

Fungicide and Nematicide Update

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Recently Labeled Fungicides for Use on Turfgrasses

A surprisingly large number of new chemicals have been registered recently for controlling diseases on turfgrasses (Table 1). The new fungicides can be divided into "broad-spectrum" chemicals for several fungal diseases and "narrow-spectrum" chemicals for diseases caused by *Pythium* species.

strains of the fungi have not succeeded. Thus, resistance of *Pythium* species to Subdue on turfgrasses has not been demonstrated. Resistant strains of *Pythium* species, or closely related fungi, have not been reported to the active ingredient in Banol. Intermittent use of Subdue and Banol with each other and

been reported. Duosan is a 75% wettable powder with 50% mancozeb and 15% thiophanate-methyl as active ingredients. It is recommended for the control of eight different diseases. A synergistic effect of the combined older chemicals in Duosan has been suggested. Vorlan is a 50% wettable powder of 3-(3,5-dichloro-

Table 1. New fungicides for controlling turfgrass diseases

Diseases	Application rates (oz/1,000 sq ft) and intervals (days) ^a					
	Banol 66.5L (7-21 days)	Bayleton 25WP (7-21 days)	Chipco 26019 50WP (14-28 days)	Duosan 15+60WP (5-7 days)	Subdue 2E (10-21 days)	Vorlan 50WP (7-21 days)
Anthracoise	4-6	...	...
Brown patch	...	1-2	1.5-2	4-6	...	...
Copper spot	...	1-2	...	4-6	...	...
Dollar spot	...	1-2	1.5-2	3	...	2
Fusarium blight	...	4-8	4	...	...	...
Fusarium patch	2-4	4-6	...	2-4
<i>Helminthosporium</i> diseases	2	4-6	...	...
Powdery mildew	...	1-2	...	...	...	...
<i>Pythium</i> diseases	1.3-4	...	...	...	1-2	...
Red thread	...	1-2	...	4-6	...	...
Rusts	...	1-2	...	4-6	...	...
Snow mold (gray)	...	5-8	2-4	...	...	...
Snow mold (pink)	...	5-8	2-4	...	...	...
Stripe smut	...	2-4	...	...	...	...

^a Lower rates are usually for prevention and higher rates for cure. Higher rates and shorter intervals are recommended for severe disease conditions.

The narrow-spectrum group includes Banol and Subdue, relatively long-lasting materials that have given excellent control of diseases caused by *Pythium* species. Koban and Tersan SP, which have been available for a number of years, give control for only a few days during hot, wet weather, whereas the new fungicides have given excellent control for up to 4 weeks.

Banol was available in limited quantities under an experimental use permit in 1981 and became available for use in 1982. Banol is formulated as a liquid with 66.5% active ingredient (propamocarb hydrochloride). Control of *Pythium* blight for up to 21 days is indicated on the label. Subdue 2E is a liquid formulation of metalaxyl that controls *Pythium* blight for up to 21 days.

These new chemicals should be used judiciously in a disease management program. Resistance in fungi closely related to *Pythium* species to the active ingredient in Subdue (metalaxyl) has already occurred in Europe, causing cancellation of the chemical's registration for late blight on potatoes in Europe after only a few years of use. Lack of control of *Pythium* blight on bentgrass golf greens in North Carolina has been observed after several successive applications of Subdue, but attempts to isolate resistant

with other fungicides is suggested for controlling *Pythium* species on turfgrasses. This type of use is less likely to cause resistant strains to develop to these two excellent new chemicals.

The new broad-spectrum fungicides for turfgrasses include Bayleton, Chipco 26019, Duosan, and Vorlan. Bayleton is formulated as a wettable powder with 25% triadimefon as the active ingredient and recommended at rates of 1-8 oz for the control of 10 different turfgrass diseases. This chemical has a different mode of action than most older fungicides and moves systemically up and down in the plant. The properties of downward movement may offer disease control on roots that has not been possible with other fungicides. Bayleton also has some physiological effects on plants, such as maintaining chlorophyll activity, that may help plants survive periods of stress. The fungicide has up to 21 days of activity against some diseases on the label, with longer effects noted in some experiments.

Chipco 26019 was often used in 1981 to control strains of dollar spot that were resistant to benzimidazole fungicides, with excellent results. This fungicide is formulated as a wettable powder with 50% iprodione as the active ingredient. Chipco 26019 has given excellent control for up to 28 days for some diseases, and resistant strains of fungi on turf have not

phenyl)-5-ethenyl-5-methyl-2,4-oxazolidione and has been labeled for the control of dollar spot and *Fusarium* patch; other diseases are expected to be added to the label soon. Iprodione and triadimefon have been formulated as granules and called Fungicide VI and Fungicide VII, respectively.

These new broad-spectrum fungicides have given good control of the diseases indicated on the labels but should be used intermittently with each other and with some of the older fungicides for a good disease management program. Several other new fungicides are being evaluated and may eventually have labels for use on turfgrasses.

Some of the new fungicides are rather expensive per pound, but because fewer applications are needed, the overall cost is often similar to that of some of the older fungicides. Wise and careful use of these and older products should ensure the availability of effective fungicides for many years.

Dr. Lucas is editor of the turf 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.