one year. He took victories in the US and British Opens and Amateurs. Jones won the British Amateur at St. Andrews, the British Open at Hoylake (by 10 strokes), the US Open at Interlachen CC (in Minnesota) and the US Amateur at the Merion Cricket Club.

Jones was honored with a ticker-tape parade in New York City after the British victories. The United States captured another Walker Cup in 1930, at Royal St. George in Sandwich, England. It was our sixth consecutive victory, and the team included Bobby Jones and Francis Ouimet.

Tommy Armour beat Gene Sarazen in the PGA Championship, a big tournament then but not one of the four majors it is today.

Miniature golf took off in popularity in the 1920s, and by 1930 a total of $125 million had been invested in "Tom Thumbs," as the miniature golf courses were known then.

And the Merion Cricket Club in Philadelphia must have consulted a crystal ball when they made their decision to install a state-of-the-art watering system. After all, the year was in the throws of a drought and the system was operable (in late July) for the late season US Amateur, the final tourney of Bobby Jones' grand slam. It took until 1938 for the first hoseless fairway irrigation systems to appear in Wisconsin, at Blue Mound and Blackhawk.

Even though times were tough after the crash and during the depression, there was quite a bit of golf course construction activity in Wisconsin. Although speculation on my part, such discretionary activity could have been due to low labor costs because of the lack of jobs. Obviously low labor costs reduce significantly the cost of construction. Land may have been very affordable. And then there is the old saw that says people of means always have money. Who knows? Between 15 and 20 courses opened in Wisconsin in 1929, and around a dozen or so in 1930. Lawsonia, North Shore GC, Mascoutin, Johnson Park, Bloomer GC and Spooner GC are among the familiar courses opened in 1930. And in Wisconsin golf competition, Ned Allis of Milwaukee CC won the State Amateur at Blue Mound.

It was against the backdrop of 1930 events that the golf course greenkeepers of Wisconsin met in Madison at their land grant university for an educational conference. They used that meeting to organize themselves into the association we know today. They could not possibly have imagined how far we have come in 75 years.

"SUPER" Event at Barton Creek

By Mike Werth, *Golf Course Superintendent, Monroe Country Club*

The moment my wife Angie and I arrived in Austin, Texas we knew that the "People vs. The Pros" Tournament was more than just having the opportunity to win $100,000. We realized this early on into our trip when we met Rafael Martinez, a golf course superintendent from California, and his wife Maria at the Hertz Rent-a-Car desk. We immediately bonded, like most superintendents and their wives do. This bond, along with many others we made during our six-day trip to Barton Creek, was the recurring theme that BASF wanted and did achieve for all 20 participants in the superintendent field of the event. I cannot say enough about what BASF and Dave Oberle did for us!

After picking up our car and driving to the resort, Angie and I also realized that we were in for an extraordinary stay. The accommodations were comparable with those at the American Club in Kohler. When we reached our room, we had a view overlooking the 18th hole of the Fazio Foothills course and the beautiful canyons surrounding the west end of Austin.

After regaining composure, the surprises continued. I made my way down to the tournament registration table and was given a PvP embroidered Nike duffel bag full of all sorts of golf gifts - a dozen Pro-V golf balls, five golf shirts (color-coded for each day) and my wife's schedule of events. We were scheduled for a practice round on Wednesday and Thursday, but Rafael and I arrived too late for our first practice round so we hit balls on the range just before sunset. That night the golf course superintendents and their wives, our BASF regional representatives, BASF managers and BASF's tournament coordinator — Winnercomm and their representatives — gathered for a "meet and greet" session. This is where we started to meet and hear everyone's stories on how they arrived at Barton Creek.

9th Hole Bartton Creek (Fario Foothills)

Thursday arrived and I played a practice round with two other amateurs on the Fazio course. Fortunately, we were able to take carts throughout the regular tournament because it was 95 degrees with 100% humidity all week. I happened to play with an over-50 participant and an under-50 participant. The under-50 golfer, Mario Lopez, was from the panhandle of Texas and was here because he won a sweepstakes that his wife entered him into without his knowledge.

I birdied the first hole, but that was the only highlight I can remember for that day. It took some time for me to get used to the Bermuda grass greens. All the participants gathered that night for a mandatory rules meeting. Andy Batkin, the tournament chairman, made it clear that the rules officials and the handicap committee would make adjustments and review scores to ensure fair play for this competition. They kept their promise; a number of participants were disqualified before and during the tournament due to incorrect handicaps. In fact, the leader of the over-50 field going into the final round was disqualified that morning.

Mike and Angie at superintendent's dinner.

9th Hole Bartton Creek (Fario Foothills)

Larry Awlward (Golfdom) and Mike (Caddie)

Mike, Rafael, Maria and Angie.

I was fortunate enough to sit at the same table with the golf course superintendent of Barton Creek, Ken Gorzychi. It was interesting to hear how he prepared for a tournament and also how he ended up at Barton Creek. He said his biggest challenge is the rocky terrain the resort sits on. The west end of Austin is all canyons and rock ledges, and the east end is flat with beautiful rich soil, which is why they built the Austin CC on the east end of town a few years ago.

On Friday I played my first tournament round on the Fazio Foothills course. I didn't fare too well again. I shot a 95 with an 11 handicap (net 84). All handicaps were adjusted 80% for the tournament. I played with three amateurs who all paid an entry fee to enter the event. Two were from Texas and one was from Arizona. I did happen to win a closest to the pin contest on the 9th hole that day, which helped salvage my round a little bit.

Again, Angie had a better day. She attended a cooking class with the executive chef of the resort and lounged by the pool. BASF treated us to an exclusive "superintendents and wives only" five-course meal at Barton Creek's Governors' Ballroom that night. The Governors' Ballroom was named for the former governors of Texas who initially built the resort. It was sold to ClubCorp. a few years ago.

I played my second round on the Crenshaw course on Saturday. Crenshaw's fairways were a little wider than Fazio's, but the greens had much more undulation in them. I played with a member from Austin CC and an AirBus salesman from Virginia. I played much better and shot an 85 (net 74). I was tied

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for third in the superintendent division and tied for 12th in the under-50 division after two rounds. I was pretty optimistic going into the final round on Sunday. We were on our own Saturday night, so we took a shuttle into downtown Austin with Mario and his wife. We ate dinner at a nice Italian restaurant and then went to a few bars during the Texas/Ohio State football game! The atmosphere reminded me of Madison.

Sunday morning arrived, literally, with a bang. We woke to thunder and lightning and waited for the storm, which came from the southeast off the Gulf Coast, to subside. Unfortunately, it never did. After 2.5 inches of rain, they called the event and the tournament ended with only two rounds played instead of three. The "50 and over" and the "49 and under" amateurs were decided, but the Superintendent's Cup wasn't that simple. There was only one first place winner, but two players were tied for second after two days. Greg Wiles of Ohio finished in first place. Matt Curl of Illinois and Rafael Martinez of California tied for second place. It was decided that there would be a three-hole playoff on Monday morning before the finals.

With golf cancelled for the day, Rafael, Maria, Angie and I decided to take advantage of the free use of the VW vehicles that were provided to the participants. We drove down to a Mexican restaurant for lunch and went to a mall for souvenirs. That night all the participants were privileged enough to be accompanied by Ben Crenshaw and Justin Leonard for dinner at the Governors' Ballroom. Both spoke on what an honor it was to be involved in this event and that they appreciated all the hard work every golf course superintendent does for golf. To top it off, all the players were given a placard autographed by both Justin and Ben.

After all the anticipation leading up to the final round, Monday did not disappoint anyone. Angie and I watched Rafael win the three-hole playoff to start the day. You knew it was his to win when he chipped in a 25-yard shot on the first playoff hole (the 16th). We then thought our trip had finally ended because our flight was set for 12:30 p.m. As we were zipping up our luggage bags, the phone rang in our hotel room. Rafael was on the other end, asking me to caddie for him in a half an hour! After BASF pushed back our flight and a quick call was made to the in-laws and parents who were watching our two daughters, I made my way to the first tee on the Fazio Foothills course to meet Rafael. This was a once in a lifetime opportunity I couldn't pass up.

The first match-play event was between Rafael and Greg Wiles, with the Crenshaw and Leonard matches following right behind. I just cleaned clubs, figured yardages and lugged Rafael's golf bag after he drained a 40-foot putt that I read the opposite way for him. Rafael was on fire. He shot a 37 on the front and finished his opponent out on the 15th hole with a four-stroke win.

I think I lost five pounds over that 15-hole stretch. It was blazing hot with no breeze to speak of. Fortunately, we did get some rest when we had to wait for the ESPN camera crews to set up on some holes. You couldn't have asked for a better ending than that. Rafael took home a beautiful glass trophy, $10,000 in cash and $10,000 in BASF products for his home course of Via Verde Country Club in San Dimas, California. Rafael was kind enough to give me a tip, but it wasn't the Pro Tour percentage that we discussed before the match!

I just want to again thank Dave Oberle and BASF, along with our regional event host Marc Davison of Green Bay Country Club. They gave Angie and me the opportunity and trip of a lifetime. BASF also donated $2,000 to our Wisconsin chapter for hosting this event, and will continue to do so next year when Eric Jasin and Lake Arrowhead will host the 2006 PvP regional. I hope my experience will inspire many more of you to participate next summer.

Have a great winter!

Managing Earthworm Castings in Golf Course Turf

By Dr. R. Chris Williamson and Seung Hong, *Department of Entomology, University of Wisconsin-Madison*

SUMMARY

In the spring of 2002 University of Wisconsin scientists initiated a comprehensive study to investigate the effectiveness of abrasive aggregates for potential suppression of earthworm casting production in low-cut golf course turf when applied as a topdressing amendment.

- Earthworms are beneficial to the soil, but on golf courses the castings they form are a nuisance.
- Because earthworms are beneficial organisms, no pesticide is registered or labeled for their control in the United States.
- Abrasive aggregates applied as topdressing reduce earthworm activity to tolerable levels, but their efficacy declines over time.

Earthworms are abundant, well-known inhabitants of the soil belonging to the order Oligochaeta. They are often referred to by a variety of names such as angleworms, fish worms, night crawlers, and dew worms. They are widely considered beneficial organisms due to certain favorable attributes such as soil formation, aeration and drainage, organic matter breakdown and incorporation, and even enhancement of microbial activity (3).

It is estimated that there are as many as 8,000 species from about 800 genera worldwide (3). They live in diverse locations, ranging from forests to lakes and streams, as well as grasslands, agroecosystems, including turfgrass (3, 4, 5). Earthworms are found in many regions of the world occurring in a wide variety of soil types, though they tend to be relatively scarce in primarily sandy soils.

Earthworms have two primary requirements: moist soil and an organic-matter food source, both of which are commonly plentiful on golf courses. In North America, it is estimated that there are 24 species of earthworms, however only three have been reported in turfgrass.

Friend or Foe?

Despite the beneficial attributes of earthworms, they can be problematic due to the earthen casts that they produce on golf course turf, particularly in shaded, well-irrigated sites (1, 2, 6). Of the three earthworm species found in turf, only two species create soil castings. The night crawler, *Lumbricus terrestris* L., is the most common and abundant species of the two that construct earthen castings.

Earthworm casts are most common on low-cut turf including putting greens, approaches and collars, tee boxes, and fairways (6) (Figure 1). Earthworm casts disrupt the uniformity, appearance, and playability of affected areas (2). Soft wet castings are readily squashed flat by early morning mowing operations, and closely mowed turf beneath the leveled casting is smothered. As a result, appearance and playability are negatively impacted in areas of the course where earthworm populations are dense. Furthermore, such impacted turf areas often experience turf damage or loss due to the inability of the plants to properly photosynthesize (4). Moreover, mechanical damage to mowing equipment including bed knives and reels may occur.

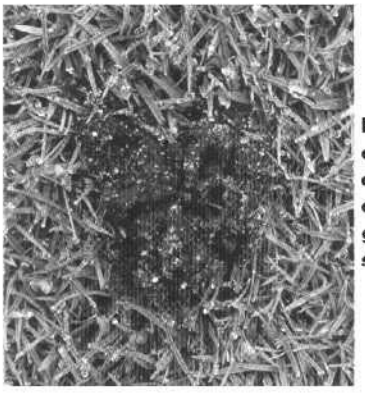

Figure 1. Despite the beneficial attributes of earthworms, they can be problematic due to the earthen casts they produce on golf course turf, particularly in shaded, well-irrigated sites.

Because earthworms are considered beneficial organisms, no pesticides are registered or labeled for their control, and any pesticide application specifically intended to control earthworms is illegal in the United States. Therefore, alternative, nonchemical earthworm management strategies are needed.

Earthworms migrate up and down through the soil profile in response to changes in soil moisture content and soil temperature. Because the cuticle (skin) of earthworms is quite sensitive, sand and other abrasive substances likely irritate and repel them. The following research was aimed at exploiting this weakness.

Casting Suppression Studies

A three-year study was initiated in 2002 on two golf course fairways at Blackhawk Country Club (Madison, Wis.) where earthworms were problematic. The fairway was comprised of a mixture of creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) maintained at approximately 7/16 inch (11 millimeters). Respective treatments were applied to 10 x 10

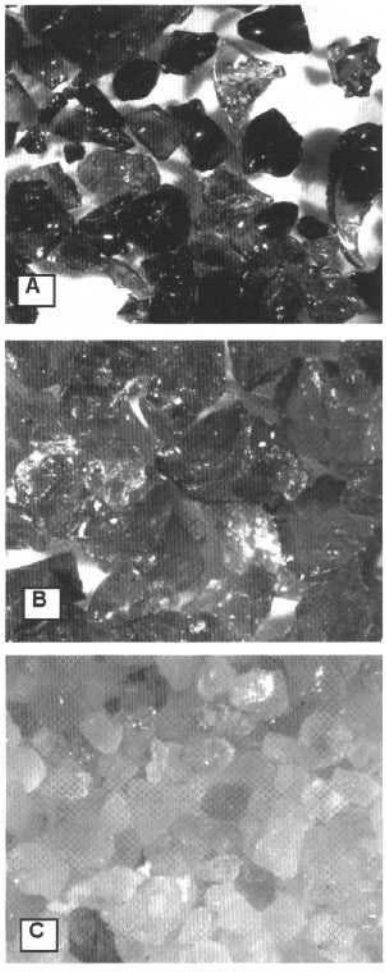

Figure 2. Experiments were initiated in 2003 and 2004 that included treatments of a coarser grade of Black Jack (A), another abrasive aggregate called Amber Jack (B), and Best Sand, an angular topdressing sand (C).

feet plots (i.e., 100 ft^2) in a randomized design with four replications per treatment.

Several diverse earthworm casting suppression treatments were applied in 2002. Based on the promising results obtained from 2002 study, another similar experiment was initiated in 2003 and 2004 that included new treatments. These treatments included a coarser grade of Black Jack, another abrasive aggregate called Amber Jack, and Best Sand, an angular topdressing sand (Figure 2).

Black Jack, a byproduct of the coal industry, is composed of the remains of coal after it is burned for production of electricity. Once the coal is burned, the resulting 1-2 inch (2.5-5-centime-ter) colloids are crushed, fractionated into respective size ranges, demagnetized and kiln-dried. Black Jack is essentially inert, extremely hard, highly angular and predominantly black in color. Amber Jack, a byproduct of the paper mill industry, is comparable to Black Jack. It, too, is inert, highly angular and extremely hard, but it is considerably lighter in color, ranging from almost clear to reddish amber.

2002 Treatments

In spring 2002, an earthworm activity study was initiated that included the following treatments:

- untreated control
- thiophanate-methyl (Cleary's 3336) fungicideapplied every 14-21 days
- carbaryl (Sevin) insecticide applied every 14-21 days
- soap, Joy dishwashing detergent applied every 7 days
- Hydroject, water-injection every 28 days
- Dragon spice (ground oriental mustard seed), one application
- zeolite, soil amendment, one 1/8-inch (3.2-millimeter) application
- Black Jack 20/40 crushed coal slag, one 1/8-inch (3.2-millimeter) application

2003-2004 Treatments

- untreated control
- thiophanate-methyl, fungicide applied every 21-28 days (1 gallon spray volume/1,000 ft^2)
- thiophanate-methyl, fungicide applied every 21-28 days (2 gallon spray volume/1,000 ft^2)
- Black Jack 20/40, spring application only
- Black Jack 20/40, fall application only
- Black Jack 20/40, spring and fall application
- Black Jack 30/60, spring application only
- Black Jack 30/60, fall application only
- Black Jack 30/60, spring and fall application
- Amber Jack, spring application only
- Amber Jack, fall application only
- Amber Jack, spring and fall application
- Best Sand, spring application only
- Best Sand, fall application only
- Best Sand, spring and fall application
- 2002 application of Black Jack 20/40

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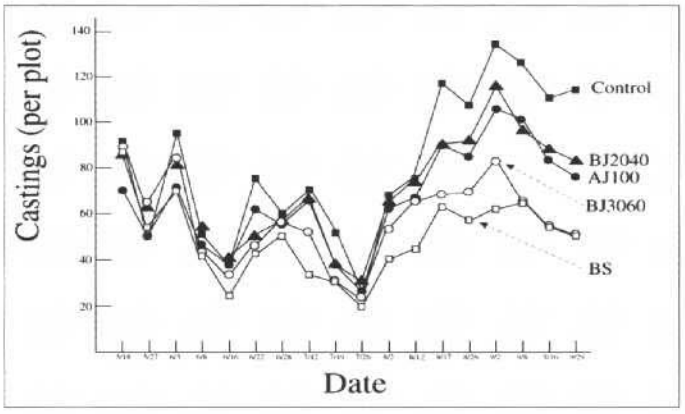

Figure 3. The use of angular, abrasive materials (Black Jack, Amber Jack, and Best Sand) resulted in fewer earthworm castings per plot when compared to untreated control plots. (2004 data)

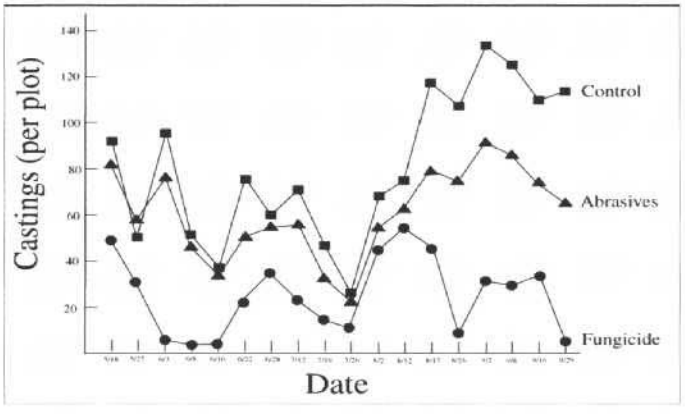

Figure 4. Although the use of abrasive topdressing materials to plots reduced the number of earthworm castings compared to untreated control plots, they were not as effective as fungicide (thiophanate methyl) and insecticide (carbaryl, data not shown) in reducing the number of earthworm castings per plot. (2004 data)

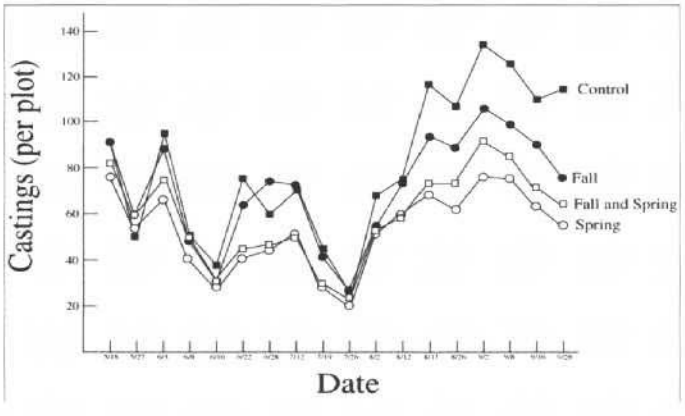

Figure 5. The results of timing study for abrasive applications were variable, however, due to the abrasives' dispersion or its incorporation into the soil, it is recommended that abrasives be applied both spring and fall to maintain suppression of earthworm castings.

Results

Mean number of castings were calculated for each treatment during the growing season (April-November). Using pooled data, the use of abrasives (Black Jack 2040, Black Jack 3060, Amber Jack 100, and Best Sand) significantly reduced number of castings per plot compared to untreated control plots (Figure 3). However, abrasives were not as effective in reducing castings per plot as fungicide treatments (Figure 4) or insecticides (data not shown). All other treatments had relatively little effect on earthworm activity.

The effects of spring versus fall applications and a combination of spring and fall application of abrasive topdressing abrasives were evaluated in the 2003 growing season (April November). Turf quality, thatch accumulation and disease activity were also rated throughout the 2003 season to document any possible adverse effects that a thin layer of abrasive material might have in the upper rootzone of intensively managed golf course turf. Figure 5 shows the mean number of earthworm castings per plot for abrasives applied in the fall only, spring only, and spring and fall versus untreated control plots. Although results were variable between years, fall and spring treatments seem effective compared to untreated control plots.

Data also revealed that the effectiveness of the abrasives' abilities to reduce earthworm castings decrease measurably over time. We hypothesized that the aggregate's effectiveness had decreased because of its dispersion or its incorporation into the soil. These results support the idea that the aggregates eventually disperse into the soil, thus lose their effectiveness over time. As a result, additional applications of the aggregates are necessary to maximize their effectiveness.

When angular soil aggregates such as Amber Jack, Best Sand, or Black Jack were applied in both spring and fall (combination), sustained suppression of earthworm castings occurred. No measurable differences the aforementioned aggregates occurred, nor did particle size have any meaningful effect.

As previously mentioned, the residual activity (effectiveness) of single season applications of soil aggregates appear to decline over time. Thus, multiple treatment applications is necessary. Since earthworm activity is most pronounced in the spring and again in the fall when ambient and soil temperatures are typically lower and soil moisture is greater, spring and fall topdressing applications of highly angular, abrasive aggregates may reduce earthworm populations to tolerable levels.

Potential for use of abrasive, angular aggregates for suppression of earthworm casts

The results of this study suggest that abrasive, angular aggregates such as Amber Jack, Best Sand, and Black Jack may provide an alternative, legal, nonpesticidal management strategy for reducing earthworm castings to tolerable levels on low-cut golf