Getting the Most Out of the Newest Strobilurin Fungicide

By Paul Vincelli and Ed Dixon

Several months ago, Insignia 20WG fungicide received a federal label for use on golf courses for disease control. Insignia contains the active ingredient pyraclostrobin, which is a member of the strobilurin (QoI) class of fungicides. Turf managers should note that Insignia is labeled only for use on golf courses.

Pyraclostrobin has a rather broad spectrum of activity against fungal pathogens in turfgrass as reflected by the range of diseases on the label. In preparation for writing this article, we searched the literature available to us and found 52 scientifically valid research reports which included Insignia. As always, the principal source for fungicide efficacy ratings in the University of Kentucky Turf Program was the journal *Fungicide and Nematicide Tests*, although other published reports were used when available. The efficacy of the product was evaluated in the 52 reports, and the results are summarized in Table 1.

These efficacy ratings are based on the best information available to us at the time of publication; ratings may change as new information becomes available. It should also be noted that the manufacturer has access to results of many research trials that we have not seen.

Based on the available data, it is clear that Insignia has excellent activity against brown patch and gray leaf spot. It also appears to be useful for control of pink snow mold/Microdochium patch, red thread and take-all patch. In a single test for each disease, Insignia performed well against leaf spot, leaf rust and summer patch. One test is not enough to make a judgement about efficacy, however.

Performance against anthracnose, dollar spot, and Pythium blight has been erratic in published tests. While it performed well against these diseases in certain tests, efficacy has been variable enough that superintendents may wish to use this tank-mix product with other fungicides when targeting these diseases. It should be noted that the Insignia label only claims "suppression" for dollar spot, and it recommends tank-mixable with another effective dollar-spot fungicide under moderate to severe dollar spot pressure. The reader should also note that there is no single product that consistently controls anthracnose.

As is typical of the strobilurin fungicides, pyraclostrobin is effective at low use rates and has low mammalian toxicity. Strobilurin fungicides typically are toxic to highly toxic to rainbow trout and Daphnia magna (water flea), which are indicator species of toxicity to aquatic ecosystems. Among the strobilurins, pyraclostrobin is particularly toxic to rainbow trout. Thus, it will be important when using the product carefully to avoid contamination of streams, ponds and lakes.

The potential for resistance to pyraclostrobin is high.

Some guidelines for minimizing the risk of contamination are available on the label. One factor that will help reduce risk to aquatic ecosystems is pyraclostrobin's strong ability to bind to organic matter in leaves and thatch. The binding ability of pyraclostrobin is the highest among the range of turf fungicides to which we compared it. This strong binding to organic matter will also help minimize leaching potential.

Pyraclostrobin is strongly lipophilic, which means it binds tightly to the waxy cuticle of turfgrass plants. It's not a systemic fungicide; pyraclostrobin simply moves across the leaf blade from the treated leaf surface to the other surface. Thus, applicators should strive for excellent spray coverage to get the most out of this product.

Insignia has a single, specific biochemical site of action in the fungal cell, which it shares with other strobilurin fungicides. Since resistance to these fungicides has occurred rather quickly in certain fungi, including the gray leaf spot and anthracnose fungi in turf, the potential for resistance to pyraclostrobin is high. In locations

Continued on page 62

TABLE 1

Efficacy ratings for Insignia 20WG® fungicide based on published reports available to the authors as of February, 2003.

DISEASE (PATHOGEN)	EFFICACY OF INSIGNIA[a]
Anthracnose (Colletotrichum graminicola)	++
Bentgrass Dead Spot (Ophiosphaerella agrostis)	L
Brown Patch (Rhizoctonia solani)	++++
Dollar Spot (Sclerotinia homoeocarpa) (suppression only)	++
Fairy Ring (various basidiomycete fungi)	L
Fusarium patch (=Microdochium Patch) (Microdochium nivale)	+++
Gray Leaf Spot (Pyricularia grisea)	++++
Gray Snow Mold (Typhula incarnata)	NA
Leaf Spot (Bipolaris, Drechslera, Exserohilum)	L
Melting Out (Drechslera poae)	L
Pink Patch (Limonomyces roseipellis)	L
Pink Snow Mold (Microdochium nivale)	+++
Pythium Blight (Pythium aphanidermatum, Pythium spp.)	++
Rapid Blight (Labyrinthula spp.)	L
Red Thread (Laetisaria fuciformis)	++++
Rust (Puccinia and Uromyces spp.)	+++
Summer Patch (Magnaporthe poae)	L
Take-All Patch (Gaeumannomyces graminis var. avenae)	+++

[a] **Rating system for fungicide efficacy is as follows:**
++++ = consistently good to excellent control in published experiments
+++ = good to excellent control in most experiments
++ = fair to good control in most experiments
+ = control is inconsistent between experiments, but performs well in some instances
= no efficacy
L = limited published data on effectiveness
NA = not applicable to Kentucky

Continued from page 60

where resistance to strobilurin fungicides is known to occur, there will be generally no value in using Insignia to control that disease. (There may be occasional exceptions to this statement, depending on the particular resistance mutation present at the site, but these exceptions are not expected to be common.)

Given the high risk of resistance to pyraclostrobin, it is strongly recommended that users be familiar with the section in the label on "Resistance Management."

Vincelli is an extension professor and Dixon is a research analyst in the Department of Plant Pathology at the University of Kentucky.