# 2018-2019 Snow Mold Timing Evaluation:
# OJ Noer Research Facility – Madison, WI
# Wausau Country Club – Schofield, WI
# Timber Ridge Golf Club – Minocqua, WI

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## OBJECTIVE

To evaluate optimal timing of fungicide applications to control gray snow mold (caused by *Typhula incarnata*), speckled snow mold (*T. ishikariensis*), and Microdochium patch (*Microdochium nivale*) on fairway height turfgrass.

## MATERIALS AND METHODS

This evaluation was conducted at three locations: the OJ Noer Turfgrass Research and Education Facility in Madison, WI on an 'Penncross' creeping bentgrass (*Agrostis stolonifera*) fairway maintained at a height of 0.5 inches, and at Wausau Country Club in Schofield, WI and at Timber Ridge Golf Club in Minocqua, WI on a creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) golf course fairway maintained at a height of 0.5 inches. Individual plots measured 3 ft x 10 ft and were arranged in a randomized complete block design with four replications. Treatments consisted of multiple fungicide application timings, beginning 8 weeks prior to traditional snow cover at each location and proceeding at 2-week intervals until immediately before snow cover (Table 1). Individual treatments were applied at a nozzle pressure of 40 psi using a $CO_2$-pressurized boom sprayer equipped with two AI8004 Teejet air induction nozzles. All fungicides were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 $ft^2$. Disease severity and turf quality were evaluated on 21 Mar 2019 in Madison, on 2 Apr 2019 in Schofield, and on 26 Apr 2019 in Minocqua. Disease severity was visually rated as percent area affected, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable. Treatment means were analyzed using Fisher's LSD method and are presented in Table 1.

## RESULTS AND DISCUSSION

No snow mold was observed at the site in Wausau and very little snow mold was observed at the Madison location. Heavy snow mold pressure was observed in Minocqua and primarily consisted of speckled snow mold. A sharp drop in disease severity was observed when fungicides were applied 4 weeks prior to traditional snow mold (treatment 4), though an even greater decrease was observed when fungicides were applied 2 weeks prior to traditional snow cover (treatment 5). Treatment 5 was applied when heating degree days accumulated to 115, which is consistent with past effective timings from previous research at this location. Fungicides are likely most effective at this time due to the snow mold fungus beginning to grow and hence able to absorb the fungicide.

**Table 1. Treatment list for the field study investigating the impact of fungicide timing on snow mold severity.**

| Trt # | Fungicide | Projected Application Timing[z] | Proposed Application Dates Each Year | | |
|---|---|---|---|---|---|
| | | | Minocqua | Wausau | Madison |
| 1 | Non-treated | NA | NA | NA | NA |
| 2 | Instrata (9.3 fl oz) | 8 weeks | Sep 1 | Sep 15 | Oct 1 |
| 3 | Instrata (9.3 fl oz) | 6 weeks | Sep 15 | Oct 1 | Oct 15 |
| 4 | Instrata (9.3 fl oz) | 4 weeks | Oct 1 | Oct 15 | Nov 1 |
| 5 | Instrata (9.3 fl oz) | 2 weeks | Oct 15 | Nov 1 | Nov 15 |
| 6 | Instrata (9.3 fl oz) | 0 weeks | Nov 1 | Nov 15 | Dec 1 |
| 7 | Instrata (9.3 fl oz) | Pre snow | -- | -- | -- |

[z]Projected application timing refers to number of weeks prior to typical snow cover. Typical snow cover was defined as Nov 1 for Minocqua, Nov 15 for Wausau, and Dec 1 for Madison.

**Table 2. Heating Degree Days, 2-inch soil temperature, disease severity, and turf quality as assessed at Timber Ridge Golf Course in Minocqua, WI in 2018-2019.**

| Trt # | Application Date | HDD[z] | 2" Soil Temp (F) | Disease Severity[y] | Turf Quality[x] |
|---|---|---|---|---|---|
| 1 | Non-treated | NA | NA | 93.8a | 1.0d |
| 2 | Aug 31 | 0 | 63.7 | 95.0a | 1.0d |
| 3 | Sep 14 | 0 | 62.7 | 93.8a | 1.0d |
| 4 | Oct 2 | 24 | 49.3 | 51.3b | 5.0c |
| 5 | Oct 15 | 115 | 38.8 | 8.8c | 6.0b |
| 6 | Nov 2 | 273 | 34.9 | 0.0c | 7.0a |
| 7 | Nov 15 | 599 | 33.3 | 0.0c | 7.0a |

[z]Heating Degree Days was calculated by taking the mean temperature for each day beginning on July 1st and subtracting that number from 50°F. Negative numbers (ie means temperatures above 50°F) were removed and the summation is presented here.

[z]Disease severity visually assessed as percent area affected on April 26th, 2019. Means followed by the same letter do not significantly differ (P = 0.05, Fisher's LSD).

[y]Turf quality was visually assessed on a 1-9 scale with 6 being acceptable on April 26th, 2019. Means followed by the same letter do not significantly differ (P = 0.05, Fisher's LSD).

**Table 3. Heating Degree Days, 2-inch soil temperature, disease severity, and turf quality as assessed at Wausau Country Club in Schofield, WI in 2018-2019.**

| Trt # | Application Date | HDD[z] | 2" Soil Temp (F) | Disease Severity[y] | Turf Quality[x] |
|---|---|---|---|---|---|
| 1 | Non-treated | NA | NA | 0.0a | 7.0a |
| 2 | Sep 14 | 0 | 72.1 | 0.0a | 7.0a |
| 3 | Oct 2 | 28 | 50.1 | 0.0a | 7.0a |
| 4 | Oct 15 | 133 | 41.4 | 0.0a | 7.0a |
| 5 | Nov 2 | 293 | 37.8 | 0.0a | 7.0a |
| 6 | Nov 15 | 1414 | 31.1 | 0.0a | 7.0a |
| 7 | NA | -- | -- | 0.0a | 7.0a |

[z]Heating Degree Days was calculated by taking the mean temperature for each day beginning on July 1st and subtracting that number from 50°F. Negative numbers (ie means temperatures above 50°F) were removed and the summation is presented here.
[z]Disease severity visually assessed as percent area affected on April 2nd, 2019. Means followed by the same letter do not significantly differ (P = 0.05, Fisher's LSD).
[y]Turf quality was visually assessed on a 1-9 scale with 6 being acceptable on April 2nd, 2019. Means followed by the same letter do not significantly differ (P = 0.05, Fisher's LSD).

**Table 4. Heating Degree Days, 2-inch soil temperature, disease severity, and turf quality as assessed at the OJ Noer Turfgrass Research Facility in Madison, WI in 2018-2019.**

| Trt # | Application Date | HDD[z] | 2" Soil Temp (F) | Disease Severity[y] | Turf Quality[x] |
|---|---|---|---|---|---|
| 1 | Non-treated | NA | NA | 6.0ab | 6.3ab |
| 2 | Oct 2 | 0 | 57.6 | 0.0c | 7.0a |
| 3 | Oct 15 | 51 | 51.1 | 1.0bc | 7.0a |
| 4 | Oct 31 | 145 | 49.3 | 0.5c | 7.0a |
| 5 | Nov 15 | 399 | 31.4 | 0.0c | 7.0a |
| 6 | Dec 3 | 714 | 33.4 | 0.0c | 6.8a |
| 7 | NA | -- | -- | 7.5a | 5.8b |

[z]Heating Degree Days was calculated by taking the mean temperature for each day beginning on July 1st and subtracting that number from 50°F. Negative numbers (ie means temperatures above 50°F) were removed and the summation is presented here.
[z]Disease severity visually assessed as percent area affected on March 21st, 2019. Means followed by the same letter do not significantly differ (P = 0.05, Fisher's LSD).
[y]Turf quality was visually assessed on a 1-9 scale with 6 being acceptable March 21st, 2019. Means followed by the same letter do not significantly differ (P = 0.05, Fisher's LSD).