'Buried Bag' Technique for Testing 'D-D' as a Soil Fumigant against the Potato-root Eelworm

In recent years, many workers investigating the effect of different soil fumigants have enclosed their test organisms in cotton or cheese-cloth bags[1–3], which were later buried in soil at varying distances from the point of application of the chemical. One advantage of such a method is that the experimental material is readily available for viability tests after treatment; also a number of bags can be buried at different lateral distances from the injection point as well as at different depths. It might therefore be of interest to record an apparent failure of this technique when it was applied to a pot experiment on the nematocidal effect of the soil fumigant 'D-D' against the potato-root eelworm, *Heterodera rostochiensis*. The experiment was designed to investigate the effect of different soil types on the efficacy of this chemical and is the subject of another paper.

Samples of three naturally infested soils were put into 6-in. flower pots, the inner as well as the outer walls of which had been waxed to render them impervious to the spread of the fumigant. The hole in the base of the pot was sealed with gummed paper, which was afterwards waxed. Small cotton bags containing eelworm cysts were then buried in the soil at a depth of one inch below the soil surface; a measured quantity of 'D-D' was then introduced into the soil mass at a depth of four inches below the surface. Four dosages were applied consisting of 0, 0·75, 1·50 and 3·00 c.c. per pot, replication being four-fold. The pots were afterwards watered daily with a fine rose to seal the soil surface and minimize loss of vapour into the air.

Four weeks after treatment the bags were removed and the soil in the pots washed to recover the naturally occurring cysts. Both 'bagged' and 'soil' cysts were subjected to normal root-diffusate hatching tests. The hatch from each treated batch of cysts was expressed as a percentage of the hatch from the corresponding control batch, this figure being subtracted from 100 to obtain an estimate of the percentage mortality. The average mortality among the 'bagged' cysts throughout the experiment was found to be 93·1 per cent, while for the 'soil' cysts it was only 73·4 per cent.

Mortality Induced in 'Bagged' and in 'Soil' Cysts

Dosage	Bagged cysts 0·75	1·50	3·00	Soil cysts 0·75	1·50	3·00
Soil *A*	47·90	99·90	99·98	36·9	76·1	85·6
Soil *B*	99·87	99·97	99·67	25·7	64·0	86·3
Soil *C*	99·91	99·91	100·00	69·3	88·4	93·6

A summary of the mortalities according to dosage and soil type is given in the accompanying table, from which it will be seen that kills from 'bagged' cysts are consistently higher than for 'soil' cysts. It is suggested that one reason for this is the disturbance of the soil which occurs when the bags are buried, coupled with the fact that it is impossible to ensure that subsequent consolidation of the soil in the immediate vicinity of the buried bag is comparable with that in the surrounding zones. The interpretation of results from such a technique would, therefore, appear to require the exercise of extreme caution, since results applicable to cysts enclosed in bags buried in soil would not appear to be of necessity applicable to cysts which occur naturally in soil.

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Structural and Insulating Boards from Sawmill Waste

Boards of this type have been made experimentally in these laboratories using the well-known condensation reaction between phlobatannins[1] and aldehydes.

Phillips and Rottsieper[2] patented a process for making moulding compositions from materials rich in tannins such as mimosa bark, mangrove bark and quebracho wood. They caused the tannins to react *in situ* with paraformaldehyde or hexamine at a pressure of 2 tons per sq. in. and a temperature of about 150° C. to form moulded products such as ash-trays, with exceptional mechanical strength.

Recently, Dalton[3] investigated the tannin-formaldehyde resins prepared from the bark extracts of six Australian species as adhesives for plywood. He found that most of these resins gave strong, water-resistant bonds with wood, and he emphasized their potential importance for the plywood industry.

We have made good, low-cost boards from bark-sawdust mixtures of white cypress pine (*Callitris glauca*) by causing this waste material to react with small quantities of paraformaldehyde at temperatures and pressures obtainable on the type of press used in Australia for the hot pressing of plywood; $\frac{3}{16}$-in. boards containing equal parts by weight of sawdust and ground bark with 1 per cent by weight of paraformaldehyde have been formed by pressing for 3 min. at 180 lb. per sq. in. and at 140° C. The boards have mechanical and water-resistant properties similar to fibre boards such as 'Masonite'.

For plants operating in conjunction with sawmills the raw material costs, including the cost of paraformaldehyde, should not exceed three shillings per 100 sq. ft. The cost of such plant would also be low, and the process appears to offer a solution to the utilization of some of Australia's sawmill waste. Boards with a wide range of properties have also been made by varying the proportions of sawdust and bark as well as the reaction conditions. Promising results have been obtained with other commercial timber species.

The work is proceeding, and full experimental details will be published elsewhere.

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