laying eggs, as she has the perception she’s never running out of space. She seems to prefer building her brood from the bottom up (don’t we all?) so once the queen is laying eggs in the top deep (usually the third,) the Bee Squad will move that box to the bottom of the stack, and she’ll re-start her upward ascent. Most importantly, a reversal allows workers to store honey in the new top deep (previously the bottom) which is where the colony will spend the winter eating and shivering together.

The bees have become a favorite topic of conversation amongst Somerset Golf Club members and guests, and that, says Brian, is the whole point of keeping them on the golf course property. The answer to the honey bee crisis is a very complex one involving multiple factors, from mites to management, but there are simple ways to work towards a solution: spreading interest and awareness about the importance of pollinators through gardens, hives, and conversations with neighbors, learning to keep bees, or sup-
porting research on honey bees and other at-risk pollinators.

Remember, planting food for bees and other pollinators on golf course properties can be as simple as selecting plants that provide good pollen and nectar sources throughout the growing season (Plants for Minnesota Bees). It’s also imperative to care for all pollinators in ways that will ensure that their food is clean (http://www.pollinator.org/golfcourse.htm). For more information about the UMN Bee Squad, visit us at www.beesquad.umn.edu.
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OBJECTIVES

To evaluate fungicides for the control of Typhula blight (caused by Typhula ishikariensis and T. incarnata) and Microdochium patch (caused by Microdochium nivale).

MATERIALS AND METHODS

This evaluation was conducted at The Legacy at Craguns GC in Brainerd, MN on a creeping bentgrass (Agrostis stolonifera) golf course fairway maintained at a height of 0.5 inch. Individual plots measured 3 ft x 10 ft (30 ft²), and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i using a CO₂ pressurized boom sprayer equipped with two XR Teejet 8004 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 2 gallons of water per 1000 ft². All applications were made on October 24th, 2013. The experimental plot area was not inoculated. There was consistent snow cover on the experimental area from late November until mid-April, a total of over 120 days. Disease severity, turf quality, and color were recorded on May 7th, 2014. Disease severity was visually rated as percent area affected, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable, Normalized Difference Vegetative Index (turfgrass color) was rated using a GreenSeeker NDVI Turf Color Meter® from NTech Industries (Ukiah, CA). Treatment means were analyzed using the Waller Duncan method and are presented in Table 1.

RESULTS AND DISCUSSION

Disease pressure was high at Craguns in 2013-2014, with non-treated controls averaging 75% disease. Speckled snow mold (T. ishikariensis) was the primary disease observed in the experimental area, though minor amounts of snow scald (Myriosclerotinia borealis) were also observed. Despite this intense pressure, all 29 treatments suppressed snow mold relative to the non-treated control. Of these 29 treatments, 20 provided outstanding suppression (< 5.5% disease). Nearly all of these treatments contained at least three active ingredients, with some treatments containing four or even five active ingredients. Turf quality closely mirrored disease severity, with the same 20 treatments providing acceptable quality (6 or higher). No differences in turf color were observed using the NDVI meter amongst products providing adequate disease suppression.
Table 1: Mean snow mold severity, turf quality, and turf color assessed on May 7th, 2014 at The Legacy at Craguns GC in Brainerd, MN.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>Application Timing</th>
<th>Disease Severity</th>
<th>Turf Quality</th>
<th>Turf Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Non-treated control</td>
<td>75.0a</td>
<td></td>
<td>2.8g</td>
<td>0.465h</td>
<td></td>
</tr>
<tr>
<td>2 Instrata</td>
<td>7.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>8.8d-g</td>
<td>5.5cde</td>
<td>0.690c-f</td>
</tr>
<tr>
<td>3 Instrata</td>
<td>9.3 fl oz/1000 ft2</td>
<td>Late</td>
<td>5.5e-h</td>
<td>6.0bcd</td>
<td>0.692b-e</td>
</tr>
<tr>
<td>4 Compass</td>
<td>0.2 oz/1000 ft2</td>
<td>Late</td>
<td>62.5b</td>
<td>3.3g</td>
<td>0.550g</td>
</tr>
<tr>
<td>5 Interface Mirage</td>
<td>4.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>2.3fgh</td>
<td>6.8ab</td>
<td>0.710a-d</td>
</tr>
<tr>
<td>6 Interface Mirage</td>
<td>5.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>2.3fgh</td>
<td>6.8ab</td>
<td>0.717abc</td>
</tr>
<tr>
<td>7 Interface Mirage</td>
<td>5.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>2.8e-h</td>
<td>6.8ab</td>
<td>0.720abc</td>
</tr>
<tr>
<td>8 Mirage Compass</td>
<td>0.63 fl oz/1000 ft2</td>
<td>Late</td>
<td>5.0e-h</td>
<td>6.3abc</td>
<td>0.715abc</td>
</tr>
<tr>
<td>9 Mirage Compass</td>
<td>0.94 fl oz/1000 ft2</td>
<td>Late</td>
<td>4.8e-h</td>
<td>6.3abc</td>
<td>0.700a-e</td>
</tr>
<tr>
<td>10 Mirage Compass</td>
<td>1.57 fl oz/1000 ft2</td>
<td>Late</td>
<td>4.3e-h</td>
<td>6.3abc</td>
<td>0.712abc</td>
</tr>
<tr>
<td>11 Mirage Compass</td>
<td>1.89 fl oz/1000 ft2</td>
<td>Late</td>
<td>2.5e-h</td>
<td>6.5ab</td>
<td>0.705a-e</td>
</tr>
<tr>
<td>12 SP28296 Mirage</td>
<td>5.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>2.0fgh</td>
<td>7.0a</td>
<td>0.730a</td>
</tr>
<tr>
<td>13 SP28296 Mirage</td>
<td>6.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>1.0h</td>
<td>7.0a</td>
<td>0.722abc</td>
</tr>
<tr>
<td>14 SP28296 Mirage</td>
<td>8.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>1.0h</td>
<td>7.0a</td>
<td>0.727ab</td>
</tr>
<tr>
<td>15 SP28297 Mirage</td>
<td>3.816 fl oz/1000 ft2</td>
<td>Late</td>
<td>1.8fgh</td>
<td>6.8ab</td>
<td>0.715abc</td>
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<tr>
<td>16 SP28297 Mirage</td>
<td>4.77 fl oz/1000 ft2</td>
<td>Late</td>
<td>0.0h</td>
<td>7.0a</td>
<td>0.727ab</td>
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<tr>
<td>17 SP28297 Mirage</td>
<td>5.724 fl oz/1000 ft2</td>
<td>Late</td>
<td>1.3gh</td>
<td>6.8ab</td>
<td>0.722abc</td>
</tr>
<tr>
<td>18 Trilogy</td>
<td>3.14 fl oz/1000 ft2</td>
<td>Late</td>
<td>10.0de</td>
<td>6.0bcd</td>
<td>0.697a-e</td>
</tr>
<tr>
<td>19 Trilogy</td>
<td>5.56 fl oz/1000 ft2</td>
<td>Late</td>
<td>9.3def</td>
<td>5.5cde</td>
<td>0.687c-f</td>
</tr>
<tr>
<td>20 Interface Triton FLO Droplex</td>
<td>3.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>15.0d</td>
<td>5.0ef</td>
<td>0.672ef</td>
</tr>
<tr>
<td>21 Instrata Droplex</td>
<td>5.5 fl oz/1000 ft2</td>
<td>Late</td>
<td>13.8d</td>
<td>5.3de</td>
<td>0.690c-f</td>
</tr>
<tr>
<td>22 Banner MAXX II Civitas Harmonizer Droplex</td>
<td>1.0 fl oz/1000 ft2</td>
<td>Late</td>
<td>32.5c</td>
<td>4.3f</td>
<td>0.655f</td>
</tr>
</tbody>
</table>

*A fungicide treatments were applied on Oct. 24th, 2013.
*B Mean percent diseased area assessed on May 7th, 2014.
*C Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.
*D Color was assessed using a Greenseeker NDVI Turf Color Meter from NTech Industries®.
Disease pressure was very high at Cragun’s and provided some excellent results for northern mid-west golf courses.

### Table 1 (cont): Mean snow mold severity, turf quality, and turf color assessed on May 7\(^{th}\), 2013 at The Legacy at Craguns GC in Brainerd, MN.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Rate</th>
<th>Application Timing(^a)</th>
<th>Disease Severity(^b)</th>
<th>Turf Quality(^c)</th>
<th>Turf Color(^d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QP TM/C</td>
<td>6.0 oz/1000 ft(^2)</td>
<td>Late</td>
<td>16.3d</td>
<td>5.3de</td>
<td>0.675def</td>
</tr>
<tr>
<td>QP Iprodione</td>
<td>4.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>QP Propiconazole</td>
<td>2.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foursome</td>
<td>0.5 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QP TM/C</td>
<td>6.0 oz/1000 ft(^2)</td>
<td>Late</td>
<td>3.0e-h</td>
<td>6.5ab</td>
<td>0.697a-e</td>
</tr>
<tr>
<td>QP Iprodione</td>
<td>4.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QP Tebuconazole</td>
<td>0.6 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Foursome</td>
<td>0.5 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>QP Iprodione</td>
<td>4.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td>0.5h</td>
<td>7.0a</td>
<td>0.727ab</td>
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<tr>
<td>QP Tebuconazole</td>
<td>1.1 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foursome</td>
<td>0.5 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QP Enclave</td>
<td>8.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td>2.5e-h</td>
<td>6.5ab</td>
<td>0.710a-d</td>
</tr>
<tr>
<td>Foursome</td>
<td>0.5 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Torque 26/36</td>
<td>0.75 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td>5.5e-h</td>
<td>6.0bcd</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td>0.687c-f</td>
</tr>
<tr>
<td>28</td>
<td>Torque 26/36</td>
<td>0.75 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td>2.3fgh</td>
<td>6.8ab</td>
</tr>
<tr>
<td></td>
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<td>4.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td>0.727ab</td>
</tr>
<tr>
<td></td>
<td>Legend</td>
<td>5.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td></td>
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<tr>
<td>29</td>
<td>Torque 26/36</td>
<td>0.6 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td>3.0e-h</td>
<td>6.5ab</td>
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<tr>
<td></td>
<td>Heritage TL</td>
<td>4.0 fl oz/1000 ft(^2)</td>
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<td></td>
<td>0.715abc</td>
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<td></td>
<td>1.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
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<tr>
<td>30</td>
<td>Chipco 26GT</td>
<td>4.0 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td>25.0c</td>
<td>4.8ef</td>
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<tr>
<td></td>
<td>Daconil W eatherstik</td>
<td>5.5 fl oz/1000 ft(^2)</td>
<td>Late</td>
<td></td>
<td>0.687c-f</td>
</tr>
</tbody>
</table>

\(^a\)Fungicide treatments were applied on Oct. 24\(^{th}\), 2013.

\(^b\)Mean percent diseased area assessed on May 7\(^{th}\), 2014.

\(^c\)Quality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.

\(^d\)Color was assessed using a Greenseeker NDVI Turf Color Meter from NTech Industries®.