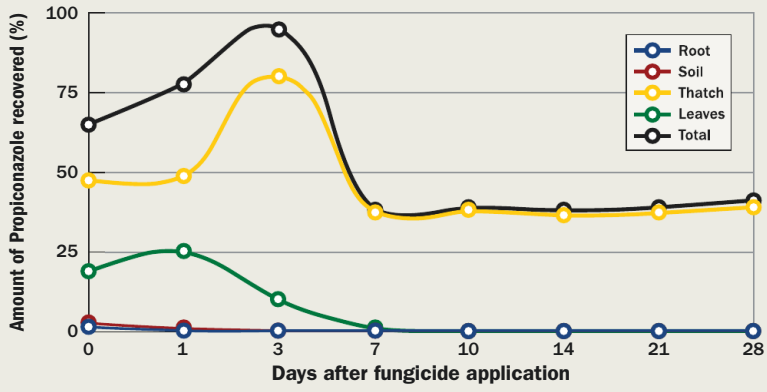
FIGURE 2

Fate of propiconazole after application using a boom-sprayer in a Kentucky bluegrass sward.



Roots, soil, thatch and leaves were sampled zero, one, three, seven, 10, 14, 21 and 28 days after the initial fungicide application to determine percent recovery of propiconazole. Figure was adapted from Schumann et al., 2000.

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thatch (Figure 2) (Schumann, 2000).

Most turf pathologists acknowledge that the thatch is where *R. solani* survives when not causing disease; therefore it is plausible that fungicide residues in the thatch may prevent the fungus from starting new infections for about one month or so. Of course the major assumption here is that products, such as azoxystrobin and flutolanil, follow the same fate as propiconazole. At least with azoxystrobin, Syngenta materials claim the product readily binds to organic matter. It is likely a safe assumption that most azoxystrobin residue would reside in the thatch (Syngenta, 2005).

KNOW YOUR ENEMY

Many different factors affect fungicide persistence in the environment. Turfgrass systems are extremely dynamic with respect to plant growth and microbial metabolism and consequently, fungicides applied to the foliage do not persist for more than seven to 10 days. Although most fungicides are re-applied every 14 to 28 days when conditions favor disease development, in some cases it may be necessary to tighten that re-application interval to account for increased pathogen activity and fungicide depletion.

Alternatively, fungicides may persist for long periods of time (> 28 days) when pathogen activity and/or fungicide depletion is low. Fungicide depletion is important to consider when breakthrough occurs because not all fungicide failures should or can be attributed to fungicide resistance. During hot, humid summers when pathogen activity is high, shorter intervals may be needed to overcome fungicide depletion and intense disease pressure, regardless of the status of fungicide resistance in the fungal population.

My goal with these articles are not to frighten superintendents, but to educate on all the factors that encompass fungicide program development. Developing a fungicide program is more complex than simply picking a product or products and applying them on a pre-designated application strategy. Improvisation is likely needed depending on what Mother Nature deals us during the season.

Most superintendents develop sound fungicide programs that hold up season after season, but if problems have occurred I encourage you to investigate some of the topics I've discussed. In some instances we can extend residual control of fungicides and in others we cannot. Fungicides are essential, valuable tools for superintendents, but they do have limitations. When used in conjunction with sound agronomic practices they will work. However there are times when they fail and it is not necessarily the fault of the chemistry.

The best way to combat diseases and thereby maximize fungicide efficacy is to understand the diseases and the fungicides that are used to control them.

Remember that when fighting diseases and good luck this season!

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