out by adding tenfold dilutions of mouse brain virus to groups of five tube-cultures. Results were read on the sixth day of incubation under low-power magnification and the 50 per cent end-point calculated as in mice. Mice were inoculated simultaneously with the identical virus dilutions. One cytopathogenic (50 per cent) dose (*CPD*50) was determined to be equivalent to 400–600 mouse *LD*50 doses.

Neutralization of the cytopathogenic effect in culture was carried out both by serum and virus dilution techniques. The results of a test in which tenfold dilutions of sera were tested against approximately 300 *CPD*50 doses and 300 mouse *LD*50 doses of mouse brain virus in cultures and mice respectively are shown in Table 1. Serum–virus mixtures were incubated for 2 hr. at room temperature (22° C.) followed by ½–1 hr. at 4° C. prior to inoculation into the test systems; results were read as before. The marked inhibition of cytopathogenicity by louping-ill hyperimmune sheep serum was regarded as proof of the specificity of the reaction.

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Treatment of Hops with Dimefox

Dimefox, a systemic insecticide, is extensively used in commercial practice for the control of the hop aphis (*Phorodon humuli*) and the hop red spider (*Tetranychus urticae*). Because of toxic hazards it is not used as a spray or dust but is applied via the soil at the rate of approximately 0·5 gm. active ingredient in 120 ml. water per plant or hill. A single application is normally made each season in May or June.

The plants involved in this investigation were grown at Wye at a spacing of 6 ft. 6 in. (2 m.) square on wirework 14 ft. 6 in. (4·4 m.) high. Dimefox was applied to all plants at 0·5 gm. per hill on May 31; a second application at 0·25 gm. per hill was made to some of the plants on July 19. Samples of leaves were collected at different heights at intervals throughout the season up to the time of harvesting, and were analysed in the Department of the Government Chemist. Samples of ripening cones and dried hops were also examined.

It was found that the progress of the insecticide from the soil to the plant could be followed by means of the analytical figures. The rate of travel in the plant itself could be measured by examining leaves from different levels.

The method of analysis used throughout this work was that of Field and Laws[1]. The samples, when picked, were packed in air-tight 'Polythene' bags and were examined immediately on arrival at the laboratory. The results are expressed as p.p.m. on the samples as received, no attempt being made to correct for moisture content.

Table 1. Dimefox Content of Leaf Samples from Treated Hop Plants

Days from treatment	Height of leaves above ground-level		P.p.m. dimefox	
	Bottom sample	Top sample	Bottom sample	Top sample
Control	2 ft.	—	0·1	—
4	3 ft.	—	3·5	—
11	3 ft.	7 ft.	2·2	1·2
18	3 ft.	8 ft.–8 ft. 6 in.	2·5	3·2
32	4 ft. 6 in.	11 ft.	1·6	0·9
39	4 ft. 6 in.	11 ft.	1·9	1·0
47	4 ft. 6 in.	12 ft. 6 in.	0·9	1·0
53 (3)	4 ft. 6 in.	12 ft.	0·8 (2·9)	0·6 (2·0)
58 (8)	4 ft. 6 in.	12 ft.	1·0 (1·4)	1·1 (6·0)
72 (22)	4 ft. 6 in.	12 ft.	0·1 (0·2)	0·3 (0·4)

Treatments: 0·5 gm. dimefox per hill on May 31, 1937, to all plants; a further 0·25 gm. dimefox per hill on July 19, 1957, to some plants. Data for plants given a second treatment in brackets. 50-gm. sample examined in each case

The results of the leaf analyses are given in Table 1. In each case a representative 50-gm. sample was examined. When dried cones were examined, only 10 gm. was taken.

The figures show that dimefox is rapidly taken up and transmitted to the whole plant until a steady state is reached lasting for several weeks. Increase in the amount of dimefox in the soil brought about by the second application on July 19 showed up about a week later in the upper part of the plant.

Analysis of the ripening cones showed that in the plants which had received only the single application on May 31, 94 days before sampling, the level of dimefox concentration was 0·1 p.p.m. In those plants which had also received the second application on July 19, 44 days before sampling, the level was 0·3 p.p.m.

Harvesting took place in September, 108 and 60 days respectively after the first and second applications. Analysis of samples dried in the commercial manner to about 10 per cent water content showed the level of dimefox to be 0·13 p.p.m. in hop cones from plants which had received the first application only. In the dried cones from plants that received both applications, the concentration of dimefox was 0·33 p.p.m. These values correspond to 0·03 p.p.m. and 0·07 p.p.m. respectively in terms of fresh green material. Such residues would appear to be too low to constitute a health risk.

The results demonstrate the uptake and distribution of dimefox in hops. Many more experiments under different conditions will be necessary before the behaviour of this insecticide is fully understood. It is not at present known whether the dimefox undergoes chemical break-down in the plant or whether it evaporates with the moisture from the leaves. These investigations show that it does not remain as dimefox in the plant tissue.

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