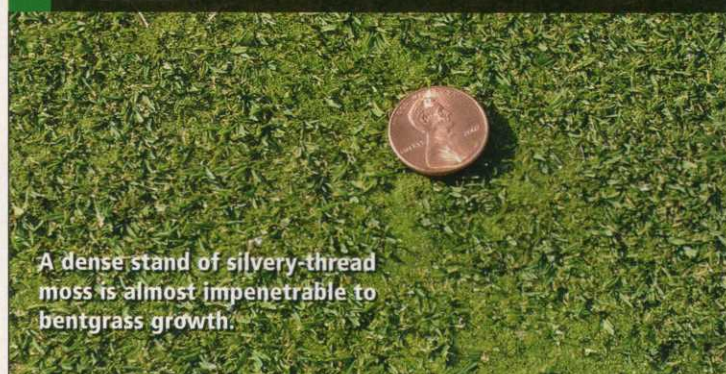


New Control Option Available for Moss on Bentgrass Greens

By Scott McElroy and Greg Breeden

“Moss is a weed problem in turf.” When non-golf course people hear me make this comment during a presentation, they think I’m joking. Some get a quizzical look on their face, like they are trying to solve a hard math problem.

FIGURE 1



A dense stand of silvery-thread moss is almost impenetrable to bentgrass growth.

But for superintendents, moss is a real problem. Specifically silvery-thread moss (*Bryum argenteum*) is an increasing problem on bentgrass putting greens. The dense stands that moss develops on a bentgrass green (Fig. 1) are virtually impenetrable to bentgrass growth.

Moss does not seem to conform to environmental conditions either, so it is difficult to pinpoint specific causal agents. It appears in shade and sun. Dry and wet conditions. Native soil and constructed, sand-based greens. North or south, east to west. It seems to appear everywhere or nowhere.

While moss contamination cannot be attributed to certain environmental weather factors, it can be correlated with management practices. In other words, moss is a problem that you create a niche for it to thrive. All for the sake of green speed.

To determine what gives moss a chance to survive, think of some of the practices you undertake to speed up your greens, namely lower nitrogen fertility and more intense mowing practices. Both of these practices decrease the competitive ability of the bentgrass, specifically the ability of

the bentgrass to recover from injury. And soon that slow-to-recover divot is filled with moss.

To control moss and regain a healthy stand of turf, superintendents have tried numerous different ideas — all with varying degrees of success but no consistency. Researchers have tried numerous ideas, such as utilizing copper, iron and fungicides, but these products have had varying degrees of success and injury to the bentgrass has been observed (Burnell et al. 2003).

Traditional herbicides currently on the market haven’t been of much help either. If they controlled the moss, it injured the bentgrass, or if no injury to the bentgrass, no moss control. For example, many traditional herbicides such as 2,4-D and dicamba [neither of these herbicides controls moss] that are only active on broadleaf weeds and not grasses still have restrictions on how they can be used on bentgrass golf course greens. This is because bentgrass under greens management conditions is under such stress that it has a difficult time metabolizing any herbicide.

QuickSilver is a new herbicide product from FMC that contains a single active ingredient, carfentrazone. Carfentrazone is a contact herbicide that is active only on broadleaf dicot weeds, such as henbit, white clover and chickweed.

Because carfentrazone is a contact material in nature and does not translocate through the plant, one should not expect complete control of large plants. For this reason, carfentrazone has recently been included in products such as PowerZone and SpeedZone that contain broadleaf herbicides such as 2,4-D, dicamba, MCPP and MCPA. In these products carfentrazone aids in providing faster weed control, but the end result is usually the same.

QuickSilver, however, has filled the niche for moss control with bentgrass safety. In one of those odd phenomena, it was discovered that QuickSilver provides excellent control of moss, with no injury to bentgrass greens (Fig. 2). Because this herbicide solves a problem for turfgrass managers, a special registration label is in

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 Floratine

QUICK TIP

Floratine recommends fertility strategies to provide all the essentials required for strong turf. In practice, this means maximizing soil availability of nutrients and supplementing with foliar feeding as needed to insure linear supplies of all the essentials, all the time, in appropriate amounts.

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the process of being submitted to EPA for use of QuickSilver on bentgrass greens in Tennessee for moss control.

Extensive research around the country has confirmed that bentgrass is extremely tolerant of QuickSilver, even up to 6X the label rate of 2.2 fluid ounces per acre (McElroy and Breeden 2005). Extensive testing was conducted at the University of Tennessee this year to evaluate tolerance of several bentgrass cultivars to QuickSilver. No injury was observed on four of the five greens that were evaluated (Table 1).

But the one golf green that was injured was a problem, because if one green could be injured, how many more would be injured when this product enters wide spread use? This one case of injury had the potential to jeopardize the entire registration process for using QuickSilver on bentgrass golf greens for moss control. But some differences began to come to light regarding QuickSilver injury at this golf course. Working with superintendent Steve Livesay at the Crossings in Fall Branch, Tenn., we came up with two possible reasons why injury was observed and why this situation was unique.

First, core aeration and sand top dressing occurred approximately three days prior to the initial QuickSilver application. Everyone knows that these abrasive management practices are absolutely necessary for the sustainable management of bentgrass putting greens. It is not known, however, if the stress induced by cultural practices, such as core aeration, top-dressing and also verticutting create a situation where the bentgrass is more susceptible to turfgrass injury.

It seems intuitive that this would be the case but there are no studies that indicate that this is true. But from our experience at The Crossings, the cultural management prior to treatment most likely created a turf primed for injury.

Second, when we started closely evaluating the injury observed on the bentgrass green at The Crossings, one revelation quickly came to light: Underlying all of the damaged turfgrass was the weed we were targeting — moss. In other words, in the areas where injury occurred, moss was present below the grass canopy, hiding, probably already causing a lot of stress to the bentgrass before we treated with QuickSilver.

When we began looking closer it was apparent there was a lot more moss in this putting green than just the circular spots as observed in Figure 1. Most of the moss seemed to be invisible until you part back the bentgrass leaves and look below the canopy.

These observations will most likely lead to precautionary statements being added to the QuickSilver label. Here are some of those probable precautions that one will have to take when using QuickSilver for moss control in bentgrass greens:

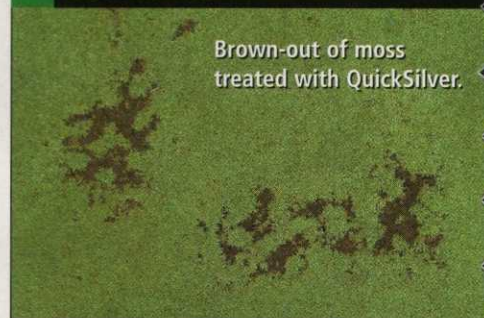
- Wait two weeks after aeration or verticutting practices before applying QuickSilver.
- If injury is observed, wait until the bentgrass is completely recovered (three to four weeks) before making a second application.
- Do not apply to bentgrass that is under stress.
- Do not apply above 85 degrees Fahrenheit.
- Make sure you have a clean spray tank. Any contaminants can quickly lead to damaged bentgrass.

Develop management plan

As discussed earlier, moss is a problem that we create an environment for it to thrive. So simply killing it with QuickSilver will not solve the problem. You must increase the vigor of the turf to fill in damaged areas and prevent moss invasion. To this end, here is a more adaptive strategy for controlling moss:

- Apply QuickSilver at 6.7 fluid ounces per acre. Evaluate injury to

FIGURE 2



bentgrass. If injured, discontinue use for four weeks to allow recovery.

- Apply a second application at 6.7 fluid ounces per acre, two to three weeks later according to label recommendations.

■ Increase fertility to a practical level based on your current fertility use throughout the application period to improve recover of the bentgrass.

- Possibly integrate light verticutting or grooming after QuickSilver applications to disturb the killed thick moss mat and stimulate bentgrass growth.

Final thoughts

QuickSilver has been a unique find in the turfgrass weed science arena. While precautions have arisen, this is normal in the development of a herbicide program.

No herbicide out there is completely safe and all herbicides must be used according to label recommendations to insure safe and effective use. In all cases, remember to consult the herbicide label for specific directions and precautions before applying any herbicide.

Special thanks to Steve Livesay, superintendent at The Crossing Golf Course; Joe Kennedy and Jerry Craven, superintendents at the Little Course and The Vanderbilt Legends Club; and Bobby Campbell, superintendent of the University of Tennessee athletic fields, for use of their facilities in conducting this research.

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