SINCE 1927—The Resource for Superintendents // Golfdom.com // 02.14

Golfdom

HERB GRAFFIS BUSINESSPERSON OF THE YEAR

JIMMY THE KID

Range picker at 14…

Superintendent at 24…

Director of operations by 28…

How Schuylkill CC's decision to hire the local kid paid off.

JIM RATTIGAN
Director of Operations
Schuylkill Country Club,
Orwigsburg, Pa.

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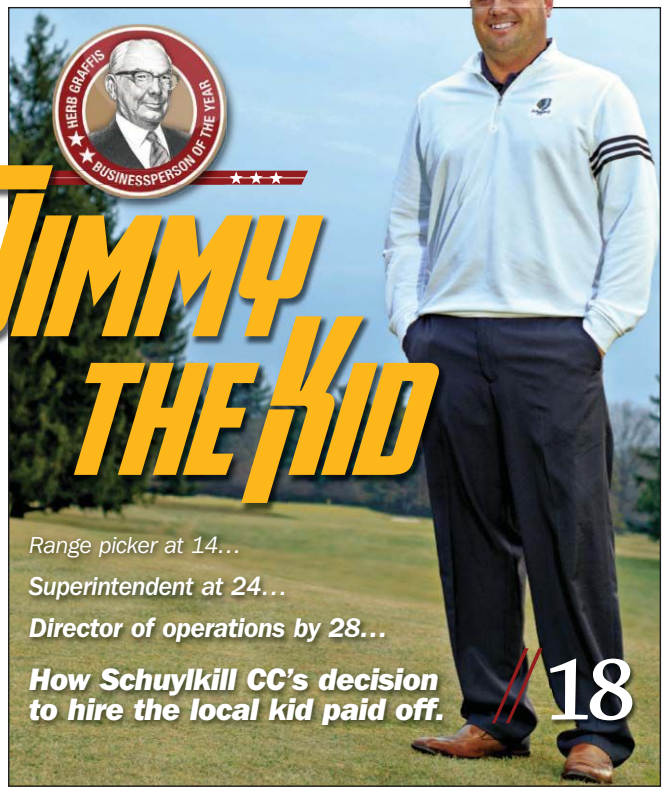

JIMMY THE KID

Range picker at 14…

Superintendent at 24…

Director of operations by 28…

How Schuylkill CC's decision to hire the local kid paid off.

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Golfdom

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"It takes some doing to get to Orwigsburg, Pa. You can't just claim to be in the neighborhood, like I did with both Chojnacky and Kappelman."

SETH JONES, *Editor-in-Chief*

Over hamburgers in Hamburg

The MacKenzie Bar and Grill at Pasatiempo Golf Club in Santa Cruz, Calif. No. 13 green at Sharp Park Golf Course in Pacifica, Calif. And now, the Red Robin in Hamburg, Pa. ¶ *One of these things is not like the others…*

These are the three places where I first told the three winners of the Herb Graffis Businessperson of the Year Award that they were the recipients of *Golfdom*'s only (and therefore "most prestigious") award. In 2012 Paul Chojnacky, then at Pasatiempo, now superintendent at Oakridge CC in Utah, was our first winner. Last year I flew to the same part of the country and told Sharp Park's Wayne Kappelman that he was the 2013 honoree.

It takes some doing to get to Orwigsburg, Pa. You can't just claim to be in the neighborhood, like I did with both Chojnacky and Kappelman. Schuylkill Country Club is as hard to get to as it is to spell. It's 90 minutes northwest of Philadelphia, a picturesque, mountainous setting in the middle of coal country.

Yet I convinced this year's winner, Jim Rattigan, to meet me at a nearby Red Robin for dinner on a Tuesday night in the middle of January for no particular reason.

I had the good fortune of having met Jim previously, while I was on assignment doing my 2013 U.S. Open preview on Merion. A member had invited me out to play the course, telling me I just had to see this Donald Ross beauty and I'd fall in love with it. It didn't matter that not only had I never heard of the course, I also continuously struggled pronouncing its name. (As far as I can tell, you say it *SKOOK-uhl*. That's the pronunciation I gave it in my story, at least.)

That member, Roy Heim, was right. I was instantly impressed by the course, its greens, its stunning panoramic views of the mountains, its hospitable members and its outstanding superintendent/general manager, the aforementioned Mr. Rattigan.

So two weeks ago I met Rattigan for dinner at Red Robin. Over hamburgers and a couple beers, I pitched him the idea for the story you'll find in this issue: Local kid does good. Jim was agreeable.

I decided that over those hamburgers and Yuengling beers was as good a time as any. I went ahead and told Jim that, based on what I knew of him and the work he had done, and based on conversations with Roy and others, I would be naming him the 2014 Herb Graffis Businessperson of the Year.

Jim's demeanor totally changed. "Are you serious?" he asked me, incredulous. "You're totally blowing me away with this… are you sure I deserve it?"

I told Jim that he has a great story, that he's done a great job, and though it might just be called "doing my job" to him, it was indeed an impressive thing he had done in the past 12 years at Schuylkill CC.

Jim then tried to redirect the credit. He has an increible team at the course, he told me. Humility. I've come to expect it from supers.

Eventually I got Jimmy on board with the idea. The next day at the course I got him to tell me his whole story. The more I learned, the more I knew: Rattigan personifies what we're looking for with this award.

When Mr. Graffis founded this magazine in 1927, he did it for readers like Rattigan. He knew there were professionals out there like Jim, people probably like you, who pour their souls into making the game profitable. That's what the award embodies: people who strive to make their business the best it can be.

I doubt that Mr. Graffis would have ever imagined his name being thrown about at a Red Robin in Hamburg, Pa. in 2014.

But I guarantee you, he would have been impressed by Jim Rattigan.

Email Jones at: sjones@northcoastmedia.net.

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NEWS, NOTES AND QUOTES

//DROUGHT

CALIFORNIA DECLARES DROUGHT EMERGENCY

On this winter's day, Californians are dreaming about rain. Not that it's doing them any good.

"We're on our 53rd day without any rain," sighs Billy Hausch, superintendent the Nicklaus Club Monterey in Monterey, Calif. The drought in California has caused Governor Jerry Brown to declare a statewide emergency. Superintendents are gearing up for what promises to be a challenging year.

Normally the wettest part of the year, Hausch is one of many superintendents left in a lurch from this unusually dry weather. Other states are in the same boat — federal agriculture officials designated parts of 11 states, including Arkansas, Colorado, Hawaii, Idaho, Kansas, New Mexico, Nevada, Oklahoma, Texas and Utah — as disaster areas, citing the economic strain this drought is putting on farmers.

"This takes a coming together of all the people of California to deal with this serious and prolonged event of nature," Gov. Brown told reporters in San Francisco. "Hopefully it'll rain eventually. But in the meantime, we have to do our part."

For now, Gov. Brown is asking — nicely — for Californians to do their part. If the drought continues much longer, he won't be asking.

"We have X amount of water allocated to us from wells each year," says Hausch. However, this year they may be looking for more water before the year's out. " We may be begging (for water) by the time it's all done."

One additional problem Hausch is facing is the use of sodium rich recycled water. For Hausch, the extra sodium found in the water can be a problem. When used on the course, the sodium from the water can create small build ups called "sour spots." "You see pockets build up in our fairways and its no good."

If the rain doesn't show soon, Hausch worries about many busted budgets for area courses, especially those who use municipal water supplies. "We only pay for electricity to move the water, but not the water itself," says Hausch. "It's going to be a tough year for everyone down here."

//ALL THE BUZZ

ODA DETERMINES CAUSE OF BUMBLEBEE DEATHS

The Oregon Department of Agriculture (ODA) announced the findings of an investigation into the deaths of bumblebees at multiple sites in Oregon. They concluded that product misapplication was the cause.

The ODA issued a temporary rule in June, restricting the use of products containing the active ingredients dinotefuran and imidacolprid in the wake of four separate incidents. One of which involved a foliar application of Valent U.S.A. Corporation product, Safari insecticide, to European linden trees during bloom. This was a violation of label instructions.

The ODA report determined that the bumblebee deaths connected to the use of Safari, were the direct result of a private commercial applicator "performing a pesticide application in a faulty, careless, or negligent manner."

The applicator company at fault has been issued civil penalities totaling $1,665. The ODA requested that Valent include new language on Safari labels. The updated labels will be seen on March 1, 2014.

//HONORABLE MENTION

GWAA HONORS ROBERT ALLENBY

The Golf Writers Association of America have selected PGA Tour member Robert Allenby as the 2014 Charlie Bartlett Award winner. This award goes to a playing professional who makes unselfish contributions for the betterment of society. The Australian Allenby has raised over $26 million over the last 23 years through the Robert Allenby Golf Day and Gala Dinner. Inspired by the death of a close friend when he was 13, Allenby has been dedicated to raising money to help children with cancer throughout his career. The award will be given on April 9 in Augusta, Ga., the night before the Masters begins.

Past winners include Arnold Palmer, Lee Trevino, Jack Nicklaus, Greg Norman, Tiger Woods, K.J. Choi, Lorena Ochoa, Ernie Els, Tom Watson and Payne Stewart.

ISTOCKPHOTO (GOLF BALL) / SHUTTERSTOCK (MAP, SUNBURST)

Damage to the tenth green at Coal Creek.

Cleaning up Coal Creek

The best-laid plans can amount to nothing with Mother Nature's help. When late summer storms uprooted trees, washed out bunkers and wrecked the Coal Creek GC in Louisville, Colo., prior restoration plans were swept away.

In 2011, golf course architect Kevin Norby was hired by the city to complete a long-range capital improvement plan for the course, directed at improving overall course conditions and identifying long-term improvements. However, Norby now has to sort storm repairs out from the list of improvements originally planned. Norby explained that some repairs, those caused by storm damage, will be funded by FEMA. "FEMA gets involved and they will only pay to get (the course) back to original conditions," says Norby.

Norby is currently working to determine which damages fall under FEMA funding and which the original plan. "It's a very tedious process, but it's the process we have to go through," says Norby. Construction begins this month.

EMAILS @ TEXTS # TWEETS

Mr. Woodward, after reading about your father ("A Dymond in the rough," January 2014) I want you to know that I too lost my hero, as my father passed away last March. He was a retired farmer who instilled in me a work ethic that I know has made me a better superintendent. Something that helped me was a quote from Arnold Palmer, that not a day goes by that he doesn't think of his father. And I know I now have a "special" crew member who joined my staff this year.

—Dave Blasiman, Superintendent, Alliance (Ohio) Country Club

Golfdom's Seth Jones will be the MC of Monday's Palm Beach GCSA meeting? Good. Looking forward to recapping the Florida/Kansas game!

—Brian Birney (@BrianBirneyGCS)

THEY SAID IT

Ron Prichard, Architect

On one of the first things he recommends when he visits a course:

"There's always some need for management of the trees that have been planted over the years. Too many courses have planted inexpensive pine trees all over the golf course, making the course very difficult to play. It's not the most expensive or difficult process (to remove them), it's not a major surgery. But we created a problem for many of our great old classic courses."

PHOTO COURTESY OF: KEN MOUM

Golfdom Gallery

WE CAME.
WE SAW.
WE TOOK PICTURES.

1 Bird of a different feather We had to turn to Twitter to help us identify this Wood Stork spotted at the Breakers Rees Jones Course in West Palm Beach, Fla. We also learned it is the only North American stork, thanks to the wisdom of Scott Griffith (@UGAGCAgronomy).

2 Playing partners John Spiwak, Eastpointe CC, Palm Beach Gardens, Fla.; Curtis Tyrrell III, CGCS, MG, Medinah CC, Medinah, Ill.; and Steve Wright, CGCS, Boca West CC, Boca Raton, Fla., take time from a busy round for a friendly photo.

3 Familiar faces Daniel McCann, director of grounds at San Antonio (Texas) CC; James Smith, assistant superintendent at San Antonio CC; and Scott Boyle, media relations manager for Plant Sciences at the University of Tennessee, were spotted at the Sports Turf Managers Association Conference & Exhibition in San Antonio last month.

4 The coach and I It only took two months for Seth to meet his limit of Jayhawk photos in the magazine for a year, thanks to this photo with Kansas Jayhawks head basketball coach Bill Self. Now, the only other Jayhawks he can picture in the magazine for the remainder of the year are Gary Woodland and Paul Pierce. (*Update: Turns out people around the office are still sore about a 1997 Kansas victory over Ohio State in which Pierce scored 22 points. So it's down to Woodland now.*)

5 America's oldest brewery Though it wasn't mentioned in this month's cover story, Schuylkill CC is located just a few miles from America's oldest brewery, Yuengling Brewery, in Pottsville, Pa. It took Jim Rattigan about 2 seconds to convince Seth to go on the brewery tour.

PHOTOS BY: SETH JONES (1-3) / ERIC NEUTEBOOM (4)

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"To me, all of these signs are an indication that the successful golf courses and operators will continue to improve and grow."

MARK WOODWARD, *Contributing Editor*

Positive signs for golf

After several years of tough times in golf, I choose to believe that 2014 is going to be a good year for our industry. Now, I don't have any magic formula of predicting the future, but I'm already seeing small signs that make me feel optimistic about this year. As we all know, beginning in late 2008 and continuing through 2013, our industry has struggled right along with the economic times.

We've all seen the statistics about rounds being down, revenues being down, people being laid off, more golf courses closing each year than opening and budgets being cut. I have personally felt the impact of these tough economic times and downturns in everything related to golf.

When I was with the GCSAA, we laid off close to 30 employees and the organization felt the direct impact of the entire industry tightening its collective belt. Our vendors/partners gave the association less marketing dollars, so we had to take special, but necessary measures to balance the budget.

When I returned to Arizona and worked for a golf course construction/renovation company, it was extremely difficult to get work because golf facilities were hunkering down, not spending any money on their much needed renovation work.

When I started my own golf course renovation company, we saw a niche in the business, focusing on small to medium sized renovation projects. Even though we did well as a small start-up company, the work is seasonal, making it hard to keep staff busy year-round.

With all of these examples of how our industry has struggled, I still choose to believe that things are looking up for 2014.

One positive sign is at the golf course where I do consulting work. It is doing quite well considering what has happened there over the past several years. Rounds have gone from 29,000 to 49,000 in just 18 months. Revenue has also increased substantially, commensurate with the increase in play. Additionally, rounds are up for the first part of January 2014 compared to the same period in 2013.

Our renovation company is already seeing an increase in golf courses wanting renovation work. We're right in the middle of our golf season here in the desert southwest, when no renovation work typically occurs, and we already have more work on the books and scheduled in 2014 than we've had the past two seasons. We believe that the golf courses that are going to make it through these tough times are now beginning to approve budgets and projects to take care of their number one asset, the golf course itself.

In my mind, another indication of a slow turn around, is that golf course owners in all sectors of the industry (private, daily fee, resort and municipal) are looking for new ways to keep their golf courses open. They obviously recognize the importance of golf to their members, guests and communities and are taking measures to insure that their facilities remain viable business entities.

They are looking at alternative ways to manage their golf courses and engaging more actively in player development programs. They are changing their methods of managing the tee sheets, focusing on yield management, they are making efforts to grow the game and attract new golfers to their facilities and, as I mentioned earlier, taking better care of the physical plant itself, the golf course.

To me, all of these signs are an indication that the successful golf courses and operators will continue to improve and grow, giving our industry one of its better years in quite some time.

I understand that there are many variables that could affect how successful our 2014 will be, including weather and the economy. There won't be a huge spike in rounds, revenues and course openings, but I still choose to believe that if we all do our respective parts, we can collectively make a difference and this will be a great year in golf.

Mark Woodward is a senior vice president for OB Sports, principal of Damarco Golf, president of Mark Woodward and Associates and a contributing editor for *Golfdom*. He can be reached at mwoodward@obsports.com.

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JOEL JACKSON, *Senior Contributing Editor*

The wild, wacky, wonderful world of golf maintenance

As the new year unfolds and my travels line up on the calendar, I'm reminded what a great career I've had as a superintendent and still being associated with the profession.

The exposure to human nature and Mother Nature is a constant learning experience that keeps one physically and intellectually engaged. If you're getting bored, then maybe it is time you make a career change to find something that will get your juices flowing again. For those who enjoy what you are doing, here is a look at the wild, wacky and wonderful world we inhabit in the golf industry.

Wild

More natural areas are being incorporated into new golf course designs as the "target golf" concept lessens maintained turf acreage, which reduces water use, labor, fertilizer and chemical inputs, which in turn, lowers budget expenses.

On older courses the trend to convert formerly maintained turfgrass, but otherwise "out-of-play" sections of the course, into natural areas grows annually. These changes are mainly in response to economic pressures and fallout from a flat national golf participation rate. However they are also positive environmentaly.

For those of us on the course at sunrise, the encounters with wildlife are priceless. Why not have some eco-tours on your course this year to educate your members or public about the great wildlife habitats on our courses?

Wacky

The constant refrain we hear, "Golf is a Big Water User" is so off-key it hurts my ears. Anyone can Google "Water Use Reports," key in a state and do a little searching on use by water consumer groups (agriculture, public supply, business/industry, power generation, recreation and private wells). You'll find out pretty darn quickly that "recreational use," which usually includes a golf portion along with sports fields, parks and recreation, etc., is usually one of smallest slices of the water-use pie chart.

You have to do a little math, but in Florida, golf water use has been running about 3-3.5 percent of the total since 1995. Nationally, the GCSAA figure is one-half of one percent. Considering that Florida has more courses than any other state, perhaps that's not so surprising. Outdoor water use (lawn irrigation), in the public supply sector, runs about 15 percent. I'll just "set and forget" that factoid.

Also wacky is the push by activists to ban fertilizer use during the summer "rainy" season for fear of runoff and leaching nutrient pollution of Florida's waterways. Banning plant nutrition during the summer "growing" season is really wacky. Don't feed the turf when it can take it up most efficiently. Feed it in the spring or fall when roots are just coming back or are just shutting down. Duh!

Wonderful

Last is the wonderful category. All of the above occur in all walks of life. To me, golf combines business, sport, camaraderie, health, nature, hard work, leadership, skill, imagination, communication and perseverance.

Our profession offers so much diversity. We are exposed to so many people, places and possibilities. We are very fortunate to have this opportunity to enrich our own lives and share our bounty with our families and our friends. One sure-fire way to enhance your life is to join, support and volunteer with your local superintendent's chapter.

I hope I get to meet and see many of you at the Golf Industry Show or in my travels. It seems to me that many of us have wild, wacky and wonderful stories about this profession.

Joel Jackson, CGCS-Ret., is senior contributing editor for *Golfdom*. Email him at flrgn@aol.com.

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MATT NEFF, *assistant superintendent, Wedgewood G&CC, Powell, Ohio*

Part office, part museum, all incredible

Rembrandt. If you were ever forced to endure an art history class in college, the professor probably mentioned the 17th century Dutch master on the first day of class before he even got his beret and scarf off.

What does he have to do with golf? Not a whole lot really, but he did produce an etching entitled *The Golf Player.* What does that have to do with this column? I actually got to see it, among many other amazing pieces at the offices of Hurdzan Golf in Columbus, Ohio.

Dr. Mike Hurdzan is not only a well known architect with several courses appearing in all of "The Lists" and the 2013 Old Tom Morris Award winner, he's an avid collector of golf memorabilia.

Actually, "memorabilia" doesn't even seem like the right word. Memorabilia, to me, conjures images of old pennants, bobblehead dolls and autographed pictures. Believe me, this collection far surpasses that.

Let it be known that there is no way for me to adequately describe this collection in the space I am allotted. After several vain attempts to do so, I've come to terms with the fact that a general overview, with highlights mixed in, will have to suffice. Maybe it's better that way, so if you ever have a chance to see it for yourself, you too can be blown away by the magnitude of it all.

The 5,000-square-foot building occupied by Hurdzan Golf is most accurately described as a functional museum. The offices and common areas of the building all serve their traditional purposes, while also serving as mini galleries for the artifacts, artwork, literature and ephemera that Dr. Hurdzan has amassed over nearly 50 years of collecting.

In addition, the building houses a functioning hickory golf club repair shop (which is probably a necessity when you own thousands of them) and an unbelievable library, packed with hundreds of volumes on golf history. As you might expect from a former superintendent and practicing architect, many deal with golf course maintenance and architecture.

The collection includes original writings, drawings, field sketches and notes by some of the most famed architects of the Golden Age, including MacKenzie, Ross, Tillinghast, MacDonald, Colt and Raynor. While there were literally dozens of highlights in the library alone, two of the most impressive involve the great Alister Mackenzie.

One is a map of the Old Course inscribed "To my friend A.W. Tillinghast, from A. MacKenzie." The other is a hand written document that contains sketches and notes of all 18 greens at Augusta, penned by MacKenzie. Dr. Hurdzan found this piece tucked into the back of a book acquired for the collection, unknown to both him and seller. I would be remiss if I didn't also mention the almost complete set of *Golfdom* Magazine issues, dating back to the first volume published in 1927. That's right, this is no fly-by-night publication you're reading.

Even the exterior is cool. There is a rather impressive artificial grass green and chipping area, complete with a bunker. Every parking space in the lot has a sign reserving it for a pro golfer, famous architect or other golf course industry professional (i.e. head pro, caddymaster, etc.). Glaring omission: no reserved parking for Assistant Superintendents. So I took Tiger's spot.

I am by no means an experienced golf collection reviewer, if such a thing exists, but I can tell you one thing for sure: This place is nothing short of amazing. Dr. Hurdzan is unbelievably accommodating and more than willing to give anyone the full tour — after all, I got in. As he told me when I set up my tour, his only requirement is that you love golf.

So if you're reading this magazine, you surely qualify.

Matt Neff (mneff4@yahoo.com) is assistant superintendent at Wedgewood G&CC in Powell, Ohio.

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JIMMY THE KID

Range picker at 14…

Superintendent at 24…

Director of operations by 28…

How Schuylkill CC's decision to hire the local kid paid off.

BY SETH JONES

PHOTO BY CHANDON DE LA TORRE

It was a courtesy interview that made everything else possible: a career would be born; a private club would be revitalized; and a Donald Ross gem would be restored.

Jim Rattigan (Jimmy to many) was the 14-year-old kid with the A-game who used to work picking balls on the range. When he was 16 he took a job on the crew cutting cups. Even when he left for college — Coastal Carolina first, to try out the PGA Golf Management program, then Penn State to earn a turf degree — he still returned home to work summers on the crew.

So when the superintendent job opened up during his senior year at Penn State, he decided to "throw his hat in the ring and see what happened." He had little expectation to get an interview.

A week after his interview, the phone rang.

"It went from a courtesy interview to they were going to give me a shot, and I hadn't even gotten out of school yet," Rattigan recalls. "It was a whirlwind of excitement… a little bit of fear, but ultimately it was something I was so excited to take on and to do, I couldn't wait to get here and get started."

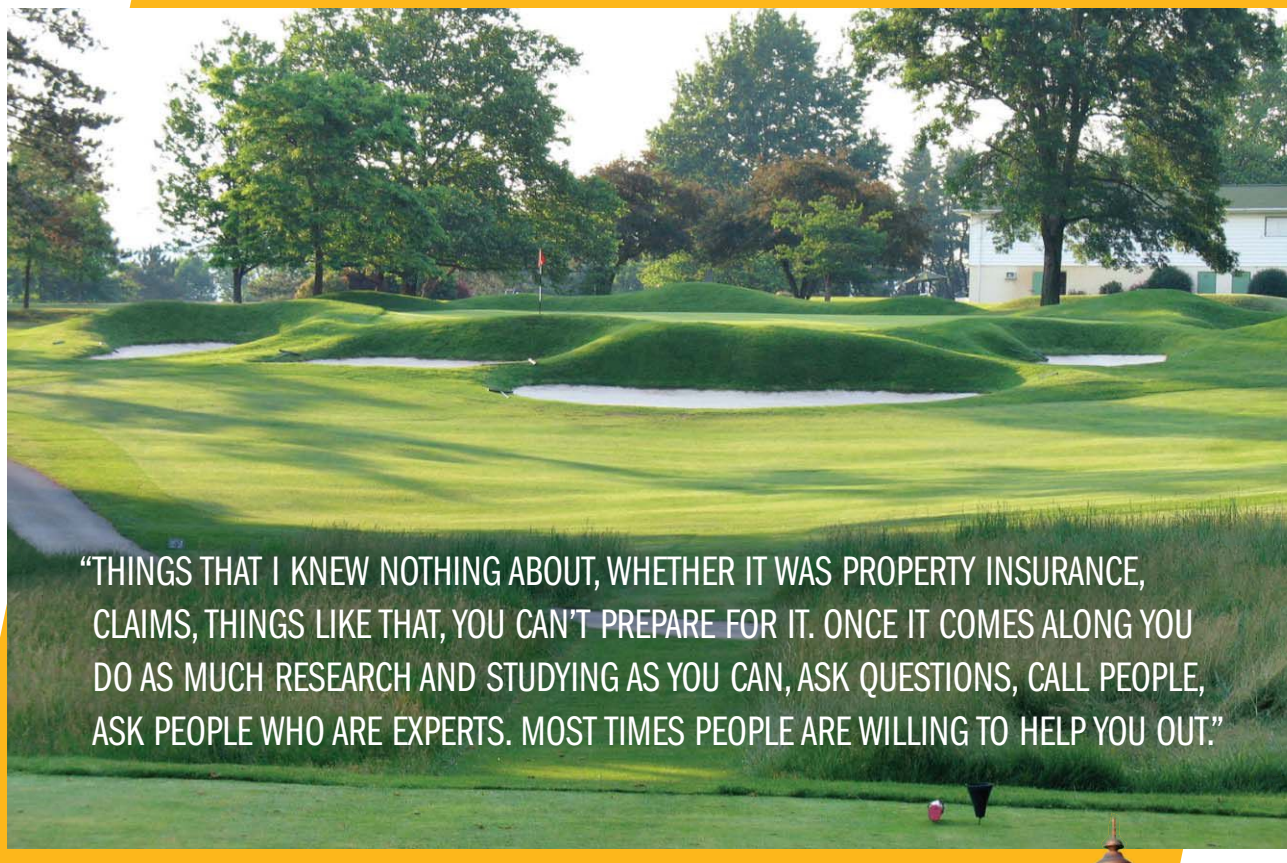
Continued on page 20

"It went from a courtesy interview to they were going to give me a shot, and I hadn't even gotten out of school yet."

JIM RATTIGAN
Director of Operations
Schuylkill Country Club,
Orwigsburg, Pa.

The HERB GRAFFIS BUSINESSPERSON OF THE YEAR award is named in honor of *Golfdom*'s founder, World Golf Hall of Fame member Herb Graffis. Graffis was one of the first people to look at golf as a business when he and his brother Joe founded *Golfdom* in 1927. With his foresight, Graffis helped advance the game in numerous ways, from co-founding the National Golf Foundation and founding the Golf Writers Association of America to his work advocating on behalf of superintendents and helping elevate their profile.

The award includes a *Golfdom* cover story celebrating the person's accomplishments, as well as expenses-paid trips to both the *Golfdom* Summit and the Golf Industry Show. It is in all due respect that we present this award in Mr. Graffis' honor.



"THINGS THAT I KNEW NOTHING ABOUT, WHETHER IT WAS PROPERTY INSURANCE, CLAIMS, THINGS LIKE THAT, YOU CAN'T PREPARE FOR IT. ONCE IT COMES ALONG YOU DO AS MUCH RESEARCH AND STUDYING AS YOU CAN, ASK QUESTIONS, CALL PEOPLE, ASK PEOPLE WHO ARE EXPERTS. MOST TIMES PEOPLE ARE WILLING TO HELP YOU OUT."

Continued from page 19

★ ★ ★

Going all-out

From that fateful day in 2002 to today, Rattigan has seen many successes. Now add to that list the 2014 Herb Graffis Businessperson of the Year Award, named in honor of *Golfdom*'s founder, Herb Graffis, who started the magazine in 1927 (see sidebar, page 19.)

A lot of things happened fast for Rattigan. He was only 24 when he was offered the job at Schuylkill (pronounced *SKOOK-uhl*), a Donald Ross/Willie Park Jr. designed private club in sleepy central Pennsylvania. It was then a quick six years later that he was promoted to general manager, taking on the title of director of operations/superintendent.

Before he applied for the superintendent position, Rattigan discussed the possibility at length with the late George Hamilton, his professor at Penn State who convinced him to leave Coastal Carolina to pursue a turf degree over a career as a PGA Professional. They agreed it couldn't hurt to apply, but if he did get a courtesy interview, he should go all-out in order to respect the opportunity.

Rattigan entered the interview room with a projector and laptop, both borrowed from Hamilton, and a nothing-to-lose attitude.

"A couple things stood out about Jimmy: first and foremost, his excellent academic record," recalls Joe Troy, a Pennsylvania attorney and a longtime member of Schuylkill CC. Troy was one of the members in the room that day.

"His knowledge and commitment to Schuylkill didn't hurt, either," Troy continues. "Then there was the fact that he was close to a scratch golfer, so he knew how the course should play viewed from a golfer's perspective. Lastly, he had done an internship with (architect and Donald Ross expert) Ron Prichard at Aronimink,

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PHOTOS BY: WILL SCHNEIDER

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so he had an appreciation for the historical aspect of this Donald Ross course."

He hasn't told anyone this before, but Jimmy also had a secret weapon: he had just picked up some tricks from one of the best in the business, fellow Penn State alumnus Mark Kuhns, CGCS at Baltusrol.

"(Kuhns) came to the turf club and did a presentation for the turf students on how he did his interview when he went to Baltusrol — things to think about, questions and some neat little tricks," Rattigan recalls with a sly smile. "I paid attention to that and I actually implemented quite a few of them in my interview."

It all added up to the opportunity of a lifetime. Rattigan was now a superintendent at age 24, before he had even graduated from Penn State. Once he graduated he moved back in with his parents, sleeping on their couch for the first six months while he again went "all-out" making as many improvements as quickly as he could to his home course.

TIPS AND TRICKS FROM JIMMY RATT

Mark Kuhns gave Jim Rattigan some well-timed tips back in 2002, so it's only fair that Rattigan offers some tips of his own today. Here's a few from our 2014 Graffis Businessperson of the Year winner:

The 70-percent rule: "I found myself becoming a little bit overwhelmed trying to wear so many hats. I wasn't good at delegating things, I always felt like I had to do everything myself. In the last couple years I came to the conclusion that I have to learn to let go. In my head I'll look at something, and I'll say if someone can do this 70 percent as good as I can do it, I'm going to let them do it. In my head it was 70 percent, but in reality they did a lot better than I thought they could, so it's worked out well."

Three solutions: "Everyone would come to me for every little issue or problem. My desk became a dumping ground. Because I liked to handle everything, I'd take care of it. But then I changed my philosophy: if you're coming to me with a problem, I don't want to hear a problem, I want to hear three solutions, and we'll talk about which one we're going to do. It's definitely changed the dynamics of the thought process around here, and how people look at things when something goes wrong. They don't say "Oh, that's got to get done Jim, just so you know." Now they say, "Here are three things we can do." It's changed the way people look at things, and I have less things come my way."

Play golf. (If possible, play it well.): "I'm a scratch golfer, and I play often. Playing golf is something superintendents should definitely try to find time to do. It gives you a different perspective of your job. Especially if you can get some members in there. The relationships you can build, golfing with members, and just hearing their perspectives, and explaining things. I think it was a big part of me getting my job. The members were aware of who I was, and that gave me extra credibility, that I understand the game and I know what a golf course is supposed to play like."

Follow Jim on Twitter: @JimmyRATT

★ ★ ★

Small club, small budget

Just because he got a shot didn't mean he'd make it work. Once again, Hamilton helped.

"George, we sat down and had a real long meeting. I brought him in for a visit… he was the guy I leaned on. He helped me put together some programs," Rattigan says. "Having a guy like that was a huge help. He was the biggest influence in me getting into the business and getting off on the right foot."

According to Roy Heim, owner of Heim Construction and a member at Schuylkill since 1998, the conditions have gone from average to superb on Rattigan's watch.

"It's the closest thing to Pinehurst No. 2 I've ever played," says Heim, comparing the course to a legendary Ross course and host of this year's men's and women's U.S. Opens. "I went to Pinehurst and the caddie was trying to give me reads. I told him, 'I've got it.' I putted well that day and the caddie said 'Wow, I'm not used to seeing someone read the greens this well.' I told him, 'We've got the same thing back home.'"

That's a bold statement considering Rattigan took over a course that, when he was hired, didn't own a grinder.

"When I walked into the door, there were some interesting challenges. We really were hurting on the equipment side," Rattigan recalls. "When I was interning at Aronimink, I made good friends with the mechanic, Muhamed "Hamo" Krkbesevic. He's a brilliant mechanic, and a really good guy. I had him come up, we went through all the equipment together, he helped me find some grinders, trained our guys how to use them, and that really took us to the next level."

Will Schneider, assistant superintendent, has been at the course for 17 years, and says the equipment has never been better than it has these last five.

"It's the worst when you don't have good equipment, but Jim's been getting us better and newer equipment," he says. "With the money situation, needing to keep costs down, we're doing pretty good. I wouldn't still be here for 17 years if this wasn't a great place to work."

The crew, which ranges from five to 15 depending on the season, gets it done with a maintenance budget of $470,000.

"Walking into a smaller club with a smaller budget, there wasn't a lot of new equipment," Rattigan says. "Those first four years were the toughest, trying to get everything here that we needed. Buying used equipment, three-year off-lease stuff… There are a lot of equipment dealers out there, we would pick and choose deals to get what we needed through the door. Now we have what we need, and a couple backups."

★ ★ ★

Restoring Ross

Also a concern: this Donald Ross course was losing its Ross characteristics.

Bringing back Ross' design elements was always a wish of Rattigan's, and now he was empowered to try to make it happen. He picked up the phone to reintro-

Continued on page 24

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Continued from page 22

duce himself to respected Ross historian and golf course architect Ron Prichard.

"Jim had heard about me, called me up and introduced himself over the phone. I only live about 60 miles away, so I traveled up to take a look at (the course)," Prichard recalls. "I spent time with Jim, and I was particularly impressed by him. At the time the club was not well financed, so I told Jim I'd be happy to do it on a gratis basis, work with them as best I could."

Prichard teamed up with Rattigan and the late Roger Hornberger, a longtime greens committee member who was a geologist with a passion for golf course architecture. The team came up with a plan to remove trees, bring back lost bunkers and probably most important, rebuild a few greens.

"It was a case of a few of the original greens were so steeply pitched — which was justifiable years ago when greens were mowed at much higher heights — that it created a problem where they only had a handful of places they could put a pin from day to day," Prichard says.

Or, as longtime member Joe Troy says, "We liked to joke that No. 4 was the shortest par 5 in America. The green was so sloped it was impossible to putt. They recontoured it... now it's still a difficult par 3, but it's fair."

Even more exciting to the fiscally minded, Rattigan did much of the work in-house.

"Jimmy would bring in interns from Penn State and make a bunker renovation their assignment. Sometimes we didn't have the equipment so we'd have to contract outside help, but he'd always be careful," Troy says. "Also important, a green would go under construction at the end of one season, and be reopened for play by the middle of the next."

Greg Stewart, a civil engineer in Orwigsburg, Pa., and one of Schuylkill's new members, says the restoration efforts have made what he calls a "hidden treasure" even more fun to play.

Well, most of the time.

"The tree program has been great and has opened up some spectacular views. Taking the greens back to the original design has been fantastic," he says. "But they brought back one of Ross' original greenside bunkers on No. 7. I hit in there the other day, I get in the bunker and I can't even see the green! I took a photo with my phone and sent it to Jim with a '*REALLY?!?*' He texted back and said, '*HAHA, you're my first victim!*'"

★ ★ ★

Director of operations

It is said that success breeds success, and

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Continued from page 24

the many improvements Rattigan had made on the course was about to be rewarded — and challenged — again.

It was the 4th of July, 2007, a mere six years into his tenure at Schuylkill when he was approached by the club president to take a ride on the course. During the ride, Rattigan was told a change was being made, and they'd need him to take over management of the entire club while they searched for a new general manager.

His staff went from seven to 50 — from managing the maintenance facility to managing the pro shop, restaurant, membership and events.

"I didn't know anything about running a restaurant and all that, but I looked at it from a customer's perspective — if I was walking through the door, what would I see? What would I like to have? That was basically the perspective I tried to keep," Rattigan says.

Three months passed. Rattigan was learning more everyday. Promotions were made, along with a few difficult changes. By the time the end-of-the-year financials came in, it appeared 2007 was going to be a successful year for the club.

Following the October board meeting, Rattigan was asked to take the job on a permanent basis. His new title became director of operations/superintendent.

"It was very gutsy for him to take a position he was not trained to do. As a superintendent, he's knowledgeable and can out-work anyone," Heim says of Rattigan. "As a general manager, he understands that what he doesn't know, he can research, and he'll call every person in the world until he does know."

Since taking the new position, Rattigan has become an expert on making quick changes from golf casual to business professional.

"There are some really long days there between the two, trying to be both places when you need to be. In the summertime

Assistant superintendent Will Schneider, Rattigan, Bob Dohner and mechanic George Toback, photog crew now are one of the best crews we've ever ha

CHANDON PHOTOGRAPHY

John Sanders, Kevin Peiffer, second assistant
raphed last month. "The guys we have on the
d," Schneider says. "It's a total team effort."

I'll be out there pulling hoses, just like the rest of the guys. Then I do a quick change, come inside, walk around the restaurant," Rattigan says. "I'll go in at night and watch the sprinklers, making sure everything is going on. Then I come in early and set up a spray. I'll be here in the night until 10 o'clock to lock up the doors after the restaurant closes. "

★ ★ ★

Hometown hero

Hard to believe that Rattigan, who turned 36 on Christmas Eve, has been working at the course for 22 years now.

"I never thought of it like that," Rattigan says, considering the years that have passed since he was the range picker. "I hardly golfed when I first started. I was just the kid who was always hanging around, so one day they gave me something to do."

Rattigan has grown up on this course. He went from the kid who was always hanging around to the director of operations/superintendent at Schuylkill Country Club. It's no stretch to say he's also the favorite son of Schuylkill Country Club.

"There's no more of a hometown hero than you can get than with Jim and Schuylkill," says Stewart. The two knew each other in high school, and both worked at the club growing up. "As soon as he could drive, he was always there. On weekends, he'd always be running over to water, to cut cups. He was always dedicated to that course. He was appointed superintendent right out of college, mainly because of his dedication. People who don't know him, who think he's just the general manager? He's actually paid his dues more than anybody out there."

"You just gravitate to people who are fun and nice," Rattigan says. "When I was a kid, the members would say, 'There's little Jimmy Rattigan!' and pat me on the head."

Jimmy the kid has grown up. And the boy's done good.

Rick Weihl, inventor of the Hurricane Blo-Vac, demonstrates what the ride on tool can do.

Blown away

The 2013 *Golfdom* Summit knocked attendees off their feet, both literally (see: the Hurricane blower) and figuratively (witness: Annika Sorenstam's keynote address).

BY MOLLY GASE

From a blower that was strong enough to knock grown men off their feet to a stunning presentation by arguably the greatest female golfer of all time, the 2013 *Golfdom* Summit was full of breath-taking moments… and that's not even including the cigar roller.

The *Golfdom* Summit, now going on its fourth year, takes the opportunity for superintendents to learn, network and have fun and combines it with a guarantee that sponsors will get sufficient time with their most desirable demographic. The 2013 Summit, held for the second straight year at Reunion Resort in Orlando, hosted nearly 50 hand-picked superintendents from across the country and was sponsored by a benchmark 15 industry suppliers.

To attend the event, qualifying superintendents needed to apply (see sidebar, page 30) via Golfdom.com. Not every applying superintendent was selected, but those who were experienced firsthand arguably the most innovative event in the industry.

"This is absolutely, by far the best conference that I've ever attended, and I've been to many over my 24 years in the industry," Darin Pearson, (pictured above) superintendent at Eagle Bend GC in Lawrence, Kan., said of the event. "The one-on-one time

PHOTO BY: SETH JONES

The *Golfdom* Summit included four guest speakers and presentations from 15 sponsoring vendors. Pictured left to right, top then bottom: Annika Sorenstam; Chuck Greif of Jacobsen; Steve Mona of the World Golf Foundation; Scott Kinkead of Turfco; Josh Huffman of Oregon Cordless Tool System; and Melissa Swart of Cushman.

with the vendors is priceless. And the facility is first class, you couldn't host it at a better place."

Learning materials

Unique to the *Golfdom* Summit is the many one-on-one meetings that occur — almost 500 meetings take place between industry suppliers and the superintendents in attendance at the Summit. Sponsors also get the opportunity to present their products in a group demonstration.

The 15 sponsors of the 2013 *Golfdom* Summit included: Air-O-Lator Corporation; Cushman; FMC Professional Solutions; GenNext Biotech; Healthy Grow; Holganix; Hurricane Inc.; Jacobsen; John Deere Golf; Lebanon Turf; Oregon Cordless Tool System; Phoenix Brands by UPI; Quali-Pro; Smithco Inc. and Turfco.

It wasn't uncommon for mingling superintendents to share notes about what caught their eye. Rick Weihl, inventor of Hurricane Blo-Vac, was happy to be on the receiving end of a lot of the chatter this year.

The stand-on riding blower he invented and brought to the Summit gives operators the ability to clear course paths, from leaves to small logs, on the go. In a short demonstration video, Hurricane showed its ability to not only direct air to the right, left and front, but also to literally knock someone's feet out from under them when hit with a blast. (To view the video, visit hurricanedemo.com.)

"A lot of people say they've never seen anything like it before," Weihl said. Weihl worked in the landscape industry previously and had wished for a blower that could switch directions. As of press time he had sold 1,000 units.

"The biggest thing is to be able to blow three ways and be able to switch directions of air flow within two seconds," Weihl said.

One superintendent who was pleasantly surprised by the Hurricane Blo-Vac was Fred Gehrisch, Highlands Falls CC in Highlands, N.C. "The Hurricane Blo-Vac was one of those products that, at first I didn't think much of," Gehrisch said, "but after demoing it and going out with them, that's a great product for a golf course."

Throughout the sessions, superintendents saw everything from fertilizer produced on a chicken farm to a self-sharpening chainsaw that dramatically shot sparks across the room. Steve Cohoon, CGCS at Heritage Hunt G&CC in Gainesville, Va., was most impressed by the new Cushman utility vehicle he saw at the Summit.

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PHOTOS BY: PETE SELTZER

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"I like the electric (drivetrain) — I think that's really a nice product," said Cohoon.

After absorbing so much information, attendees were ready to get some fresh air and hit the course. The Summit golf tournament was played on Reunion's Tom Watson course, the first Watson design in Florida. While it was best that most scores were soon forgotten, the day wrapped up with a more memorable outdoor barbecue dinner, live music and a cigar roller.

The 2013 Summit was the second in a row to be held at the Reunion Resort near Orlando, Fla.

Words of inspiration

The 2013 Summit featured four speakers who shared their wisdom with attendees.

Mark Woodward, senior vice president for OB Sports as well as principal of Damarco Golf, spoke as *Golfdom*'s featured columnist. Woodward centered his discussion on the reality of employment in the industry, which closely mirrored his monthly "At the Turn" column for the magazine. Woodward advised superintendents to plan ahead, thinking about which of their skills could be translated into another industry.

"I'm sure all of you know someone who has worked for 20 years in this industry and is now unemployed," Woodward said. "The only thing constant in our industry is change."

Wayne Kappleman, superintendent at Sharp Park GC in San Francisco, was the 2013 Herb Graffis Businessperson of the Year winner. A truly humble guy, Kappelman began his lecture by saying how shocked he was to have been selected for the Graffis award. He then told the group about some of the challenges of his course.

"Some of the things we have to overcome are pretty special compared to situations at your typical golf course," Kappleman said with a shrug.

One example? Frog delays.

Kappleman's course is home to the threatened red-legged frog and the endangered San Francisco garter snake. Because of these tenants, he must think outside of the box and tread carefully — one of the reasons he was selected for *Golfdom*'s prestigious award.

"My No. 1 priority is the protection of these two species. Legally, if we kill one frog or snake, we could be shut down," Kappelman said of his situation at Sharp Park. "I told the lawyers that I shooed a frog away and it became a 30-minute discussion on (if) shooing the frog was harassment… That's how ridiculous it becomes," Kappleman told the group, evoking both laughs and looks of disbelief.

Planning ahead as the golf industry changes was a main topic of discussion for Steve Mona in his "State of the Industry" speech. Mona, the CEO of the World Golf Foundation and a former CEO of GCSAA, advocated changing aspects of golf to match modern society.

"There's always going to be a group of people who will play the game," Mona said. But that group alone will not grow the game, he warned. Instead, women, children and minorities need to get involved. The changes of society, including the economic downturn, divorce and second families, run parallel to the game of golf. "We don't operate in a bubble, so these are things we have to consider," Mona concluded.

Rounding out the roster of speakers was Annika Sorenstam, eight-time Rolex Player of the Year and 2003 World Golf Hall of Fame inductee. Sorenstam spoke with passion about getting more women and children involved in the game and making it more of a family activity.

Sorenstam reflected back on her time working at a golf course as a good experience that helped her understand what happens behind-the-scenes. "I worked with the greenskeeper for three months on my summer break. It was early mornings, so I know what you guys go through… I'd go out there and cut some greens, cut some fringes," Sorenstam said.

Understanding her audience, Sorenstam spoke to their struggles in this ever-changing industry. "We heard numbers from (Mona) here, but you play a big part in (the industry). I'm sure things have changed. I'm sure regulations have changed. The expectations have changed and the way we build golf courses nowadays, the way we maintain golf courses nowadays…I'm sure you hear sustainability constantly," said Sorenstam.

Recognizing the challenges of the changing nature of golf, she tipped her hat to the attending superintendents. "I applaud you guys for the efforts that you put in. You're a big part of growth of the business."

PHOTO BY: PETE SELTZER

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Super Science

//UNDER THE SURFACE

EFFECT OF TURFGRASS MANAGEMENT ON WATER QUALITY IN THE CHESAPEAKE BAY WATERSHED

Chantel Wilson, Stephen Schoenholtz, Ph.D. and Erik Ervin, Ph.D.

High-quality turf on golf courses is maintained with fertilizer, irrigation and pesticide inputs. As a result, they are perceived as significant contributors to water pollution. Hundreds of courses are located in the Chesapeake Bay Watershed, where there is a history of nutrient pollution and eutrophication problems, resulting in major declines in fish and shellfish populations.

Chantel Wilson measuring velocity at one of the participating golf course research streams, January 2014.

PHOTO BY: SCOTT MAULDIN

No completed studies have investigated the connection between golf course turf management and nutrient deposition or attenuation in Virginia streams. The project goal is to quantify effects of turf management on water quality by comparing areas upstream (INs) and downstream (OUTs) of courses. Data will be compared to the Chesapeake Bay Total Maximum Daily Loads for nitrogen and phosphorus, clarifying if future regulation of water quality is warranted for golf course management.

Data for 11 seasons at six courses in the James River Basin within the Chesapeake Bay Watershed have been collected. No significant impairment trends of dissolved oxygen, conductivity, temperature or pH have been observed to date. Nitrate-N was always below the 10 mg L-1 EPA drinking water standard. Phosphate-P in downstream waters was below the 0.05 mg L-1 EPA recommendation. There appears to be no significant differences between the IN and OUT locations at all sites for ammonium-N and phosphate-P.

A weak significant increase in nitrate-N was observed at one stream, but is at a low level. Overall, no significant degradation of local water quality appears from the six golf courses studied.

Funding: GCSAA/EIFG, Virginia GCSA, Virginia Agricultural Council

Chantel Wilson, Stephen Schoenholtz, Ph.D. and Erik Ervin, Ph.D., Virginia Tech. Contact Chantel at cwilson5@vt.edu for more information.

ON THE MOVE

PAUL KOCH JOINS UNIVERSITY OF WISCONSIN-MADISON DEPARTMENT OF PLANT PATHOLOGY

Paul Koch was recently hired as an assistant professor in the Department of Plant Pathology at the University of Wisconsin – Madison. The position has a 70 percent extension appointment, 20 percent teaching and 10 percent research. His research will likely focus on the impact of environmental conditions on fungicide persistence on turfgrass, snow mold diseases and root-infecting diseases.

Koch received his Ph.D. in Plant Pathology from the University of Wisconsin – Madison in 2012, with a minor in Molecular and Environmental Toxicology.

Before joining the faculty, Koch managed the Turfgrass Diagnostic Lab (TDL) for the University of Wisconsin from 2005 to 2013. The TDL is a non-profit diagnostic facility specializing in fast, accurate diagnoses from both professional and do-it-yourself turfgrass managers across the country. Koch will continue to oversee both the TDL and the fungicide testing program.

Koch can be reached via email at plkoch@wisc.edu, by phone at 608-576-2673, or via Twitter at @uwpaul.

> "IF NICKEL LEVELS CAN BE INCREASED VIA GRANULAR FERTILIZER APPLICATION, FERTIGATION OR INJECTION TECHNIQUES... FOLIAR-APPLIED UREA MAY BE MORE EFFICIENTLY ABSORBED."
>
> **Richard J. Hull, Ph.D.**
> *(see full story on page 34)*

//IT'S ELEMENTARY

How turfgrasses use urea-nitrogen

By Richard J. Hull, Ph.D., Haibo Liu, Ph.D. and N. Menchyk, Ph.D.

Nitrogen (N) is the most abundant mineral element in turfgrasses, comprising three to five percent of leaf dry weight. Consequently, N is the fertilizer nutrient applied to turf in a greater quantity than any other (two to five lbs per 1000 sq. ft. per year). Most of this N is applied to turf as urea, either as free urea, coated-urea granules or polymerized methylated urea.

Because of the perennial sod character of turf, most fertilizer N is applied directly to grass leaves in granular form or as an aqueous solution. Only during turf establishment is fertilizer spread directly on the soil. While most crops utilize less than 50 percent of fertilizer nitrogen (Witte, 2011), turfgrasses do much better, often recovering 85 to 90 percent (Hull & Liu, 2005).

Even with this relatively good performance, N recovery by turfgrasses may still be improved. Since urea is the major N source applied to turf, its absorption and assimilation will be critical factors in working for improved N use efficiency. Recent research has discovered some aspects of the uptake and metabolism of urea-N that may be exploited by turf managers to reduce their N use and prevent its off-site movement.

HOW UREA-N IS ABSORBED BY TURFGRASSES

It has long been assumed that urea-N is not absorbed directly by plant roots but rather as ammonium (NH_4^+) or nitrate (NO_3^-) and by leaves as ammonia (NH_3) or NH_4^+. Urea is not stable in the soil or on leaf surfaces due to the ubiquitous presence of the enzyme urease that hydrolyzes urea to carbamic acid and one free ammonia. The unstable carbamic acid then spontaneously decays to another ammonia and a carbon dioxide (CO_2) molecule (Fig. 1). Both NH_3 and CO_2 are gases that would diffuse into the atmosphere and be lost were it not for their high solubility in water. CO_2 can combine with water to form carbonic acid that under slightly acid pH conditions, dissociates to a bicarbonate anion and a free H^+.

$$CO_2 + H_2O \longrightarrow H_2CO_3 \longrightarrow HCO_3^- + H^+$$

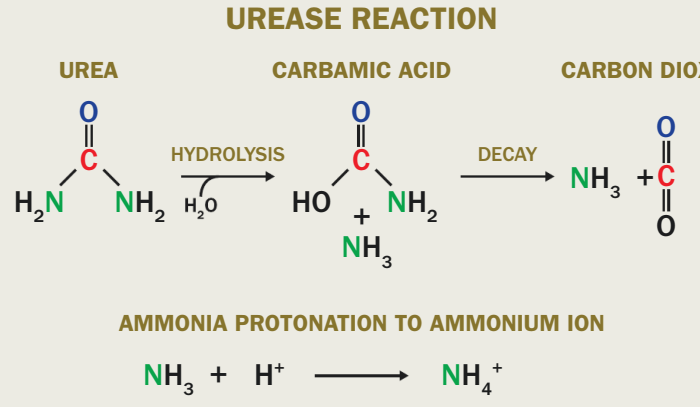
On the other hand, in an acid solution, NH_3 will acquire a H^+ (become protonated) to form the stable ammonium cation (NH_4^+) (Fig. 1). The pKa for NH_3 protonation is 7.2 (the solution pH at which the concentrations of NH_3 and NH_4^+ will be equal). Therefore, if the soil solution or the liquid on a leaf surface is more alkaline than 7.2, much nitrogen from hydrolyzed urea will remain in the gaseous NH_3 form and readily defuse from solution into the atmosphere.

Fortunately, leaf surfaces and soil solutions are generally acid, so nitrogen derived from urea fertilizers will be maintained in the stable NH_4^+ form. In that form, nitrogen can enter plant cells via cation transporters and become assimilated into amino acids and eventually into nucleic acids, proteins, chlorophyll and other N-containing molecules.

However, in the soil, NH_4^+ will be oxidized rapidly to nitrate (NO_3^-) by nitrifying bacteria and in that form will be actively absorbed into root cells via specific NO_3^- transporter proteins imbedded in the plasma membranes of most plant cells. Nitrate ions are not subject to volatilization from the soil solution but they can leach in rain or irrigation water through the root zone and be lost to the water table.

FIGURE 1

The pathway by which urease hydrolyzes urea and the protonation of NH_3 to NH_4^+



Thus, urea applied to the soil should be treated much as inorganic nitrogen materials, with respect to leaching and potential ground water contamination.

Urea is a natural chemical in most living things. It is formed during biosynthesis of the essential amino acid arginine and likely during the normal metabolism of nucleic acids (Hull 2003; Witte 2011). Urea can be regarded as a waste product and as such must be eliminated from the organism. This is no problem for animals that have a circulatory system. For plants, such wastes pose more of a problem.

Normally plant byproduct wastes are deposited in cellular vacuoles, where they are excluded from the sensitive metabolic machinery within the cytoplasm and where some recycling may occur. However, waste products from major metabolic pathways could be made in quantities large enough to overwhelm vacuolar sequestration and contribute to nutrient inefficiency especially when they are N-rich chemicals like urea. Since most plants are normally N-limited and could not tolerate such inefficiency, they have evolved a method for metabolizing urea and recycling its N. Urease is at the core of urea-N recovery.

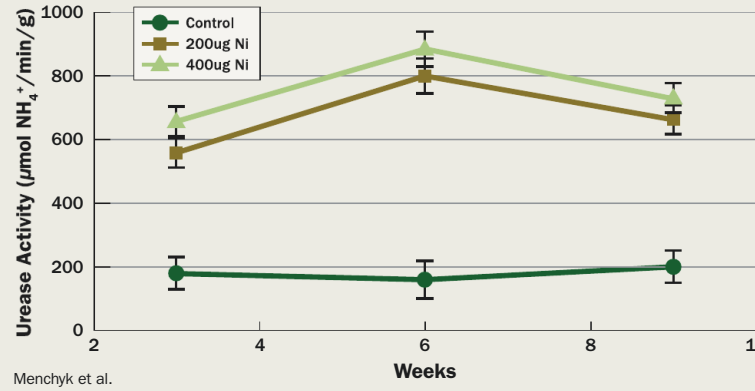
The presence of the urease enzyme in most plant cells permits urea-N to be efficiently returned to the plant's N assimilatory pathway and reutilized for the synthesis of essential N-containing compounds. The presence of urease makes plants, algae and many bacteria among the most N-efficient life-forms on earth. If a plant lacks the urease enzyme, urea can accumulate to toxic concentrations and eventually cause plant death. This occurs in mutant plants that fail to synthesize functional urease or when Nickel (Ni), an essential metallic component of urease, is deficient.

Nickel is the latest mineral element to be added to the list of essential nutrient elements in plants. When grasses are grown in solution cultures lacking Ni, severe leaf tip burn is observed resulting from an excessive accumulation of urea in this oldest part of a grass leaf (Hull, 2003). Because Ni is required in such small amounts (~0.1 ppm in dry leaf tissue) and grass leaves normally contain at least three to five times that amount, Ni deficiency has never been observed in the field (Menchyk et al. 2013).

Even so, Ni may have a role to play in the use of urea fertilizers applied to turf. We will get back to that later.

FIGURE 2

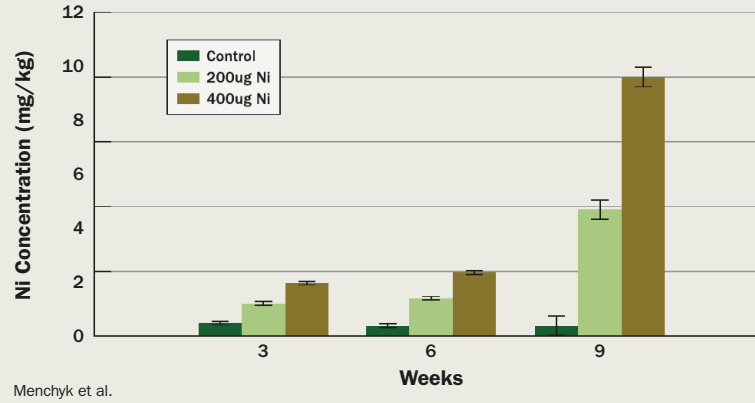
Urease activity in leaf tissue of Diamond zoysiagrass and TifEagle bermudagrass as influenced by Ni levels in three harvest dates over nine weeks.



Menchyk et al.

FIGURE 3

Nickel concentration in leaf tissue of Diamond zoysiagrass and TifEagle bermudagrass as influenced by three nutrient solution Ni levels in three harvest dates over nine weeks.



Menchyk et al.

CAN UREA BE ABSORBED BY PLANTS AS AN INTACT MOLECULE?

Because urease-endowed organisms are so abundant in nature, it has been assumed that urea-N applied as fertilizer is readily hydrolyzed and absorbed by plants primarily as NH_4^+. While this is generally true, recent evidence indicates it may not be the whole story (Witte 2011). For example, plants can be grown in sterile solution culture with urea as the only N source.

Continued on page 36

Continued from page 35

Such plants fail to grow as well as plants receiving a mixture of NH_4^+ and NO_3^- but they still grow reasonably well, indicating that intact urea must be entering root cells.

In addition, plants have been shown to possess dedicated high affinity urea transporter proteins in their cell membranes that permit urea uptake and distribution throughout the plant. Once inside plant cells, urea is readily hydrolyzed by their abundant urease or loaded into vacuoles by urea transporters that are also present in their tonoplasts (membrane enclosing a vacuole). The induction of these urea transporters appears to be stimulated by external urea and suppressed by the presence of other soluble N sources, e.g. NO_3^-, NH_4^+ and amino acids.

Urea transporters are most abundant in N-starved plants, especially when urea is introduced to their external environment and when plants are provided no N-source except urea.

The urea transporters discussed above facilitate secondarily active urea uptake. That is, urea crosses a membrane accompanied by a proton (H^+) in a co-transport process. During normal root growth, the surface (epidermal) cells pump H^+s through their plasma membrane from the cell's interior into the external cell walls via a H^+-transporting ATPase (H^+ pump).

Put more simply, for each two H^+s pumped out of a cell, an ATP molecule is expended. ($ATP + H_2O \longrightarrow ADP + H_2PO_4^- + 2H^+$). Since ATP is the chemical energy currency of metabolism, H^+ pumping is an energy expending process that is driven by ATP hydrolysis. As this process continues, the H^+ content within the cell walls increases (becomes more acid) relative to the cell interior that remains the same or actually becomes less acid. This pH gradient across the plasma membrane constitutes an energy gradient equivalent to the energy lost by ATP when it gives up a phosphate and becomes ADP.

How is this H^+ gradient used to pump urea into a plant cell? When urea is introduced as an N-fertilizer, it diffuses into the walls of root or leaf epidermal cells where it activates the synthesis of urea transport proteins in their plasma membranes. These transport proteins have aqueous pores through which H^+s can move from the cell walls back into the cell's interior. The structure and chemistry of the pores is such that an H^+ can pass through the pore only if accompanied by a urea molecule. Since the H^+ concentration in the cell wall is greater than it is within the cell interior, influx of H^+ is energetically favored. Urea will always be transported inward because the influx of H^+, its transport partner, is an energetically favored process.

There is recent evidence that urea may also enter plant cells and move across internal cell membranes via aquaporins, the membrane channels by which water enters cells (Witte 2011). Like water, urea is a small, uncharged molecule that probably would not be excluded from moving passively with water through aquaporin channels. Whether urea can enter cells as an intact molecule by active or passive mechanisms is less important than the emerging idea that urea-N can be absorbed by roots and leaves without first being released as free NH_3.

MANAGING UREA-N UPTAKE BY TURFGRASSES

To a turf manager, all this may seem pretty academic and of little practical value toward keeping grass green and healthy by maintaining an adequate N supply. Such a judgment may be premature when the vulnerability of NH_3-N to volatility losses is considered. We know that as much as 30 percent of urea-N applied to turf can be lost to the atmosphere unless it is watered into the thatch/soil by irrigation immediately following application (Hull and Liu 2005). This precaution fails to work very well if the soil is even slightly alkaline or the irrigation water has a pH greater than seven. Even if the soil is acid enough to convert NH_3 to NH_4^+ ion, it will be readily oxidized to NO_3^- that may be subject to leaching loss.

Foliar applied urea initially comes in contact with leaf surfaces that may be populated by enough urease-containing bacteria to cause most of the urea-N to be released as free NH_3. However, leaf surfaces are generally acidic, so urea-derived NH_3 will likely become NH_4^+ ions in the spray solution retained on leaf surfaces. These NH_4^+ ions can penetrate the leaf cuticle and become absorbed by epidermal cells just as other nutrient ions are during foliar fertilization. If the spray solution dries on the leaf surface, any remaining NH_3 will be lost to the atmosphere.

Does an understanding of urea-N absorption and metabolism suggest ways of making urea use more efficient?

Recent research by our Clemson team (Menchyk et al. 2013) indicates that the efficiency of urea-N use by turf can be optimized by coordinating

Ad Index

Companies featured in this issue

its application with management of the micronutrient, Nickel (Ni). They worked with two warm-season grass species, TifEagle ultradwarf bermudagrass (*Cynodon dactylon x C. transvaalensis*) and Diamond Zoysiagrass (*Zoysia matrella*). Plugs of these grasses were grown in greenhouse conditions with the nutrient solution supplemented with three levels of Ni (0, 200 & 400 µg Ni per liter). Nitrogen was supplied exclusively through weekly foliar applications of urea at a rate equivalent to 0.2 lbs. N per 1,000 sq. ft. (1.8 lbs. N per 1,000 sq. ft. during the nine-week duration of the experiment).

The addition of Ni to the nutrient solution substantially increased the leaf Ni content at a rate that increased throughout the nine weeks of the experiment (Fig. 2). This resulted in a dramatic stimulation of leaf urease activity that, unlike the Ni content, leveled off after six weeks (Fig. 3). The amino acid content of leaves increased steadily following a pattern very similar to Ni increase.

Not surprisingly, these changes contributed to greater leaf growth in both grasses. However, with this stimulated N metabolism occurring, the total leaf N concentration actually declined. Others have observed this and attributed it to a dilution of plant nitrogen by increased leaf growth. In this experiment, all N was being introduced from foliar applied urea. As growth was stimulated throughout the plant, its demand for N would increase, causing a drain in leaf N.

This study reveals ways by which Ni manipulation, as a way of regulating urease activity, might become a management tool for increasing N use efficiency. If urea-N can enter grass roots or leaves as intact urea molecules, and by applying Ni, internal urease activity can be stimulated, the concentration gradient of urea across the plasma membranes of root and leaf epidermal cells can be increased. Such a steepened urea gradient would stimulate urea influx, especially via aquaporin-like membrane channels.

This probably has less potential benefit for soil-applied urea since the natural sources of urease are so abundant there, that urea would have a short half-life in most soils. However, if urease inhibitors are used in conjunction with urea absorption stimulation techniques, direct urea absorption by roots could be enhanced with less urea-N lost via NO_3^- leaching.

The greatest potential for increased urea-N recovery by turf may be in the foliar application of urea. If Ni levels in turfgrasses can be increased via granular fertilizer application, fertigation or injection techniques, thereby increasing urease activity within leaf cells, foliar-applied urea may be more efficiently absorbed. Applying foliar urea in the evening at concentrations that have little burn potential and delaying irrigation until morning could significantly increase the opportunity for intact urea adsorption. Including a surfactant in the urea solution would increase leaf coverage and also favor absorption. Of course, using mildly acidic water will keep any free NH_3 in the NH_4^+ form that will be more readily absorbed.

These are suggestions. They have a reasonably sound scientific basis for working. In any event, they can do no harm, and are worth trying.

Richard J. Hull, Ph.D., is a professor emeritus of plant science at the University of Rhode Island and adjunct professor of horticulture at Clemson University. Haibo Liu, Ph.D., professor of turfgrass science and N. Menchyk, Ph.D. are at Clemson University. Dick Hull can be contacted at rjhull34@yahoo.com for more information.

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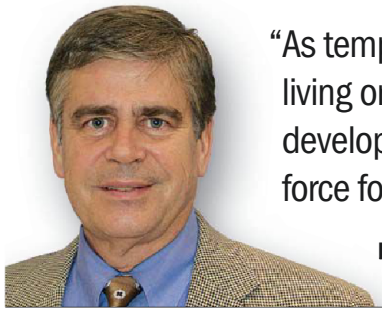

"As temperatures increase, plants and living organisms begin to grow and develop. Temperature is the driving force for all biological activity."

KARL DANNEBERGER, PH.D., *Science Editor*

Spring triggers growing degree-days

With the arrival of spring, the warmth of the sun is most evident. As temperatures increase, plants and living organisms begin to grow and develop. Temperature is the driving force for all biological activity. One method of using temperature to describe and predict the development of living organisms is accumulative growing degree days. In a previous column I described how growing degree days are calculated and used to predict annual bluegrass seedhead emergence (*Golfdom,* March 2010). In this column, I look more in-depth at ways to calculate growing degree days.

There are three ways to calculate growing degree days (GDD). The most common is the Average Method where the daily minimum temperature is added to the maximum temperature for that day and then divided by two. The base temperature, which can vary depending on the plant model, is subtracted from the average. If the calculated growing degree day is greater than zero, it is added to the cumulative total that has occurred since the start date. If the GDD is less than zero, it is set to zero. The base temperature can vary widely depending on the GDD model ranging from 32 to 55 degrees F with some models. The most common base temperature used is 50 degrees F (10 degrees C).

The second method is the Modified Average Method, which calculates GDD the same way as the Average Method except if the minimum temperature is below the base temperature; the base temperature is used as the minimum temperature in the calculation. This calculation has an advantage over the Average Method when temperatures fluctuate above and below the base temperature that occurs often in the early spring. When fluctuation occurs above and below the base temperature, the Average Method underestimates the number of GDDs. From an application perspective, timing a mefluidide (growth regulator) application for *Poa annua* seedhead control would be best based on the Modified Average Method of calculating GDD.

The Modified Sine Curve Method is the third and most accurate means of calculating GDD. It is based on the assumption that the daily diurnal temperature pattern is similar to a sine curve. The GDD calculated is the area under the curve. The Modified Sine Curve calculation is considerably more complex than the previous two methods and often requires a computer program.

The Modified Sine Curve Method also accounts for a high temperature threshold. In other words an upper temperature limit can be set where GDD are calculated to the threshold and not above. The upper threshold concept can be used to calculate Stress Degree Days that may help define and predict the summer stress period.

Lastly, there is the start date. With all GDD models, a set start date is given, which is sometimes referred to as biofix. The common start date is January 1st, but this can vary depending on the model. Early GDD models that predicted annual bluegrass or Kentucky bluegrass seedhead emergence had a start date of April 1 and March 1, respectively.

Recently, applications of the growth regulator trinexapac-ethyl are being recommended based on the work of Kreuser and Soldat (2011) at the University of Wisconsin. Based on GDD, they have proposed applications being timed around 200 GDD (base temperature zero degrees C). Repeated applications can be made on 200 GDD increment, or the GDD is reset to zero and accumulation starts again.

When creating or using a GDD model, be aware of the method used to calculate GDD, the temperature units used (Fahrenheit or Celsius), the base temperature and the start date used.

Karl Danneberger, Ph.D., *Golfdom*'s science editor and a professor at The Ohio State University, can be reached at danneberger.1@osu.edu.

Will my putting green turf survive winter?

Jim Skorulski is a USGA Senior Agronomist in the Northeast Region. Jim has made over 2,000 Course Consultation Service visits in over 20 years of service with the USGA. Jim can be reached at jskorulski@usga.org.

Q What has this winter been like so far in the Northeast?

There have been at least three severe temperature swings that occurred since November with the last occurring in January when temperatures in many areas reached the upper 50s and then plummeted into single digits or lower within a 48 hour period. Currently, most golf courses in the southern part of the Region are clear but those in more northern parts of the region and in Canada are not. There are reports of significant ice layers present in those areas.

Q Has the turf survived the winter so far?

Yes, as of the end of January the reports from the field have been positive. This is based on a limited number of superintendents who have grown out turf plugs taken from greens. This is great news but we all know there is plenty of winter ahead and it is impossible to predict what might happen going forward.

Starting about mid-February the health of annual bluegrass can change rapidly as it begins to deacclimate and becomes more susceptible to rapid drops in temperature.

Q Are there any other diagnostic tools to help a superintendent determine if the turf has survived?

The only definitive way to tell if the turf has survived is to pull turf plugs and bring them indoors to see if they grow. This is a reliable technique, provided the plugs are taken from a representative area of the green.

We also recommend monitoring for the presence of an anoxic or anaerobic condition beneath the ice. It can occur fairly quickly under some circumstances, such as when the ground is not fully frozen, or soils are high in organic matter. A distinctive odor will be present that has been termed the "smell of death." Begin monitoring for the condition under ice sheets that have been in place for three to four weeks, especially on greens that have a history of low temperature injury.

Q Should a superintendent consider removing accumulated snow/ice from greens?

There are no guarantees when it comes to snow and ice removal from greens. There is always risk involved when the covered turf is exposed to lower temperatures, knowing that hardiness of those plants may be compromised. Removal of an ice layer should be considered on annual bluegrass greens if it is creating an anoxic condition. Initiate the work based on a favorable forecast for moderate day and night time temperatures. A winter cover or snow can sometimes be used to protect recently exposed surfaces.

Q What are your thoughts about drainage as the snow and ice melt?

It is critical to keep water from collecting on the surfaces whenever possible. Open paths through snow and ice layers that impede water flow from the surface. Be sure that any snow that is cleared from the surface is piled far enough away from a green so that snowmelt does not flow back onto the green.

Q Anything else you would like to add?

Hopefully, our luck will continue through the rest of the winter season. However, if you end up having to deal with damaged playing surfaces, it is critical to be out front with the problem with club officials, golfers

> "SOME SUPERINTENDENTS CALL THESE ODORS THE 'SMELL OF DEATH.' "

and other professional staff at your facility. Develop a sound recovery plan, procure the necessary resources and be realistic when estimating the length of the recovery process and importance of using temporary greens. Finally, it is a good idea to get the irrigation system charged up early if you expect some degree of damage has occurred. Early season irrigation may be critical to the survival of the weakened plants and a necessity for the establishment program.

Editor's Note

Jim Ross and his colleagues at the Prairie Turfgrass Research Centre at Olds College in Alberta, Canada conduct winter injury research on turfgrass and their information can be found at http://www.oldscollege.ca/ptrc/home.html.

Clark Throssell, Ph.D., loves to talk turf. Contact him at clarkthrossell@bresnan.net.

HERBICIDES TO THE RESCUE

THESE FOUR PRODUCTS CAN HELP MAKE A DIFFERENCE AT YOUR COURSE.

By Seth Jones // *Editor-in-Chief*

WHILE AT THE SPORTS TURF MANAGERS ASSOCIATION CONFERENCE & EXPO last month, we ran into Jared A. Hoyle, Ph.D., assistant professor and extension turfgrass specialist at Kansas State University. The native North Carolinan reports that he's enjoying having Kansas as his new turf region. For a video interview with Hoyle, visit Golfdom.com. While we had him, we also asked him for some key advice on applying herbicides. See below for his top tips.

1. Clipper

Clipper Aquatic Herbicide from **VALENT PROFESSIONAL PRODUCTS** is now available for use by superintendents. Clipper controls many tough aquatic plants including duckweed and watermeal, and has activity on some algae. It's easy to handle, easy to mix and easy to apply. It also provides consistent results: Activity is observed within three to five days after application. Available in a convenient new 1-lb. package, Clipper dissipates quickly from the water column and does not accumulate in the sediment. It has minimal irrigation restrictions and does not require perfect coverage for maximum results. Available as a water dispersible granule for easy mixing, transport and application, Clipper can be easily applied to small ponds with a backpack sprayer from the shoreline.

valent.com/professional

2. Katana

University trials prove **PBI GORDON'S** Katana Turf Herbicide controls grassy and broadleaf weeds with postemergent and some preemergent activity. Highly selective in Bermuda, zoysia, centipede and buffalo grasses and seashore paspalum, Katana controls a much broader spectrum of grassy and broadleaf weeds than other products of its type, especially in cooler weather, the company says.

pbigordon.com

3. Tribute Total

From **BAYER CROPSCIENCE**, Tribute Total post-emergent herbicide can now be used on zoysiagrass. It delivers broad-spectrum control in one complete solution to help golf course superintendents selectively remove troublesome grassy and broadleaf weeds, sedges and kyllingas. Approved for use on bermudagrass and now zoysiagrass, it is effective against 55 grassy and broadleaf weeds including dallisgrass, crabgrass, and yellow and purple nutsedge. At a use rate range of 1 to 3.2 oz. per acre, each 6-oz. container of Tribute Total treats between 1.875 and 6 acres. After application, the product is readily absorbed by the foliage and carried to the site of action in the growing points of the susceptible weed. Additionally, with a 60.5% water-dispersible granule formulation, Tribute Total requires less storage space, transportation, and less frequent container disposal.

backedbybayer.com

4. Hammerkop HydroCap

Featuring an encapsulation technique, Hammerkop HydroCap is a water-based formulation of pendimethalin with improved mixing and handling characteristics. This exclusive formulation from **PHOENIX BRANDS BY UPI** also reduces odor and potential staining. Hammerkop HydroCap contains 3.8 lbs. of pendimethalin per gallon to control more than 45 troublesome weeds and grasses including: henbit, spurge, *poa annua*, crabgrass, goosegrass and oxalis plus 40 more. Hammerkop HydroCap is labeled for use on golf courses, sod farms, athletic fields, commercial and residential lawns and landscapes, Christmas tree and other tree nurseries, field and container nurseries as well as non-crop areas.

phoenixenvcare.com

TIPS FROM DR. HOYLE

- Always remember that the best weed control is a healthy turf stand.
- Remember to apply at the proper timing. (At the correct growth stage of the weed.)
- Always keep records so you can look back at what chemistries and rates you used in the past.
- It's never a bad idea to have a check plot to see what would have happened if you did not apply the herbicide. Keeping a check plot in a similar area of turf can let you compare the two and see if the results were with the money and effort.

CONTINUED ONLINE
For more listings of herbicides, go to:
golfdom.com/category/products

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Hammerkop™ HERBICIDE
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4

3

1

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1. TB 220

The TB 220 grooming brush is the recently redesigned version of the highly regarded TB 200 produced by **SGM INDUSTRIES**. Hundreds of turf managers around the world have found this tool to be one of the best investments in turf maintenance equipment they have ever made, the company says. Regular use of the brush gently removes the "grain" from putting greens, and the brush is invaluable during topdressing and aerification procedures. The brush is also used on tee and fairway turf, as well as on artificial turf surfaces.
sgmindustries.com

2. Z700-Series

KUBOTA unveils its new Z700-Series commercial zero-turn mower line including three models: the Z723, Z724 and the Z725. Designed to run day in and day out, the Z700-Series is a true workhorse boasting the powerful Kohler Command V-Twin Engine and integrated Parker 14cc pump and wheel motor. Available with a rugged commercial deck in three popular cutting widths, 48-inch, 54-inch and 60-inch, the Z700-Series comes equipped with a wide operator platform, a thick high-back adjustable seat and a convenient deck height adjustment dial. Maintenance is easy with an optional maintenance lift kit attachment that allows operators to lift the front of the deck, plus sealed greaseless spindle bearings create less down-time in between jobs.
kubota.com

3. Reelmaster 3550-D

THE TORO CO. says their Reelmaster 3550-D is the lightest fairway unit on the market, weighing in at 1,985 pounds. The lightweight design allows for gentle turns, and minimizes compaction and tire tracks. It has an 82-inch width of cut and can travel at up to 7 miles per hour. The Reelmaster has five 18-inch cutting units for enhanced ground following over fairway undulations. The Reelmaster 3550-D features a 24.8 hp Kubota diesel engine. Turf-friendly tires are standard, as is a series/parallel 3-wheel drive system that provides outstanding traction on wet, uphill grades.
Toro.com

4. UMAXX Mini

KOCH is excited to introduce UMAXX Mini. Whether you spray or spread, UMAXX Mini delivers nitrogen with enhanced efficiency at 150 SGN. This particle size dissolves faster in the tank, or when applied dry, with reduced N rates and less mottling. The result is a faster fill-in with deep green color throughout the season. That's the lasting power of stabilized nitrogen.
kasturf.com

ONE PERCENT
FOR THE wee one FOUNDATION

One Cause. One Goal. One Percent.

***One Cause**: Help golf course management professionals and their dependents that are having trouble paying medical bills due to the lack of comprehensive insurance or adequate financial resources.*

***One Goal:** Raise $10 million in 10 years to support these families.*

***One Percent:** Donate 1% of your 2013 revenue, maintenance budget, or salary over the next 10 years in 10 payments.*

Example Contribution:

2013 maintenance budget = $65,000

1% = $650

Donation = $65 per year for 10 years

To learn more about One for the Wee One,
visit weeone.org/onepercent or call (630) 457-7276.

wee one foundation

Wee One Foundation is a 501(c)3 non-profit association. A tribute to Wayne Otto, CGCS.

The 19th Hole with...

Billy Hausch

SUPERINTENDENT // Nicklaus Club Monterey, Monterey, Calif.

Billy, what can I get you to drink? Don't tell Jack, but I want an ice cold Arnold Palmer.

Wait… doesn't Jack have his own drink now? He does, it's a lemonade. We carry it, it's made by Arizona (Beverage Co.) as well… but I prefer the Arnold Palmer.

Whoa… Sounds like a political football. It is. We're not even allowed to call them Arnold Palmers in the clubhouse, we have to call them "50/50s!"

Give me a guess: how many concerts have you been to? I've probably been to close to 600 concerts. I've seen the Grateful Dead — or the entities they've created since Jerry Garcia died — the most. In fact I just got back from Playa del Carmen (Mexico), seeing them for four days. I also celebrated my 40th birthday down there.

I'm impressed! You're a musician too, right? I play harmonica, guitar and I sing, and I play in a Grateful Dead cover band.

Man, you should have grabbed the mic at the *Golfdom* Summit when we had the guy playing acoustic guitar! When the guy was doing his solo in the tent? I considered it. But I figured people already thought I was weird enough with my long hair and mustache.

You still rocking the 'stache? It's dead until next November. I didn't want to see it go but my fiancée, Kim, was very happy to see it go.

"I WAS PREVIOUSLY THE ASSISTANT AT PEBBLE BEACH… IT WAS PROBABLY THE BEST FOUR YEARS OF MY CAREER. IT'S A BUSY PLACE, BUT TO GET TO HOST THE U.S. OPEN? I TELL PEOPLE: IT WAS THE MOST FUN I'VE EVER HAD SEVEN DAYS SOBER!"

Read anything good lately? I read a really good book… it was impactful. It's called "Allen Carr's Easy Ways to Stop Smoking." You can guess why that was impactful — it actually got me to quit smoking after 24 years. February 25th will be one year, smoke free. After reading that book, man, I put the book down and never touched tobacco again.

How do you celebrate a job well done with the crew? We do barbecues. I bought a large griddle. So we can do *carne asada*, *al pastor*, that sort of stuff.

Do you cook or does someone else man the grill? It's always me cooking. I enjoy cooking for them. I feel like, as an employee, when you roll into the shop for lunch and there's your boss slaving away, setting you up with a great lunch… that makes you feel valued.

So when was the last time they impressed you? Honestly, I'm impressed with them every day. I'm fortunate to have a great group of guys… every day they do something that makes me proud.

As interviewed by Seth Jones, January 29th, 2014.

MAIN PHOTO BY: MOLLY GASE / SHUTTERSTOCK (GUITAR) ISTOCKPHOTO (CIGARETTE, BBQ)

Day in, day out—your turf has it tough. It must endure daily mowing, UV rays, golfers and extreme weather conditions, not to mention the constant threat of disease. Daconil Action™ fungicide combines the power of Daconil® fungicide with a revolutionary Turf Protein Booster that helps turf activate its own natural production of PR proteins. Use on a regular application interval for stronger and healthier turf that is better able to defend itself against disease while offering greater drought tolerance. So whether it's disease or cleats, it's not a problem. To learn how to rotate Daconil Action with Secure™ fungicide, visit **GreenCastOnline.com/programs**

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