THE NEWSLETTER

January 2008

of the Golf Course Superintendents Association of New England, Inc.

Sponsors and administrators of the Troll-Dickinson Scholarship Fund – Awarded yearly to deserving Turf Management Students.

Tim Hood Starting a Legacy of His Own at His Hometown Needham Golf Club

By Gary Trask

In the grand spectrum of things, it's really no surprise that Tim Hood ended up working at his hometown course of Needham Golf Club. Heck, he grew up a block away from the private, nine-hole course and was raised in a self-proclaimed "golf family" that includes a golf professional.

But Hood's road to becoming the head superintendent at Needham GC was much more complex than it probably should have been. In fact, the journey almost ended before it even started.

The year was 1984 and Hood, who was 14 at the time, was recruited by his older brother Peter, the caddy master at Needham GC, to loop at the club's three-day Member-Guest. Hood, who had never carried a bag before, didn't realize what he was getting into and had a troublesome first day. Bad enough that he bailed out on his duties the next two days.

"My brother wasn't too happy," Tim says about Peter, who has been the head professional at Bass Rocks Golf Club in Gloucester for the last 14 years. "But I just couldn't do it for more than that first day. At the time I thought I was already pretty much done in the industry."

Hood got a second chance at the club when the head super, Ron Kirkman, asked him to work on his maintenance crew. He accepted the job and kept it on a part-time basis as he graduated from Needham High School in 1988 and went on to attend Northeastern University, where he earned a degree in business management in 1993. After college, he worked for Winston Flowers in Boston, managing a retail store and working at weddings and other functions. After two years in the flower business, Hood started a

Tim Hood, Needham Golf Club

Photo credit: Rich Gagnon

restaurant delivery service with his other older brother, Chris, in Needham that lasted nearly three years. All the while, Hood kept his part-time gig working for Kirkman at Needham GC.

"I did it because I really enjoyed it," he says. "And then finally I said to myself, 'Why not do this for a living?' I finally realized that's what I wanted to do full-time, so I went for it."

In 1998, Hood took the seven-week winter class at UMass-Stockbridge and earned his certificate before joining the crew at Belmont Country Club under Superintendent Arthur Silva for a season. The next year Hood was back on his home turf at Needham GC once again working on Kirkman's crew, but this time as the first assistant.

At the end of the 2006 season, Kirkman, who was just the third superintendent in the 105-year history of the storied club, retired after 46 years on the job, opening the door for Hood, the kid who grew up down the street, to become No. 4.

"I guess I've kind of come full circle," says Hood, 37, who just completed his first season as Needham GC's head man. "It's really strange. I never, ever thought this is what I'd be doing for a living. My father was in the corporate world as an accountant and I just thought that I would follow his footsteps. I'm really not much of a golfer; nothing like my brothers, so I just figured I would do something else with my life. I tried, but here I am back at Needham. I couldn't be happier."

Hood still lives less than a mile away from the club with his wife, Kathy, and their three children – Peter, 9, Sarah, 6, and John, 3. Also still living in the area is Kirkman, which has made the transition much easier for Hood.

"He lives on the course and he still works in the clubhouse from time to

Continued on page 2

Hood - continued from page 1

time so it's great for me to have him around," Hood says. "Ron taught me quite a bit. He was a great mentor. He still will fertilize a fairway for me if I ask. He's that type of guy."

Despite not lasting long in the "corporate world," Hood says he has taken some of the lessons he learned working away from the golf course to his job as superintendent.

"I think in anything you do, paying attention to detail is real important," says Hood, who in addition to his two brothers has a pair of sisters – Amy and Jennifer. "I learned in the flower business that you can have everything perfect, but just one small thing can be out of place and that's what everybody sees and remembers. The same goes for working on a golf course.

"You also have to allocate your time correctly. It's the type of business where you don't want to fall behind on your work. You've got to keep you and your crew on a schedule. That's the only way you can get everything done that needs to be done."

Hood has also made a seamless transition to working with the membership and other staff members at Needham GC thanks to his deep roots at the club.

"The head pro – Rich Hasenfus – is from Needham and I've known a lot of the members for most of my life, so I'm very comfortable here," says Hood, whose parents – Peter and Janet – were members at Needham GC and Charles River Country Club while raising their family in Needham. "The key is to remember that you're here to serve the membership. If you keep them happy, you're job will be a lot easier."

"Ron did a great job in educating the members about what we have to deal with in regards to the elements we battle. Everybody is understanding, which is great. It's a great bunch of people to work with."

Just last month, Hood was named to the GCSANE Board of Directors as Education Chairman, a role that he is looking forward to very much.

"I'm excited," says Hood, who spends a lot of his free time coaching his kids in basketball and baseball. "It will really give me a chance to get an even more formal education about the industry by setting up the seminars and attending them."

"Ron was here for 46 years and if I want to carry on that tradition I know I have to digest as much information about the job as I can. This will help me do just that."

GCSANE Elects 2008 Board of Directors

2008 Board of Directors (from L-R): Front Row: Peter Hasak; Jason Adams, Mark Gagne, Russell Heller, CGCS; Richard Gagnon Back Row: Tim Hood; Michael Stachowicz; Scott Lagana, CGCS; Patrick Daly, CGCS; David Stowe, CGCS (GCSANE Board members not in photo: Michael Luccini, CGCS and Michael Hermanson)

Photo Credit: Jim Cohen

CALENDAR

Jan. 28 - Feb. 2	**Golf Industry Show** Orlando, Florida
Jan. 31	**Nor'Easter Hospitality Reception** Omni Rosen Hotel 6:00 - 10:00 pm Orlando, Florida
Mar. 3-6	**New England Regional Turfgrass Conference & Show** RI Convention Center Providence, RI
Mar. 20	**GCSANE Monthly Meeting** Joint meeting with HFTP Woodland G.C. Host: David Mucciarone

New Challenge to an Old Foe, Dollar Spot Fungicide Resistance

By Geunhwa Jung and Young-Ki Jo
Department of Plant, Soil & Insect Sciences, University of Massachusetts, Amherst, MA

Fungicide resistance of dollar spot caused by *Sclerotinia homoeocarpa* is a common problem on golf courses in North America (Fig. 1) (Jo et al. 2006). Fungicide resistance management is a complex and controversial topic (Couch, 2003; Vargas, 2002). Many questions about the fungicide resistance management of dollar spot still require further investigation. The issue of whether or not to use the same fungicide until resistance develops, or to rotate with different chemistries and tank mixtures still remains to be definitively answered. Will the addition of contact fungicides in rotations and tank mixture with systemic fungicides prevent fungicide resistance? How many times can a single fungicide be used before efficiency is reduced or complete failure occurs? Do application intervals or rates of fungicides affect the development of fungicide resistance?

Fig. 1. Dollar spot on creeping bentgrass fairway (Courtesy S. Abler).

Fungicide resistance in dollar spot is an important problem, but it is poorly understood at the "population" level. In sociology and biology, a population is the collection of people or individuals of a particular species. Individual isolates composing the population may vary in genetic make-up, fungicide sensitivity, pathogenicity, and vegetative compatibility.

Our lab has attempted to carefully tease out these questions about dollar spot fungicide resistance at the population level by using DNA fingerprinting techniques and in vitro assays for both fungicide sensitivity and vegetative compatibility. Our recent findings revealed that a population of dollar spot isolates collected from the same location could have differences in genetic makeup, which result in differential response to fungicides (Jo et al. 2007). A single dollar spot patch can be caused by more than one genetically different isolate. The development of fungicide resistance is caused by selecting a "population" of resistant isolates, which do not necessarily have to be genetically identical.

The development of fungicide resistance is a total failure or a reduced efficacy of a particular fungicide in the field against a specific pathogen. Fungicide resistance develops from two important biological steps: 1) preexistence of a small population of resistant isolates before the first application of a fungicide and 2) selection of the small resistant population by use of fungicides. The initial occurrence of fungicide resistant isolates results from spontaneous mutations, which are biologically natural and possibly inevitable events. However, the selection process is mainly driven by management practices like fungicide applications. Fungicides suppress the population of sensitive isolates and selectively allow a subpopulation of resistant isolates to build-up and dominate the population.

Development of fungicide resistance greatly depends on the chemical mode of action. There are two types of fungicide resistance against site-specific fungicides: single-step or single gene mutation (e.g., as seen with benzimidazoles such as thiophanate-methyl and benomyl), and multi-step or multiple gene mutation (e.g., as seen with sdemethylation inhibitors such as propiconazole, fenaminol, triadimefon, myclobutanil, tebuconazole, and triticonazole). The development of resistance against the single-step fungicides can be rapid (Fig. 2) and results in the complete loss of efficacy.

Contrary to the single-step fungicides, resistance to the multi-step fungicides gradually develops (Fig. 3) and causes reduced efficacy rather than complete failure since a number of mutations are related with the level of insensitivity.

Therefore, the main goal of resistance management strategies is to minimize the chance of spontaneous mutations occurring in the population. This can be accomplished by rotating fungicides with different modes of action and integrated disease management in order to delay the selection of resistant populations, while monitoring current dollar spot populations for resistant strains.

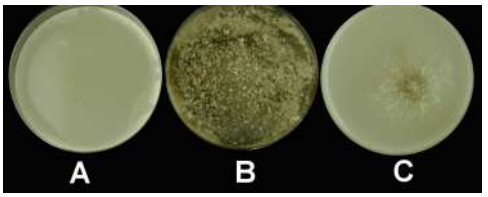


Fig. 2. Mycelial growth of dollar spot fungus on growth medium amended with thiophanate-methyl (1,000 ug a.i./ml). A) A sensitive isolate does not grow. B) A resistant isolate grows normally. C) The sensitive mycelium is chopped an spread on the medium. Spontaneous mutation conferring thiphanate-methyl resistance occurs with a very low chance and resistant hyphae grow.

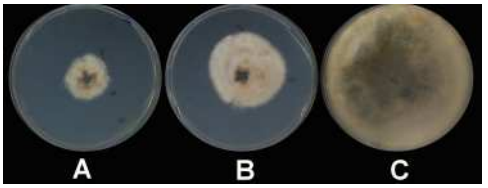


Fig. 3. Mycelial growth of dollar spot fungus on growth medium amended with propiconazole (0.1 ug a.i./ml). Resistance is associated with mutation at multiple genes and so gradually developed. A) Sensitive, B) intermediate and C) highly resistant isolates grow at different rates.

1. Origination of fungicide resistance

Fungicide resistance of dollar spot originates from naturally occurring spontaneous gene mutations. If this is the case, how often do spontaneous mutations occur? In-vitro petri dish assays were carried out in our lab to test this question. Several dollar spot isolates, which are sensitive to thiophanate-methyl, were selected from a

Continued on page 5

A Thankful and Reflective Ruszala Honored by His Peers

By Rich Gagnon

The Golf Course Superintendent's Association of New England gathered for their Annual Meeting on Tuesday, January 8, 2008 at the Andover Country Club, hosted by Superintendent Wayne LaCroix CGCS. The most anticipated and prestigious award given out that afternoon was the Distinguished Service Award given annually to a turfgrass professional for their longstanding service and commitment to the game of golf and to the advancement of the golf course superintendent profession. This year's winner is Robert Ruszala from Hickory Ridge Country Club in Amherst, Massachusetts.

It would be difficult to find a more deserving and qualified recipient than the Chicopee resident and long time Hickory Ridge superintendent. Some of the many accomplishments Ruszala has achieved over the years include: president of the Golf Course Superintendent's Association of New England (2000-2001), serving on the Board of Directors for the GCSANE for 14 years (1990-2004), and president of the New England Regional Turfgrass Foundation. Ruszala was also instrumental in the development of the Joseph Troll Turf Research Center in South Deerfield, has served as chairman of the Nor'easter hospitality room at the annual Golf Industry Show, and is responsible for starting up the GCSANE "toys for tots" program which allows underprivileged children an opportunity to have toys they wouldn't normally have.

Pictured from L-R: Scott Lagana, CGCS; Bob Ruszala and Russ Heller, CGCS

Photo Credit: Rich Gagnon

Ruszala's journey started in 1977 upon his graduation from the Stockbridge School of Agriculture where he developed the basic skills to start a career in the turfgrass profession. Before Bob could even get out of his cap

Continued on page 7

Dollar Spot - continued from page 3

collection of field isolates and grown on growth medium, potato dextrose agar (PDA). Mycelium of each fully-grown culture was harvested and chopped into small fragments of hyphae at 100-500 µm. The fragmented hyphae were plated on PDA amended with 1,000 ppm of thiophanate-methyl. We found that some hyphae were capable of growth on thiophanate-methyl amended PDA (Fig. 2). This indicates that fungicide resistant mutants (particularly against thiophanate-methyl) of the dollar spot fungus occur naturally and are inevitable. We also found that mutation rates vary significantly among dollar spot isolates tested under the in-vitro assays. Certain isolates generated mutants in a higher frequency than the others.

Practical information obtained from the study:

Resistance is likely to occur rapidly with fungicides that have a sing-site mode of action because a single gene mutation on the specific target is the only required step to acquire complete resistance to the fungicide. However, resistance will take longer to develop with multi-site mode of action fungicides due to the multiple gene mutations that are required. Our in vitro petri dish assay supports this notion and field experiments confirmed this hypothesis as well. The more isolates that are exposed to fungicides, the greater probability for the selection of fungicide resistant mutants. Therefore, the first and foremost step for fungicide resistance management is to maintain a low amount of inoculum and keep disease pressure as low as possible by adhering to the use of all available cultural and chemical options:

1. Plant with resistant cultivars if available.
2. Apply cultural practices including dew removal and proper fertility to minimize dollar spot pressure and maximize healthy growth of turfgrass.
3. Follow the label recommended intervals and rates of fungicides

2. Population structure of dollar spot:

Turfgrass pathologists believe that the dollar spot fungus only uses mycelium as the primary form of its life cycle in the U.S. The dollar spot fungus has yet to be observed containing sexual/asexual fruiting bodies or spores in the field or laboratory. Previous studies provided limited information about how this life cycle influences dollar spot population. Our recent research shed light on the genetic structure and spatial distribution of the dollar spot field populations on a fairway and putting green established at the Univ. of Wisconsin-Madison (UW) and on a fairway at the Univ. of Massachusetts-Amherst (UMass) (Jo et al. 2007). The dollar spot populations were very different among the locations in terms of genetic variation, fungicide sensitivity, and vegetative compatibility. Isolates in the population at UMass were genetically similar and were highly sensitive to two systemic fungicides, thiophanate-methyl and propiconazole at the inception of this study. On the other hand, isolates collected from the fairway and green at UW were separated into two genetically distinct subpopulations. Interestingly, these two subpopulations showed different sensitivities to the two systemic fungicides. The isolates from the two subpopulations were also vegetatively incompatible, meaning that they did not grow together, but instead competed with each other.

Another interesting finding at UW was the uniform distribution of the two subpopulations within the same turfgrass sites (fairway and putting green), regardless of the sample sizes. However, a significantly different percentage of the two subpopulations existed within the putting green and the fairway. This suggests different management practices such as mowing height, mowing frequency, and fungicide applications can influence the percentage of subpopulations.

In addition, a recent survey conducted at seven golf courses located in Wisconsin and Massachusetts (Koch, 2007), suggested that dollar spot populations are different among golf courses and between the putting green and fairway within the same golf course. Thiophanate-methyl resistance of dollar spot was generally higher on the fairway than the green regardless of course age or fungicide history. In the case of propiconazole, higher resistance was generally observed on putting greens than fairways.

Practical information obtained from the study:

Knowing the fungicide sensitivities of the dollar spot population within the turfgrass area is key information for designing a successful fungicide resistance management plan.

3. Shift of dollar spot population responding to repeated uses of fungicides

Based on the previous population research, we have developed an idea of the dollar spot field population composition within the fairways and putting green of our university research field plots. Our next question is how these populations will change in response to fungicides applications. To tackle this question, field experiments were conducted at UW and UMass in 2006 and 2007. Dollar spot populations were monitored as fungicides were repeatedly applied. We speculated that consecutive applications of fungicides under high dollar spot pressure would select a subpopulation of resistant

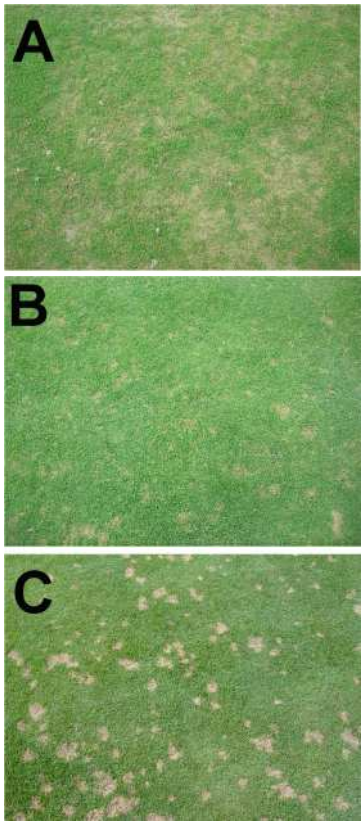


Fig. 4. Dollar spot on creeping bentgrass fairway established at the research facility of University of Massachusetts, where thiphanate-methyl was applied on August 4 and September 8, 2006. A) Dollar Spot before the first application. B) Dollar spot after the first application significantly reduced. C) Dollar spot after the second application did not decrease because a population of resistant isolates was selected.

Continued on page 6

Dollar Spot - continued from Page 5

isolates. The results from two consecutive thiophanate-methyl applications (4 oz/1000 ft^2) with a long interval (4 weeks) in both 2006 and 2007 did in fact select a subpopulation of resistant isolates on the UMass fairway plot (Fig. 4). Picture 'A' shows dollar spot severity before the first thiophanate-methyl application. Picture 'B' shows dollar spot severity 3-4 weeks after the first application. Picture 'C' taken five days after the second application, shows dollar spot damage caused by a population of resistant isolates.

In order to test persistence of resistant isolates, the thiophanate-methyl treated plots were not treated with additional fungicides in 2007. The percentage of resistant isolates in the population that developed in 2006 has significantly decreased in the absence of thiophanate-methyl use after one growing season. This result may be explained by a lack of fitness of the resistant isolates, or by an increase of sensitive isolates which lead to the dilution of the resistant populations.

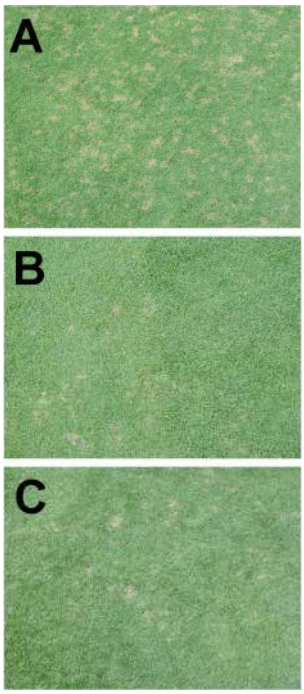


Fig. 5. Dollar spot on creeping bentgrass fairway established at the research facility of University of Wisconsin, where propiconazole was applied once a month between June and August 2006. A) Dollar spot before the first application. B) Dollar spot significantly reduced after the first application. C) In August, dollar spot broke out earlier as a population of highly resistant isolates was selected and fungicide efficacy gradually reduced.

On the other hand, six consecutive applications (three in 2006 and three in 2007) of propiconazole on the UMass fairway plot did not affect the fungicide sensitivity of the population. All isolates collected at the end of the season in 2007 were still highly sensitive to propiconazole.

The field experiment conducted on the fairway at UW in 2006 showed that three consecutive applications of thiophanate-methyl rapidly selected a resistant population. The UW fairway plot results were consistent with the results from the UMass fairway plot. Contrary to the findings at UMass, the dynamics of dollar spot populations at UW were different in terms of propiconazole sensitivity. The difference in propiconazole sensitivity can be attributed to the wide genetic variability and a broad range of fungicide sensitivities to propiconazole that preexisted in the UW fairway plot populations prior to the experiments. The origin of the insensitive populations is not known. Isolates highly insensitive to propiconazole were gradually selected and eventually dominated the population. Consequently, the population significantly shifted to higher insensitivity to propiconazole at the end of 2006 season, resulting in reduced fungicide efficacy in the field (Fig. 5).

Practical information obtained from the study:

The long interval between subsequent applications of the same fungicides allowed for the fungus to recolonize plants and to produce massive amounts of mycelia, which increased the number of mutations occurring in the population.

1. Repeated application of site-specific systemic fungicides is not recommended.
2. Dynamics of population response to fungicides is dependent on the initial population, but the population shift to insensitivity can be accelerated by the repeated application of site-specific fungicides.

Key findings:

1. Dollar spot populations have differential sensitivity to thiophanate-methyl and propiconazole among golf courses and between the putting greens and fairways within the same golf course.
2. Dollar spot populations quickly shift from sensitivity to resistance if applications of the same site-specific, single-step fungicides such as thiophanate-methyl are made back-to- back in long-stretched intervals.
3. Dollar spot populations gradually shift from sensitivity to insensitivity if applications of same site-specific, multi -step fungicides such as propiconazole are repeatedly made back-to-back in long-stretched intervals.

In conclusion, despite our attempts to understand the mechanisms of fungicide resistance in dollar spot, more questions still remain to be answered. In the next issue we will present our recent research results on the effects of repeated applications, rotation, or tank mixture on the incidence of fungicide resistance development in dollar spot.

Literature Cited

Couch, H. B. 2003. Strategies for preventing and managing fungicide resistance. *Golf Course Management* 71(5): 111-115.

Jo, Y., M. Boehm, and G. Jung. 2007. Rapid population shift of *Sclerotinia homoeocarpa* in response to fungicide applications on turfgrass. Phytopathology 97:S53 (Abstract).

Koch, P. 2007. Effect of cultural practices on the population structure of fungicide resistant isolates of *Sclerotinia homoeocarpa* of turfgrass. M.S. thesis, University of Wisconsin, Madison, Wisconsin.

Vargas, J.M., Jr. 2002. To rotate or not to rotate? *Golf Course Management* 70 (4): 53-56.

Ruszala - continued from Page 4

and gown he landed his first head superintendent's job at the Holyoke Country Club where he remained for seven years. In 1984 Ruszala became the head superintendent of Hickory Ridge Country Club in Amherst where he is still currently employed and starting his 25th year as superintendent. "The ownership at my place of employment, Hickory Ridge Country Club has been very good to me. My present owners Doug and Cathy Harper have been behind me 150%. When I asked them if we could use Hickory Ridge CC for a fund raising event for the UMASS Turf Research Building they said sure and waived the green and cart fees. That tournament raised $70, 000 for the UMASS Turf Program. I wish to extend my sincere thanks to Doug and Cathy," Ruszala explained, as he stood at the podium in the Andover Country Club's main dining room.

Bob Ruszala accepting the Distinguished Service Award

Photo Credit: Rich Gagnon

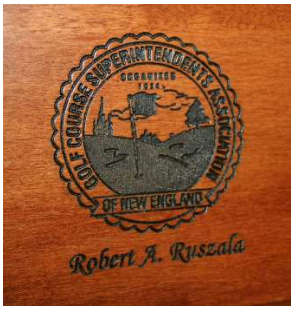
Some of the many people Ruszala thanked for their support over the years included Dr. Joseph Troll, his advisor and mentor at Stockbridge, Don Hearn, who asked him to serve on the Board of Directors for GCSANE in 1989 and the grounds crews who have worked for him over the years. "My grounds crew has been very good over the years. I was always fortunate to be able to leave for various meetings, and thankfully my crew kept the fort in order while I was away."

Away from the golf course Ruszala's support system is just as strong as it is at the golf course. "I have truly been blessed with a great family. My parents are still alive in their 80's. They have been a great influence on me to this day. My wife, Denise has been very supportive to me always. My son, Paul, and daughter, Jaclyn are always great in understanding my love for this profession and its demands on family time. I thank them very much."

"You truly cannot receive this award without a lot of people assisting you along the way. I am truly honored and blessed to receive this prestigious award. This award will be cherished by me always," A modest and humble Ruszala said before finishing his speech. A most deserving recipient, a true gentleman, and class act.

"You truly cannot receive this award without a lot of people assisting you along the way. I am truly honored and blessed to receive this prestigious award."

Robert Ruszala



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OSHA Issues Final Personal Protective Equipment Rule

By Ron Smith

On November 15, 2007 the Occupational Safety & Health Administration (OSHA) announced a final rule that all personal protective equipment (PPE), with a few exceptions, will be provided by the employer at no cost to the employee. OSHA anticipates that this rule will have substantial safety benefits that will result in more than 21,000 fewer occupational injuries per year.

The "final" PPE rule is actually a clarification of the 1999 proposed PPE standard and was issued after several months of public review and input regarding the 1999 standard. The final rule contains a few exceptions for ordinary safety-toed footwear, ordinary prescription safety eyewear, logging boots, and ordinary clothing and weather-related gear.

The final rule also clarifies OSHA's requirements regarding payment for employee-owned PPE and replacement PPE. While these clarifications have added several paragraphs to the regulatory text, the final rule provides employees no less protection than they would have received under the 1999 proposed standard.

It has been my experience with superintendents throughout New England that the required PPE for turf and equipment maintenance work (safety glasses, ear plugs & muffs, sunscreen, insect repellent, protective work gloves, hard hats, welding aprons & gloves, respirators & dust masks, etc.) has been provided to employees who need them to perform their assigned work tasks. Consequently, the final rule will cause few, if any, changes in how superintendents manage their respective PPE programs.

I have listed several of the requirements and exceptions the final rule either confirmed or implemented that I feel superintendents should be aware of. They are as follows:

- *The first paragraph in the final rule contains the general requirement that employers must pay for the protective equipment, including personal protective equipment that is used to comply with the amended OSHA standards. Employers are responsible for paying for the minimum level of PPE required by the standards. If an employer decides to use upgraded PPE to meet the requirements, the employer must pay for that PPE. If an employer provides PPE at no cost, an employee asks to use different PPE, and the employer decides to allow him or her to do so, then the employer is not required to pay for the item.*

- *The first exception addresses non-specialty safety-toe protective footwear and non-specialty prescription safety eyewear. The regulatory text makes clear that employers are not required to pay for ordinary safety-toe footwear and ordinary prescription safety eyewear, so long as the employer allows the employee to wear these items off the job-site.*

- *The fourth exception to employer payment in the final rule relates to everyday clothing. The final rule recognizes that there are certain circumstances where long-sleeve shirts, long pants, street shoes, normal work boots, and other similar types of clothing could serve as PPE. However, where this is the case, the final rule excepts this everyday clothing from the employer payment rule. Similarly, employers are not required to pay for ordinary clothing used solely for protection from weather, such as winter coats, jackets, gloves, and parkas. In the rare case that ordinary weather gear is not sufficient to protect the employee and special equipment or extraordinary clothing is needed to protect the employee from unusually severe weather conditions, the employer is required to pay for such protection.*

- *The final rule clarifies the issue of who pays for replacement PPE. The final rule requires that the employer pay for the replacement of PPE used to comply with OSHA standards. However, in the limited circumstances in which an employee has lost or intentionally damaged the PPE issued to him or her, an employer is not required to pay for its replacement and may require the employee to pay for such replacement.*

For a detailed review of the final rule please visitwww.osha.gov.

Questions regarding the rule can be directed to your local OSHA office or to me at 877-848-5978.

Action Alert!

Please visit the GCSANE web site (www.gcsane.org) for details on proposed legislation that if passed, will have a significant impact on the turf management industry in Massachusetts.

The legislation is referred to as S.B. 2406 -- "An Act for a Healthy Massachusetts Safer Alternatives to Toxic Chemicals" In a nutshell, S. 2406 establishes a permanent subcommittee to direct the advisory committee of Toxics Use Reduction Institute (TURI) on developing a categorized record of all chemicals commonly used or sold in the Commonwealth. The chemicals will be categorized and TURI will begin the process of publishing Safer Alternative Assessment Reports and designating which toxic substances are to be deemed a priority. Anyone who manufactures or uses a priority toxic substance would be required to file a notice with the DEP identifying the product, the approximate number of units distributed in the Commonwealth, an estimate of the amount or concentration contained in each unit, and the purpose for including the substance in the product. The EOEEA is directed to develop Chemical Action Plans for each priority toxic substance use to ensure substitution with a safer

Continued on page 11

Myth Busted?

By Rich Gagnon

One of my first jobs after accepting the superintendent position at Segregansett Country Club in Taunton Mass., was to sit down with my green chairman at the time, Chris Ryding, and figure out which pins/flagsticks the members wanted on the golf course. I had three full sets of completely different style pins and no idea which ones they preferred.

Par Aide manufactured all three different style flagsticks, which are listed in the company's catalog as:

- the half-inch solid regulation fiberglass flagstick;
- three-quarter-inch tapered tournament flagstick; and

one-inch aluminum/fiberglass tournament flagstick.

Ryding and I agreed on the three-quarter-inch tapered tournament flagstick, which seemed to look better and would be more durable because of its weight and thickness. We didn't give it much more thought than that.

That is until a complaint rolled in from a member that changed our way of thinking a bit. The complaint was that we needed to get rid of the "metal" flagsticks because the ball bounces off them too hard and is less likely to fall into the hole. I was told we needed to go back to the half-inch, solid regulation fiberglass flagsticks. I assured the chairman the flagsticks were made of fiberglass and the only metal component was the ferrule on the bottom and the screw threads on the tip, which hold the flag on. I was told that regardless of what the flagsticks were made of, fewer balls go in the hole with the flagsticks we were currently using.

A couple years passed. The same three-quarter-inch tapered tournament flagsticks were being used, but now I had a new chairman, Earl Dion. The old complaint had resurfaced with a new set of ears to listen, and I was asked if it was a legitimate complaint once again. It seemed that if all the flagsticks were eight-feet tall and had a half-inch-wide base made of fiberglass that it wouldn't affect the ball dropping into the hole or kicking to the side. After hearing this complaint yet again, I figured I'd try to put the myth to rest – that the flagsticks we were using were reducing the chances of the ball dropping into the hole.

Segregansett has 20 members who have a USGA handicap index of 2 or lower, 12 members who qualified for the Massachusetts Amateur Championship in 2007 and two members who played in national USGA events last year. The members have the reputation of being one of the best playing memberships in the state. I wasn't about to win any debate with any of them about what a ball does or doesn't do when it hits a flagstick. That is unless I had data to back up what I said.

Device used to measure ball reaction to flagstick

Photo Credit: Rich Gagnon

Set it up

To conduct this test, I used all three sets of pins. I set a regulation cup into a green mowed at one-eighth inch on a flat surface and set up a transit tripod several feet away from the cup. Then I cut a 10-foot section of PVC irrigation pipe, set it on the tripod and raised the entry point of the pipe two feet off the ground, with the exiting end of the pipe 14 inches from the hole resting on the green. All the flagsticks had flags on them, the ferrules were all the same, and the Par Aide cup was set at regulation depth.

Assistant superintendent Tate Asselin and I rolled 100 balls through the PVC pipe at each of the flagsticks. We removed a ball from the cup every time one landed in it to make sure the balls leaning against the flagstick didn't have any effect on vibration or stability. We wanted to simulate a chip shot as it hits the flagstick but wanted to make sure all balls hit the flagstick dead-on at a normal pace to see how the ball reacted.

We understood that, in the real world, any perfect chip shot that just drops in the hole wouldn't be affected by which flagstick was in the cup and any ball skulled or off center wouldn't be impacted either. What we wanted to avoid was the ball traveling too fast, too slow or too off center. The 10-foot pipe set up at two feet off the ground on one end and 14 inches from the hole on the other end seemed to be the perfect combination for simulating a direct hit at a medium pace.

As the flagstick test was under way, Asselin thought it would be a good idea to take the test to another level and use the exact same make of ball to assure consistency and accuracy. I'm sure some balls might react differently than others based on their individual characteristics, and the idea was a great one, but our final decision to use 100 random golf balls, not 100 of the same kind. This was based on one factor: I wanted to duplicate what is actually happening on the golf course when my membership hits the flagstick on a chip shot. What better way to test for this than having 100 random balls that were hit by the membership at one time, picked up by me after they were lost and eventually used in this experiment?

Results that matter?

After 300 balls were sent through the pipe, the results were in. With the flagstick we were using (three-quarter-inch tapered), 67 percent of the balls fell into the cup. With the half-inch flagstick, 72 percent of the balls fell into the hole. The complaints were valid, but barely. At a 5-percent difference in the members' favor, it appeared that for every 20 chip shots that hit the flagstick dead-on, one more fell into the cup with the half-inch flagstick com-

Continued on page 11

Myth Busted? - continued from Page 10

pared to the three-quarter-inch tapered flagstick. Although not a major difference, there still was a difference.

"If I hit the flagstick with 100 chip shots this year, I want the five birdies – there's a difference!" Dion says. "If I go up against a good chipper in the club championship, I want the three-quarter-inch flagsticks in. Who wouldn't?"

Most golfers would say there's no difference which flagstick was in the cup. And, statistically, the 5-percent difference in our results would probably hold true for 100 coin tosses. But one flagstick had to win the race and the results would never turn out 50/50 anyway. There might not seem to be a difference between the half-inch and the three-quarter-inch flagsticks, but when the two pins were matched up against the one-inch flagstick, the results proved there can be a significant difference between flagsticks and the percentage of balls falling into the cup.

The biggest shock of all was that with the one-inch flagsticks, no balls fell into the hole. That's right, none. It's hard to imagine there would be such a big difference, especially since the bottom 12 inches of all three flagsticks is exactly the same width (half-inch) and made of fiberglass.

Weigh in

I took things a step further and wanted to see if weight had any effect on the results since the area that the ball was hitting was exactly the same on all the flagsticks. The three-quarter-inch flagstick was heavier than the half-inch one, but the one-inch flagstick was lighter than the three-quarter-inch flagstick. Weight, materials and width in the impact area all have no effect on the results.

Is 5-percent difference enough to change the flagsticks at Segregansett to the half-inch ones? It's still debatable, but I can assure you that after reading the results of our experiment you'll never see the one-inch flagsticks in our cups again. That is, until my chairman goes up against a good chipper in the club championship.

Action Alert! - continued from Page 9

alternative and restrict the use of priority toxic substances. Within 1 year after the release of a Chemical Action Plan, all manufacturers and users must complete a substitution plan and file a certification of compliance that good faith efforts toward substitution have been implemented. It is time to be aggressive in conveying opposition to Senate members.

All GCSANE members are strongly encouraged to e-mail, call and meet with their elected officials in January. The GCSANE.ORG web site provides a link to simplify contacting your representative and it only takes a few minutes to complete.

DIVOT DRIFT... announcements ... educational seminars ... job opportunities ...tournament results...and miscellaneous items of interest to the membership.

MEMBERSHIP

Proposed New Members:
Mega Green, Friend, Middleton, MA

Sean M. Smith, Assistant Superintendent, Thorny Lea GC

Jonathan Vandale, Assistant Superintendent, Essex County Club

ANNOUNCEMENTS

Condolences go out to Gary Sykes and family on the recent passing of Gary's mother-in-law.

Congratulations to Chris and Adrienne Donato on the recent birth of their son, Charles.

Congratulations to Jason Adams as he leaves Norfolk Golf Club to accept the superintendent position at Blue Hill Country Club.

Congratulations to John Zolkowski as he leaves Norfolk Golf Club to accept the assistant superintendent position at Blue Hill Country Club.

Congratulations to Jonathan Burke as he leaves The Ranch Golf Club to accept the superintendent position at the Hartford Golf Club, East Hartford, CT.

Congratulations to Ed Downing as he leaves A.A. Will Materials to accepts a sales position with New England Specialty Soils out of Lancaster, Massachusetts. Ed's new cell phone number is (978) 230-2300.

The S.V. Moffett Company is pleased to invite you to our 2008 Technical Training Schools. We have teamed up with Jacobsen factory service representative Paul Zellner to present basic troubleshooting of electrical and hydraulic systems. Due to limited classroom sizes we are asking that only one maintenance technician from each facility join us for this no-cost one-day training session.

TUESDAY FEBRUARY 12, 2008

S.V. Moffett Co., Inc., 87 Concord Street, North Reading, Massachusetts. Registration begins at 7:30 am and the class will begin promptly at 8:00am. Lunch will be provided. We will have time for product specific questions and issues to be addressed after lunch. **Please R.S.V.P. to Melissa at our toll free number (888) 708-5296 Ext. 139.** If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Craig Freeman, Service Director,
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GCSANE would like to congratulate the following members who were recognized for 25 Years of Membership at the Annual Meeting:

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The 2008 Joseph Troll Classic is set for Monday, **September 29, 2008** at Lyman Orchards Golf Club, honoring George B. Thompson.
Additional details to follow and will soon be on the web site.
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