"We did have damage the previous year from tropical storm Irene, which I believe was worse on the turf because of the time of the year but I did not lose any equipment then," says Stanya. Seawane floods on a regular basis as the high-tide full-moon phase compromises the course’s bulkheads. "The water in our canals and bay is more brackish than the pure Atlantic current water, so when we flood it isn’t as severe," Brian Benedict says. "When we took Irene in 2011 it was about a 35-acre flood but we didn’t lose power, so we were able to dilute the salt water with our irrigation water right away. When Sandy hit we lost power for eight days and were unable to dilute the salt toxicity, which has created the issues we face now."

Seawane’s salt base saturation levels were substantial, to say the least. Normal acceptable levels should be three percent and lower, Brian Benedict says, and "we are testing out at 16 to 24 percent, depending on where you test." He worries about long-term issues. "I am really worried about when the weather changes and we get hot. How is the grass going to react when the soil temps get to 70-plus degrees and up? Is it going to bake out? Our gypsum applications continue and we are seeding greens on a bi-weekly basis trying to get 007 and Seaside II Bentgrass to establish in them."

Recovery has been assisted by influxes of insurance money, Tim Benedict says. "Only recently has the money started flowing, which has definitely delayed our recovery process," he says. "The clubhouse was the first facility to be restored. We must be able to do business and host parties. The rest of the buildings are still coming along. We are still re-wiring buildings and fixing walls. It is a long road. I have a new assistant and that should help things improve a bit."

"On top of everything else, my home was also hit with the flood waters. My family was displaced for five weeks while we got repairs organized," he adds. "Everything is back to normal now but that was a true life test."

One that Long Island golf course superintendents, managers and owners, and members hope they never have to face again. GCI

John Torsiello is a Torrington, Conn.-based writer and frequent GCI contributor.
10-hour days, it took a solid week to get the trees that had fallen into play cut up and then it took another two weeks to clean up the debris and then three weeks to chip all the stuff.”

Rogers says the average number he heard from other supers in most of the state “was more like 160 trees down for each golf course.”

The eye of Superstorm Sandy came in over Brigantine, home for many years to the Links at Brigantine, a place where PGA pros used to go in the 1930’s and 40’s to practice for the British Open. Known for its near-constant breezes, Brigantine is also home to a massive migratory bird sanctuary and preserve.

Nathan Robbins, general manager at the Links at Brigantine, said the 18-hole golf course suffered more from water damage than from wind.

“The eye of the storm literally crossed 17th Street in Brigantine, so in some ways it was a blessing,” Robbins says.

“If you look at damage to places twenty miles north of us, they really had sustained winds. Our damage was limited to flooding.
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Right: Damage to the 7th green at TPC Jasna Polana following the destruction of Superstorm Sandy. Far right: Debris cleanup at TPC Jasna Polana.

and we were fortunate not to have any water in our clubhouse or cart barn. But there were areas of the course under three and four feet of water, and that forced us to close for three weeks after the storm.”

Links at Brigantine was back up and running by Thanksgiving.

The Links at Brigantine’s 9th and 18th greens were the only ones underwater for any length of time, “but we had an 18-foot powerboat that was in the left rough of our second hole for a time, and the walking bridge on the third hole ended up in the left rough of the second hole.” Robbins says the walking bridge must weigh at least a ton, and the force of the incoming water moved it more than 100 yards.

“We didn’t have any fast moving current so it was more a matter of making sure we did everything we could to make sure the effects of salt water were limited,” Robbins says. Absecon Bay is about 50 yards from the 1st tee at the Links, and the 15th hole sports a peninsula green, which also got submerged, but for much less time than the 9th and 18th greens.

The Links at Brigantine re-opened to those who enjoy winter golf Thanksgiving week.

“One of the biggest challenges has been combating the perception that this whole area was closed down and damaged beyond repair. There was no damage to Atlantic City casinos and no damage to the boardwalk there. Other area golf courses might have had a tree or two come down, but for the most part, they were back open within a week,” Robbins says.

Matthew Morrow, the superintendent at Manasquan River Golf Club in Brielle, a private club nestled along the river of the same name and less than two miles from the ocean, says he, the GM and members at the course used Super Storm Sandy as a learning experience and found out ways to improve on infrastructure and drainage on the property.

“Hopefully this is a once-in-a-lifetime event. The good part about the whole experience was we learned a lot about the golf course and how we can improve drainage and create a better tree management program,” Morrow says, adding Manasquan River lost about 100 trees.

“We had a 25-foot and a 38-foot boat that both ended up on the golf course,” Morrow says. Needless to say, both boat owners immediately came forward on Tuesday, Oct. 30th to make arrangements with their insurance companies to have their vessels removed from the 12th and 17th holes.

Morrow said he and his crew did as much as they could in-house but left big or overly dangerous jobs to a tree company in Pennsylvania that he’d worked with in the past.

“Losing power was pretty much a foregone conclusion in my mind and knowing the golf course is so close to river and we were going to flood, we got all our pumps ready and our equipment fueled up and generators were all primed and ready to go,” he says. Manasquan River leads to the Manasquan Inlet which leads out to the ocean, visible on clear days from the course’s 7th, 10th and 11th holes.

One thing Morrow and other seaside superintendents may not have considered was the effects of salt-laden blown air and the damage that can do to trees and grasses.

“Salt blown air actually damaged trees several miles inland, including some of ours,” he said, “we were prepared for flooding and wind damage, but then to have a secondary issue with trees that were saturated with salt air and subsequently falling down, the needles
“Even with ten hour days, it took a solid week to get the trees that had fallen into play cut up and then it took another two weeks to clean up the debris and then three weeks to chip all the stuff.”

- Lance Rogers, Colonia Country Club in Woodbridge, N.J.
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A New Tool For

Poa Annua Control in Turf

Poa annua (annual bluegrass) is a problematic winter annual weed that reduces turf aesthetics and functionality. Annual bluegrass has a bunch-type growth habit, light green color and abundant seedhead production. Additionally, Poa annua has poor stress tolerances and decline of populations in late spring reduces turf quality (Beard 1970; Lush 1989).

Postemergence herbicides are used in late winter or spring to control Poa annua, but populations resistant to specific chemistries may limit potential for successful control. Herbicide resistance in annual bluegrass populations may result from repeated use of the same herbicide or mode of action in consecutive years. Sulfonyleureas inhibit acetolactate synthase (ALS), an enzyme in the biosynthesis of the branched-chain amino acids (LaRossa and Schloss 1984). Products like flazasulfuron (Katana), foramsulfuron (Revolver), and trifloxysulfuron (Monument) are popular sulfonyleureas used for postemergence annual bluegrass control in warm-season turfgrasses, but significant resistance issues have been reported in turf and other crops (McElroy et al. 2013). Triazines inhibit photosynthesis by binding to D-1 proteins that transfer electrons from photosynthesis and form highly reactive free radicals (Devine et al. 1993). Free radicals oxidize and destroy membranes and pigments, resulting in cell death in susceptible species. Extensive use of triazines has led to prevalent annual bluegrass resistance
in turfgrass in Georgia and other states. Glyphosate is a nonselective herbicide that inhibits 5-enolpyruvylshikimate-3-phosphate (EPSP) synthase that produces EPSP in the shikimic acid pathway (Amrhein 1980). Glyphosate is used for controlling annual bluegrass in dormant Bermudagrass, but overuse has also resulted in the spread of resistant populations throughout the southern U.S. Turfgrass managers should have an appreciation for the fundamentals of resistance management by utilizing herbicides with different modes of action in spray programs.

Flumioxazin is the active ingredient in SureGuard, a product labeled in 2011 for use in dormant bermudagrass. Flumioxazin has been extensively used in ornamentals and row crops including cotton and peanuts for annual weed control. Flumioxazin is a chlorophyll synthesis inhibitor similar to carfentrazone, oxadiazon, and sulfentrazone. In susceptible plants these herbicides inhibit the enzyme protoporphyrinogen oxidase (Protox). The inhibition of Protox leads to a toxic level accumulation of protoporphyrinogen IX that reacts with oxygen and light to form singlet oxygen resulting in rapid lipid peroxidation, membrane destruction, and eventual cell death. Protox inhibitors are not systemic herbicides, but are mainly used for annual weed control in turf.

Unlike other Protox inhibitors, flumioxazin provides postemergence annual bluegrass control in dormant bermudagrass. In Georgia, flumioxazin applications are generally most effective in November and December, prior to annual bluegrass tillering. Applications at spring timings may also control Poa annua with residual control for summer annual weeds, including crabgrass and goosegrass (McCullough et al. 2012).

Currently, flumioxazin use is limited to dormant Bermudagrass since applications may cause injury to actively growing turf (Umeda 2012). Preliminary experiments at the University of Georgia show flumioxazin efficacy increases when temperatures are warmer in spring compared to winter timings. Flumioxazin also appears to be root absorbed and irrigation could maximize efficacy of applications. Our current research at the University of Georgia is evaluating the effectiveness of flumioxazin with adjuvants and tank-mixtures with other herbicides on mature annual bluegrass. We are also evaluating residual control of crabgrass and goosegrass following applications for postemergence annual bluegrass control and tolerance of five warm-season turfgrasses.

Overall, flumioxazin has potential as a new tool for annual blue-
References


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