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Plant Growth and Quantity of Fertiliser

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PLANT GROWTH AND QUANTITY OF FERTILISERS.

Of the many attempts to find the relationship between the amount of plant growth and the quantity of fertiliser applied, the most widely discussed is the attractive one of E. A. Mitscherlich, which, however, is open to some criticism. Professor Balmukand, working in Dr. Fisher's laboratory, has shown that the results may be expressed in terms of two constants, one representing the importance of the nutrient to the crop, while the other represents the amount of nutrient the crop can extract from the unmanured soil. The first of these constants is presumably a crop and even a varietal factor, and the second is a soil factor: the constants promise to afford a means of estimating both, and so of expressing numerically both the crop need and the amount of available plant food in the soil.

DETAILED LABORATORY AND POT CULTURE INVESTIGATIONS ON FERTILISERS.

The laboratory work is carried out in the Chemical Department by Mr. R. G. Warren and Dr. H. L. Richardson, under Dr. E. M. Crowther, and the pot culture work by Dr. W. E. Brenchley and Miss K. Warrington.

Cyanamide. No experiments had been made at Rothamsted with this substance since 1920 and, as the method of manufacture has considerably altered, an extended series of investigations was begun in 1927 and is being continued. The modern material is practically free from the dicyanodiamide which used to cause much trouble, and it is also easier to handle than the old samples: it still needs, however, to be applied a few days before sowing. In our experiments, it has been as effective as sulphate of ammonia on barley at Rothamsted, but less on potatoes at Woburn and sugar beet at Colchester. The increments in crops for 1 and 2 doses of cyanamide and of sulphate of ammonia have been:—

	No Nitrogen. bushels	One dose.			Two doses.			Cyanamide value when Sulphate of ammonia = 100	Urea value when Sulphate of ammonia = 100
		Sulphate of ammonia	Cyanamide	Urea	Sulphate of ammonia	Cyanamide	Urea		
<i>Rothamsted.</i>									
Barley, bushels.									
1927	23.6	10.4	12.4	9.2	14.2	12.3	20.2		
1928	28.6	7.0	4.8	6.4	6.0	8.9	7.2		
Additional bushels per lb. nitrogen.									
1927	—	0.45	0.54	0.40	0.31	0.27	0.44	106	110
1928	—	0.31	0.21	0.28	0.13	0.19	0.16	94	100
<i>Woburn.</i>									
Potatoes	tons.	cwt.	cwt.		cwt.	cwt.			
1926	6.50	17.6	15.2	—	27.2	25.0	—		
1927	6.53	12.8	7.2	11.0	-2.0	4.0	8.0		
1928	11.9	44.4	16.6	—	—	—	—		
Additional cwts. per lb. nitrogen.									
1926	—	0.76	0.66	—	0.59	0.54	—	89	—
1927	—	0.37	0.21	0.32	-0.03	0.06	0.12	79 ¹	129
1928	—	1.29	0.48	—	—	—	—	37	—
<i>Colchester.</i>									
Sugar beet.	tons.				tons.	tons.			
1928	6.09	—	—	—	1.32	0.70	—		
Additional cwts. per lb. nitrogen									
...	—	—	—	—	0.44	0.23	—	52	—

¹ Single dressing.