

The Effects of Various Fungicides on the Control of Overwintering Diseases 2011-12

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Summary

This trial was initiated at two sites, Candle Lake Golf Course and Pine Hills Golf Course, to test the efficacy of two new fungicides that are mixtures of three active ingredients. Disease pressure was considered to be low at Candle Lake and high at Rocky Mountain House. In this trial, a single application of the two products, Trilogy SC and Instrata provided sufficient protection from the diseases present.

Introduction

Fine turfgrasses, which are not protected by fungicides are predisposed to damage caused by snow moulds. On golf greens, where creeping bentgrass (*Agrostis palustris*) or annual bluegrass (*Poa annua*) are the predominant species disease damage is a frequent occurrence. Turfgrasses weakened or damaged by snow moulds are extremely slow to recover and are often invaded by opportunistic weedy grass species.

Synthetic fungicides are registered for the prevention of diseases on putting greens through the Pest Management Regulatory Agency, a department within Health Canada. Individual fungicides are most frequently used, but for snow moulds research has shown that a tank mix of fungicides can provide better protection. In addition, research has shown that two applications of the same product are more effective than a single application. Therefore, the industry standard is to make two applications of a tank mix, usually of two fungicides. Recently, fungicides that have been formulated with three active ingredients have shown good effectiveness. This study was developed to test some of these new formulations applied as a single application in areas that typically have high disease pressure.

Materials and Methods

Two formulated products Instrata and Trilogy SC were tested at two sites in Western Canada over the winter of 2011-12 (Table 1). The first trial was located on a bentgrass nursery green at the Candle Lake Golf Course, in Candle Lake, Saskatchewan and the second trial was located on A Kentucky bluegrass rough at the Pine Hills Golf Club in Rocky Mountain House, Alberta.

The sites were chosen due to consistently high disease pressure due to the long duration of snow cover. Plots measuring 1 x 2 meters were arranged in a randomized complete block design with four replications. A 0.5 meter buffer was maintained around each plot.

Treatments were applied with a compressed air sprayer that was equipped with TeeJet 11008 nozzles and calibrated to apply 10 litres/100m². For this trial, the products were applied as a single application on November 2, 2011 at Rocky Mountain House and on November 4, 2011 at Candle Lake.

Table 1 - List of products tested and their percent of active ingredients.

Product	active ingredients
Instrata	chlorothalonil 28.9% propiconazole 4.7% fludioxonil 1.2%
Trilogy SC	iprodione 29.4% triticonazole 3.14% trifloxystrobin 1.47%

Results

Soon after snow melt, the effectiveness of the treatments were assessed by rating the percent area damaged by snow mould. The Candle Lake site was rated on April 28, 2012 while the Rocky Mountain House site was rated on May 3, 2012

Weather Conditions 2011-12

Generally, at both locations temperatures were mild, with well below average precipitation and short duration snow cover. These conditions produced very low to high disease pressure. At Candle Lake, permanent snow cover developed in late November and was present until late March. Snow cover duration was approximately 120 days and maximum snow depth was 30 cm. Rocky Mountain House received a permanent snow cover in late November and snow melt was complete by mid-April. Duration of snow cover was approximately 140 days and snow depth was 50 cm.

Determination of Pathogens Present

It is not uncommon to find colonies of both pink and grey snow mould coexisting on the same piece of turf. Because the environmental conditions and the potential control measures differ with each organism it is important to identify the primary disease.

When plots were rated at Candle Lake, the site was dry and mycelium was not observed. Turf damage included some circular patches and some areas of general decline. The circular patches did not reveal any sclerotia and the stand symptoms were consistent with pink snow mould (*Microdochium nivale*).

Although, the snow cover had disappeared prior to assessment, some mycelium was still evident on the turf surface at Rocky Mountain House. There was some presence of small black sclerotia, symptomatic of grey snow mould (*Typhula ishikariensis*). Other patches were circular in nature, bleached in colour, with a number of smaller patches that had grown together. These symptoms are consistent with pink snow mould (*Microdochium nivale*). In addition, there was some turf damage that was irregular in nature and was symptomatic of freezing or ice cover injury. This was particularly evident in the Instrata 300ml treatment, which showed a high level of damage (over 90%) in two of the four replications.

Candle Lake Results

Although the two Trilogy treatments were significantly lower, the disease pressure was very low at Candle Lake due to a shallow depth of snow and a short duration snow cover.

Table 2 - Candle Lake winter fungicide trial 2011-12.

Treatment	April 28, 2012
	% Turf Damage
Untreated control	8.7a*
Instrata 150mls/100m ²	8.0a
Instrata 220mls/100m ²	9.2a
Instrata 300mls/100m ²	7.5ab
Instrata 600mls/100m ²	7.5ab
Trilogy SC 130mls/100m ²	1.2b
Trilogy SC 177mls/100m ²	1.2b
	LDS _{0.05} = 6.4

* Values that have the same letter as a suffix are not considered to be significantly different from each other.

Rocky Mountain House Results

As mentioned above, two of the plots in the Instrata 300ml treatment had damage that was over 90% and was thought to be from freezing injury. As a result, the mean value in Table 3 for this treatment is based on two of the four plots, which puts into question the validity of this result. All other treatments provided good control even with just a single treatment.

Table 3 - Rocky Mountain House winter fungicide trial 2011-12.

Treatment	May 3, 2012
	% Turf Damage
Untreated control	81.2a*
Instrata 150mls/100m ²	5.0b
Instrata 220mls/100m ²	12.5b
Instrata 300mls/100m ²	20.0b**
Instrata 600mls/100m ²	13.2b
Trilogy SC 130mls/100m ²	7.5b
Trilogy SC 177mls/100m ²	7.5b
	LDS _{0.05} = 22.4

* Values that have the same letter as a suffix are not considered to be significantly different from each other.

** Mean value was calculated after exclusion of two individual plots rating due to injury from other factors