

lowed by irrigation with Folidol-E 605 has given an almost complete control of the stem-borer incidence. Since seed soaking alone was not found to be much effective, irrigating the crop as described above, seems to be the only possible control. By irrigating the plots with Folidol-E 605, the plants seem to have absorbed the active ingredient of Folidol-E 605 into their tissues and thus developed resistance to stem-borer attack. Inducing resistance by this method of sap absorption appears to be more feasible than evolving pest-resistant strains.

In view of the highly toxic nature of the insecticide, it is to be considered whether this method is practicable in the field. It is claimed by the manufacturers that the toxicity of Folidol-E 605 for man and animals is considerably reduced by the use of the special emulsifier and therefore no protective appliances are required while spraying the field. While conducting the experiments described above, no protective appliances were used. The conclusions of Deichmann, Hecht and Wirth¹ in their studies on the "Toxicity of E 605" are summarised below: Folidol-E 605 is toxic to man by contact, ingestion or inhalation. 2.5 cc of this liquid is considered toxic through ingestion for a man of 70 kg. It is very improbable that this amount will be swallowed accidentally. In order to run the risk of death by contact with Folidol-E 605, the user should empty nearly the whole

content of the bottle of 1 litre on his body and remain for several hours without washing. But in practice, all that can happen is that a few drops of Folidol-E 605 may fall on the fingers of the user and as an elementary precaution, immediate washing is recommended. Mortal danger by inhalation of Folidol-E 605 would only occur if the surrounding air contains more than 1 litre solution per cubic metre of air, and such a concentration is not usual while spraying Folidol-E 605 at the recommended dose. Details regarding the optimum time and dose of irrigations, the quantity required for irrigation, the quality of the straw and grain to find out if the insecticide is absorbed by them and if they are safe for consumption by man and animals, are under investigation.

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1. *Study on the Toxicity of E 605*, Pamphlet issued by Service Technique Esso d'après les chiffres des Professeurs Deichmann, Hecht et Wirth communiqués par le Centre de Recherches de Gorsem, Belgique.
2. Hajime Suenaga and Bunji Hashizume, *Bull. Kyushu Agri. Expt. Sta.*, 1953, 336.
3. Kisabu Iyatomi, *Shizuoka Agri. Expt. Sta. Pamphlet*, 1952, Tokyo, Japan. "Preliminary Experiments on Systemic Insecticides against Rice Stem borer".

ODOUR AND CHEMICAL CONSTITUTION

AN interesting correlation of odour with the pattern of molecular vibrations in the frequency range below $1,000\text{ cm}^{-1}$ is suggested by R. H. Write in *Nature* (1954, 173, 831). The Raman effect is at present the most convenient tool for the purpose.

A panel of fifteen observers was used to select sixteen compounds with an odour resembling that of nitrobenzene. Of these compounds, all but one (nitrothiophene) were benzene derivatives, all but one (isocoumarane) had multiple bonds in the side chain conjugated with the ring. Apart from this general similarity of type, the compounds had such varied functional groups as nitro, nitrile, aldehyde, ketone, ester, etc. When the low frequency Raman shifts of these compounds were

scrutinized, there was some evidence of a statistically significant correlation between the odour and the pattern of the Raman lines below 800 cm^{-1} .

Raman lines below about $1,000\text{ cm}^{-1}$ appear to depend upon the whole configuration of the molecule more than on the constituent groups. Odour also appears to depend more on the whole configuration of the molecule, so that a correlation of odour with vibration would be more reasonable at low frequencies than at high. Moreover, the Planck formula shows that only normal vibrations with a wave number considerably less than $1,000\text{ cm}^{-1}$ have a significant possibility of being active at body temperature.