The *p*H value of this medium was 5·2; all cultures were incubated for 30 days at 20°–22° C. Both with glucose and with sucrose, a negligible amount of growth was made in the control medium to which no growth-factor was added, and in the media receiving any one of the following: riboflavine, pyridoxine hydrochloride, *d*-pantothenic acid (as calcium salt), nicotinic acid, and *p*-aminobenzoic acid at rates of 250 μgm. per litre; inositol at a rate of 100 mgm. per litre. The responses to thiamine hydrochloride and to biotin, which varied with the carbohydrate source, are shown in the accompanying table.

Mycelial Dry Weights (mgm.)

	With glucose	With sucrose
Thiamine hydrochloride (250 μgm. per litre)	129·5	89·9
(+) Biotin (100 μgm. per litre)	negligible	59·7
Control (no growth-factor added)	negligible	negligible

A further investigation of these interesting effects of thiamine and biotin is in progress.

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Influence of Mineral Nutrition on the Resin Content of the Hop Cone

The influence of manuring on the resin content of the hop cone (strobile) has been the subject of a number of investigations. Doerell[1] concluded from German and Czecho-Slovakian experiments that the resin content rose when potassium and phosphorus were applied in excess of nitrogen, and more recently Zattler[2], in Germany, has stated that phosphorus has a beneficial effect on resin content, but that excess of potash, and especially of nitrogen, depresses the resins. The depressing effect of nitrogen has also been reported by Keller and Magee[3] in the United States.

Contrary results have, however, been found by other workers. In the Poperinghe district of Belgium, a detailed study of the chemical and physical composition of the soil and its influence on the resin content of the hop was made by de Koker, Verbelen and Van der Velde[4]; no relationship could be found. In England, Burgess[5], in a manurial trial carried out over a period of years, studied the effect of complete omission of nitrogen, phosphorus and potassium on hop growth. The yield of cones was markedly depressed by these treatments, and, in the case of nitrogen and potassium, the plants developed characteristic deficiency symptoms; samples of hop cones were taken from each treatment and from a plot receiving complete nitrogen–phosphorus–potassium manuring, but on analysis no appreciable difference in resin content was found which could be attributed to the manurial treatments.

In view of these conflicting results, and as part of a programme devoted to the study of the mineral nutrition of the hop now being carried out at Wye, the question is being further investigated.

In 1951, samples of cones were taken from a long-term factorial manuring experiment primarily designed to study the effect of different levels of nitrogen, phosphorus, potassium and magnesium on the yield of cones of the Fuggle hop. The samples were analysed for total soft resins and α-acid, and the β-fraction determined by difference. The results obtained are shown in the accompanying table, the figures representing the mean values for totals of sixteen plots.

Treatment		Resin content as per cent of oven-dry cones		
		α-Acid	β-Fraction	Total soft resins
Nitrogen (as N)	300 lb. per acre	4·06	7·57	11·63
	400 " " "	4·09	7·46	11·54
Phosphorus (P_2O_5)	200 " " "	4·15	7·55	11·70
	500 " " "	4·00	7·48	11·47
Potassium (K_2O)	200 " " "	4·02	7·36	11·37
	400 " " "	4·13	7·67	11·80
Magnesium (as Mg)	28 " " "	4·01	7·40	11·43
	83 " " "	4·14	7·63	11·76

As will be seen from the table, the levels of nitrogen, phosphorus, potassium and magnesium applied to the plots differed widely; but the effect on resin content was negligible, none of the differences found being statistically significant.

Sand-culture experiments using the Fuggle variety were also carried out at Wye in 1951 to investigate the effect of nitrogen, phosphorus and potassium nutrition on resin production. As this was a pilot experiment, the nutrient-levels chosen were necessarily somewhat arbitrary, but they were selected to give wide differences in the levels of nitrogen, phosphorus and potassium as follows:

Nitrogen	50 p.p.m. and 500 p.p.m.
Phosphorus	10 p.p.m. and 200 p.p.m.
Potassium	25 p.p.m. and 500 p.p.m.

Under the low-potassium treatment, the hop plants produced no cones; but samples were taken from all the other treatments and these showed no appreciable differences in resin content with the exception of the high-phosphorus treatment; this produced cones which were low in resins, but which were abnormal in that they were small and underdeveloped.

To date, these experiments lend support to the earlier findings of Burgess and the Belgian workers that mineral nutrition has little influence on resin-production in the hop cone.

The experiments are being continued and will be reported in full elsewhere at a later date.

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