So Abler's Gone...What's Next?

By Paul Koch, *Department of Plant Pathology, University of Wisconsin-Madison*

As many of you already know, Steve Abler has taken a sales position with Syngenta and is no longer the manager at the Turfgrass Diagnostic Lab. As some of you may also know, I am his replacement. For those who do not know who I am or those who I have only spoken briefly with, I will use this article as a more formal introduction.

I graduated from UW-Madison's undergraduate turfgrass program this past May with majors in horticulture and soil science. I am currently pursuing an M.S. degree in plant pathology at UW-Madison under Dr. Geunhwa Jung, while simultaneously managing the Turfgrass Diagnostic Lab. I became interested in the golf course maintenance profession during my summers off from high school while working at The Bog, near where I grew up in Grafton. Enjoying the work and the outdoors, I decided to pursue turf management as a career once I arrived in Madison (after an initial major selection of bacteriology...poor choice). I worked as an intern two summers ago at the Meadow Valley course of Blackwolf Run under Ron Bierwirth, and also had the privilege of being on the crew of the PGA Championship that was held at Whistling Straits that same summer.

I was just beginning my search for an assistant superintendent position when Geunhwa asked me if I was interested in the possibility of further studies. After a little wavering and few job openings, I accepted Geunhwa's offer and preparations were made for me to work out at the O.J. Noer Turfgrass Research and Education Facility doing research and aiding Steve Abler at the TDL. I worked closely with Steve this past summer, learning as much as I could on disease diagnosis and the efficient manner in which he coordinates the lab. While all the heat and humidity caused havoc on many area golf courses, it proved a great way for me to see a full range of diseases that we may not see in Wisconsin every year. I even got a few week test run on managing the lab myself this past summer when Steve's wife Becky gave birth to little Matt, who properly was watching the US Open at Pinehurst when we arrived at the hospital for a visit.

Steve did a great job of building the TDL into an accurate and efficient tool for turf managers to use when a problem arises, and I intend to keep it that way. There will be no major changes in the structure of the lab at this moment, but that is not to say that none will be made in the future. If you have a suggestion on how the lab can better serve you as a turf manager, please do not hesitate to let me know. This lab was created to serve you in a timely and accurate manner, and it is supported by you in great numbers. Being 22 years old and a recent graduate, I doubt I will have an immediate answer to every one of your questions. But great minds such as Dr. Jung, Dr. Stier, Dr. Williamson, and Dr. Casler are here for assistance when needed, and I can assure you an accurate answer to all of your questions will be given in a short amount of time.

One thing I would like to ask of those of you that submit samples to the TDL this upcoming season is to please send or bring in pictures of the symptoms in relation to the surrounding environment. There are often several different types of fungi on samples submitted, and descriptions or drawings can be hard to decipher. Pictures can be especially helpful in determining if abiotic factors such as traffic or shade are having a significant effect on the decline of your turf. Pictures can be sent digitally to plk@plantpath.wisc.edu or mailed along with the sample.

Contract memberships with the TDL are also still available for 2006! Please contact me by email or at (608) 845-2535 if you are still interested. Stay tuned for further updates from the TDL about any disease developments and also the dates for the 2006 Snow Mold Field Days. I look forward to working with all of you this upcoming summer, where hopefully we are discussing how green your grass is, how happy the golfers are, and how little work I have to do!

Preventative Application of Fungicides for the Control of Dollar Spot

By Jonathan Rivers[1], Pat Sisk[2], Mark Manemann[1], Paul Koch[1], Steve Abler[1], Dr. Geunhwa Jung[1],
[1]Department of Plant Pathology, University of Wisconsin-Madison, [2]The Milwaukee Country Club, River Hills, WI

Introduction

Each year golf course superintendents will encounter numerous turf grass pathogens attempting to wreak havoc upon their golf courses. To defend their courses, superintendents rely on a barrage of cultural and chemical controls. A particular turf pathogen that can have debilitating effects on a golf course is the fungus *Sclerotinia homoeocarpa,* commonly referred to as dollar spot. This past summer I evaluated the efficacy of a new and progressive chemical control approach that is designed to apply effective fungicide(s) in early spring when the pathogen starts to be active. The goal of this new approach is to delay the initial occurrence of dollar spot and or reduce the overall disease severity by knocking down the initial pathogen inoculum. This working hypothesis has been tested by several renowned turf pathologists such as Drs. J. Vargas, B. Clarke, M. Boehm, and R. Latin. It still requires more experiments before this practice is put in place. Two identical experiments designed to evaluate the early preventative application of fungicides were preformed at the OJ Noer Turfgrass Research and Education Facility in Verona, WI and at the Milwaukee Country Club in River hills, WI. The goal of the past summer's study was to determine the efficacy of various labeled fungicides and tank mixtures for controlling dollar spot when applied to turf grass in early spring. This is when the dollar spot pathogen slowly comes out of their over-wintering structure and becomes active.

Biology

Dollar spot (*Sclerotinia homoeocarpa*) is one of North America's most prevalent perennial turf grass pathogens. Dollar spot is an especially problematic disease of bentgrass putting greens and other common grass species used in Wisconsin and other states. Dollar spot fungus is active from early spring to late fall, covering a range of temperatures between 50° F and 90° F (Couch, 1995). As winter gives way to spring and eventually summer, dollar spot begins to transform from the dormant compact masses of mycelium or the thin flakes of fungal tissue and into the active fungus that is able to directly infect the tissues of many grass species. Greatest disease activity and development occurs between 70° F and 85° F with cool nights (~ 60° F). Moisture on the foliage of the desired host must also be present to allow for the disease to develop and spread. Once infection of the host tissues has occurred, the infected tissues will begin to show common symptoms associated with dollar spot due to the release of toxic metabolites by the fungus.

Symptoms of dollar spot include bleached hourglass shaped lesions of individual leaf blades (Image 1) and a cobweb like growth called mycelium, which can be observed in the mornings while morning due is still present on leaf blades (Image 2). With disease progression the lesions on individual leaf blades illustrated by Image 1 coalesce, forming larger blemishes approx-

imately the size of a silver dollar (Image 3).

Cultural and chemical controls thwart the spread of dollar spot. Cultural controls include adequate nitrogen fertility and reducing the duration of leaf blade moisture. Thatch removal is another example of a valuable cultural control practice. In addition, planting some recently developed cultivars with improved resistance to dollar spot is another control strategy. Chemical control elicits the help of individual and synergistic applications of fungicides. A synergistic combination is a calculated application of two chemicals with reduced rates, resulting in an effect greater than the sum of the effects from the two full rate chemicals when applied individually. Due to the prevalence of the pathogen, superintendents will apply multiple applications of different classes of fungicides in an effort to combat the negative effects (fungicide resistance) of the disease. The multiple applications of fungicides makes dollar spot one of the most expensive turf pathogens to control, giving further purpose for research designed to decrease the number of fungicide applications and thus the money and amount of chemicals that superintendents expend.

Rationale

In an attempt to answer the growing desire for cost effective and environmentally friendly fungicide application practices a progressive approach to dollar spot control has been proposed. The preventative application of fungicides is a new approach designed to suppress the barely active turf pathogen before it can infect host tissue. The hypothesis is that by reducing the initial population of pathogen in the thatch and soil the symptoms of dollar spot infection will be delayed until later in the summer or the disease severity that is observed is lower than normal. The delay increases the time between fungicide applications, saves superintendents money, and reduces the use of chemicals. The exact mechanisms of the preventative application for control of dollar spot have yet to be established. Possible explanations deal with the suppression of the initial pathogen population so that it will take longer for the pathogen to build up enough inoculum to cause symptomatic disease on plants

Experimental Methods

Two identical studies were preformed at the OJ Noer Turfgrass Research and Education Facility in Verona, WI and Milwaukee Country Club in River Hills, WI. The Noer performed studies at green and fairway heights while Milwaukee only had a study at fairway height. The individual plots of the study measured 3 x 5 ft and were arranged in a randomized complete block design with four replications. All study locations received all 26 treatments on May 2nd, 2005 (Table). Fungicide treatments were applied at a rate of 2 gallons per 1000 ft^2 using a CO_2 pressurized boom sprayer (40 psi) equipped with XR Teejet 8005 VS nozzles. Ratings of the amount of disease present (% diseased area per plot) were taken weekly at both experimental locations. The results of the weekly ratings were then analyzed for their statistical significance via analysis of variance.

Image 1: Dollar spot lesion on an individual grass blade, bleached hourglass shaped lesions.

Image 2: A cobweb like growth called mycelium, which can be observed in the mornings while morning due is still present on leaf blades.

Image 3: Individual lesions forming larger, symptomatic, "dollar spots".

Table 1: Efficacy of fungicides and tank mixtures for pushing the initial outbreak of dollar spot or reducing the disease severity by knocking down the initial disease inoculum based on a working hypothesis from Milwaukee Country Club in 2005.

		Disease rating (mean percent diseased area per plot)					
Treatment	Rate	21-Jun	6-Jul	12-Jul	18-Jul	21-Jul	28-Jul
1 Untreated Control		4	7.5	6.5	29.3	28.8	71.3
2 Chipco 26GT	4 FL OZ/1000 FT2	0	2.3	1.3	23.8	33	56.3
3 Chipco 26GT	2 FL OZ/1000 FT2	0	0.8	5.5	26.8	33.8	68.8
4 Emerald	0.18 OZ/1000 FT2	0	2	1.3	13.8	23	67.5
5 Banner MAXX	2 FL OZ/1000 FT2	1.3	0.3	1.3	18.5	12.5	50
6 Banner MAXX	0.5 FL OZ/1000 FT2	3	1.8	2.3	14.3	21.3	47.5
7 Spotrete	5 OZ/1000 FT2	0	2.5	3.3	12.5	20.5	66.3
8 3336F	4 FL OZ/1000 FT2	12.5	3	3.3	9.3	26.3	67.5
9 Curalan EG	1 OZ/1000 FT2	9.3	2.5	2.5	7	9.3	53.8
10 Turfcide 400	3 FL OZ/1000 FT2	0	1.3	3.8	10.5	9.3	56.3
11 Fore Rainshield	8 OZ/1000 FT2	6.3	8.8	6.3	19	30	57.5
12 Daconil Ultrex	5 OZ/1000 FT2	1.3	2.3	2.5	21.3	18.8	50
13 Daconil Ultrex	1.8 OZ/1000 FT2	5	8.8	7.5	27.3	48.8	76.3
14 Rubigan AS	1.5 FL OZ/1000 FT2	0	1.8	0	10	14.3	52.5
15 Eagle	2.4 FL OZ/1000 FT2	0	1.3	2.5	10.5	10	50
16 Lynx	2 FL OZ/1000 FT2	0	4	1.8	11.8	20	51.3
17 Bayleton	1 OZ/1000 FT2	0	0	0.5	6.8	11.5	48.8
18 Bayleton	0.25 OZ/1000 FT2	0.8	1.5	3	12.5	12.5	61.3
19 Banner MAXX Chipco 26GT	2 FL OZ/1000 FT2 4 FL OZ/1000 FT2	0	0	1.8	11.3	15	62.5
20 Banner MAXX Chipco 26GT	0.5 FL OZ/1000 FT2 2 FL OZ/1000 FT2	2.5	0.3	1.8	11.3	11.3	55
21 Banner MAXX Curalan EG	2 FL OZ/1000 FT2 1 OZ/1000 FT2	0	1.8	1.8	20	25	61.3
22 Banner MAXX Curalan EG	0.5 FL OZ/1000 FT2 1 OZ/1000 FT2	0	0	1.3	11.3	12.5	52.5
23 Banner MAXX Daconil Ultrex	2 FL OZ/1000 FT2 5 OZ/1000 FT2	3.8	1.8	2.3	18.8	11.3	65
24 Banner MAXX Daconil Ultrex	0.5 FL OZ/1000 FT2 1.8 OZ/1000 FT2	0	1.8	4.3	8.3	11.3	73.8
25 Banner MAXX Bayleton	2 FL OZ/1000 FT2 1 OZ/1000 FT2	0	0	0.3	8.3	10	48.8
26 Banner MAXX Bayleton	0.5 FL OZ/1000 FT2 0.25 OZ/1000 FT2	0	1.3	3.8	21.3	27.5	71.3
Treatment Prob (F)		NS	Sig	NS	NS	Sig	NS

Sig and NS define Significant and Non-significant at P=0.05 based on Student-Newman-Keuls, respectively.

Results

Due to the abnormally cool spring and then a hot, dry summer, disease pressure did not appear until much later than anticipated. At the Noer major disease pressure was not observed until the 1st week in August, well past the efficacy of the fungicides applied on May 2nd. As a result of the abnormal disease pressure no statistically significant data was obtained from the Noer. However, Milwaukee did have a small amount of statistically significant data. Daily high and low temperatures in each site (Graphs 1 and 2) illustrate the unfavorable range of temperatures for dollar spot development. Through June and July Madison and Milwaukee rarely fell below 80°F, and into the favorable range of temperatures for dollar spot activity. Furthermore, the nights also slowed the development of the disease by staying above 65°F.

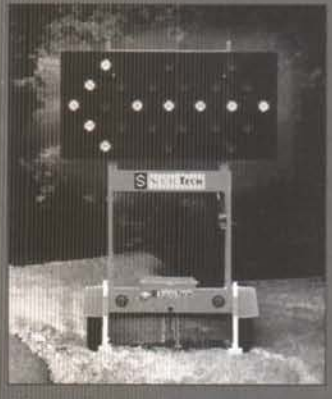
The slight difference in daily highs and lows between Madison and Milwaukee did allow for earlier disease pressure at Milwaukee. The first rating in Milwaukee occurred June 21st 2005. At this point many of the treatments still displayed efficacy against dollar spot. Treatments 8, 9 and 11 were less effective than the untreated control (only 4%). The ratings for % dollar spot and quality on July 6th, 2005 were statistically significant among the treatments at $p = 0.05$ but still low on the control plot (7.5%). On July 21st the % dollar spot among the treatments was statistically significant with $p = .03$. Most of the synergistic combinations of reduced rates (treatment# 20, 22, and 24) controlled the dollar spot as much as with the combinations of the same chemicals with full rates. The synergistic combination of Banner Maxx and Bayleton (treatment #26) did not work for this particular study. Interestingly, three fungicides, Curalan (1 oz/1000 ft^2), Turfcide 400 (3 fl oz/1000 ft^2), and Eagle (2.4 fl oz/1000 ft^2) showed exceptional control (less than 10% damage) against dollar spot. This significant result is hypothesized to be related to the differences in the ability of the treatments to suppress the initial pathogen population. Increased control of the initial pathogen population correlates with a decrease in disease prevalence during the summer ratings. The first major indication of dollar spot disease pressure occurred between the 12th rating and the 18th rating of July when dollar spot percent per plot in control plot jumped from an average of 6.5 to 29.3 percent disease per plot. By July 28th dollar spot lesions ranging

Ingersoll-Rand
Milwaukee

Meeting the Needs of Wisconsin's Construction Industries

Light Tower

SOLARTECH



Message & Arrow Boards

Soil & Asphalt Compactor

Forklifts:
Complete Inventory

Club Car Utility Vechicle with plow & cab

Generators from
G20 to G575

Air Compressors
up to 1600 CFM

Rentals • Sales • Parts • Service

- Soil and Asphalt Compactors
- Air Tools
- Hoist
- Generators
- Message & Arrow Boards
- Compressors
- Light Towers
- Rock Drills
- Fork Lifts
- Utility Vehicles

Club Car™
Performance Utility Vehicles

DIRECT™
On-Site Construction Equipment Service

Ingersoll Rand Equipment Service Company

1-800-338-5436

12311 W. Silver Spring Dr. • Milwaukee, WI 53225

www.irmil.com

from 47.5 to 73.8% densely covered the experimental area.

In summary, most DMI fungicides (treatments: 5, 14, 15, 17, and 18) and synergistic combinations (treatments: 20, 22, and 24) displayed significant control over dollar spot through July 21st when applied once on May 2nd. These synergistic combinations also showed great curative efficacy on the dollar spot suppression just published in the Grass Roots article (Jan/Feb issue of 2006). Interestingly, Bayleton at both rates, 0.25 and 1 oz/1000 ft^2, controlled dollar spot equivalently. In conclusion, the early preventative application of fungicides individually or in synergistic combinations significantly delayed the progression of dollar spot.

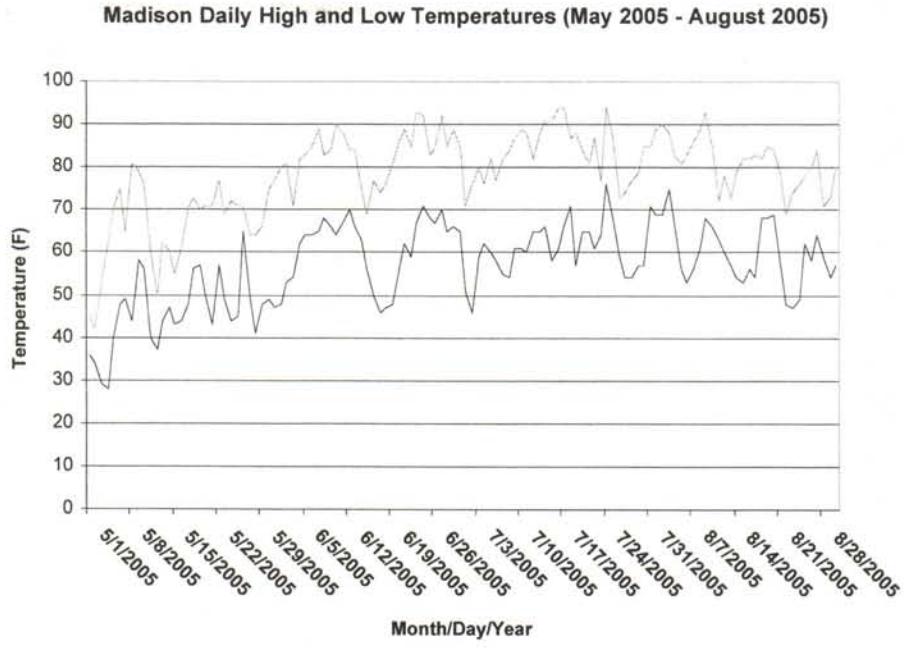
Importance of Study

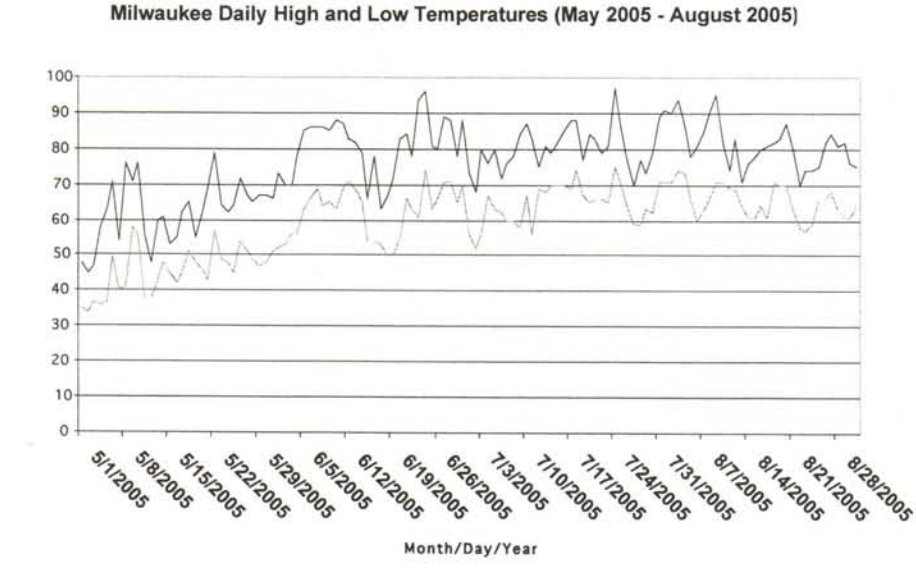
The studies at the Noer and Milwaukee Country Club were designed to identify effective and appropriate rates of fungicides for the control of dollar spot when applied preventatively (early May). The abnormal weather conditions reduced the overall disease pressure. Despite the lack of cooperation from the weather, the data from the preventative study still adds to the growing understanding of the rationale behind early preventative applications. The goal of this study and the preventative applications is to save superintendents money and decrease the use of pesticides. Future studies will be needed to further investigate the practicality and efficacy of preventative fungicide applications.

Literature Cited

Couch, H. B. Diseases of Turfgrass. 1995. Krieger Publishing Company: Malabar, Fl.

Vargas, J. Preventive control of dollar spot. Michigan State University: 2002-2003 Fungicide Research Report.





YES,
We Have Changed Our Name Again!

Verdicon is Now

UAP is a national distribution company offering the finest chemicals, fertilizer and seed products along with technical support for the turf & ornamental, pest control and vegetation management markets.

For more information contact:

Shawn Hilliard

N125 Co. Hwy. C, DeForest WI, 800-362-8049

Fax: 608-846-1115 Cell: 608-516-4006

Operational Reports — Lessons learned from 2005

One of the best parts of the WTA EXPO last January was the discussion of winter injury recovery and golf turf management during the season of 2005. Rod Johnson, Mike Handrich, Gary Tanko and Pat Sisk made excellent presentations to an audience that was listening intently. They agreed to provide a summary of their remarks for The Grass Roots, and those reports follow.

Pine Hills Greens Management Programs 2005

By Rod Johnson, Golf Course Superintendent, Pine Hills Country Club

The following is a summary of a presentation given at the January 2006 WTA Expo. A large portion of the presentation was slides and charts with "off the cuff" remarks so I will attempt to summarize the presentation.

The thoughts of Wisconsin superintendents in early 2005 were on a thick ice accumulation that had been on courses since the first week in January. The potential for large areas of turf loss was high. Pine Hills shared those concerns with solid dense ice accumulations ranging from two to four inches in thickness. With those concerns in mind we went forward with a snow and ice removal program in early March. Rented and in house snow blowers were used to remove up to 12 inches of snow cover and Milorganite was used to darken the ice and take advantage of warm sunshine. All greens were cleared completely of all snow and ice over a five day period in the first week of March.

The physical removal of ice and snow accumulations is subject to debate. I don't know how big of a factor removal was, but turf damage to greens at Pine Hills was minimal with only small "dots" of *Poa Annua* affected. Our recovery program consisted of a "kick the dog" philosophy with an application of Andersons 14-0-29 with *Poa annua* control. With a fairly large percentage of bentgrasses I have found an early season application of a *Poa*-controlling growth regulator beneficial in further reduction of annual species. An application of 2.3 lbs of the product per M was made on May 2.

Greens at Pine Hills are mowed with four Toro 1000 mowers normally equipped with heavy cast grooved front rollers. The first mow of the 2005 season took place on April 7. From April 16-May 14 greens were mowed three times per week on a Tuesday, Thursday, and Saturday schedule. Between May 15 - October 22 greens were mowed daily. From October 25 - November 8 we were back on the 3 times per week schedule.

Height of Cut

- First Mow - .170 (April 7)
- Mid May - .160
- Late May - .150
- June 16 - .140
- July 9 - .130
- July 11 - .115 (solid roller)
- July 19 - .140 (grooved roller w/daily rolling)
- Aug 20 - .135
- Sept 4 - .130

Starting on June 2 as seasonal labor became available greens were rolled on a three times per week basis, again Tuesday, Thursday, and Saturday. A Tru-Turf side-winder type roller was used. Starting on July 19 and continuing until September 22 entire greens were rolled on the three time per week schedule, and on alternating days the 30% of the green where the hole was located was rolled. This schedule resulted in a consistent day to day ball roll.

Greens at Pine Hills are historically aerified the first Monday of June. The following chart provides the details.

Greens Aerification – June 6th

- Soil Reliever @ 8 " depth and spacing
- Followed with Toro Procore 648 fitted with 3/8 " solid quad tines @ 2" spacing and 2 1/2" depth
- Collars aerified with Toro Procore 648 fitted with 5/8 " hollow tines @ 2 1/2" spacing and 2 " depth
- Sand applied @ 1.2 cu ft/M (180 cu ft or 9 tons used total)
- Drag once over with astroturf mat
- Vibrating roller twice over, two different directions
- Hand water heavily due to wilt and to wash sand down
- Greens syringed often during the day due to high temps and wind
- Time spent aerifying 20 greens (not including collars):
  Soil Reliever – 8.5 hrs.; Toro Procore – 9 hrs

Sand topdressing is applied on a light and frequent basis. Thirteen sand applications were made in 2005 with rates and annual totals of sand applied contained in chart form.

Sand Topdressing

Date	Amount per M	Total sand applied
Mon May 16	.45 cu ft	60 cu ft
Mon May 23	.45 cu ft	60 cu ft
Mon June 6 (greens aerification)	1.35 cu ft	180 cu ft
Mon June 13	.45 cu ft	60 cu ft
Fri July 1	.45 cu ft	60 cu ft
Mon July 11	.45 cu ft	60 cu ft
Mon July 18	.90 cu ft	120 cu ft
Mon July 25	.90 cu ft	120 cu ft
Mon Aug 15	.45 cu ft	60 cu ft
Mon Aug 29	.45 cu ft	60 cu ft
Mon Sept 12	.45 cu ft	60 cu ft
Mon Oct 3	.45 cu ft	60 cu ft
Tues Nov 29	.90 cu ft	120 cu ft
TOTAL	8.1 cu ft/M/yr	1080 cu ft 40 cu yds 54 tons

Growth regulators are a major component of the greens management program at Pine Hills. I have chosen to use Primo on a regular basis to improve turf

Primo Applications

Date	Amount per M
Tues May 17	.10 oz
Fri May 27	.10 oz
Fri June 17	.16 oz
Fri June 24	.13 oz
Tues July 12	.20 oz
Mon July 18	.20 oz
Tues July 26	.15 oz
Wed Aug 3	.20 oz
Fri Aug 12	.20 oz
Fri Aug 26	.23 oz
Wed Sept 7	.20 oz
Tues Sept 20	.20 oz
12 Total Apps	2.07 oz/M/year