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Report for 1935

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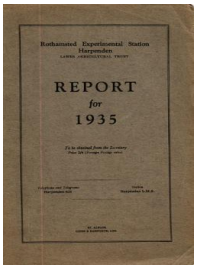

Effectiveness of Fertilisers

Rothamsted Research

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EFFECTIVENESS OF FERTILISERS

Our experiments show certain consistent differences between the three main groups of fertilisers. Nitrogenous fertilisers nearly always increase plant growth, though in many cases they produce their full effect only when potash and phosphates are also supplied. It is not usually possible to say beforehand whether these will be necessary or not ; soil analysis reveals the extreme cases of poverty but often fails to show the requirements on ordinary good farms. The effectiveness of potash and phosphate depends much more on soil and season than does that of nitrogen ; in 1935 some of the responses to potash were very marked, while others were not :

Comparison of Potash Response of Different Crops in 1935

				Mean Yield	Increase per 1.0 cwt. K_2O	% Increase
Six course rotation	Sugar beet.	Roots.	Tons	8.56	−0.24	−2.8
		Tops	,,	9.05	−1.55	−1.7
	Barley	Grain.	Cwt.	37.1	0.7	1.9
		Straw	,,	45.2	1.2	2.6
	Wheat	Grain	,,	25.3	3.2	12.6
		Straw	,,	42.0	6.2	14.8
	Potatoes		Tons	6.75	1.08	16.0
	Beans		Cwt.	21.0	2.7	12.9

Superphosphate was less effective than potash in 1935. Many experiments show that potash or phosphate can in certain seasons be omitted from the fertiliser without loss of crop, the necessary food being taken from the soil. But this process cannot be continued indefinitely ; if phosphate or potash starvation sets in it seriously reduces yields of important and expensive crops like potatoes. There may be times when the stored up fertility of the soil can be drawn upon and converted into cash, but as a regular procedure this may soon have undesirable effects. Now that rotations are not so strictly followed as before and farmyard manure is less readily obtainable it becomes important to watch the manuring closely and ensure that ample dressings are given for full crops and for maintaining the productiveness of the land.

MECHANISED CULTIVATION OF GRAIN CROPS

Problems arising out of the mechanised cultivation of arable land continue to receive attention. Both at Rothamsted and at Woburn deterioration of yield has followed from long continued growth of cereals on the same land where only artificial fertilisers are used, but the yields have been better maintained with farmyard manure. On modern mechanised farms and market gardens, little or no farmyard manure is made and therefore organic manure must either be brought in from outside or more or less dispensed with. For cereal growing it is not yet clear that this will matter very much for a few years, and good yields have been obtained without farmyard manure by suitable additions of artificial fertilisers, by occasional fallows and clover leys. For root crops, potatoes, sugar beet, for market garden crops and in some circumstances apparently