

New Fungicides for Stone Fruit Disease Control

Of the 23 fungicide trials on stone fruit crops (1 on prune, 10 on cherry, 12 on peach) reported in volume 38 of *Fungicide and Nematicide Tests, Results of 1982*, 18 evaluated sterol-inhibiting (SI) fungicides. The SI fungicides provide a broad spectrum of control for some of the most common and destructive diseases of stone fruit, including brown rot blossom blight and fruit rot (*Monilinia fructicola* and *M. laxa*), cherry leaf spot (*Coccomyces hiemalis*), and powdery mildews (*Podosphaera oxyacanthae* and *Sphaerotheca pannosa*).

Tests throughout the stone fruit production regions of the United States have shown that the following SI fungicides provide good to excellent control of brown rot, cherry leaf spot, and powdery mildews: bitertanol (Baycor, Bay KWG 0599), triadimefon (Bayleton, Bay MEB 6447), etaconazole (Vanguard, CGA-64251), fenarimol (Rubigan, Bloc, EL-222), and triforine (Cela W-524, Funginex, Sapro). The SI fungicides appear to be weak in controlling scab (*Cladosporium carpophilum*) and provide little or no control of *Rhizopus* fruit rot (*Rhizopus* spp.) on all stone fruit and *Alternaria* fruit rot (*Alternaria* spp.) on cherry.

The development of resistance to benomyl and thiophanate-methyl in several stone fruit production areas has also increased interest in the SI fungicides. Cherry leaf spot resistance to the benzimidazoles created a major problem for Michigan cherry growers, and peach growers in South Carolina face a similar problem with control of brown rot. Alternative fungicides for combined brown rot and leaf spot control are less effective, cost more, or require more frequent applications, and the choice of fungicides effective against the leaf spot or brown rot organisms is severely limited until new ones are registered.

The SI fungicides are systemic or locally systemic and possess strong curative or after-infection control activity. This curative activity opens new horizons for the management of stone fruit diseases. In greenhouse evaluations in New York, etaconazole, fenarimol, and triforine provided excellent after-infection control of brown rot blossom

blight in cherry. In a Michigan test for control of cherry leaf spot, after-infection applications of bitertanol, etaconazole, fenarimol, and triforine provided excellent control equaling that of a protective program with captafol (Difolatan); control of brown rot and powdery mildew was also excellent.

The potential benefits from the use of SI fungicides in stone fruit production are great, but certain concerns exist. Even though the SI fungicides have a similar biochemical mode of action, each is in some way unique and efficacy against specific plant-pathogenic fungi does differ. For example, triadimefon is highly active against many powdery mildews but not against *P. oxyacanthae* on cherry. Another concern is the relatively short residual life of SI fungicides, compared with that of the conventional protective fungicides. We need to know how many days after the initiation of infection SI fungicides are effective and the extent of their protective activity. Other concerns include possible phytotoxic effects to fruit and foliage and the potential for resistant strain development in fungi. Nevertheless, the future of these new tools for control of stone fruit diseases appears bright. Through continued, persistent testing, these questions will be answered and the SI fungicides will most certainly evolve within modern disease control programs. Several new numbered compounds are being introduced and tested for control of stone fruit diseases.

The only SI fungicide currently registered for use on stone fruit in the United States is triforine. Triforine is labeled for control of brown rot blossom blight on all stone fruit (apricots, cherries, nectarines, peaches, plums, prunes) and may be applied up to three times during bloom. Triforine may not be applied to cherries, plums, and prunes after petal fall, but up to three preharvest applications can be made for control of brown rot on apricot, nectarine, and peach fruit.

The increased interest in SI fungicides in no way implies reduced importance of the conventional fungicides. Many of the 1982 trials involved tank-mixing or alternating SI fungicides with benomyl, captafol, captan, chlorothalonil, dichlone, dicloran, dodine, or thiophanate-methyl. Tank mixes are generally being evaluated

for increased efficacy, a broader spectrum of disease control, and increased protective activity for a longer period of time. Some researchers are hopeful that tank-mixing or alternating fungicides with different modes of action will reduce the potential of resistant strain development in fungi.

Chlorothalonil (Bravo 500), a broad-spectrum protective fungicide, was recently labeled for use on stone fruit in the United States: for control of brown rot on all stone fruit; for leaf curl (*Taphrina deformans*), Coryneum blight shot hole (*Coryneum carpophilum*), and scab on peach, nectarine, and apricot; and for cherry leaf spot on sweet and sour cherries. Except for postharvest applications on cherry for control of leaf spot and dormant applications for control of leaf curl, chlorothalonil may not be applied on stone fruit after shuck split.

Vinclazolin (Ronilan, BASF 352) and iprodione (Rovral, Chipco 26019) are two relatively new protective fungicides that are highly effective for control of brown rot. One test in West Virginia showed that both also have good activity against scab on peaches. Similar results were reported from Alabama and Virginia. Iprodione was recently labeled in the United States for the control of brown rot blossom blight and fruit rot on all stone fruit.

New fungicides for control of *Rhizopus* and *Alternaria* fruit rots on stone fruit are badly needed. Although considerable testing for control of these diseases has been conducted, results are generally poor or inconsistent.

Results of tests in stone fruit production areas throughout the world would be extremely helpful, and researchers are encouraged to submit their results for publication in *Fungicide and Nematicide Tests*. Guidelines for preparing and submitting reports are available in the current volume.

Dr. Ellis is editor of the stone fruit section of Fungicide and Nematicide Tests, William C. Nesmith, Editor, published annually by the New Fungicide and Nematicide Data Committee of The American Phytopathological Society. Copies of current and past volumes may be obtained from Richard E. Stuckey, Business Manager F & N Tests, Plant Pathology Department, University of Kentucky, Lexington 40546.