

Fungi, Plants, Insects Future Sources Of Safe Chemicals

WASHINGTON, D.C. — If the Irish of the 1840s had known about a fungus called *Penicillium cyclopium*, the potato famine might never have happened.

U.S. Department of Agriculture plant physiologist Hank Cutler has discovered a chemical antibiotic in the fungus that is 95 percent effective in stopping the growth of another fungus that caused the Irish potato blight.

Ireland's potato crop was virtually wiped out in 1845-46, causing 1 million Irish to die from starvation and malnutrition and 1.5 million more to emigrate to the United States and other countries.

Cutler, a fungus expert for USDA's Agricultural Research Service, says the antibiotic, cyclophenol, has "great potential as a natural fungicide."

"Cyclophenol is one example of fungal chemicals," he adds, "that have potential to repel disease-

causing organisms, regulate plant growth and serve as human drugs similar to penicillin."

Cutler and other agency scientists have been researching plants and insects, as well as fungi, as sources of a new generation of natural agricultural chemicals. "Natural compounds hold great promise," he says. "They work against specific targets, can be extremely potent and because they're biodegradable, don't pose environmental hazards."

Cutler, working at the agency's Richard B. Russell Center in Athens, Ga., grows fungi on breakfast cereal in his laboratory. Then he studies the compounds they produce and the effects they have on plants. He says these compounds could be produced in fermentation or serve as models for synthesizing chemicals commercially.

"Our findings are preliminary

and industry would have to conduct further studies to confirm them," he said. "We're cooperating in our research with several chemical companies that are interested in what we've found. It is possible there will be international competition to produce these chemicals in the future."

Other chemicals Cutler has found with commercial potential:

*Cytochalasin H, produced by a

Phomopsis sp. fungus, controlled flowering in six-week-old tobacco seedlings. In field tests, three-tenths of an ounce of the compound in water controlled flowering in an acre of tobacco. "This has great potential as a growth regulator and could replace costly and time-consuming hand labor in the field," he said.

*6-pentyl-pyrone, from the fun-

gus *Trichoderma viride*, inhibited the growth of *Aspergillus flavus* in laboratory studies. Under certain environmental conditions, *A. flavus* grows on grains and other field crops and produces aflatoxin, a carcinogen. "We believe 6-pentyl-pyrone has the potential to be sprayed on these crops in the field to suppress the growth of *A. flavus*," he said. "This could reduce or eliminate aflatoxins."



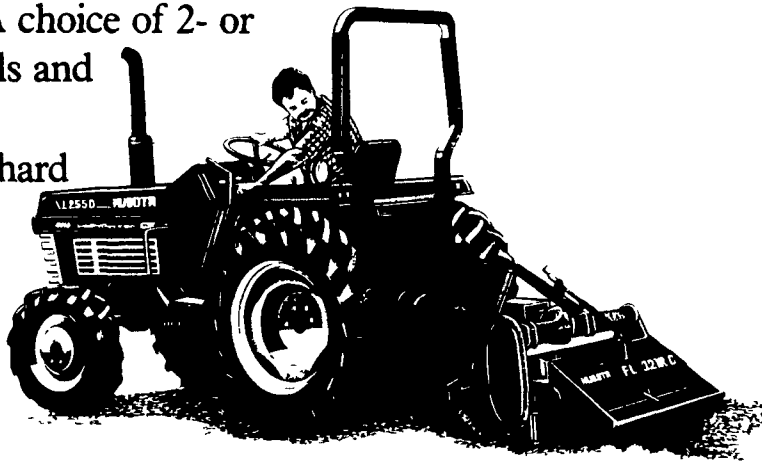
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