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Report for 1935

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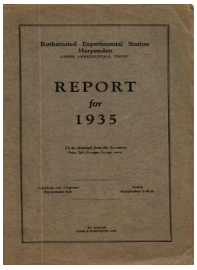

Other Experiments at Woburn

Rothamsted Research

Rothamsted Research (1936) *Other Experiments at Woburn ;* Report For 1935, pp 194 - 202 **- DOI: https://doi.org/10.23637/ERADOC-1-67**

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WHEAT

WOBURN

Effect of sulphate of ammonia applied at five different times

WW—Butt Close, 1935

Yield in lb., grain above, straw below

1	**5** 29.8 39.5	**2** 26.9 57.5	**3** 19.5 58.3	**1** 26.7 51.6	**0** 22.2 29.7	**4** 24.6 48.0	6
	0 30.8 29.8	**4** 34.7 46.2	**5** 33.5 36.5	**3** 27.8 57.9	**1** 32.6 53.7	**2** 32.1 45.8	
W ↑	**2** 37.0 51.0	**1** 34.2 47.0	**4** 39.6 48.1	**5** 39.0 45.8	**3** 33.3 58.0	**0** 26.2 33.1	
	1 34.0 49.4	**5** 37.5 42.3	**0** 27.0 33.6	**2** 39.2 59.4	**4** 39.6 53.4	**3** 28.5 45.9	
	4 39.6 50.3	**3** 35.5 52.3	**2** 42.8 50.2	**0** 34.2 45.0	**5** 43.7 48.9	**1** 37.0 50.0	
	3 37.0 50.8	**0** 29.9 38.0	**1** 38.5 55.0	**4** 41.4 55.3	**2** 39.6 63.3	**5** 36.1 39.5	36
31							

SYSTEM OF REPLICATION : 6×6 Latin square.
AREA OF EACH PLOT : 1/100 acre (40 lks. × 25 lks.).
TREATMENTS : No sulphate of ammonia (**0**) and sulphate of ammonia at the rate of 0.4 cwt. N per acre, applied on Dec. 7 (**1**), Jan. 31 (**2**), Mar. 28 (**3**), May 9 (**4**) and June 6 (**5**).
CULTIVATIONS, ETC. : Ploughed : Oct. 31. Harrowed : Nov. 3, 7 and 8. Drilled : Nov. 8. Harvested : Aug. 2. Plots harvested by weighing total produce and sampling for grain-straw ratio. Variety : Victor. Previous crop : Potatoes.
STANDARD ERRORS PER PLOT : Grain : 1.59 cwt. per acre or 5.31% ; straw : 3.27 cwt. per acre or 7.66%.

Summary of results, cwt. per acre

	Dates of application of sulphate of ammonia (0.4 cwt. N per acre)						*Mean of all N*	*St. error*
	No N	Dec. 7	Jan. 31	Mar. 28	May 9	June 6		
GRAIN (±0.649)	25.3	30.2	32.4	27.0	32.7	32.7	*31.0*	*±0.290*
Incr. *(±0.918)*		*+4.9*	*+7.1*	*+1.7*	*+7.4*	*+7.4*	*+5.7*	*±0.711*
STRAW ±1.34	31.1	45.6	48.7	48.1	44.8	37.6	*45.0*	*±0.597*
Incr. *(±1.89)*		*+14.5*	*+17.6*	*+17.0*	*+13.7*	*+6.5*	*+13.9*	*±1.46*

Conclusions

There was a significant average response to sulphate of ammonia of 5.7 cwt. of grain and 13.9 cwt. of straw per acre. There were also significant differences in yield due to time of application, the grain yields varying irregularly while the straw yields increased to a maximum and then decreased, the parabolic regression of yield on time of application being significant for straw.

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SUGAR BEET

WOBURN

Effect of sowing date, spacing of rows and of sulphate of ammonia.

WS—BUTT CLOSE, 1935

Plan and yields in lb.

			Roots (dirty)	Tops	Sugar per cent.	Plant number
54	3	S_{15} N_2	887	852	15.95	854
	2	S_{15} N_1	902	735	16.39	896
	2	S_{10} —	1,021	724	16.13	1,642
	3	S_{20} —	592	492	15.64	610
	2	S_{20} N_2	757	778	14.80	600
	1	S_{15} —	861	846	14.14	846
	3	S_{10} N_1	957	1,094	15.64	1,353
	1	S_{20} N_1	810	742	15.20	555
	1	S_{10} N_2	1,023	1,105	14.89	1,524
	1	S_{15} N_1	907	859	15.61	867
	1	S_{10} —	921	878	15.94	1,438
	3	S_{10} N_2	964	905	15.84	1,481
	2	S_{10} N_1	1,061	1,011	15.40	1,539
	2	S_{15} N_2	966	1,018	15.03	773
	3	S_{20} N_1	750	639	16.53	537
	3	S_{15} —	815	660	16.42	880
	2	S_{20} —	721	543	16.56	591
	1	S_{20} N_2	833	676	16.24	546
	1	S_{15} N_2	868	715	15.55	861
	3	S_{15} N_1	671	554	16.44	802
	2	S_{10} N_2	849	766	15.61	1,462
	2	S_{20} N_1	559	461	15.98	518
	3	S_{10} —	722	533	16.59	1,380
	1	S_{10} N_1	837	485	16.30	1,330
	2	S_{15} —	669	497	15.61	872
	3	S_{20} N_2	555	513	15.46	504
28	1	S_{20} —	558	398	15.81	547

W ↑

			Roots (dirty)	Tops	Sugar per cent.	Plant number
	3	S_{20} —	473	357	16.96	537
	2	S_{10} —	692	479	16.76	1,546
	1	S_{10} N_1	742	495	16.36	1,500
	3	S_{15} N_1	635	460	15.98	727
	3	S_{10} N_2	653	504	16.04	1,294
	2	S_{20} N_1	545	385	15.58	574
	1	S_{15} —	596	437	16.27	802
	2	S_{15} N_2	643	512	14.97	783
	1	S_{20} N_2	511	440	15.81	488
	1	S_{10} N_2	693	528	15.92	1,285
	2	S_{20} N_2	518	476	15.20	531
	1	S_{20} —	445	328	15.30	558
	2	S_{15} —	612	384	16.59	876
	1	S_{15} N_1	704	489	15.88	753
	3	S_{15} N_2	760	547	16.47	764
	3	S_{20} N_1	641	398	16.56	511
	3	S_{10} —	764	433	16.65	1,406
	2	S_{10} N_1	956	609	15.64	1,498
	2	S_{20} —	609	409	15.98	552
	3	S_{20} N_2	580	480	16.50	503
	1	S_{10} —	781	429	16.53	1,386
	2	S_{10} N_2	837	617	16.53	1,350
	1	S_{20} N_1	567	393	15.84	483
	2	S_{15} N_1	642	465	15.75	729
	1	S_{15} N_2	661	580	15.61	639
	3	S_{15} —	598	436	16.70	740
	3	S_{10} N_1	571	504	15.58	1,249
27						1

SYSTEM OF REPLICATION: 6 randomised blocks of 9 plots each. Certain second order interactions are partially confounded with block differences.

AREA OF EACH PLOT (after rejecting edge-rows): 10 inch spacing: 0.02381 acre; 15 inch spacing: 0.02143 acre; 20 inch spacing: 0.01905 acre. Plots actually: 15.2 links × 188 links rows.

TREATMENTS: All combinations of:

Sowing dates		Spacing		Sulph. Amm.
April 18 (1)	×	10 inch (S_{10})	×	None (—)
May 9 (2)		15 inch (S_{15})		(0.3 cwt. N) (N_1)
May 25 (3)		20 inch (S_{20})		(0.6 cwt. N) (N_2)

Sulphate of ammonia to be applied at time of sowing (see special note).

BASAL MANURING: Superphosphate at the rate of 0.5 cwt. P_2O_5 per acre. 30% potash manure salt at the rate of 1.0 cwt. K_2O per acre. (Applied before winter ploughing.)

CULTIVATIONS, ETC.: Basal manures applied: January 4-11. Ploughed: January 4-11. Tractor-cultivated and harrowed: March 8-11. Harrowed and rolled first sowing: April 18. Harrowed and rolled second sowing: May 9. Cut out thistles first and second sowings: May 19-20. Spring-tine harrowed: May 25. Hand-hoed 10.-in. rows on first sowing: May 29. Horse-hoed 15 and 20-in. rows on first and second sowing: May 30. Singled first sowing: June 5-11. Hoed 10-in. rows on second sowing: June 9-12. Singled second sowing: June 11-14. Horse and hand-hoed: June 19-20. Singled third sowing: June 24-26. Hand-hoed: July 8-22. Lifted: November 7-16. Variety: Kleinwanzleben E. Previous crop: Potatoes.

SPECIAL NOTE: The first sowing was originally made on March 14, but this failed and was replaced by the sowing on May 25. The sulphate of ammonia for this sowing was applied on March 14.

STANDARD ERRORS PER PLOT: Roots (washed): 1.06 tons per acre or 8.37%. Tops: 1.78 tons per acre or 14.2%. Sugar percentage: 0.459. Plant number: 2.63 thousands per acre, or 6.05%. Mean dirt tare: 0.1714.

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Yields of Separate Treatments (block effects eliminated)
ROOTS (washed), tons per acre

Sowing Date	Sulph. amm. per acre None			Sulph. amm. per acre. 0.3 cwt. N.			Sulph. amm. per acre. 0.6 cwt. N.		
	Spacing (inches)			Spacing (inches)			Spacing (inches)		
	10	15	20	10	15	20	10	15	20
April 18	13.18	12.28	10.81	13.97	13.35	13.39	13.07	15.05	13.24
May 9	12.11	11.91	11.93	14.85	12.89	12.18	14.52	13.40	12.14
May 25	11.71	11.92	9.52	11.04	12.28	12.30	11.20	13.78	12.34

Main effects : Interaction of sulphate of ammonia with spacing and sowing dates

	Spacing (inches)			Sowing date			*Mean*	*Increase*
	10	15	20	April 18	May 9	May 25		
ROOTS (washed) : tons per acre (±0.433. *Means:* ±*0.250. Increases:* ±*0.354.*)								
0.0 cwt. N ..	12.33	12.04	10.75	12.09	11.98	11.05	*11.71*	
0.3 cwt. N ..	13.29	12.84	12.62	13.57	13.31	11.87	*12.92*	*+1.21*
0.6 cwt. N ..	12.93	14.08	12.57	13.79	13.35	12.44	*13.19*	*+0.27*
Mean	*12.85*	*12.99*	*11.98*	*13.15*	*12.88*	*11.79*	*12.61*	
Increase ..		*+0.14*	*−0.87*		*−0.27*	*−1.36*		
TOPS : tons per acre (±0.727. *Means:* ±0.420. *Increases:* ±0.594.)								
0.0 cwt. N ..	10.86	11.32	9.87	11.37	10.54	10.14	*10.69*	
0.3 cwt. N ..	13.12	12.37	11.79	12.18	12.53	12.56	*12.42*	*+1.73*
0.6 cwt. N ..	13.83	14.67	13.14	13.96	14.53	13.14	*13.88*	*+1.46*
Mean ..	*12.60*	*12.79*	*11.60*	*12.50*	*12.53*	*11.95*	*12.33*	
Increase ..		*+0.19*	*−1.00*		*+0.03*	*−0.55*		
SUGAR PERCENTAGE (±0.187. *Means:* ±0.108. *Increases:* ±0.153.)								
0.0 cwt. N ..	16.43	15.96	16,04	15.67	16.27	16.49	*16.14*	
0.3 cwt. N ..	15.82	16.00	15.95	15.86	15.79	16.12	*15.92*	*−0.22*
0.6 cwt. N ..	15.80	15.60	15.67	15.67	15.36	16.04	*15.69*	*−0.23*
Mean	*16.02*	*15.85*	*15.89*	*15.73*	*15.81*	*16.22*	*15.92*	
Increase ..		*−0.17*	*−0.13*		*+0.08*	*+0.49*		
TOTAL SUGAR : cwt. per acre (±1.49. *Means* : ±*0.860. Increases* : ±*1.22*)								
0.0 cwt. N ..	40.4	38.1	34.6	38.1	38.8	36.5	*37.8*	
0.3 cwt. N ..	42.0	41.1	40.2	42.8	42.2	38.1	*41.0*	*+3.2*
0.6 cwt. N ..	40.7	43.9	39.4	42.9	40.9	40.0	*41.3*	*+0.3*
Mean	*41.1*	*41.0*	*38.0*	*41.3*	*40.7*	*38.2*	*40.0*	
Increase ..		*−0.1*	*−3.1*		*−0.6*	*−3.1*		
PLANT NUMBER : thousands per acre (±1.07. *Means:* ±0.618. *Increases:* ±0.874).								
0.0 cwt. N ..	61.6	39.0	29.7	42.2	45.9	42.1	*43.4*	
0.3 cwt. N ..	59.3	37.1	27.8	41.5	43.5	39.3	*41.4*	*−2.0*
0.6 cwt. N ..	58.8	36.4	27.8	40.4	41.7	40.8	*41.0*	*−0.4*
Mean	*59.9*	*37.5*	*28.4*	*41.4*	*43.7*	*40.7*	*41.9*	
Increase ..		*−22.4*	*−31.5*		*+2.3*	*−0.7*		

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Interaction of spacing and sowing dates

Sowing date	Spacing (inches) 10	15	20	Spacing (inches) 10	15	20
	ROOTS (washed) : tons per acre (±0.433)			TOPS : tons per acre (±0.727)		
April 18	13.41	13.56	12.48	12.25	13.63	11.63
May 9	13.83	12.73	12.08	13.14	12.54	11.92
May 25	11.32	12.66	11.39	12.42	12.18	11.25
	SUGAR PERCENTAGE (±0.187)			TOTAL SUGAR : cwt. per acre (±1.49)		
April 18	15.99	15.51	15.70	42.7	41.8	39.2
May 9	16.01	15.72	15.68	44.1	40.0	37.9
May 25	16.06	16.33	16.28	36.3	41.3	37.0

Sowing date	Spacing (inches) 10	15	20
	PLANT NUMBER : thousands per acre (±1.07)		
April 18	59.2	37.1	27.8
May 9	63.2	38.3	29.4
May 25	57.1	37.1	28.0

Conclusions

The 10 and 15 inch spacings gave significantly higher yields of roots and tops than the 20 inch spacing, and did not differ significantly. Spacing had no appreciable effect on the sugar percentage.

The first two sowings, April 18 and May 9, gave significantly higher yields of roots and a significantly lower sugar percentage than the third sowing, May 25, the net result being increases in total sugar over the third sowing of 3.1 and 2.5 cwt. per acre respectively. The differences in yield and sugar percentage between the first two sowing dates were small. The results for tops were quantitatively similar to those for roots, but the decrease in yield at the third sowing was not in this case significant.

Sulphate of ammonia gave significant increases in roots and tops, and also significantly decreased the sugar percentage. The increase in total sugar to the double dressing was 3.5 cwt. per acre.

Sulphate of ammonia significantly decreased plant number, and the second sowing, May 9, gave a significantly higher plant number than the first or the third, the last two not being significantly different.

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KALE

WOBURN

The residual effects of Lupins as green-manure

WK—LANSOME, 1935

Plan and yields in lb. (green weights)

1	R 91	PT 160	P 116	O 67	4
NW ↑	P 89	O 89	PT 126	R 70	
	O 68	P 105	R 90	PT 114	
13	PT 138	R 93	O 126	P 132	16

SYSTEM OF REPLICATION: 4 × 4 Latin square.
AREA OF EACH PLOT (after rejecting edge-rows): 0.00973 acre. Plots actually 0.0107 acre.
TREATMENTS: Lupins were grown over the whole area in 1934.
O = Whole plant removed.
R = Tops removed, roots only buried.
P = Whole plants buried.
PT = Whole plants and additional tops from plots receiving treatment (R) buried.
These treatments were applied to kale sown in 1934. Kale was grown again in 1935 without further treatment.
CULTIVATIONS, ETC.: Kale sown: Rows 18½ inches apart: May 13. Thinned: June 24-26. Plants 5 inches apart in the rows. Hoed: Oct. 15, 17 and 19. Harvested: Mar. 13. Variety: Thousand head. Previous crop: Kale.
STANDARD ERROR PER PLOT: 0.693 tons per acre or 14.4%.

Treatment	Nitrogen added per acre (lb.), 1934	
	As Tops	As Roots
O	—	—
R	—	11.31
P	122.34	11.31
PT	244.77	11.31

Summary of results

Lupins dug in	Yield tons per acre	*Increase over no dressing*
Mean ..	*4.80*	
None	4.01	
Roots only ..	3.94	*—0.07*
Whole plant	5.07	*+1.06*
Whole plant and extra tops	6.17	*+2.16*
St. Errors ..	±0.346	*±0.489*

Conclusions

The crop of kale was an exceedingly poor one, but showed residual effects of the tops dug in in 1934, the yield of kale being increased by 1.1 tons per acre with single tops and 2.2 tons per acre with double tops. Roots had no apparent effect.

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CARROTS.

WOBURN

Effect of sulphate of ammonia, poultry manure, soot and rape dust

WN—LANSOME, 1935

Plan and yields in lb. roots (washed) above, tops centre, plant number below.

1	S_1 88 51 593	N_2 104 55 627	R_1 117 51 652	N_1 127 50 684	S_0 134 36 687	R_1 121 41 664	R_0 145 48 704	S_2 128 47 607	8
	R_0 115 50 660	N_0 128 51 676	M_0 134 49 670	S_0 121 44 697	N_0 147 43 700	M_2 151 44 674	S_1 141 48 675	M_1 132 44 709	
NW ↑	S_2 119 60 650	M_2 134 56 661	R_2 128 61 676	M_1 125 52 665	N_2 138 62 638	R_2 150 50 641	N_1 139 51 681	M_0 131 29 694	
	S_1 128 56 658	M_0 153 70 691	M_2 124 60 681	M_1 141 54 659	N_2 143 61 651	M_1 134 39 669	R_0 137 34 700	S_0 136 29 703	
	R_0 120 45 649	N_2 115 61 627	N_0 127 48 658	S_0 134 55 685	N_0 133 42 667	S_2 116 37 612	M_2 122 33 674	R_2 138 43 671	
41	N_1 100 43 626	R_2 102 65 633	S_2 102 65 656	R_1 108 51 636	S_1 109 42 632	M_0 96 27 677	N_1 108 35 679	R_1 108 34 633	48

SYSTEM OF REPLICATION : 4 randomised blocks of 12 plots each.

AREA OF EACH PLOT : 1/160 acre (25 lks. × 25 lks.)

TREATMENTS : 1935—No nitrogen (O), and sulphate of ammonia (N) half applied in seed-bed and the remainder as a top dressing, soot (S), poultry manure (M) and rape dust (R) applied at the rate of 0.4 cwt. N per acre (1) or 0.8 cwt. N per acre (2). Plots receiving treatment 0 in 1935 had treatment 2 in 1934 and *vice versa*. Plots receiving treatment 1 had this in both years. For N_0, S_0, M_0 and R_0 (see plan), the treatment symbols refer to the 1934 treatment.

BASAL MANURING : All plots were made up to 1.0 cwt. P_2O_5 per acre and 1.0 cwt. K_2O per acre, using superphosphate and muriate of potash (an allowance being made for the P_2O_5 and K_2O contained in the organic manures.)

CULTIVATIONS : Ploughed : Jan. 5-7. Double harrowed : Mar. 21. Harrowed April 24-25. Rolled : April 25. Seed sown : May 1-2. Manures applied : (sulphate of ammonia at half-rate) : May 1. Thinned : June 18-24. Rows 11 ins. apart. Plants 5 ins. apart in the row. Second half of sulphate of ammonia applied : June 26. Hoed : June 12 and July 12-16. Lifted : October 30. Variety : Garton's Intermediate. Previous crop : Carrots.

STANDARD ERRORS PER PLOT : Roots (washed) : 0.971 tons per acre or 10.8%. Tops : 0.460 tons per acre or 13.4%. Plant number : 3.29 thousands per acre or 3.11%. Mean dirt tare : 0.0651.

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Summary of Results

Quantity (cwt. N. p.a.) 1934	1935	Sulph. Amm.	Soot	Poultry Manure	Rape Dust	*Mean*
		ROOTS (washed): tons per acre (±0.486)				
0.8	0.0	9.55	9.37	9.18	9.23	*9.33*[1]
0.4	0.4	8.46	8.32	9.50	8.11	*8.60*[1]
0.0	0.8	8.93	8.30	9.48	9.25	*8.99*[1]
Mean		*8.98*[2]	*8.66*[2]	*9.39*[2]	*8.86*[2]	*8.97*
		TOPS: tons per acre (±0.230)				
0.8	0.0	3.28	2.93	3.12	3.16	*3.12*[3]
0.4	0.4	3.20	3.52	3.37	3.16	*3.31*[3]
0.0	0.8	4.27	3.73	3.45	3.91	*3.84*[3]
Mean		*3.58*[4]	*3.39*[4]	*3.31*[4]	*3.41*[4]	*3.42*
		PLANT NUMBER: thousands per acre (±1.64)				
0.8	0.0	108.0	110.9	109.3	108.5	*109.2*[5]
0.4	0.4	106.8	102.3	108.1	103.4	*105.2*[5]
0.0	0.8	101.7	101.0	107.6	104.8	*103.8*[5]
Mean		*105.5*[6]	*104.7*[6]	*108.3*[6]	*105.6*[6]	*106.1*

Standard errors: (1) ±0.243, (2) ±0.281, (3) ±0.115, (4) ±0.133, (5) ±0.820, (6) ±0.947.

Conclusions

The experiment is designed to measure the differences in the immediate and cumulative effects of certain organic fertilisers and sulphate of ammonia. The results this year show no significant effect of any kind on the yield of roots. Tops, however, show a significant response to nitrogen applied this year, but no traces of any residual effect. The differences in present response cannot be regarded as fully significant. Plant number is significantly depressed by the present application of all forms of nitrogen, with the exception of poultry manure, this depression being closely associated with the apparent response of tops.

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PYRETHRUM

WOBURN

The effect of lime, fish manure, and artificial fertilisers on the yield of flowers, and their content of Pyrethrins.

ROADPIECE—1935

Plan and yields in grammes

Dry stalkless heads

1	LOA1 1945	LFO2 1614	OFO2 1462	LOO1 1331	OOA1 1553	LOO1 2055	OOA2 1647	OOO2 1727	8
NW ↑	LFO1 1682	OOA2 1796	OOA1 1809	OFA2 2304	OFO1 2285	LOA2 2113	LOA1 2648	LFA1 2226	
	LFA2 2150	OFO1 2634	LFA1 2472	LOA2 2218	LFO1 2215	LOO2 2181	LFO2 2439	OFA2 1991	
25	OOO1 1622	LOO2 1987	OOO2 1958	OFA1 1921	OFA1 1926	LFA2 1994	OOO1 2209	OFO2 1741	32

SYSTEM OF REPLICATION : 2 randomised blocks of 16 plots each.

AREA OF EACH PLOT (after rejecting edge rows) : 0.00560 acre. Plots actually 29.6 links × 22.7 links.

TREATMENTS : All combinations of :

{No lime (O), Lime (L)} × {No fish manure (O), Fish manure (F)} × {No complete artificials (O), Complete artificials (A)} × {Manures applied in 1st year only 1933 (1), Manures applied every year (2)}

Lime was applied in the first year only.

RATES OF APPLICATION : Lime, 2.88 tons of ground lime, equivalent to 4 tons $CaCO_3$.

Fish Manure : Where applied in first year only, 5 cwt. per acre (0.4 cwt. N) ; where applied every year half this dressing is given per annum.

Artificials : Where applied in first year only, sulphate of ammonia (0.4 cwt. N), superphosphate (0.4 cwt. P_2O_5) and muriate of potash (0.5 cwt. K_2O) ; where applied every year half those rates are given per annum.

CULTIVATIONS, ETC. Weeded : Oct. 18. Hoed : Dec. 17. Manures applied : Mar. 12. Harvested : July 8. Previous crop : Pyrethrum.

SPECIAL NOTE : Owing to mildewing consequent upon heavy rain during harvesting there was a serious degeneration in quality during drying. The pyrethrin contents were not determined.

STANDARD ERROR PER PLOT : 1.04 cwt. per acre or 14.8 %.

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Summary of Results

Yields of separate treatments : dry stalkless heads, cwt. per acre

	Manures applied	Neither	Artificials	Fish manure	Artificials & fish manure	*Mean*
No lime ..	First year	6.61[2]	5.91[1]	8.65[1]	6.77[1]	*7.11*[3]
	All years		6.05[1]	5.63[1]	7.55[1]	*6.41*[3]
	Mean	*6.61*[2]	*5.98*[2]	*7.14*[2]	*7.16*[2]	*6.76*[4]
Lime	First year	6.64[2]	8.08[1]	6.85[1]	8.26[1]	*7.73*[3]
	All years		7.62[1]	7.13[1]	7.29[1]	*7.35*[3]
	Mean	*6.64*[2]	*7.85*[2]	*6.99*[2]	*7.78*[2]	*7.54*[4]

Standard errors : (1) ±0.736, (2) ±0.520, (3) ±0.424, (4) ±0.300.

Effects of artificials and fish manure : cwt. per acre

Manures applied	Neither	Artificials	Fish manure	Artificials and fish manure	*Mean*	*Increase*
First year ..	6.62	7.00	7.75	7.51	*7.42*	
All years ..		6.84	6.38	7.42	*6.88*	*−0.54*
Standard errors	±0.368		±0.520		*±0.300*	*±0.424*

Conclusions

No significant effects.

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