

# Search for a "Super"

IF ALL GOES WELL, growers and managers of turf and ornamental plantings soon will have a highly effective new weapon for use against the troublesome and costly soil-borne diseases — cottony blight, damping off and the root rots and stem rots caused by *Pythium* and *Phytophthora*.

By late 1975, Dow Chemical Company hopes to have its new systemic fungicide Nurelle (common name is "pyroxychlor") registered for use on ornamental crops in greenhouses, outdoor nurseries, and in landscape ornamental plantings. Registration for use on turf is anticipated in 1976. And registration for foliar applications may come in 1976 or shortly after.

In dozens of tests, Nurelle consistently has outperformed currently available fungicides being used to combat *Pythium* and *Phytophthora* (the water molds) on such crops as turfgrass, ornamental foliage plants, bedding plants, azaleas, and rhododendrons.

In addition to being more effective against the water molds than any currently available fungicide, or any other experimental compound now being tested, the product has these additional advantages:

1. Used as a foliage spray, it is translocated downward to the roots of plants, instead of upward like most systemic compounds.

2. In proper concentrations, applied correctly, it gives long-lasting control of *Pythium* and *Phytophthora*, eliminating the need for continuous treatments at short intervals.

3. Used correctly, it is nonphytotoxic to plants.

Dr. Herbert Cole, plant pathologist at Penn State University, has been working with Nurelle for two years now for the control of *Pythium* blight on golf course grasses. He has been investigating different dosages, the need for drenching or watering in the chemical, the effect of soil type on disease control and other application techniques.

"Nurelle's unique benefit on golf course grasses is its long-lasting effect," says Cole. "Instead of giving *Pythium* blight control for three to four days like the standard chemicals now available, Nurelle controls the disease for three to four weeks." *Pythium* blight, also known as grease spot or cottony blight, varies in degree from a curiosity to a serious pest. It's worse in hot, humid weather. "When you've got it, you've really got it," Cole adds. Research results so far indicate that for best *Pythium* blight control on golf course grasses, the fungicide should be watered in thoroughly after application.

Many researchers currently are working with the product for the control of *Pythium* and *Phytophthora* on ornamentals. Dr. Harry Hoitink, Department of Plant Pathology, Ohio State University, has been experimenting with the chemical since 1972.

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*In many tests, the fungicide has been highly effective both as a drench and as a foliar spray. Close-up views show *Phytophthora* and *Pythium* symptoms on dieffenbachia and ivy.*



# fungicide



"We've used Nurelle as a drench to control Phytophthora on azaleas and rhododendrons," says Hoitink. "It also works as a foliar spray against Phytophthora on rhododendrons, azaleas, and pieris — three of the most Phytophthora-susceptible plants known to man.

We're now looking at how Nurelle is translocated through the plant to the roots," Hoitink adds. "We can detect the compound in the roots five days after application as a foliar spray and we can still detect it in the roots a month after application.

"A second foliar spray about a month after the first application increases the concentration in the roots. We're working on chemical concentrations that give good disease control. Sprays of 600 parts per million are helpful, but sprays of 1,200 parts per million are completely effective when applied more than once."

At Apopka, Florida, the "Foliage Plant Capital Of The World," Dr. Jim Knauss, associate professor of plant pathology, has done extensive testing with Nurelle

on many species of foliage plants. "As a group, Phytophthora and Pythium molds are probably the worst disease problems of the ornamental plant industry," Knauss explains. "We already had our disease-control tests underway when we learned about Nurelle. Since then, we have tested the compound extensively both as a drench and as a foliar spray. It has been more effective than any presently available fungicide or any other experimental compound we've tested.

"One of the problems in the beginning was that researchers didn't know how to properly test Nurelle," Knauss believes. "The chemical should be tested on plants in realistic situations at adequate concentrations — not on artificially damaged plants inoculated with unrealistically high levels of disease."

Knauss' work indicates that certain criteria are important for good results with the chemical applications:

1. When the fungicide is used as a drench, foliage plants should be in an active state of growth so they will absorb enough of the chemical.
2. When it is used as a foliar spray, plants also must have actively growing leaves. Foliage sprays should contain about three times as much chemical as drenches. The faster the plants are growing, the more chemical is necessary for good disease control.

Knauss says you can't spray the foliage of plants with Nurelle and then take cuttings and expect to get disease control in the new plants that grow from the cuttings. The product moves out of the leaves and to the roots too fast. He's experimenting now, though, with ways that the chemical might be held in the leaves longer. For instance, he thinks a drench might be used to saturate the roots, followed by a foliar spray. He has used the product this way to control the foliar form of Phytophthora in petunias.

In Knauss' tests, the product has rarely been exceeded in performance. It has given excellent control of Phytophthora without phytotoxicity in repeated tests on dieffen-

bachia, peperomia, petunia, and Christmas cactus and against Pythium on Christmas cactus. Knauss is now experimenting with combination treatments of Nurelle and other disease control compounds.

Growers of foliage plants in the Apopka area have watched Knauss' work and have cooperated in many instances. They are anxious to have the product approved for use in their commercial operations. Herman Englemann, owner of Englemann's Nursery, Apopka, is a good example. "I have seen dieffenbachia plants treated with Nurelle grow well in fully disease infested soil," Englemann says. "We used it on ivy and it was just fantastic. The minute we can use the product commercially, we'll use it on everything as a preventive.

"I'll use the chemical first as a drench," Englemann says. "It should be most effective this way. Then later on we'll probably also use it as a foliar spray. I hope we can mix it with other chemicals, too."

Will Webb, production manager for Johns, Inc., Apopka, is also excited about the fungicide. "We like the potential for using it as a foliar spray," Webb explains. "Foliar sprays would be much cheaper, quicker, and simpler. We would use the chemical as a preventive on all plants that are susceptible to Pythium and Phytophthora."

Dow hopes Nurelle also will prove effective against diseases of many other plants. Research is currently underway with such additional crops as blueberries and Christmas trees, both of which suffer severely at times from root rot diseases.

John Lillich, product manager for Dow, says that if all goes well, the company plans to first launch Nurelle in a limited way in Florida and California. "We're set up to manufacture only a modest amount of the chemical with present facilities," Lillich says, "so supplies will be very limited until about mid-1976." Dow is building a new facility to produce pyroxychlor, however, and should have increased supplies by late 1976. □



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