Grain	Straw	Grain	Straw	Grain	Straw
				First Cycle				
	1939 - Block 3		1940 - Block 5		1941 - Block 4		1942 - Block 2	
No dung					8.7	14.3	Crop complete failure	
Dung*					9.5	16.2		
Mean	12.9	22.5	15.2	24.2	9.1	15.2		
Increase	-	-	-	-	0.8	1.9		
	1943 - Block 1							
	Crop eaten by rats							
				Second cycle				
	1944 - Block 3		1945 - Block 5		1946 - Block 4		1947 - Block 2	
No dung	9.1	23.3	13.7	30.2	10.8	18.0	7.7	14.8
Dung*	11.3	27.8	14.0	25.8	12.6	24.2	8.8	14.8
Mean	10.2	25.6	13.8	28.0	11.7	21.1	8.2	14.8
Increase	2.2	4.5	0.3	-4.4	1.8	6.2	1.1	0.0
Previous rotation:								
Ley	14.1	32.1	15.2	33.4	12.1	21.5	9.6	18.4
Lucerne	10.6	24.3	15.0	26.0	12.7	21.9	8.6	13.5
Arable with hay	11.2	27.6	11.0	22.2	8.6	14.2	5.5	10.5
Arable with kale	5.0	18.1	14.2	30.4	13.3	26.8	9.3	16.8

* The dung was applied three years previously, e.g. in 1938 on block 4, etc.

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Ley and Arable Rotations Experiment

Rotation 3

Third year - Hay, yield (85% dry matter) in tons per acre

	First Crop	Second Crop	Total	First Crop	Second Crop	Total	First Crop	Second Crop	Total
				First cycle					
	1940 - Block 3			1941 - Block 5					
	0.78	-	0.78	1.31	0.33	1.64			
	1942 - Block 4			1943 - Block 2			1944 - Block 1		
No dung	1.85	0.22	2.07	1.04	-	1.04	1.02	0.37	1.38
Dung*	2.10	0.21	2.31	1.12	-	1.12	1.02	0.34	1.36
Mean	1.98	0.21	2.19	1.08	-	1.08	1.02	0.35	1.37
Increase	0.25	-0.01	0.24	0.08	-	0.08	-	-0.03	-0.02
				Second cycle					
	1945 - Block 3			1946 - Block 5			1947 - Block 4		
No dung	1.32	0.33	1.65	2.64	1.12	3.76	1.76	0.32	2.07
Dung*	1.62	0.39	2.01	2.80	1.16	3.96	1.89	0.23	2.12
Mean	1.47	0.36	1.83	2.72	1.14	3.86	1.82	0.27	2.10
Increase	0.30	0.06	0.36	0.16	0.04	0.20	0.13	-0.09	0.05
Previous rotation:									
Ley	1.27	0.30	1.57				2.18	0.40	2.59
Lucerne				2.86	1.20	4.06			
Arable with hay	1.68	0.42	2.10	2.58	1.07	3.65	1.46	0.14	1.60

*Dung was applied four years previously, e.g. in 1938 on Block 4 etc.

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Rotation 4

Third year - Kale, in tons per acre, Cycle 1 or

Sugar Beet, clean beet and tops in tons per acre, total sugar in cwt. per acre and sugar percentage, Cycle 2.

Cycle 1. Kale

Block	1940 3	1941 5	1942 4	1943 2	1944 1
No dung			7.15	Crop	4.94
Dung*			7.62	failed	4.27
Mean	7.34	9.35	7.38		4.60
Increase			0.47		-0.67

Cycle 2. Sugar Beet.

	1945 - Block 3				1946 - Block 5			
	Clean beet	Tops	Total Sugar	Sugar %	Clean beet	Tops	Total sugar	Sugar %
No dung	6.2	2.8	21.9	17.47	7.29	7.29	27.9	19.14
Dung*	7.9	3.4	27.2	17.20	8.12	7.45	31.7	19.53
Mean	7.0	3.1	24.6	17.34	7.70	7.37	29.8	19.34
Increase	1.7	0.6	5.3	-0.27	0.83	0.16	3.8	0.39
Previous rotation:								
Ley					8.16	7.88	31.2	19.10
Lucerne	7.2	3.0	25.4	17.60				
Arable with kale	6.9	3.1	23.6	17.08	7.24	6.86	28.3	19.57

*Dung was applied four years previously, e.g. in 1938 on Block 4, etc.

	1947 - Block 4			
No dung	4.97	2.88	20.7	20.82
Dung	8.63	4.82	35.4	20.52
Mean	6.80	3.85	28.1	20.67
Increase	3.66	1.94	14.7	-0.30
Previous rotation:				
Ley				
Lucerne	7.42	4.21	30.9	20.82
Arable with kale	6.18	3.49	25.3	20.52

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Ley and Arable Rotations Experiment

Yields of Indicator Crops

Potatoes - effect of dung in current year

	Total tubers, tons per acre		Percentage ware	
Prior to rotations				
	1938 - Block 4	1939 - Block 2	(1938)	(1939)
No dung	11.41	10.89		85.2
Dung	15.47	12.52		88.6
Mean	13.44	11.69	89.2	86.9
Increase	4.06 (±0.32)	1.63 (±0.11)		3.4 (±1.45)

1940 - Block 1

	After Hay	After Kale	Mean	After Hay	After Kale	Mean
		±0.64[1]			±2.0[1]	
No dung	8.23	6.75	7.49	82.0	76.6	79.3
Dung	9.83	7.85	8.84	82.4	79.5	81.0
Mean ±0.59	9.02	7.30	8.16	±1.70 82.2	78.0	80.1
Resp. ±0.50	1.60	1.10	1.35	±2.36 0.4	2.9	1.7
			±0.36			±1.67

Fourth year of cycles

	Previous crop rotation					Previous crop rotation				
	Ley	Lucerne	Arable with Hay	Arable with Kale	Mean	Ley	Lucerne	Arable with Hay	Arable with Kale	Mean
1941 - Block 3			±0.45[1]					±1.47[1]		
No dung	15.19	11.15	11.82	9.35	11.88	87.6	84.1	83.4	82.2	84.3
Dung	14.38	14.23	14.40	12.19	13.80	86.2	85.0	84.2	86.6	85.5
Mean ±0.41	14.79	12.69	13.11	10.76	12.84	±1.32 86.9	84.6	83.8	84.4	84.9
Resp. ±0.37	-0.80	3.08	2.58	2.84	1.93	±1.27 -1.4	0.9	0.8	4.4	1.2
					±0.18					±0.64
1942 - Block 5			±0.37[1]					±1.16[1]		
No dung	13.70	13.22	12.52	10.83	12.57	87.0	85.0	85.0	81.4	84.6
Dung	14.66	15.40	14.75	13.14	14.49	87.4	86.1	87.2	84.2	86.2
Mean ±0.35	14.18	14.31	13.64	11.98	13.53	±0.97 87.2	85.6	86.1	82.8	85.4
Resp. ±0.26	9.96	2.18	2.23	2.31	1.92	±1.27 0.4	1.1	2.2	2.8	1.6
					±0.13					±0.64

Standard errors (1) for comparisons other than vertical ones.

https://doi.org/10.23637/ERADOC-1-145 *pp 12*

Potatoes - effect of dung in current year.

Fourth year of cycles (continued)

Total tubers, tons per acre

	Previous crop rotation: Ley	Lucerne	Arable with Hay	Arable with Kale	Mean
1943 - Block 4			±0.68[1]		
No dung	8.84	9.76	8.08	7.43	8.53
Dung	10.31	13.52	9.50	10.63	10.99
Mean ±0.40	9.58	11.64	8.79	9.03	9.76
Resp.±1.11	1.47	3.76	1.42	3.20	2.46
					±0.56
1944 - Block 2			±0.61[1]		
No dung	12.08	13.20	10.56	11.22	11.76
Dung	13.04	14.64	11.76	12.24	12.92
Mean ±0.57[1]	12.56	13.92	11.16	11.73	12.34
Resp.±0.45	0.96	1.44	1.20	1.02	1.16
					±0.22
1945 - Block 1			±0.78[1]		
No dung	13.28	12.96	12.46	11.06	12.44
Dung	13.32	12.68	11.89	12.48	12.59
Mean ±0.39	13.30	12.82	12.18	11.77	12.52
Resp.±1.35	0.04	-0.28	-0.57	1.42	0.15
					±0.68
1946 - Block 3			±0.92[1]		
No dung	11.37	9.59	8.94	8.32	9.56
Dung	13.28	11.50	11.93	8.88	11.40
Mean ±0.86	12.32	10.54	10.44	8.60	10.48
Resp.±0.69	1.91	1.91	2.99	0.56	1.84
					±0.35
1947 - Block 5			±0.38[1]		
No dung	8.42	8.74	6.28	8.03	7.87
Dung	9.06	9.62	8.11	8.86	8.91
Mean ±0.35	8.74	9.18	7.20	8.44	8.39
Resp.±0.28	0.64	0.88	1.83	0.83	1.04
					±0.14

Percentage ware

	Previous crop rotation: Ley	Lucerne	Arable with Hay	Arable with Kale	Mean
			±2.60[1]		
	80.4	79.8	76.6	71.4	77.0
	81.3	87.1	83.6	81.4	83.4
±1.14	80.8	83.4	80.1	76.4	80.2
±4.67	0.9	7.3	7.0	10.0	6.4
					±2.34
			±0.91[1]		
	89.4	87.5	86.2	82.2	86.3
	89.4	89.0	88.1	85.5	88.0
±0.82	89.4	88.2	87.2	83.8	87.2
±0.76	0.0	1.5	1.9	3.3	1.7
					±0.38
			±1.55[1]		
	87.0	86.8	84.7	85.0	85.9
	86.8	85.0	85.8	83.2	85.2
±0.71	86.9	85.9	85.2	84.1	85.6
±2.76	-0.2	-1.8	1.1	-1.8	-0.7
					±1.38
			±0.52[1]		
	90.2	89.1	87.6	89.7	89.2
	90.6	92.3	90.8	93.2	91.7
±0.47	90.4	90.7	89.2	91.4	90.4
±0.46	0.4	3.2	3.2	3.5	2.5
					±0.23
			±0.64[1]		
	93.3	92.8	92.4	93.2	92.9
	94.1	93.2	93.2	94.0	93.6
±0.53	93.7	93.0	92.8	93.6	93.3
±0.70	0.8	0.4	0.8	0.8	0.7
					±0.35

Standard errors (1) for comparisons other than vertical ones.

In 1946 and 1947 read "Arable with sugar beet" for "Arable with kale".

https://doi.org/10.23637/ERADOC-1-145

Ley and Arable Rotations Experiment

Potatoes

Standard errors per plot

		d.f.	Total tubers tons per acre	Total tubers % of mean	Percentage ware
1938 - Block 4	Whole plot	7	0.68	5.08	
	Sub-plot	7	0.64	4.79	
1939 - Block 2	Whole plot	7	1.00	8.52	1.49
	Sub-plot	7	0.22	1.86	2.90
1940 - Block 1	Whole plot	6	1.18	14.5	3.40
	Sub-plot	6	0.72	8.75	3.34
Fourth year of cycles					
1941 - Block 3	Whole plot	4	0.57	4.47	1.87
	Sub-plot	4	0.37	2.86	1.27
1942 - Block 5	Whole plot	4	0.49	3.62	1.38
	Sub-plot	4	0.26	1.95	1.27
1943 - Block 4	Whole plot	4	0.57	5.82	1.61
	Sub-plot	4	1.11	11.3	4.67
1944 - Block 2	Whole plot	4	0.80	6.51	1.17
	Sub-plot	4	0.45	3.65	0.76
1945 - Block 1	Whole plot	4	0.55	4.40	1.00
	Sub-plot	4	1.35	10.8	2.76
1946 - Block 3	Whole plot	4	1.21	11.5	0.66
	Sub-plot	4	0.69	6.6	0.46
1947 - Block 5	Whole plot	4	0.50	6.0	0.75
	Sub-plot	4	0.28	3.3	0.70

https://doi.org/10.23637/ERADOC-1-145 *pp 14*

Barley - residual effect of dung applied to potatoes in the previous year.

	Grain, cwt. per acre.			Straw, cwt. per acre.	
		1938 - Block 5	1939 - Block 4	(1938)	(1939)
No dung			15.3		23.1
Dung			16.2		28.6
Mean	7.66		15.8	12.6	25.8
Response			0.9 (±0.22)		5.5 (±1.08)
1940 - Block 2					
No dung	6.4			7.9	
Dung	8.5			11.4	
Mean	7.5			9.7	
Response	2.1	(±0.80)		3.5	(±1.02)

1941 - Block 1

	Crop previous to potatoes					
	Hay	Kale	Mean		Hay	Kale	Mean
	±1.16[1]				±1.28[1]		
No dung	7.0	10.6	8.8		10.0	13.2	11.6
Dung	7.6	9.7	8.6		10.1	14.2	12.2
Mean ±0.87	7.3	10.1	8.7	±1.03	10.1	13.7	11.9
Resp. ±1.56	0.6	-0.9	-0.2	±1.52	0.1	1.0	0.6
			±1.10				±1.07

Standard errors (1) for comparisons other than vertical ones

https://doi.org/10.23637/ERADOC-1-145

Ley and Arable Rotations Experiment

Barley - residual effect of dung applied to potatoes in previous year.

Fifth years of cycles

	Grain, cwt. per acre — Crop previous to potatoes					Straw, cwt. per acre — Crop previous to potatoes				
	Ley	Lucerne	Arable with Hay	Arable with Kale	Mean	Ley	Lucerne	Arable with Hay	Arable with Kale	Mean
1942 - Block 3			±2.27[1]					±2.46[1]		
No dung	18.6	22.6	13.3	9.5	16.0	21.7	26.2	16.3	12.1	19.1
Dung	21.8	21.3	18.1	17.8	19.8	25.0	25.7	21.7	20.7	23.3
Mean ±1.42	20.2	21.9	15.7	13.7	17.9	±1.82	23.4	26.0	19.0	16.4	21.2
Resp.±3.55	3.2	-1.3	4.8	8.3	3.8	±3.31	3.3	-0.5	5.4	8.6	4.2
					±1.78						±1.66
1943 - Block 5			±2.96[1]					±3.34[1]		
No dung	13.2	14.9	14.0	22.7	16.2		23.8	24.1	20.7	34.7	25.8
Dung	12.8	14.5	17.4	16.2	15.2		19.2	22.8	26.7	23.6	23.1
Mean ±2.28	13.0	14.7	15.7	19.4	15.7	±2.19	21.5	23.4	23.7	29.2	24.4
Resp.±3.79	-0.4	-0.4	3.4	-6.5	-1.0	±5.05	-4.6	-1.3	6.0	-11.1	-2.7
					±1.90						±2.52
1944 - Block 4			±3.24[1]					±4.38[1]		
No dung	18.1	22.5	19.0	24.2	21.0		22.7	20.1	21.8	23.2	21.9
Dung	15.7	19.7	23.0	17.4	18.9		19.2	23.5	29.2	20.8	23.2
Mean ±2.21	16.9	21.1	21.0	20.8	20.0	±2.78	20.9	21.8	25.5	22.0	22.6
Resp.±4.76	-2.4	-2.8	4.0	-6.8	-2.1	±6.77	-3.5	3.4	7.4	-2.4	1.3
					±2.38						±3.38
1945 - Block 2			±2.07[1]							
No dung	13.2	17.6	11.6	13.7	14.0		15.3	18.9	11.9	14.8	15.2
Dung	11.1	20.0	14.5	15.4	15.2		13.8	20.9	16.8	17.8	17.3
Mean ±1.17	12.2	18.8	13.0	14.6	14.6		14.6	19.9	14.4	16.3	16.2
Resp.±3.43	-2.1	2.4	2.9	1.7	1.2		-1.5	2.0	4.9	3.0	2.1
					±1.72						
1946 - Block 1			±1.44[1]					±1.80[1]		
No dung	17.4	18.8	14.0	14.1	16.1		20.4	23.7	17.0	19.2	20.1
Dung	16.4	16.4	15.6	15.7	16.0		18.5	20.1	19.6	19.8	19.5
Mean ±0.80	16.9	17.6	14.8	14.9	16.0	±0.44	19.4	21.9	18.3	19.5	19.8
Resp.±2.40	-1.0	-2.4	1.6	1.6	-0.1	±3.48	-1.9	-3.6	2.6	0.6	-0.6
					±1.20						±1.74

Standard errors (1) for comparisons other than vertical ones.

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https://doi.org/10.23637/ERADOC-1-145 *pp 16*

Barley - residual effect of dung applied to potatoes in the previous year.

Grain, cwt. per acre — Straw, cwt. per acre

Fifth years of cycles (continued)

	Crop previous to potatoes					Crop previous to potatoes				
	Ley	Lucerne	Arable with Hay	Arable with Sugar Beet	Mean	Ley	Lucerne	Arable with Hay	Arable with Sugar Beet	Mean
1947 - Block 3			±1.21[1]							
No dung	15.5	12.5	12.3	10.4	12.7	15.8	15.4	13.3	14.9	14.8
Dung	18.7	16.5	15.6	12.1	15.7	21.0	20.3	18.6	17.3	19.3
Mean ±0.99	17.1	14.5	14.0	11.2	14.2	18.4	17.8	16.0	16.1	17.1
Resp. ±1.39	3.2	4.0	3.3	1.7	3.0 ±0.69	5.2	4.9	5.3	2.4	4.5

Standard errors (1) for comparisons other than vertical ones

https://doi.org/10.23637/ERADOC-1-145

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Ley and Arable Rotations Experiment

Barley

Standard errors per plot

		Barley - Grain			Barley - Straw		
		d.f.	cwt. per acre	% of mean	d.f.	cwt. per acre	% of mean
1938 - Block 5	Whole plot	7	1.79	23.4	7	2.62	20.8
	Sub-plot	8	1.67	21.8	8	1.50	11.9
1939 - Block 4	Whole plot	7	1.55	9.85	7	1.29	4.98
	Sub-plot	6*	0.44	2.76	6*	2.17	8.39
1940 - Block 2	Whole plot	7	2.34	31.5	7	2.35	24.3
	Sub-plot	7	1.60	21.5	7	2.04	21.1
1941 - Block 1	Whole plot	6	1.74	20.0	6	2.06	17.4
	Sub-plot	6	2.21	25.4	6	2.15	18.2
Fifth year of cycles							
1942 - Block 3	Whole plot	4	2.01	11.2	4	2.57	12.1
	Sub-plot	4	3.55	19.9	4	3.31	15.6
1943 - Block 5	Whole plot	4	3.22	20.5	4	3.09	12.7
	Sub-plot	4	3.79	24.1	4	5.05	20.6
1944 - Block 4	Whole plot	4	3.12	15.6	4	3.93	17.4
	Sub-plot	4	4.76	23.9	4	6.77	30.0
1945 - Block 2	Whole plot	4	1.65	11.3			
	Sub-plot	4	3.43	23.4			
1946 - Block 3	Whole plot	4	1.13	7.0	4	0.62	3.15
	Sub-plot	4	2.40	15.0	4	3.48	17.6
1947 - Block 3	Whole plot	4	1.39	9.8			
	Sub-plot	4	1.39	9.8			

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* One missing sub-plot.

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