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BIO-PESTICIDE

'BIOCON' CONTROLS NEMATODES BIOLOGICALLY

MANILA, The Philippines—The first commercially marketable biological control for nematodes is now being manufactured in the Philippines.

The product, called Biocon, was developed by Romulo Davide, associate dean of agriculture and a plant pathologist at the Los Banos campus of the University of the Philippines. It is made from the fungus *Paecilomyces lilacinus*, which attacks nematodes either by parasitizing the eggs or by

potato field trials. Such screening is necessary because only some varieties attack the nematodes.

Davide was originally motivated to develop a biological control for nematodes because of the heavy economic and environmental cost of chemical nematicides. A one-hectare application of a chemical nematicide on potatoes costs 4,000–6,000 Philippine pesos (U.S. \$200–300). Biocon costs one-tenth as much, and Davide estimates the domestic Philippine market alone to be worth about 100 million pesos (\$5 million).

Furthermore, whereas chemicals deteriorate and must be reapplied after about three months, Biocon continues to grow in soil. In fact, one field trial with okra allowed two to three plantings without any need for a fresh application of the fungus.

Davide, who has been working on biological control of pests since 1967, discovered *P. lilacinus* in 1979. He only developed it to market feasibility last year, however, because he couldn't convince industry to fund his research. "We could only get grants from chemical companies to test their chemicals," he explains.

Ironically, those same chemical companies are now beating a path to Davide's door for production and distribution rights around the world. The researcher has also received inquiries from pesticide distributors elsewhere in southeast Asia, potato growers in Utah, and even from the McDonald's hamburger chain.

A memorandum of agreement signed in August of last year gives Asiatic Technologies Inc. (Manila) the right to manufacture and market Biocon in the Philippines. Although the fungus can be grown on any number of cheap waste products—including rice husks, corn cobs, and water hyacinth—Asiatic Technologies chose coconut water as the substrate because of the ease in removing the spores for the finished product.

Biocon is sold in 10-gram foil pouches (each containing about eight billion spores), which cost 150 pesos (\$7.50) each. Planting material can be soaked in a spore suspension before planting, or the spores can be mixed with organic fertilizers like chicken manure for application on the field. One pouch mixed with two liters of water is good for 128 kilograms of potato tubers, or up to a one-half-hectare potato field. —Mark Timm

Top: A normal banana-infesting nematode (*R. similis*). **Bottom:** The same nematode species after being exposed to *P. lilacinus*.

infecting adults. Nematodes are microscopic roundworms that destroy tomato, pineapple, rice, corn, citrus, and other crops.

In tests with mung beans, *P. lilacinus* controlled 50–90 percent of all nematodes that attack this crop. The fungus also attacks *Radopholus similis*, one of the major pests in commercial Cavendish bananas. And in potatoes, where the fungus kills the golden potato cyst nematode, the result was a 10–100-percent increase in yield. Davide is now collaborating with the International Potato Center in Peru to test a Peruvian *P. lilacinus* isolate in