

# Evaluation of Newer Products for Selective Control of Moss on Creeping Bentgrass Greens

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## Objectives:

1. To evaluate new ways to reduce moss in putting greens without causing phytotoxic effects to bentgrass.

**Start Date:** 2005

**Project Duration:** two years

**Total Funding:** \$6,000

Of between four and five thousand mosses that exist, silvery thread moss (*Bryum argenteum* Hedw.) continues to be a troublesome problem for putting greens across much of the United States because it interrupts surface aesthetics and smoothness. A number of products can suppress moss to varying degrees, and they range from metals, soaps, and salts, as well as certain fungicides.

Beginning April 21 until October 4, applications were made at two-week intervals; sodium bicarbonate (baking soda) and two carfentrazone-ethyl (Quicksilver 21.3; FMC Corp., Philadelphia, PA) herbicide rates were applied on the first two dates. A third carfentrazone-ethyl treatment was applied both spring and fall at label rate: the first two and last two application dates. Contact fungicides used in the study were chlorothalonil (Daconil Ultrex 82.5 WDG), mancozeb (Fore 80 WP), and Thiram (Spotrete 75 WDG).

During the study period, all treatments reduced moss diameter and did not cause bentgrass phytotoxicity based on visual quality ratings. A single spring application of baking soda can effectively



Silvery thread moss interrupts the surface aesthetics of bentgrass green at CDGA's 3-hole Sunshine Golf Course in Lemont, IL during April 2006.

suppress moss all season, but is more labor intensive because it is phytotoxic to bentgrass and requires spot application.

Fungicides were capable of moss suppression on a majority of dates, but required multiple applications. In addition to cost considerations, Daconil Ultrex 82.5 WDG has a label limitation on greens of 88.5 pounds per acre per growing season and was exceeded by fungicide treatments in this study. However, all fungicides reduced moss diameter by June 13 following three consecutive applications.

The herbicide Quicksilver has recently been labeled for moss control of bentgrass and is safe on 'Crenshaw' and 'Penncross' at green height. Similarly, we found Quicksilver was not phytotoxic to an 'L-93'/'G-2' green. A spring and fall application of Quicksilver at 6 oz/A is recommended given: a) half label rate was unable to reduce moss diameter by June, b) moss encroachment of Quicksilver plots occurred during September, and c) Quicksilver applied during September at labeled rate reduced moss diameter by October 16.

In Chicago, the second Quicksilver applications would likely be late August to early September. This would both avoid warm conditions (> 90 °F) that risk phytotoxicity to bentgrass and be early enough to suppress the observed moss growth surge during fall.

In conclusion, no strategy was capable of eliminating moss on a green in this study. Moss control strategies should be timed during spring and fall when moss growth is peak. Although not demonstrated in this study, sequential fungicide applications can likely be discontinued at midsummer without sacrificing efficacy, a time when moss growth was static.

Controlled studies may better elucidate environmental factors such as heat which likely influence moss encroachment of putting greens. Such information could be used to optimize moss suppression with fungicides and ensure label restrictions are



Randy Kane (right) and Chris Painter evaluate treatments to reduce moss of a bentgrass green at CDGA's 3-hole Sunshine Golf Course in Lemont, IL during July, 2006.

met (e.g. Daconil Ultrex). Quicksilver at label rate (6.7 oz/1000 ft<sup>2</sup>) needs to be evaluated for health effects on *Poa annua*, as well as the plethora of improved bentgrass cultivars now available. Demonstrated safety of Quicksilver at green height regardless of turf species/cultivar would facilitate greater acceptance of this new moss control strategy.

## Summary Points

- Multiple strategies can be used to suppress moss.
- No strategy was capable of eliminating moss.
- Moss strategies should be timed when moss is actively growing spring and fall, and may not be necessary midsummer.
- Baking soda spot applied twice in spring can effectively suppress moss all season.
- Chlorothalonil alone or in combination with other contact fungicides can suppress moss, but requires at least three sequential applications every 14 days.
- Spring and fall applications of Quicksilver at 6 oz/A (four total) can effectively suppress moss without adverse effects to bentgrass health.