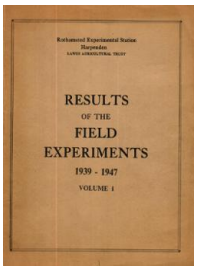
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1939-1947 Volume 1



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BE/1 Green Manuring

Rothamsted Research

Rothamsted Research (1948) *BE/1 Green Manuring ;* Yields Of The Field Experiments 1939-1947 Volume 1, pp 123 - 138 **- DOI: https://doi.org/10.23637/ERADOC-1-145**

GREEN MANURING EXPERIMENT

Woburn Stackyard (begun in 1936)

The experiment was designed to test the effects on kale of leys and green manures ploughed-in in mid-season, and also the effects of dung, straw and sulphate of ammonia. A barley crop tests the residual effects of these treatments.

The rotation was 1st year, green manure crops followed by kale, 2nd year barley. The leys and green manures were clover, ryegrass, tares and mustard: the tares and mustard were grown on the same plots every second year, but the clover and ryegrass alternately. A crop of hay was taken from the ley plots each year until 1940 and again in 1942; in other years all green material was buried.

There are 40 plots under each of the test crops, and until 1943 the experiment consisted of a single replicate (for each crop) of a 5×2^3 factorial design with all combinations of the following treatments, applied to kale;

Leys and green manures: Fallow (F), clover (C), ryegrass (R), tares (T) and mustard (M). The clover and ryegrass are undersown in the barley and the other green manures are sown after the barley stubble has been ploughed.

Dung: None, 10 tons per acre (D)
Straw: None, 1.5 tons per acre (S)
Sulphate of ammonia: 0.4, 0.8 cwt. N per acre (N)

A basal dressing of 3 cwt. superphosphate and 1 cwt. muriate of potash per acre is applied.

In 1944 and succeeding years a top dressing of sulphate of ammonia (0.3 cwt. N per acre in 1944, 0.4 cwt. N per acre thereafter) has been applied to half the plots under barley so that the experiment is now in half replicate according to the identity $I \equiv (R+C-T-M-F)$ DSNA, where A represents the top dressing of sulphate of ammonia.

From 1946 onwards, a further dressing of sulphate of ammonia (0.4 cwt. N per acre) has been applied to the fallow and all ley and green manure crops, on those plots which receive the top dressing when under barley. Also from 1946 onwards, cabbages replaced the kale (which had failed in several years), and the green manures were changed, tares being replaced by lupins and mustard by rape.

Full details of the original design are given in the 1936 Report, p. 203.

Owing to an error in the chain used, the plot area has been given previously as 0.0367 acre. The correct value is 0.0379 acre. Consequently the yields given in the Station Reports for 1936-38 should be multiplied by 0.968.

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Crop Notes

	Test Year 1939	1940	1941	1942
Leys and Green Manures				
Clover and Ryegrass				
undersown	31.3.38	19.4.39	3.5.40	5.5.41
cut	June 8	June 3		June 2
Tares sown	6.10.38	Apr.23 (1)	16.10.40	Apr.20 (2)
Mustard sown	6.10.38	Apr.23 (1)	Mar 24 (1)	Apr.15 (1)
Manures ploughed in	June 16	June 20	May 23	June 13
Kale (Thousand Head)				
Sown	June 21	June 26		June 16
Cut	Feb.1940	Feb.1941	Failed (3)	Feb and Mar.1943
Cabbages (January King)				
Transplanted				
Cut				
Barley (Plumage Archer)				
Sown	Mar.1	Mar.4	Mar.14	Apr.1
Harvested	Aug.29	Aug.26	Aug.26	Aug.19

(1) Second sowing. First sowing failed and was ploughed in
(2) Maple peas, replacing tare crop which failed
(3) First sowing destroyed by flea beetle; second sowing by pigeons

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Be/1.3

Green Manuring Experiment

Crop Notes

	Test Year				
	1943	1944	1945	1946	1947
Clover and Ryegrass undersown				23.4.45	2.5.46
	(Leys and green manures were ploughed in after failure of the kale.)				
Lupins sown				Apr.15	Apr.16
Rape sown				Apr.15(1)	Apr.16
Manures ploughed in				June 18	June 28
Kale (Thousand Head)					
Sown			(Fallow)		
Cut	Failed(4)	Failed(4)			
Cabbages (January King)					
Transplanted				July 22(5)	July 12(5)
Cut				Jan. & Mar.1947	Dec.Feb.& Mar.1948
Barley (Plumage Archer)					
Sown	Mar.17	Mar.9	Mar.6	Mar.18	Apr.18
Harvested	Aug.20	Sept.9	Aug.3	Aug.23	Aug.12

(1) Second sowing. First sowing failed and was ploughed in.
(4) Crop failed due to attack of flea beetle.
(5) Gaps were filled in by further transplanting during subsequent two months.

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N

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

Kale

Be/1.4

Means

Leys and green manures:	None	Tares	Clover	Mustard	Rye-grass	Mean
Manures	Total weight: tons per acre					
			1939			
			±0.418			±0.187
No dung	4.54	4.62	6.31	4.57	3.61	4.73
Dung	5.87	6.27	8.27	6.11	4.38	6.18
No straw	5.49	5.92	7.57	5.27	4.21	5.69
Straw	4.92	4.96	7.02	5.41	3.77	5.22
Sulphate of ammonia						
0.4 cwt.N per acre	4.56	4.69	6.58	4.79	2.44	4.61
0.8 cwt.N per acre	5.85	6.20	8.01	5.89	5.55	6.30
Mean ±0.296	5.20	5.44	7.29	5.34	3.99	5.46
			1940			
			±0.562			±0.251
No dung	6.16	5.54	5.62	4.59	3.43	5.07
Dung	7.09	7.24	8.04	6.85	5.52	6.95
No straw	6.73	6.53	6.86	6.08	5.07	6.26
Straw	6.52	6.24	6.80	5.35	3.88	5.76
Sulphate of ammonia						
0.4 cwt.N per acre	5.46	5.25	6.95	5.07	4.18	5.38
0.8 cwt.N per acre	7.79	7.52	6.71	6.36	4.77	6.63
Mean ±0.397	6.62	6.39	6.83	5.72	4.47	6.01
			1942			
			±0.725			±0.324
No dung	8.73	9.11	11.18	9.08	5.88	8.80
Dung	11.46	11.92	13.61	11.54	10.02	11.71
No straw	9.74	9.53	11.92	10.18	8.28	9.93
Straw	10.45	11.49	12.87	10.43	7.62	10.57
Sulphate of ammonia						
0.4 cwt.N per acre	9.01	9.63	12.67	8.52	5.63	9.09
0.8 cwt.N per acre	11.17	11.40	12.12	12.10	10.27	11.41
Mean ±0.513	10.09	10.51	12.40	10.31	7.95	10.25

Note: The kale failed in 1941, 1943 and 1944. The land was fallowed in 1945.

Standard errors per plot

1939 0.84 or 15.3%
1940 1.12 or 18.7%
1942 1.45 or 14.1%

These are based on 16 d.f.

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Green Manuring Experiment

Be/1.5

Cabbages

Leys and green manures:	None	Lupins	Clover	Rape	Rye-grass	Means: Mean
Manures	Total weight: tons per acre					
			1946 ±0.721			±0.322
No dung	2.96	3.27	4.68	3.20	2.46	3.31
Dung	4.80	4.09	6.67	4.44	3.78	4.76
No straw	3.52	4.29	5.90	4.27	2.84	4.16
Straw	4.24	3.06	5.45	3.37	3.41	3.91
Sulphate of ammonia						
0.4 cwt.N per acre	4.08	2.92	5.22	2.93	2.58	3.55
0.8 cwt.N per acre	3.68	4.44	6.12	4.71	3.66	4.52
Sulphate of ammonia to green manures.						
None	3.10	3.87	6.24	2.43	3.46	3.82
0.4 cwt.N per acre	4.66	3.48	5.10	5.20	2.79	4.25
Mean ±0.510	3.88	3.68	5.67	3.82	3.12	4.03
			1947 ±0.430			±0.192
No dung	3.76	2.36	1.20	1.83	1.87	2.20
Dung	4.40	3.11	1.11	2.36	2.04	2.60
No straw	4.32	2.42	1.21	2.05	2.35	2.47
Straw	3.83	3.06	1.10	2.14	1.56	2.34
Sulphate of ammonia						
0.4 cwt.N per acre	3.38	2.43	0.97	1.96	1.94	2.14
0.8 cwt.N per acre	4.77	3.04	1.34	2.22	1.98	2.67
Sulphate of ammonia to gree manures.						
None	3.95	2.92	1.12	2.07	1.85	2.38
0.4 cwt.N per acre	4.20	2.56	1.19	2.12	2.06	2.43
Mean ±0.304	4.08	2.74	1.16	2.09	1.96	2.40

Standard errors per plot

1946 1.44 or 35.7%
1947 0.86 or 35.8%

These are based on 9 d.f.

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N

Cabbages

Means

Leys and green manures:	None	Lupins	Clover	Rape	Rye-grass	Mean
Manures — Plant number: thousands per acre						
1946						
			±0.80			±0.36
No dung	16.8	16.0	16.0	16.4	15.6	16.2
Dung	16.2	15.7	16.0	16.9	16.2	16.2
No straw	16.1	17.0	15.8	16.9	15.7	16.3
Straw	16.8	14.7	16.2	16.5	16.1	16.1
Sulphate of ammonia						
0.4 cwt.N per acre	16.7	16.0	16.5	16.5	16.6	16.5
0.8 cwt.N per acre	16.3	15.7	15.5	16.8	15.3	15.9
Sulphate of ammonia to green manures.						
None	16.8	16.4	15.6	16.6	16.8	16.4
0.4 cwt.N per acre	16.1	15.4	16.4	16.7	15.1	15.9
Mean ±0.61	16.5	15.9	16.0	16.7	15.9	16.2
1947						
			±0.76			±0.34
No dung	17.1	16.9	15.6	15.8	15.5	16.2
Dung	17.4	17.6	14.9	15.1	16.0	16.2
No straw	17.3	17.4	14.7	16.1	16.9	16.5
Straw	17.2	17.2	15.7	14.9	14.6	15.9
Sulphate of ammonia						
0.4 cwt.N per acre	16.4	17.6	15.7	16.4	16.0	16.4
0.8 cwt.N per acre	18.1	16.9	14.7	14.6	15.6	16.0
Sulphate of ammonia to green manures.						
None	16.7	17.7	14.4	14.9	15.8	15.9
0.4 cwt.N per acre	17.8	16.9	16.0	16.1	15.7	16.5
Mean ±0.548	17.3	17.3	15.2	15.5	15.8	16.2

Standard errors per plot.

1946 1.60 or 9.9%
1947c 1.52 or 9.4%

These are based on 9 d.f.

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Green Manuring Experiment

Be/1.7

Differential Responses

Kale. Total weight: tons per acre

Response to	Mean	Dung Abs.	Dung Pres.	Straw Abs.	Straw Pres.	Sulphate of Ammonia to Kale cwt.N per acre 0.4	0.8	Sulphate of Ammonia to Barley and Green crops Abs.	Pres.
1939	±0.264			±0.374					
Dung	1.45	-	-	0.90	2.00	1.88	1.02		
Straw	-0.48	-1.03	0.07	-	-	-0.70	-0.26		
Sulph.of Amm.	1.69	2.12	1.26	1.47	1.91	-	-		
1940	±0.355			±0.502					
Dung	1.88	-	-	1.76	2.00	2.43	1.33		
Straw	-0.50	-0.62	-0.38	-	-	-1.45	0.45		
Sulph.of Amm.	1.25	1.80	0.70	0.30	2.20	-	-		
1942	±0.458			±0.648					
Dung	2.91	-	-	3.06	2.76	3.34	2.48		
Straw	0.64	0.79	0.49	-	-	0.33	0.95		
Sulph.of Amm.	2.32	2.75	1.89	2.01	2.63	-	-		

Cabbages. Total weight: tons per acre

1946	±0.456			±0.651					
Dung	1.45	-	-	1.76	1.14	2.54	0.36	1.43	1.47
Straw	-0.26	0.05	-0.57	-	-	-0.12	-0.40	-1.40	0.88
Sulph.of Amm.	0.98	2.07	-0.11	1.12	0.84	-	-	1.60	0.36
Sulph.of Amm. to Green crops	0.43	0.41	0.45	-0.71	1.57	1.05	-0.19	-	-
1947	±0.272			±0.389					
Dung	0.40	-	-	0.24	0.56	0.39	0.41	0.53	0.27
Straw	-0.13	-0.29	0.03	-	-	0.14	-0.40	0.03	-0.29
Sulph.of Amm.	0.53	0.52	0.54	0.80	0.26	-	-	0.44	0.62
Sulph.of Amm. to Green crops	0.04	0.17	-0.09	-0.20 ±0.20	-0.12	-0.05	0.13	-	-

Cabbages. Plant Number: thousands per acre

1946	±0.51			±0.72					
Dung	0.0	-	-	-0.1	0.1	0.7	-0.7	-0.4	0.4
Straw	-0.2	-0.3	-0.1	-	-	0.1	-0.5	-1.2	0.8
Sulph.of Amm. to Cabbages	-0.5	0.2	-1.2	-0.2	-0.8	-	-	-1.4	0.4
Sulph.of Amm. to Green crops	-0.5	-0.9	-0.1	-1.5	+0.5	-1.4	0.4	-	-
1947	±0.48			±0.69					
Dung	0.0	-	-	-0.6	0.6	0.6	-0.6	0.4	-0.4
Straw	-0.5	-1.1	0.0	-	-	-1.1	0.0	-0.6	-0.5
Sulph.of Amm. to Cabbages	-0.4	0.1	-1.0	-1.0	0.1	-	-	-0.8	-0.1
Sulph.of Amm. to Green crops	0.6	1.0	0.2	0.5	0.7	0.3	0.9	-	-

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Barley

Grain: cwt. per acre

Means

Leys and green manures before kale:	None	Tares	Clover	Mustard	Rye-grass	Mean
Manures applied to previous kale			1939			
			±1.16			±0.52
No dung	12.8	15.1	18.7	13.8	14.1	14.9
Dung	15.8	15.9	20.6	17.0	18.4	17.5
No straw	12.4	15.1	19.9	16.2	16.2	16.0
Straw	16.2	15.9	19.5	14.6	16.5	16.6
Sulphate of Ammonia						
0.4 cwt.N per acre	15.0	15.0	20.9	14.2	13.5	15.7
0.8 cwt.N per acre	13.6	16.0	18.4	16.7	19.1	16.8
Mean ±0.82	14.3	15.5	19.7	15.4	16.3	16.3
			1940			
			±1.53			±0.68
No dung	10.5	11.0	13.4	10.6	7.7	10.7
Dung	13.7	15.0	16.1	11.9	11.9	13.8
No straw	10.8	12.4	13.7	12.1	9.3	11.6
Straw	13.3	13.7	15.8	10.4	10.4	12.7
Sulphate of Ammonia						
0.4 cwt. N per acre	9.6	11.8	15.3	11.1	9.1	11.4
0.8 cwt. N per acre	14.5	14.2	14.1	11.3	10.6	13.0
Mean ±1.08	12.0	13.0	14.7	11.2	9.8	12.2
			1941			
			±0.86			±0.38
No dung	11.0	11.5	12.5	10.1	11.4	11.3
Dung	12.9	12.6	14.7	11.7	14.4	13.3
No straw	12.3	11.5	13.8	11.0	12.8	12.3
Straw	11.6	12.6	13.6	10.7	13.0	12.3
Sulphate of Ammonia						
0.4 cwt.N per acre	11.7	10.7	12.0	9.5	12.5	11.3
0.8 cwt.N per acre	12.2	13.4	15.3	12.3	13.3	13.3
Mean ±0.61	12.0	12.0	13.7	10.8	12.9	12.3

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Green Manuring Experiment

Barley

Grain: cwt. per acre

Means

Leys and green manures before kale:	None	Tares	Clover	Mustard	Rye-grass	Mean
			1942			
Manures applied to previous kale			±0.84			±0.37
No dung	9.0	8.3	7.1	8.1	9.8	8.5
Dung	11.2	12.1	10.7	10.3	12.0	11.3
No straw	9.6	8.9	8.1	9.4	9.8	9.2
Straw	10.6	11.4	9.7	9.0	12.0	10.5
Sulphate of Ammonia						
0.4 cwt.N per acre	9.0	10.4	8.3	9.6	11.1	9.7
0.8 cwt.N per acre	11.3	10.0	9.5	8.8	10.7	10.1
Mean ±0.59	10.1	10.2	8.9	9.2	10.9	9.9
			1943			
			±1.76			±0.79
No dung	7.4	11.0	9.9	7.1	6.6	8.4
Dung	13.1	11.4	11.2	13.2	11.2	12.0
No straw	9.1	12.3	11.6	8.7	8.8	10.1
Straw	11.5	10.1	9.5	11.6	9.0	10.3
Sulphate of Ammonia						
0.4 cwt.N per acre	10.2	12.0	10.4	8.9	9.6	10.2
0.8 cwt.N per acre	10.4	10.4	10.7	11.3	8.2	10.2
Mean ±1.24	10.3	11.2	10.6	10.1	8.9	10.2
			1944			
			±1.06			±0.48
No dung	9.9	10.1	8.6	8.2	7.0	8.8
Dung	8.6	10.5	8.1	8.7	12.0	9.6
No straw	9.6	10.4	7.4	8.6	7.9	8.8
Straw	8.9	10.2	9.3	8.4	11.1	9.6
Sulphate of Ammonia						
0.4 cwt.N per acre	10.0	10.6	7.5	9.3	9.2	9.3
0.8 cwt.N per acre	8.5	10.0	9.3	7.7	9.8	9.1
Sulphate of Ammonia applied to Barley						
None	7.3	9.4	6.5	7.9	9.8	8.2
0.3 cwt.N per acre	11.2	11.2	10.3	9.1	9.2	10.2
Mean ±0.75	9.2	10.3	8.4	8.5	9.5	9.2

N

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Be/1.10

Barley

Grain: cwt. per acre

Means

Leys and green manures before kale	None	Tares	Clover	Mustard	Rye-grass	Mean
			1945			
			±0.60			±0.27
No dung	13.4	15.4	13.2	13.6	13.2	13.8
Dung to kale	16.7	15.2	15.8	18.2	14.2	16.0
No straw	16.3	14.3	14.1	15.5	13.7	14.8
Straw to kale	13.8	16.3	14.8	16.3	13.7	15.0
Sulph.of Amm.to kale						
0.4 cwt.N per acre	16.2	15.4	14.1	15.8	13.2	14.9
0.8 cwt.N per acre	13.9	15.2	14.9	16.0	14.2	14.8
Sulph.of Amm.to Barley						
None	10.9	10.7	10.3	9.6	9.8	10.3
0.4 cwt.N per acre	19.2	19.9	18.6	22.2	17.6	19.5
Mean ±0.42	15.0	15.3	14.5	15.9	13.7	14.9
			1946			
			±0.90			±0.40
No dung	10.5	9.4	9.8	10.6	9.9	10.0
Dung to kale in 1943*	9.6	10.5	10.2	9.8	9.8	10.0
No straw	10.5	9.5	11.4	9.6	8.4	9.9
Straw to kale in 1943*	9.6	10.4	8.6	10.8	11.3	10.1
Sulph.of Amm.to kale in 1943*						
0.4 cwt.N per acre	10.3	10.4	8.4	11.6	7.8	9.7
0.8 cwt.N per acre	9.8	9.5	11.6	8.8	11.8	10.3
Sulph.of Amm.to Barley						
None	5.5	6.4	4.4	6.8	5.8	5.8
0.4 cwt.N per acre	14.6	13.5	15.7	13.6	13.8	14.2
Mean ±0.63	10.0	10.0	10.0	10.2	9.8	10.0

*The Kale crop of 1945 failed and therefore no manures were applied.

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Green Manuring Experiment Be/1.11

Barley

Grain: cwt. per acre

Means

Leys and green manures before cabbages	None	Lupins	Clover	Rape	Rye-grass	Mean
			1947			
			±0.96			±0.43
No dung	14.2	15.2	12.0	14.2	13.1	13.7
Dung to cabbages	18.3	17.8	16.2	18.0	16.6	17.4
No straw	16.5	16.1	14.0	16.1	14.8	15.5
Straw to cabbages	16.1	16.8	14.2	16.1	14.9	15.6
Sulphate of ammonia to Cabbages						
0.4 cwt.N per acre	16.2	16.0	13.4	16.3	15.9	15.6
0.8 cwt.N per acre	16.4	16.9	14.9	15.9	13.9	15.6
Sulphate of ammonia to Barley						
None	14.3	14.3	13.1	13.8	13.2	13.7
0.4 cwt.N per acre	18.3	18.6	15.1	18.5	16.6	17.4
Mean ±0.68	16.3	16.5	14.1	16.1	14.9	15.6

Barley

Straw: cwt. per acre

Means

Leys and green manures before kale:	None	Tares	Clover	Mustard	Rye-grass	Mean
			1943			
No dung	8.9	12.5	14.2	8.8	8;9	10.7
Dung to kale	15.8	14.2	17.2	17.4	15.0	15.9
No straw	11.1	14.5	17.1	11.9	11.6	13.2
Straw to kale	13.6	12.2	14.3	14.4	12.3	13.4
Sulphate of ammonia to kale						
0.4 cwt.N per acre	12.4	13.5	15.2	12.2	11.7	13.0
0.8 cwt.N per acre	12.2	13.1	16.2	14.1	12.2	13.6
Mean	12.3	13.3	15.7	13.1	12.0	13.3

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Barley

Straw: cwt. per acre

Means

Leys and green manures before kale:	None	Tares	Clover	Mustard	Rye-grass	Mean
			1944			
			±0.97			±0.43
No dung	12.3	12.8	11.0	10.6	8.4	11.0
Dung to kale	12.4	15.4	10.8	10.1	14.7	12.7
No straw	12.5	13.5	10.2	10.3	9.9	11.3
Straw to kale	12.1	14.8	11.6	10.3	13.2	12.4
Sulphate of ammonia to kale						
0.4 cwt. N per acre	12.6	15.1	10.5	11.1	11.4	12.1
0.8 cwt. N per acre	12.1	13.1	11.3	9.6	11.7	11.6
Sulphate of ammonia to barley						
None	9.8	13.2	8.3	9.7	12.2	10.6
0.3 cwt.N per acre	14.8	15.1	13.5	10.9	10.9	13.0
Mean ±0.69	12.3	14.1	10.9	10.3	11.6	11.8
			1945			
			±1.18			±0.53
No dung	15.3	16.2	14.6	14.5	13.8	14.9
Dung to kale	20.8	18.7	18.8	19.5	16.1	18.8
No straw	18.6	16.8	16.3	16.8	14.8	16.7
Straw to kale	17.5	18.1	17.1	17.2	15.1	17.9
Sulphate of ammonia to kale						
0.4 cwt.N per acre	19.0	18.6	15.9	17.3	14.1	17.0
0.8 cwt.N per acre	17.1	16.3	17.5	16.7	15.8	16.7
Sulphate of ammonia to barley						
None	13.4	12.1	12.3	10.7	11.7	12.0
0.4 cwt.N per acre	22.7	22.8	21.1	23.3	18.2	21.6
Mean ±0.84	18.0	17.4	16.7	17.0	15.0	16.8

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Green Manuring Experiment — Be/1.13

Barley

Straw: cwt. per acre

Means

Leys and green manures before kale(1)	None	Tares(2)	Clover	Mustard(3)	Rye-grass	Mean
			1946			
No dung	14.1	12.9	13.6	14.2	11.4	13.2
Dung to kale in 1943*	16.0	17.8	15.2	14.0	12.9	15.2
No straw	14.6	14.1	15.1	14.0	11.2	13.8
Straw to kale in 1943*	15.4	16.6	13.8	14.2	13.1	14.6
Sulphate of ammonia to kale 1943*						
0.4 cwt.N per acre	14.4	15.6	13.8	15.4	11.2	14.1
0.8 cwt.N per acre	15.7	15.1	15.0	12.7	13.1	14.3
Sulphate of ammonia to barley						
None	8.6	10.4	9.4	10.2	7.5	9.2
0.4 cwt.N per acre	21.4	20.3	19.4	17.9	16.8	19.2
Mean	15.0	15.3	14.4	14.1	12.2	14.2
			1947			
			±0.78			±0.35
No dung	14.4	15.6	12.4	14.8	14.4	14.3
Dung to cabbages	19.1	18.2	16.4	18.7	18.1	18.1
No straw	16.7	16.9	13.7	17.3	16.0	16.1
Straw to cabbages	16.8	16.9	15.1	16.2	16.5	16.3
Sulphate of ammonia to cabbages						
0.4 cwt.N per acre	16.6	16.3	13.7	16.3	17.0	16.0
0.8 cwt.N per acre	16.9	17.5	15.0	17.1	15.5	16.4
Sulphate of ammonia to barley						
None	14.3	15.2	13.3	14.4	15.3	14.5
0.4 cwt.N per acre	19.2	18.6	15.5	19.1	17.2	17.9
Mean ±0.55	16.8	16.9	14.4	16.7	16.2	16.2

* The kale crop of 1945 failed and therefore no manures were applied.

Note. The following changes in headings are applicable to the 1947 barley results.

1. Cabbages replaced Kale. 2. Lupins replaced Tares. 3. Rape replaced Mustard.

Standard errors per plot.

Grain: cwt. per acre				Straw: cwt. per acre	
1939	2.32 or 14.3%	1945	1.21 or 8.1%	1944	1.94 or 16.4%
1940	3.06 or 25.1%	1946	1.79 or 17.9%	1945	2.37 or 14.1%
1941	1.72 or 14.0%	1947	1.93 or 12.4%	1947	1.56 or 9.6%
1942	1.67 or 16.9%				
1943	3.51 or 34.3%				
1944	2.13 or 23.2%				

These are based on 16. d.f., 1939-1943
9 d.f., 1944-1947

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Differential Responses

Barley. Grain: cwt. per acre

Response to	Mean	Dung Abs.	Dung Pres.	Straw Abs.	Straw Pres.	Sulphate of Ammonia cwt. N per acre 0.4.	Sulphate of Ammonia cwt. N per acre 0.8	to Barley Abs.	to Barley Pres.
1939	±0.74			±1.04					
Dung	2.6	-	-	3.2	2.0	3.6	1.6		
Straw	0.6	1.2	0.0	-	-	0.5	0.7		
Sulph.of Amm.	1.0	2.0	0.0	0.9	1.1	-	-		
1940	±0.97			±1.37					
Dung	3.1	-	-	3.6	2.6	3.8	2.4		
Straw	1.1	1.6	0.6	-	-	0.6	1.6		
Sulph.of Amm.	1.6	2.3	0.9	1.1	2.1	-	-		
1941	±0.54			±0.77					
Dung	2.0	-	-	1.9	2.1	2.7	1.3		
Straw	0.0	-0.1	0.1	-	-	0.3	-0.3		
Sulph.of Amm.	2.0	2.7	1.3	2.3	1.7	-	-		
1942	±0.53			±0.75					
Dung	2.8	-	-	3.2	2.4	3.4	2.2		
Straw	1.3	1.7	0.9	-	-	1.0	1.6		
Sulph.of Amm.	0.4	0.9	-0.1	0.1	0.7	-	-		
1943	±0.98			±1.39					
Dung	3.6	-	-	5.1	2.1	4.7	2.5		
Straw	0.2	1.7	-1.3	-	-	2.2	-1.8		
Sulph.of Amm.	0.0	1.1	-1.1	2.0	-2.0	-	-		
1944	±0.67			±0.95					
Dung	0.8	-	-	2.1	-0.5	0.7	0.9	0.8	0.8
Straw	0.8	2.1	-0.5	-	-	1.5	0.0	0.7	0.8
Sulph.of Amm.	-0.3	-0.4	-0.2	0.5	-1.0	-	-	-0.6	0.0
Sulph.of Amm. to Barley	2.0	2.0	2.1	2.0	2.1	1.8	2.4	-	-
1945	±0.38			±0.54					
Dung	2.3	-	-	2.7	1.9	3.1	1.5	1.7	2.9
Straw	0.2	0.6	-0.2	-	-	0.1	0.3	0.2	0.2
Sulph.of Amm.	-0.1	0.7	-0.9	-0.2	0.0	-	-	-1.0	0.8
Sulph.of Amm. to Barley	9.2	8.6	9.8	9.2	9.2	8.3	10.1	-	-
1946	±0.57			±0.81					
Dung	-0.1	-	-	0.1	-0.2	0.5	-0.6	-0.1	0.0
Straw	0.2	0.4	0.1	-	-	-0.7	1.2	1.0	-0.5
Sulph.of Amm.	0.6	1.2	0.1	-0.3	1.5	-	-	1.7	-0.5
Sulph.of Amm. to Barley	8.5	8.4	8.6	9.2	7.8	9.6	7.4	-	-
1947	±0.61			±0.87					
Dung	3.6	-	-	3.9	3.3	5.0	2.2	2.5	4.7
Straw	0.1	0.4	-0.2	-	-	0.3	-0.1	-1.5	1.7
Sulph.of Amm.	0.0	1.4	-1.4	0.2	-0.2	-	-	0.4	-0.4
Sulph.of Amm. to Barley	3.7	2.6	4.8	2.1	5.3	4.1	3.3	-	-

All treatments were applied to the previous Kale (or Cabbage) unless otherwise stated.

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Differential Responses

Barley. Straw: cwt. per acre

Response to	Mean	Dung Abs.	Dung Pres.	Straw Abs.	Straw Pres.	Sulphate of Ammonia cwt. N per acre 0.4	0.8	Sulphate of Ammonia to Barley Abs.	Pres.
1943									
Dung	5.2	-	-	7.2	3.2	5.6	4.8		
Straw	0.1	2.1	-1.9	-	-	1.7	-1.5		
Sulph. of Amm.	0.6	1.0	0.2	2.2	-1.0	—	-		
1944	±0.61			±0.87					
Dung	1.6	-	-	3.3	-0.1	1.5	1.8	0.8	2.4
Straw	1.1	2.8	-0.6	-	-	2.2	0.0	1.1	1.2
Sulph.of Amm.	-0.6	-0.8	-0.4	0.5	-1.7	-	-	-1.3	0.1
Sulph.of Amm.to Barley	2.4	1.6	3.2	2.4	2.4	1.7	3.1	-	-
1945	±0.75			±1.07					
Dung	3.9	-	-	4.7	3.1	5.1	2.7	3.8	4.0
Straw	0.3	1.1	-0.5	-	-	0.2	0.4	-0.5	1.1
Sulph.of Amm.	-0.3	0.9	-1.5	-0.4	-0.2	-	-	-1.3	0.7
Sulph.of Amm.to Barley	9.6	9.5	9.7	8.8	10.4	8.6	10.6	-	-
1946	±								
Dung	2.0	-	-	2.1	1.8	2.6	1.3	1.3	2.6
Straw	0.8	1.0	0.7	-	-	0.5	1.1	1.7	0.0
Sulph.of Amm.	0.2	0.9	-0.4	-0.1	0.5	-	-	1.1	-0.7
Sulph.of Amm.to Barley	9.9	9.3	10.6	10.8	9.1	10.8	9.1	-	-
1947	±0.49			±0.71					
Dung	3.8	-	-	3.0	4.6	4.9	2.7	3.1	4.5
Straw	0.2	-0.6	1.0	-	-	0.0	0.4	-0.7	1.1
Sulph.of Amm.	0.4	1.5	-0.7	0.2	0.6	-	-	2.0	-1.2
Sulph.of Amm.to Barley	3.4	2.7	4.1	2.5	4.3	5.0	1.8	-	-

All treatments were applied to the previous Kale (or Cabbage) unless otherwise stated.

N

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

No replica within years

3 yrs on each series: from each plot take mean

lin Regr

Rem = within-plot errors

Treatment totals x Series → between plot errs

But also replica within years for first 5 years

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