

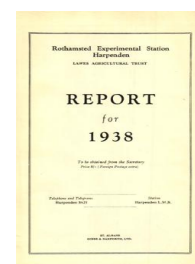
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Sugar Beet

Rothamsted Research

Rothamsted Research (1939) *Sugar Beet* ; Rothamsted Report For 1938, pp 36 - 38 - DOI:
<https://doi.org/10.23637/ERADOC-1-86>

TABLE XIV
Time of Spring Sowing

Grade			February	March 1st-14th	March 15th-28th	After March 28th
II, III	..	..	11	6	—	—
IV	..	..	3	7	2	—
V	..	..	24	22	5	—
VI	..	..	33	37	22	4
Total 1938	..	..	71	72	29	4
Per cent. 1938	..	..	40.3	40.9	16.5	2.3
Per cent. 1937	..	..	3.2	7.5	16.0	73.2

The manuring of the samples was generally similar to that reported in previous years.

TABLE XV
Manuring

Grade			No Manure	Artificial only	Organic manures	Organic and Artificial
II, III	..	..	1	12	2	6
IV	..	..	2	5	4	5
V	..	..	8	20	10	19
VI	..	..	12	48	22	24
Total	..	..	23	85	38	54
Per cent. 1938	..	..	11.5	42.5	19.0	27.0
Per cent. 1937	..	..	8.0	52.0	23.0	17.0

The newer concentrated compound fertilizers had been used for about one third of the 139 samples grown with artificial fertilizers.

For the remaining samples some nitrogen was almost always included in the dressing even when the barley followed sheep or ploughed-in tops: the average dressing was 20 lb. nitrogen per acre, slightly less than the equivalent of 1 cwt. sulphate of ammonia per acre.

In 1938 out of some 240 samples, only 27 cases of lodging were reported, nearly all of them very slight. This was practically the same as last year and only about half of that reported in 1936.

SUGAR BEET

This season 1938 was one of the most unfortunate for beet growers since 1927. Although the year started well with a dry spring and excellent conditions for working the land, the dry weather lasted too long, with the result that germination was irregular and much beet was sown too late. In the Eastern Counties severe summer drought followed with bad attacks of aphids, and really good growing conditions did not set in till late August, when the plant failed to make much use of them.

The effects of manures in this dry and unfavourable season are compared below with their average performance over the previous four years. The main fertilizer effects averaged over all soils are given in Table XVI.

TABLE XVI

Year	No. of experiments	Mean yield per acre of		Increase for					
		Roots tons	Sugar cwt.	Sulphate of ammonia		Super-phosphate		Muriate of potash	
				2 cwt.	4 cwt.	3 cwt.	6 cwt.	1½ cwt.	2½ cwt.
1934-37	94	11.25	39.2	+3.2	+4.6	+1.0	+1.6	+1.2	+1.5
1938	32	8.28	26.7	+1.9	+1.9	+0.9	+1.1	+1.4	+2.9

The yield of roots on the experimental plots in 1938 was nearly three tons below the average of the past four years; expressed in terms of sugar the difference was 12.5 cwt. Sulphate of ammonia gave much less than its average effect, and on the average the double dose was no more effective than the single application. 2 cwt. of sulphate of ammonia gave 1.3 cwt. sugar less than usual, and 4 cwt. gave 2.7 cwt. less. Superphosphate also was somewhat less effective than usual, but potash was distinctly more effective, the increase of 1.4 cwt. sugar for the single dose of potash and 2.9 cwt. for the double dose was as good as in 1937, which however was a good year for sugar beet. Unlike the other nutrients potash showed no falling off in effectiveness at the higher dressing.

As in previous years nitrogenous and potassic fertilizers each did considerably better in combination with the other than when used alone.

Sugar cwt. per acre			
Increase produced by 4 cwt. of sulphate of ammonia			
	No potash present	2½ cwt. muriate of potash present	
1934-37 ..	+3.8	+5.7	
1938 ..	+0.9	+2.0	

The increases are smaller than in previous years, but the effects are in the usual direction. In Table XVII the yield effects are summarised by soil groups.

TABLE XVII

Increase in Sugar, cwt. per acre								
			Coarse Sands	Fine Sands	Light Loams	Heavy Loams	Clay Loams	Fens
Sulphate of Ammonia								
1934-37	2 cwt. ..	..	+3.6	+3.3	+2.6	+2.9	+3.9	-0.2
	4 cwt. ..	..	+5.5	+3.1	+4.0	+5.0	+6.8	-0.7
1938	2 cwt. ..	..	+3.0	+2.2	+1.0	+1.5	+2.2	-1.3
	4 cwt. ..	..	+2.9	+2.8	+1.5	+2.6	+0.5	-2.2
Superphosphate								
1934-37	3 cwt. ..	..	+0.6	-0.1	+1.4	+0.6	+1.2	+1.4
	6 cwt. ..	..	+1.0	+1.1	+2.1	+1.4	+2.0	+0.6
1938	3 cwt. ..	..	+0.9	+1.2	+0.4	+4.8	-0.4	+1.1
	6 cwt. ..	..	+0.3	+2.0	+0.8	+6.2	+0.5	+0.9
Muriate of potash								
1934-37	1½ cwt. ..	..	+1.8	+2.0	+0.8	+1.6	+0.2	+1.2
	2½ cwt. ..	..	+1.7	+2.0	+1.4	+0.4	+0.2	+2.2
1938	1½ cwt. ..	..	+2.6	+0.4	+0.6	+0.6	+1.8	+1.6
	2½ cwt. ..	..	+3.8	+1.8	+2.0	+0.9	+4.3	+3.6

Nitrogen was less effective than usual in all soil groups, indeed in the fens its effect was if anything depressing. Superphosphate did better than usual on the fine sands and heavy loam, but the

latter value was based on only one centre in 1938. The marked effect of muriate of potash appeared in this season in three soil groups, coarse sands, fens, and clay loams, although the good results in the last group were largely due to one particularly responsive centre on a gravelly clay. The weights of tops are given in Table XVIII.

TABLE XVIII

Year	<i>Tops, tons per acre</i>		Increase for sulphate of ammonia	2 cwt.	4 cwt.
	No. of experiments	Mean Yield			
1934-37	73	9.2	+1.4	+3.0	
1938	28	9.6	+1.5	+2.8	

Although the yield of roots was low in 1938 the average production of tops was normal. Nitrogen had the biggest effect on tops, the yields and increases being close to the four year average: the increase produced by the double dressing was as usual almost twice that produced by the single dressing.

The sugar content of the roots was little affected by phosphate, somewhat lowered by nitrogen and slightly increased by potash, as in previous years (Table XIX).

TABLE XIX
Sugar in roots, per cent.

Year	Mean	Increase (+) or decrease (-) for			
		Sulphate of ammonia		Muriate of potash	
		2 cwt.	4 cwt.	1½ cwt.	2½ cwt.
1934-37	17.4	-0.15	-0.38	+0.15	+0.22
1938	16.2	-0.1	-0.4	+0.2	+0.3

The sugar percentage in 1938 was exceptionally low, no less than 1.2 per cent. below the average of the past four years.

The poor seed bed conditions were reflected in a plant number somewhat lower than usual, on the clay loams the population was only 18.8 thousands. Fertilizers had but little effect except that potash significantly increased plant number at four of the thirty-two centres.

TABLE XX
Plants. Thousands per acre

Year	Mean	Increase (+) or decrease (-) due to :-					
		Sulphate of Ammonia		Superphosphate		Muriate of Potash	
		2 cwt.	4 cwt.	3 cwt.	6 cwt.	1½ cwt.	2½ cwt.
1934-37 ..	27.8	+0.28	+0.25	+0.28	+0.25	+0.22	+0.32
1938 ..	26.1	0.0	-0.2	+0.2	+0.1	+0.2	+0.4

ORGANIC MANURES

The importance of maintaining the supply of organic matter in the soil is well recognised, but nothing is gained by the exaggerated claims sometimes put forward on the subject.

The standard organic manure, and the one which would suffice for all needs if it were available in sufficient quantity, is farmyard manure. Unfortunately the shrinking acreage of straw crops, and