

Viruses Control Orchard Pests

Insect viruses are being tested at The Pennsylvania State University for "germ warfare" against orchard pests. Penn State scientists indicate the technique, when perfected, can infect pests

such as codling moths and redbanded leafrollers with their own diseases. Such viruses produce disease in only one or a few closely related insect species, says Dr. William M.

Bode, assistant professor of entomology at the Fruit Research Laboratory, Biglerville. These viruses can kill insect pests but will not harm beneficial insects, fish, birds, mammals, or humans.

Since such viruses occur naturally in association with insects, they can not be accused of polluting the environment, Dr. Bode pointed out recently. He believes the day will come when preparations of such insect viruses can be applied with conventional spraying equipment. He even suggests that insect viruses might be dried and formulated as wettable powders.

"Right now these viruses can not compete with commercial insecticides for effectiveness, cost, and availability. However, the information we are gathering might be useful for some future situation in which chemicals can not be used," he stated.

Producing such insect viruses is a rather complicated process. The viruses can not be synthesized and manufactured like chemical insecticides. Viruses are parasites of living cells. In "germ warfare," they take control of a cell's synthetic mechanisms and produce more viruses like themselves.

To produce codling moth virus, for example, Dr. Bode and Douglas G. Baugher, research assistant, rear large numbers of moths in a laboratory. In the process, larvae are produced. When the larvae are 10 days old, they are diets inoculated with the virus. In this manner larvae become infected.

The virus enters susceptible cells within a larva and causes these cells to produce more virus like itself. As the new virus is produced, the infected cells are destroyed and the larva begins to die. By the time the larva dies, most of the internal tissues have liquified. This liquid contains 1 to 10 billion virus granules. When the skin of a larva is broken, out flows the liquid containing the virus.

Virus-killed larvae are stored in a refrigerator until needed. For experimental applications to trees, the Penn State researchers add water and shake the mixture to create a suspension. The project is carried out within the Agricultural Experiment Station at Penn State.

In field tests last year, Dr. Bode measured dosages of the virus in "larval equivalents." One larval equivalent is the amount of virus obtained from one larva. The Penn Staters used about 50 larval equivalents of virus in one-gallon of

water for each apple tree. The virus was sprayed with a backpack mistblower. This season about 25,000 larval equivalents of virus will be used in field experiments.

Before insect viruses are acceptable for field use, something needs to be done to protect their life span, Dr. Bode stated. Applied to foliage, they are inactivated rapidly by ultraviolet radiation from the sun. Of all material tested to block solar radiation, powdered charcoal was the most effective at the Biglerville Fruit Research Laboratory. Virus suspensions containing powdered charcoal were more effective than virus used alone in reducing injury to fruit.

Red Meat Increases

May 1974 slaughter of meat animals in Pennsylvania was up for cattle, and sheep and lambs, but down for hogs, while calf slaughter remained the same from a year ago, according to the Crop Reporting Service.

Cattle slaughter increased 4 percent, sheep and lambs 8 percent. Hog slaughter was down 17 percent from May a year ago.

Nationally, total red meat production was 7 percent more than a year ago and 4 percent more than April 1974. Beef production was up 7 percent from May 1973, veal was 7 percent higher, pork production increased by 10 percent, while lamb and mutton production was 25 percent less than a year earlier.

Food Preparation

All food preparation, done 1,000 years ago or done yesterday, consists of the same basic operations: heating, chilling, cutting, mixing, separation, retrieving and turning, measuring, forming and brewing. Almost all kitchen utensils perform one or another of these basic functions, despite the great variety of their forms.

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