TECHNICAL PAPERS

DDT for Powder-Post Beetle Control in Bamboo

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Scarcity of Eastern Hemisphere bamboo resulting from the war and continued shipping difficulties has created a rising interest in bamboo produced in the Western Hemisphere. About 30 species and varieties, comprising probably the largest collection of bamboo in this part of the world, have been introduced into Puerto Rico by the Federal Experiment Station in the 45 years since its establishment in Mayaguez. A number of these species have shown themselves to be well adapted to local conditions, and culms are now available in commercial quantities in Puerto Rico or other parts of the Western Hemisphere. However, the main limiting factor here, as elsewhere, in the utilization of these species has been the infestation of the dry culms by the widely distributed bamboo powder-post beetle (*Dinoderus minutus* F.).

Although none has yet been found to be immune, systematic testing over a period of years has shown that a number of species possess considerable natural resistance to this most troublesome and damaging pest. Much of this resistance was associated with lack of starch in the wood, and, where little starch was present, resistance was correlated with low moisture content and high specific gravity (*1*). The upper part of the culm was more resistant than the lower, and usually the older the culm, the greater was its total resistance to the beetle.

The best of various artificial methods to increase beetle resistance or to prevent attack either have been too cumbersome or too hazardous or have adversely affected the character of the wood for general use. Among some of the least cumbersome that have given good results have been harvesting culms of resistant ages and allowing freshly cut, untrimmed culms to dry or cure in the field. Recently, tests of the effect of "Bakelite-forcing" were conducted in cooperation with the Puerto Rico Development Company. While this impregnation of the wood with Bakelite did not entirely close the pores of the wood or change its reaction to the iodine starch test, it did harden the wood and imparted to it other commercially desirable qualities. Under the most severe conditions of infestation, pieces so treated remained immune to the beetle, while untreated wood of the same species and age was heavily attacked.

External application of DDT is proving more practicable than the foregoing and by far more effective than any other insecticidal treatment yet tried. In tests now in progress, one thorough brushing with a kerosene solution at the 5 per cent residual strength resulted in 94 per cent control of internodal infestation in highly susceptible, freshly harvested, one-year-old culms of *Bambusa vulgaris*. After treatment these culms were held in open storage away from rain and sun for 2½ months. Under the same conditions, a saturated solution of pentachlorophenol in kerosene and a 2 per cent solution of sodium pentachlorophenate in water plus 2 per cent of wettable sulfur produced 3 and 6 per cent control, respectively. Most of the few beetle holes in the DDT-treated culms were shallow. No internal infestation had developed that could be detected without splitting, while in the check and other treatments many culms were completely riddled. Heavy crystallization of DDT persisted on most of the internodes, and no living beetles (but many dead ones) were seen about the nodes where side branches had been removed. The practically colorless DDT solution did not discolor the wood or otherwise perceptibly affect its quality.

In a previous experiment freshly harvested wood was protected from beetle attack in a naturally ventilated cage for 6 months while air-drying to a moisture content of about 16 per cent. This treatment reduced infestation more than 83 per cent, indicating, with the results from field curing, that if protection against infestation can be provided for the first several months after harvest, the wood will increase considerably in beetle resistance.

From the foregoing tests it appears that DDT will supply this early protection and any that may be needed thereafter.

Reference

1. ————————. *P. R.* (Mayaguez) *fed. exp. Sta. Rep.*, 1944, 1945, p. 33.

Physiological Availability of Iodine in Dithymol Diiodide

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The insolubility of dithymol diiodide in water and brine and its chemical stability confer upon this compound distinct advantages over potassium iodide as an agent for iodizing salt blocks for cattle feeding. By means of radioactive iodine it has been shown that the iodine of dithymol diiodide is physiologically available to the thyroid of the albino rat.

Although a great many compounds of iodine have been tested with or without the use of radioactive iodine, there is apparently no experimental evidence that the iodine in dithymol diiodide in physiologically available. Dithymol diiodide is easy to synthesize and is commercially available. The material is sold under a number of trade names, including aristol, iodothymol, thymodin, thymol iodide, and others. Although the formula for dithymol diiodide is usually given as $(C_6H_2 \cdot CH_3 \cdot OI \cdot C_3H_7)_2$, with a molecular weight of 550.03, there is still some uncertainty as to just how the iodine is bound. In 1918 Bougault proposed a formula in which the iodine was connected directly to an aromatic carbon in place of the hypoiodite type of linkage; and the two thymol molecules were