

THE 1983-84 SNOW MOLD RESEARCH RESULTS

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The 1983-84 snow mold studies were conducted at Gilbert, International Falls, Detroit Lakes, Rochester, Duluth, St. Louis Park, Hopkins and Falcon Heights. The study consisted of 4 golf green research situations, 2 demonstration plots and 2 fairway research plots. The spray treatments were applied in 5 gal/1000 sq. ft. with a hand pushed wheel mounted two nozzle boom pressurized by liquid carbon dioxide. Granules were applied with a 3 ft. Scotts drop spreader, calibrated for each product used. Disease results were obtained at each location except Gilbert which had no disease on the plot.

Snow mold was expected to be very common and damaging during the winter of 1983-84. The growing green grass was covered with snow early and ground was not frozen at that time. This condition is reported to promote winter disease, while snow mold was present in many locations - Kentucky bluegrass lawns and sod fields and winter ryegrass fields - damage was quite superficial. The dead areas were the result of foliar blight - leaf disease and nearly no long lasting crown damage was observed on bluegrass. Most golf turf, if treated survived very well and golf courses are in good shape. The early snow melt this spring was, I believe a major factor in preventing significant long term damage from snow mold.

If your snow mold program failed this past year you should seriously consider what you did last fall and revise it to include treatments that are recommended for your area. Results at Detroit Lakes and Rochester are typical of product performance under low scattered disease pressure, while at Minneapolis where disease pressure was moderate fewer treatments resulted in disease control and at Duluth where disease pressure was nearly 100% the standard treatments still performed satisfactory. All golf locations do not need the level of protection which is adequate at Duluth yet it is a good location to evaluate chemical control under consistent high disease pressure. It is

however typical of what can happen in those years when snow mold is common and severe in more than the northern Minnesota Arrowhead area.

The results for Northland Country Club - Duluth, Minneapolis Golf Club - St. Louis Park, Rochester Golf and Country Club - Rochester and Detroit Country Club - Detroit Lakes are presented in Table one.

The major disease organism at all locations was Typhula ishkariensis, or small sclerotial Typhula. A few spots had Typhula incarnata while I observed no Gerlachia nivalis or Myriosclerotinia borealis. Caloclor is the only chemical, when applied alone which provided 100% disease control on a percentage basis. Caloclor in combination (Tank Mix) with Terraclor or plus Terraclor and Chloroneb also resulted in 100% disease control. Terraclor plus Chloroneb which failed at Duluth did result in 100% disease control at the other locations. Daconil 4F performed quite well, second best single chemical treatment at Duluth and should be tested in future years as a component of a tank mix. While the results at Rochester, Minneapolis and Detroit Lakes in 1984 suggest its use other years data indicates the results are variable. It does appear however, that tank mixes or sequential treatments with Daconil 4F should be evaluated further. Results with Tersan SP, Terraclor, Bayleton, Ciba Geigy 64250, Rubigan and SN 84364 at Minneapolis all suggest activity. Performance at Duluth, where at least twice the disease pressure exists reveal weakness but opportunity does exist for combinations.

The demonstration plot at International Falls was free of snow in February - the earliest spring ever. Treatment results are shown in Table two.

The results with FFII were clearly better than turfcide. No fertilization response was observed at the time the plot was visited therefore the response is judged to be due to better product performance. This difference was seen before and does not

Snow Mold Results 1983-84 at Four Minnesota Locations.
 Data Expressed as means of 4 replicates.
 Plot size is 4' x 11'.

Treatment and Rate /1000 sq ft	% Area Diseased		# Spots per 44 sq ft	
	Duluth 10/21	Minneapolis 11/3	Rochester 10/28	Detroit Lakes 10/20
No Treatment Check	95	47	9	10.5
Caloclor 3 oz.	3.8	0	0	0
Caloclor 5 oz.	0	0	--	0
Tersan SP 5 oz	45	4.5	2	2.3
Tersan SP 9 oz.	51.3	6.8	--	2
Terraclor 8 oz	47.5	0.5	1.8	0
Terraclor 16 oz.	35.	0.3	--	1.8
Tersan 1991 2 oz.	92.5	47	3.5	3.5
Chipco 26019 4 oz.	83.8	19	14.3	5
Bayleton 2 oz.	92.5	5.5	2.3	2.3
Bayleton 4 oz.	81.3	3	5	0
Bayleton 2 oz.*	86.3	13.8	11.3	--
Bayleton 4 oz.*	91.3	18.8	5.3	--
Ciba Geigy 64250 32 gms ai.	42.5	1	0	0.3
Ciba Geigy 64250 16 gms ai.	65	4.8	2	0.8
Rubigan 2 oz.	86.3	2	5.3	2.8
Rubigan 4 oz.	63.8	4.8	0.8	1.5
SN 84364 1.5 oz.	46.3	4.3	0.5	3
SN 84364 2.4 oz.	35.	1.8	0	3
Daconil 4F 8 Fl. oz.	22	1.8	0	1.8
Daconil 4F 16 Fl. oz.	11.3	0.5	0	1.5
Daconil 4F 8 Fl. oz. plus Tersan 1991 2 oz.	10.8	0.8	1	3
plus Rubigan 2 oz.	16.3	1	0	1.3
plus C 26019 4 oz	13.5	0	0.3	2.5
Tersan SP 5 oz. plus Tersan 1991 2 oz.	51.3	27	0.3	4.3
Caloclor 3 oz. plus Terraclor 8 oz.	0	0	0	0
plus Tersan SP 5 oz.	0.3	0	0	0.8
plus Terraclor 8 oz. and Tersan SP 5 oz.	0	0	0	0
Terraclor 8 oz. plus Tersan SP 5 oz.	19.3	0	0	0

*Applied before date listed - Duluth 10/5, Minneapolis 10/10 and Rochester 9/27.

Table 2.

Snow Mold Results at International Falls
 Data expressed as means of areas treated
 Treatments 3 ft. wide by 40 ft. long.

Treatment and Rate	% Area Diseased
No Treatment Check	60
Calogran 6 lbs.	2
Calogran 10 lbs.	0
Fungicide II N	60
Fungicide II D	60
Turfcide 5 lbs.	40
Turfcide 7.5 lbs.	40
FFII N	10
FFII D	5
Calogran 10 lbs plus Fungicide II D	2
plus Turfcide 7.5 lbs.	0
plus Turfcide 7.5 lbs. + Fungicide II D	0
Fungicide II D + Turfcide 7.5 lbs.	30

appear to be dependent on fertilizer. A granular form of FFII without fertilizer has also performed better than Turfcide in previous plots. The lack of control with Fungicide II was not completely expected as it often reduced disease level by 50% but in either case it is unacceptable.

Fairway plots were very disappointing due to lack of disease and non uniform turf areas. Results at one location averaged near the untreated check when disease level and injury -- chemical burn were included in ranking. The benefit of disease control was negated by chemical discoloration due to PMA. Data are presented from the plot at the University of Minnesota location in Table three.

The results from Table 3 show disease control with all products but Thiram and Chipco 26019. Turf appearance over several weeks was best with Daconil, Chipco 26019 and MF701 which contains caloclor and nitrogen. No nitrogen response was observed during April due to nitrogen. Turf color was improved when thiram was added to PMA at 1 Fl. oz. but not when 2 Fl. oz. was applied. PCNB plots appeared to be slightly pale green but the color was judged to be okay on subsequent visits. Thiram may reduce chemical injury but it also reduces

disease control. Daconil 4F results are interesting and combinations will be tested next year on fairway plots. New plot areas are needed for more uniform turf stands and sites which may have higher disease pressure. Any volunteers?

ALL ABOUT TREES--CONT.

system may become stunted because of the lack of oxygen. If you are concerned about weeds, apply a herbicide to control residual and invading weeds.

The practices discussed here are aimed at maintaining the tree in a healthy condition. By setting up a regular schedule of monitoring, pruning, fertilizing, and mulching, you can lessen the chance of treating a tree problem that can only be resolved by removal. Over the long run this attention to tree care will save you time and money.

Table 3.

Snow Mold Results at University of Minnesota
 Data expressed as means of 4 replicates
 Plot Size is 4' x 11'

<u>Treatment and Rate</u>	<u>% Disease</u>	<u>Color*</u>
No Treatment Check	24	2
PCNB 2 oz.	1.3	2
PCNB 4 oz.	2.5	2
PMA 1 Fl. oz.	3	3
PMA 2 Fl. oz.	3	4
Thiram 4 oz.	25	2
plus PMA 1 Fl. oz.	8	2
plus PMA 2 Fl. oz.	5	4
plus PMA 1 Fl. oz. & PCNB 4 oz.	0	3
plus PCNB 4 oz.	1.8	2
Daconil 4F 8 Fl. oz.	2.5	1
Daconil 4F 4 Fl. oz.	0.5	1
plus Chipco 26019 2 oz.	1	1
Chipco 26019 2 oz.	13.8	1
MF 701	0	1

*Color Scale = 1 Best, 2 Okay, 3 Poor, 4 Burn