

Fungicides Biggest Need in Tropical Agriculture

Information on how to use agricultural chemicals under tropical conditions needed

NEW YORK.—Fungus is probably the most troublesome of the pests that plague agriculture in the tropics. This was the impression left by several speakers at the Symposium on Pesticides in the Tropics sponsored by the Division of Agricultural and Food Chemistry during the AMERICAN CHEMICAL SOCIETY's 126th meeting here Sept. 13 to 18.

Among the crops which suffer most from fungus attacks are coffee, cacao, bananas, and citrus. Bordeaux mixture, it seems, is a necessary weapon, although it is not always the weapon of choice. Some of the newer fungicides are being tried on a small scale, but the lack of recommendations based on the field conditions of the tropics have so far prevented wider usage, and the same situation pertains to many of the other new pesticides. In some cases, it is felt that the newer fungicides would be more effective, but their high costs make them prohibitive. In other cases, the newer organics can do no better a job than Bordeaux. The low level of education among the small subsistence-type farmers, as is true among all of the underdeveloped parts of world, is also a factor retarding widespread use of new insecticides, herbicides, fungicides, and other pest-control chemicals.

Describing the situation in the underdeveloped countries, Edson J. Hambleton of the Pest Control Branch, Agricultural Research Service, USDA, who has spent many years abroad in technical assistance programs concerned with insect control, said that it will take time, patience, material aid, and assistance to overcome the lack of knowledge and material means. He cautioned that the biggest problem facing the exporter of American pesticides is the fact that people in these countries cannot be strongly counted on to demand our insecticides, fungicides, and other chemi-

cal products on their own initiative. Despite these difficulties, Mr. Hambleton said he was firmly convinced that pest control will continue to be one of the most important weapons in the great fight against poverty and hunger. As people become more willing and able to fight a winning struggle, said Hambleton, pesticides and the equipment to apply them will become as valuable to the small farmer as his machete and hoe.

In Central and South America, the biggest problem facing growers interested in using modern chemical pest control is the lack of information concerning their particular problems, either from experiment stations or from commercial companies. Since the development of the former can only come slowly, A. F. Camp, head of the Citrus Experiment Station in Lake Alfred, Fla., advised interested companies to study problems in

the areas in which they are attempting to sell their products and to be in a position to give advice on the use of their products. This advice, he said, must be keyed to the local situation and not the information obtained from experiment stations in this country and intended for use here.

Because of the currency problem and the dollar shortage, bureaucratic controls on imports into these countries usually assign dollars on the basis of past usage, thus eliminating the newer materials. For this reason, Dr. Camp said it is probably desirable for companies to make arrangements for the manufacture of products on a royalty basis within the foreign countries. Dr. Camp said that the casualness with which many American companies arrange for foreign representation and their general lack of progressive export policies are driving many users and potential users into the hands of European manufacturers.

Pesticides for Sugar. An idea of the tremendous potentialities that exist in the tropics for pesticides came from Eaton M. Summers of United Fruit Sugar Co., who estimates that 8 million of the 15 million acres of sugar cane grown in the tropics and subtropics are possible users of agricultural chemicals.

Norwood C. Thornton, United Fruit Co., chairman of the Symposium on Pesticides in the Tropics, goes over details of some of the papers with L. W. Hazelton of Hazelton Laboratories, chairman of the Pesticides Subdivision of the Ag and Food Division





H. H. Schwardt, New York State College of Agriculture, said that livestock diseases caused by flies and ticks constitute one of the principal deterrents to progress in agriculture in Africa and the American tropics

Present usage of pesticides on sugar cane breaks down approximately to: 2 million pounds of herbicides, 500,000 pounds of fungicides, 3 million pounds of insecticides, 25,000 pounds of rodenticides, and 250,000 pounds of bactericides. He figures that maximum possible usage could be extended to 10 million pounds each of herbicides, and fungicides, 40 million pounds of insecticides, and one million pounds each of rodenticides and bactericides. The probable usage, he states, might be something in the order of three million pounds of herbicides, two million pounds of fungicides, 10 million pounds of insecticides, 100,000 pounds of rodenticides, and one million pounds of bactericides.

Use of weed killers, particularly 2,4-D, has become standard practice in many sugar cane areas, not only on the sugar cane fields themselves, but also among the railways and pastures that are often connected with large plantations. In many sugar growing areas, labor is becoming more expensive, thus making chemical weed control more attractive economically. A combined insecticide and fungicide for soil treatments would be highly useful to sugar growers, said Mr. Summers.

Fungus Damage. Coffee rust is without doubt the most dangerous, most feared, and most troublesome disease of the coffee crop in the world, according to Frederick L. Wellman, Regional Consultant in Plant Pathology for the Foreign Operations Administration. Losses to this disease amount to about 70% of the crop each year in South India and about 30% in Uganda. In Ceylon and Java, rust caused growers to abandon Arabian coffee plantations and it was not

until more robust, but lower quality, varieties were introduced that Java eventually became a coffee exporter again. Proper timing of Bordeaux mixture applications can give good control of this disease, but it can be toxic if wet and dry seasons are not well defined.

In the Western Hemisphere, another fungus disease, American leaf spot, is almost as dangerous. Its devastations have caused the complete abandonment of large coffee acreages in Guatemala, Mexico, Costa Rica, Columbia, and Brazil. Copper - containing fungicides have been found effective, but the zinc materials were not.

Dr. Wellman said that it was his opinion that the annual world coffee crop could be increased by at least a third if proper measures were used to counteract coffee pests and disease. The present shortage he attributes to the fact that technological advances in coffee growing have not kept pace with demand.

Another tropical crop in short supply, cacao, would be augmented by more than

a third if pests and diseases were adequately controlled. Rodrigo G. Orelana estimated that insects and virus disease subtract 210,000 long tons from the annual production of about 702,000 long tons. If fungicidal control were applied to the world's cacao acreage, at a concentration of only 2 pounds per 100 gallons of spray six times a year, there would be a need for about 189 million pounds of fungicide annually.

A soil fungicide with high residual effectiveness is the need in banana growing, according to N. C. Thornton, to combat Panama wilt, the limiting factor in banana production in Central America. Crag 974 and Dithane D-14 have shown promise of economic control.

A fungicide for controlling Sigatoka, which is as destructive as Panama wilt, is also needed, said Dr. Thornton. Bordeaux mixture is effective, but its application properties are poor, because of the waxy surface of the banana leaf, and consequently Bordeaux must be applied 16 to 22 times a year.

Radiation Sterilization of Food Held Up by Side Reactions

Three approaches to elimination of side effects and off-flavors being studied

NEW YORK.—The era of radiation sterilization of foods may be approaching but it is still very much in the future. Research workers present at the symposium on radiation sterilization at the recent ACS meeting were emphatic in the opinion that there are still several important problems to be resolved before cold sterilized foods hit the supermarkets.

The fundamental principles of ionizing radiation as a device for the eradication of bacteria were known before World War II. Since that time development of high energy particle accelerators and the potential availability of fission materials produced as a by-product of nuclear weapon manufacture have aroused an increasing interest in the possible practical applications of radiation energy. Since the war the fundamental research problems associated with the techniques for the eradication of bacteria from food products have generally been resolved so that it is now possible to sterilize foods with radiation produced either by machines or isotopes. However, although practical techniques have been developed to obtain sterile food products, it has not been possible to obtain a commercial product satisfactory for human consumption.

The status of current research in this area was summed up by participants in

the symposium on radiation sterilization at the New York meeting. In the concluding paper of the symposium S.A. Goldblith of the Department of Food Technology, MIT, said that the greatest single problem holding up commercial utilization of this technique is the undesirable side reactions resulting from the radiation of foods at levels necessary to ensure sterilization.

Current research in the field is directed toward this problem of side reactions, believed to be responsible for the "off flavor" of irradiated foods. The side effect problem is being approached at two levels. Several groups of workers are studying the fundamental chemistry of these side reactions in an attempt to find what chemical compounds are modified by radiation forming the new compounds responsible for changes in flavor. Results obtained by these workers are in turn of interest to those who are concentrating on techniques for reducing the side reactions. Research results from each of these avenues of approach were presented at the symposium.

Thus far three possible methods for reducing undesirable side reactions have been proposed: irradiation in the frozen state; irradiation in inert atmosphere; addition of free radical acceptors.

All of these proposals are predicated on evidence that "off flavor" is due to