



TECHNICAL INFORMATION

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Diseases Of Turfgrass SNOW MOLD

PINK SNOW MOLD: *Microdochium nivale*

GRAY SNOW MOLD: *Typhula incarnata*
Typhula ishikariensis

HOSTS: all major cool season turf species

There are no less than twelve distinct fungi that are known to be the causal agents of 'snow mold'. Three of the most common are *Microdochium nivale*, *Typhula incarnata* and *Typhula ishikariensis*. *M. nivale* infection is characterized by two distinct phases of the disease: **pink snow mold** when the infection is associated with snow cover and **Fusarium patch** when snow cover is lacking. Both names are somewhat of a misnomer because the disease is not always associated with snow, it is not always pink and it is not caused by a fungus named *Fusarium*. Symptoms of pink snow mold can appear at any time of the year if the environmental conditions are cool (< 60°F) and moist. Pink snow mold usually infects only the leaf tissue, but under conditions extremely conducive to disease development, the fungus may attack both the crowns and the roots, killing the plant. For this reason, pink snow mold has the potential to be more devastating than gray snow mold. Conversely, gray snow mold (or Typhula blight) is almost always associated with snow cover and infection is usually confined to the leaves, rarely infecting crown tissue. *T. incarnata* usually predominates when snow cover persists for less than three months. *T. ishikariensis* generally predominates when snow cover exceeds three months in duration. What all three of these very different fungi have in common is that they are active during cool, moist conditions from late fall through spring. Temperature, moisture, duration of snow cover and inoculum load may all influence disease severity and consequently, turf damage.

THE SNOW MOLD QUESTION

What is the best way to control pink and/or gray snow mold to achieve the maximum amount of control for the longest period of time? The first step is to understand the

disease cycle and epidemiology of pink and gray snow mold. As temperature and moisture levels change from fall to spring, there is generally a snow mold progression from pink, to gray, then back to pink. Although all of the snow mold fungi have the potential to become active when temperatures drop below 60°F (18°C), it is usually *M. nivale* that is responsible for the first disease outbreaks in the fall before a permanent snow cover has developed. *T. incarnata* and *T. ishikariensis* typically do not begin to damage the turf until after a snow cover has developed. However, extended periods of cold rain accompanied by near freezing temperatures may also provide favorable conditions for gray snow mold, particularly *T. incarnata*. As winter turns to spring and rising temperatures melt the snow cover, pink snow mold again becomes the primary disease. Understanding disease progression leads to the question – will applying multiple fungicide sprays to target the different fungi better control snow mold? To help answer this question, Cleary Chemical has sponsored university trials examining the most economical and effective products, rates and application timings for snow mold control.

THE SNOW MOLD ANSWER

Snow mold fungi begin infecting turfgrass plants in late fall. This is why it is critical to apply preventative treatments in the fall to control or suppress initial infection. However, peak snow mold activity comes in the spring as both the soil and turf become saturated by melting snow. It is during this time that the most damage is done. It is important to note that this peak in activity typically comes four to five months after the last snow mold application. It is also important not to overlook cultural practices when dealing with snow mold control. Encouraging snow melt in the spring and ensuring adequate drainage can help to minimize symptoms by drying out the turf and inhibiting the snow mold fungi. Proper nitrogen fertility is also critical. Excessive fall nitrogen can delay hardening off which facilitates snow mold infection. Lack of nitrogen, however, can slow recovery and reduce vigor.

University trials have shown that tank-mixing **ENDORSE™ 2.5 WP** with **SPECTRO™ 90WDG** provides proven control of gray and pink snow mold at a cost per acre that is less than many of the tank-mix combinations currently in use.

THE CLEARY SNOW MOLD PROGRAM
As Easy As 1-2-3!

1. **Early Fall:** The **CLEARY CHEMICAL CORPORATION*** recommends a 'clean-up' spray in October** with either **SPECTRO 90WDG OR CLEARY'S 3336® or 3336 PLUS™** tank-mixed with chlorothalonil.
2. **Late Fall:** Make a late November** application of **ENDORSE 2.5 WP @ 4 oz./1000 ft²** tankmixed with **SPECTRO 90WDG** at 4 oz./1000 ft².
3. **Spring:** Following snow melt, apply **CLEARY'S 3336G** or **CLEARY'S 3336GC** to prevent any lingering pink snow mold or other early season diseases.

WHY CHOOSE THE CLEARY SNOW MOLD PROGRAM?

- Season long control of gray and pink snow mold in university trials that is statistically comparable to many of the leading tank mix combinations currently in use, including PCNB (see graphs at right).
- Most leading plant pathologists recommend a rotational approach to disease control and that philosophy doesn't end with the summer. **Endorse** turf fungicide utilizes a new mode of action that is unique in turfgrass disease control allowing superintendents to extend their rotational strategy year round.
- The translaminar movement of **Endorse** within the plant helps to ensure complete plant protection.
- Its wide range of potential tank-mix partners makes **Endorse** a convenient choice for any turf management program.

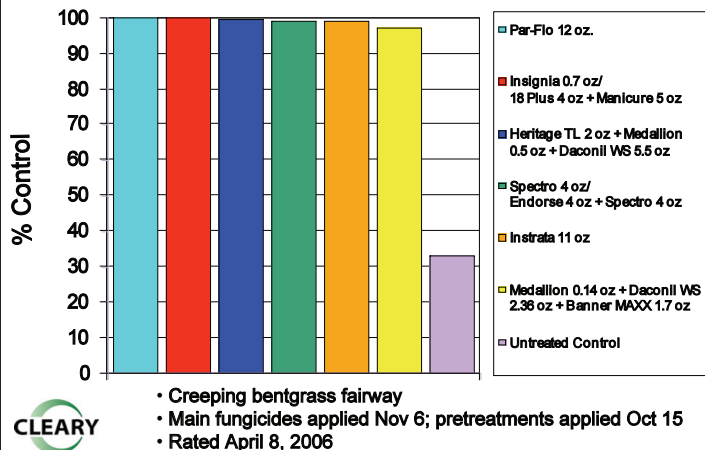
* For more information on the complete line of Cleary products, ask your local Cleary representative or visit our website: www.clearychemical.com.

** This application should be made about four weeks prior to snow mold control applications. The actual timing of this and other recommended applications may vary with your location. See your local Cleary representative for details. Always read and follow all label directions carefully.

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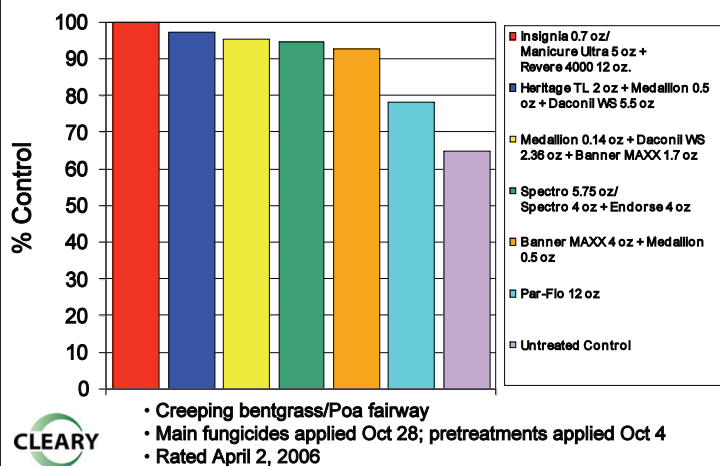
Gray Snow Mold Control

University of Wisconsin – Jung, et.al. - 2006



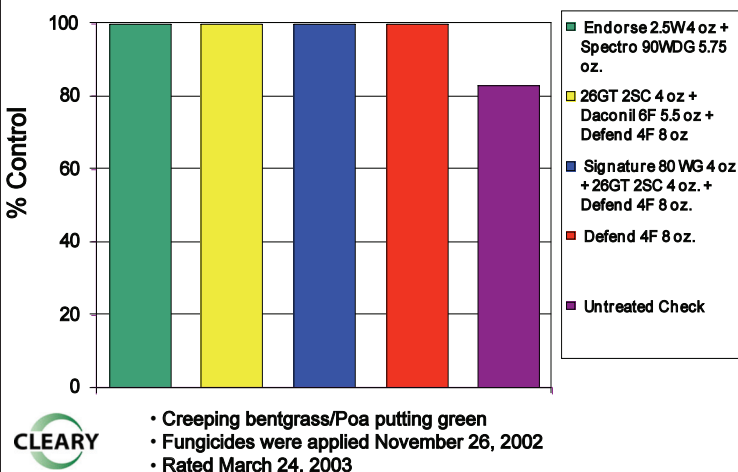
Gray Snow Mold Control

Michigan State University – Vargas, et.al. - 2006



Pink Snow Mold Control

Rutgers University – Clarke, et. al. - 2003



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