

Recently Labeled Fungicides Add Tools for Resistance Management

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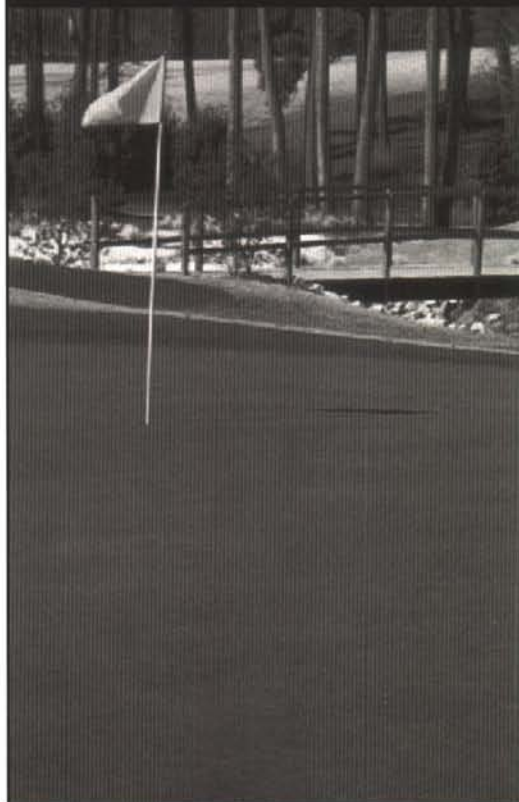


Now that the growing season has come to an end, many turfgrass managers are turning their attention to next year's budget and fungicide program. Within the last two years, four fungicides with novel active ingredients have been labeled for use on turfgrasses. Important considerations when selecting fungicides for disease control programs are the fungicide's efficacy, longevity, cost, formulation, topical mode of action, biochemical mode of action, and chemical class. Three of the four new fungicides belong to chemical classes that have not previously been used on turfgrasses. Since rotating fungicides from different chemical classes is important for resistance management, these new fungicides may become important tools for turfgrass managers as more and more chemicals are losing EPA registration. The trade names of the fungicides and the diseases that they are

labeled to control are listed in the table below.

Medallion®

Medallion® is marketed by Syngenta Professional Products. Medallion® is formulated as a 50% wettable powder that is packaged in five-ounce water soluble packets. The label rate for turfgrass diseases is between 0.20 and 0.50 oz./M with a maximum use rate of 1.5 oz./M per year. The active ingredient is fludioxonil which is the only member of the phenylpyrrole chemical class labeled for turfgrasses. Fludioxonil is a contact fungicide that has a single-site biochemical mode of action which acts by disrupting plasma membranes and amino acid uptake in the target fungi. Medallion® is labeled for the preventive control of seven diseases that are incited by ascomycetes and basidiomycetes (see table on page 24).



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Recently Labeled Fungicides & Diseases They are Labeled to Control

DISEASE	Emerald®	Endorse®	Insignia®	Medallion®
Anthracnose		X	X	
Bentgrass Dead Spot	X		X	X
Fairy Ring			X	
Gray Leaf Spot		X*	X	
Leaf Spot		X	X	X
Melting Out		X	X	
Microdochium Patch		X	X	X
Pink Patch			X	
Powdery Mildew			X	
Pythium Blight			X	
Rapid Blight			X	
Red Thread		X	X	
Rhizoctonia Brown Patch		X	X	X
Rhizoctonia Yellow Patch		X		X
Rust			X	
Sclerotinia Dollar Spot	X		X*	
Summer Patch			X	X
Take-all Patch			X	
Typhula Blight		X	X	X

* labeled for suppression but not for control

Endorse®

Endorse® is formulated as a 2.5% wettable powder and is marketed by Cleary Chemical Corporation and packaged in 1.1 pound water soluble packages. The label rate for turfgrass diseases is 4.0 oz./M. The active ingredient of Endorse® is the antibiotic polyoxin D which is in the polyoxin chemical class. Although polyoxins have been used to control rice diseases since the 1960's, polyoxin D is the first chemical in this class to be labeled for turfgrasses. Polyoxin D is a localized penetrant that inhibits chitin (an important cell wall component of many fungi) biosynthesis. Since this fungicide has a single-site mode of action, there is a moderate risk of pathogens developing resistance to the active ingredient. Endorse is labeled for nine diseases of turfgrasses that are incited by ascomycetes and basidiomycetes (see table) and is restricted from use on sod and turfgrasses grown for seed.


Emerald®

Emerald® is formulated as a 70% water dispersible granule and is marketed by BASF Professional Turf. The label rate for turfgrass diseases is between 0.13 and 0.18 oz./M. The active ingredient of Emerald® is boscalid which is only member of the anilide chemical class to be labeled for use on turfgrasses. Boscalid is an acropetal penetrant which inhibits the cellular res-

piration of the target fungi. Since this fungicide has a single-site mode of action, there is a moderate risk of pathogens developing resistance to the active ingre-


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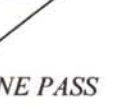
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dient. Emerald® is labeled for Sclerotinia dollar spot and bentgrass dead spot (both ascomycetes). This fungicide is currently only labeled for use on golf course turf.

Insignia®

Insignia® is formulated as a 20% water dispersible granule and is marketed by BASF Professional Turf. The label rate for turfgrass diseases is between 0.5 and 0.9 oz./M. The active ingredient of Insignia® is pyraclostrobin, which like azoxystrobin (Heritage®) and trifloxystrobin (Compass®) are members of the strobilurin chemical class. Pyraclostrobin is a localized penetrant which inhibits cellular respiration of target fungi. Since resistance to other fungicides in this chemical class with the same mode of action has already been documented, the resistance risk for Insignia® is high. Insignia® is labeled for the control of seventeen turfgrass diseases that are incited by ascomycetes, basidiomycetes, and oomycetes. Insignia® is currently only labeled for use on golf course turf.

These new fungicides add treatment options for turfgrass professionals who manage their risk of fungicide resistance by rotating chemical classes. Rotating

chemical classes of fungicides is one of several techniques that are used to reduce the development of fungicide resistance. Strategies used to avoid fungicide resistance include: never make more than two sequential applications of fungicides with the same biochemical mode of action, never use fungicides at a rate lower than stated on the label unless you are mixing two chemicals that have been proven to be synergistic, always make sure your spray equipment is calibrated and you are applying the fungicide evenly, and spray preventively whenever possible.

The fungicides discussed in this article represent three new chemical classes. Emerald®, Endorse®, Insignia®, and Medallion® have been tested for their efficacy at controlling various turfgrass diseases at the University of Wisconsin-Madison. If you have any questions regarding the efficacy of these fungicides or have any other questions, please consult the Wisconsin Turfgrass Research Reports or contact us at (608)845-2535. Additionally, if you are experiencing difficulty controlling certain diseases using fungicides that used to be efficacious, please let us know immediately and we will screen the pathogen for *in vitro* sensitivity to the fungicide. ♣



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