



# *The road to* **RECOVERY**

**Summer heat** devastated the new tee boxes at Makray Memorial Golf Club. Superintendent Timothy Christians details his path toward reestablishing even stronger turf.



No. 13 tee upon completion. You can see a significant difference from the tee prior to construction.

Below: Pythium damage on a newly established bentgrass tee box. The picture shows where a mower had spread the disease affecting the entire mowing line.



## By Timothy Christians

**I** reflect back at the 2012 growing season and I can't think of any college class, internship or assistant position that prepared me for the extreme growing conditions that I saw. Yet the lessons learned will forever change the way I manage cool-season turfgrass under Mother Nature's wrath.

Seasoned superintendents will speak of the summers of 1988 and 1995, both creating equally yet opposite extremes. The summer of 1988 was one of the driest and hottest summers on record, whereas the summer of 1995 saw record heat combined with record moisture. However, for younger superintendents, in most cases this has been the first summer battling weather extremes of such proportion.

Whether it was your first season as a superintendent or your 35th, it was a tough year to maintain healthy playing surfaces and you most likely lost some turf on areas of your property. For me, in my sixth season as a head golf course superintendent and my fourth season at Makray Memorial Golf Club, we had dramatic decline in the health of our tees. Many factors contributed to this decline, however the sharp increase in summer's extremes was the primary cause for turfgrass loss.

Statistically speaking, this past season was like no other. Drought-like conditions, combined with unprecedented temperatures caused harsh growing conditions that were less than ideal for cool-season grasses and ornamentals. The growing season started with a bang, unprecedented warm temperatures combined with a dry, mild winter brought grass out of dormancy and golfers out in droves. March saw record highs consistently broken along with average rainfall. This was great for root growth as well as the cash registers. This warm weather jump started disease development and had our mowers running earlier than normal. Much of this work had to be done without the assistance of seasonal staff. The spring returned to normal and we were able to catch up with spring clean up prior to the summer rush.

As we moved towards summer, May was

dry and had us reaching for our hoses battling wilt. The temperatures touched the 90's, however disease pressure was low. Then as June came we turned on our wells to keep up with our lack of rain. The grass required frequent supplemental irrigation to keep things green. Like the last two seasons, in the first weekend of July, things got bad – multiple days with triple-digit highs and lows in the 80s. Soil temperatures skyrocketed and turfgrass decline was quick and irreversible. During that time we experienced four consecutive record high temperatures shattered and no relief in sight.

As the summer moved along, we went from dry to drought. Roughs saw the irrigation shut off to preserve water for greens, tees and fairways. Grass went dormant and teetered on irreversible damage, while irrigation pumps ran hard to keep bentgrass and *Poa annua* alive. It wasn't just golf courses feeling the drought effects. Farmers saw massive crop decline and wildfires were a threat across much of the country. Most of Illinois was in an extreme drought with parts in an exceptional drought. Nationwide, the total cost of the 2012 drought is estimated to be more than \$12 billion.

At Makray Memorial Golf Club, we had just finished reseeding 40 tee boxes the previous fall. The decision to reestablish tees was due to excessive wear with lack of area to promote recovery. We initially decided to switch to the improved variety of Crystal Bluelinks bentgrass with characteristics of quick establishment and improved wear tolerance. Our goal was to utilize this improved variety without having to totally renovate the tees. The warm spring did wonders for establishing good growth and bringing them into play, however they were still immature and did not have an established root system. This would be one of the many factors that spelled doom for these tee boxes going into summer.

As the spring progressed, we decided to open the tee boxes in the middle of May. At the time they were opened for play, the tee boxes showed great health and color. Summer moved along quickly and the tees grew in nicely. However, in June and July we began

to back off some of the agronomic practices needed to establish quality tee boxes. We decided to back off our frequent topdressing and light fertilizer applications in fear of overstimulating the turfgrass. This caused the grass to weaken, not getting the essential nutrients needed for healthy growth. During this time we also saw little to no rainfall and triple-digit temperature extremes. With

their inadequate root development, these tees relied heavily on frequent irrigation to survive. Having to rely solely on supplemental irrigation, the turf was now starting to show signs of stress. With the dry, hot weather, we were also seeing an unusually high amount of play. The daily wear of foot traffic and divots was too much for our tee boxes and their lack of square footage. We decided to heavily



Corrugated drain lines with pea gravel were installed to move water from the tee surface.

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topdress and fertilize the tees during a cool down in August to speed recovery. This decision would be fatal to some tees as the cool down didn't last and the immature tees were covered in sand and overstimulated.

During this stretch of unprecedented summer heat, we were also under high disease pressure. We have used phosphites to control pythium in the past with great success on all turfgrass surfaces. We treated the tees all season with phosphites, expecting to see the same results as the past. However, with an immature plant that is extremely susceptible to pythium, the phosphites would not be enough. We had an outbreak of pythium on many tees and were not able to catch it quick enough to avoid turfgrass loss.

The damage had been done and we had lost grass on our tees. The dog days of summer were behind us and the road to recovery would begin. We were in the prime seeding window of Aug. 15 to Sept. 15, so we made the decision to overseed all the tee boxes. This time rather than mulling over National Turfgrass Evaluation Program (NTEP) data and research articles of which seed would be our best fit, I decided to use the best resource any young superintendent has. I spoke to other superintendents in the area who had seen season after season like this and adapted their agronomic practices to the extremes of summer. After some sound advice from trusted colleagues, the decision was made to use the old standby variety of pennncross. Pennncross is one of the older and more aggressively stoloniferous varieties and has been well adapted in the Chicagoland area for use on tees.

Prior to reestablishing our tees in the previous fall, we had purchased a Turfco Triwave walk-behind seeder. This seeder came highly recommended and we saw great results with



Left: No. 4, prior to construction, required the removal of a large white oak that had been struck by lightning and was suffering from internal rot. Right: The completed tee box on No. 4, note how much the area opened up after the removal of the large oak.

While the health of the grass on the tee boxes saw improvement through fall, this would **only be the beginning** of what issues really needed to be addressed. We made the decision to fix some of the ongoing issues that had plagued our tees.

establishing grass using the Triwave seeder. The Triwave is designed to create a square groove, rather than a “V” groove, to drop the seed into. The square groove opens up more area for seed to be established. The image to the left shows the lines that are left by the Triwave seeder. We seeded all tees directly into the existing turfgrass stand at two directions at a rate of 1 pound of seed per 1,000 square feet. We then fertilized with a starter fertilizer with the analysis of 12-28-10 at a rate of 0.5 lb. N/M. The tees were heavily topdressed and rolled to create seed to soil contact. The penncross seed was quick to establish and fill the voids of summer’s scars. We kept up with necessary agronomic practices to retain healthy turfgrass. This included frequent topdressing and spoon-fed applications of fertilizer.

While the health of the tee boxes grass saw improvement through fall, this would only be

the beginning of what issues really needed to be addressed. We made the decision to fix some of the ongoing issues that had plagued our tees. These included contamination from unwanted turfgrass species, uneven teeing surfaces and drainage issues.

Prior seasons the use of other perennial ryegrass had been utilized to increase germination time to speed recovery. The problem was that this species, known as perennial ryegrass, had a very contrasting appearance then the desired creeping bentgrass. While focusing on improving the tees, we stripped and seeded many areas on the tees where encroachment of perennial ryegrass had impacted the playability and aesthetics. We used a growing medium of 70 percent sand, 20 percent peat humus and 10 percent sphagnum peat moss. This mixture is one of the more popular rootzone blends for tee boxes because of the quick drainage and ability

to hold required nutrients. We filled the stripped area to grade with existing tee surface and seeded with penncross creeping bentgrass. Overall this process was done to five tee boxes that were heavily contaminated.

Drainage is one of the most important aspects to consider when producing superior turfgrass surfaces. An area’s inability to drain water can have devastating effects. Grass, like any living organism, requires oxygen to grow and remain healthy. Anytime water is unable to drain, the grass will undergo a significant decline in health. A few of our tees had drainage issues that required attention. We installed corrugated drain lines with pea gravel to improve drainage.

The square footage of our tees is roughly 1.75 acres. For a golf course that sees well above 25,000 rounds annually, our teeing surfaces were grossly undersized. With a management and ownership invested in providing the best playing conditions, a decision was made to expand tee size and add tees to address our need for greater square footage.

When constructing tee boxes, the philosophy bigger is better couldn’t be truer. Divots and traffic wear takes time to heal, seed takes time to establish and creating a larger area to place tee

markers can drastically improve the health of tees. Our efforts were focused on the par-3 tee boxes that could not withstand the constant golfer traffic. Where real estate was available, we built a new tee. If the area was landlocked, we created teeing surfaces as large as could be allotted.

On the fourth hole, which has always seen the greatest amount of wear, we agreed on the addition of a new tee box. The loca-



A newly established tee, just prior to opening for play.

tion of the new tee box would also provide golfers with a different angle into the green. The location required the removal of a large white oak that had been struck by lightning and was suffering from internal rot that had compromised the safety of the tree. The large oak also restricted air movement and blocked sunlight. The tee was constructed with the 7/2/1 rootzone growing medium. The tee was built at a 3-degree pitch from front to back on a base of 8-feet. No drainage was needed and irrigation was expanded to provide adequate coverage.

Upon completion of the construction of the tee, we seeded the surface with pennecross and fertilized with a starter fertilizer. It was decided to put a turf cover to protect the area through the tough winter months. Winter covering has been a common practice to assist establishment, protect annual bluegrass and prevent winter kill due to desiccation. We also sodded the perimeter of the tee to prevent contamination of seed into the surrounding areas. Once the new tee is open for play, we plan to make improvements to the existing tee

boxes on hole No. 4.

Holes No. 7 and No. 13 created a problem with their need for increased size and lack of area to expand. The goal would be to expand the original tees to a size that would accommodate the high amount of traffic we see throughout the summer. Due to our inability to close the course, we needed to find a way to reduce the downtime of these tees. It was decided that sodding the tees would benefit their ability to be ready for golf earlier in the spring. The process on these tees began by stripping the sod around the existing tee. We were able to use the sod on the perimeter of the tee box on No. 4 and to fill a few voids on the driving range.

Once the existing turfgrass was stripped, we removed the topsoil surrounding the existing teeing ground. This area was then dug out and leveled. We stripped the grass off the tee surface and leveled the entire area with 7/2/1 medium.

After leveling the tee area to desired grade, we seeded some of the tees with pennecross creeping bentgrass and sodded tees on No. 13 and No. 7 with pennecross creeping bentgrass. The process of sodding wrapped up in late November and we hope to have the tees open for play sometime in early spring.

Losing grass in the heart of summer is never easy to deal with. The key to recovery is to document the damage, communicate with membership/ownership about the loss of turf and put together a plan to repair the damage. It is also good to understand what happened and how it can be avoided in the future. Any seasoned superintendent will tell a young superintendent that they are going to lose grass, and how you deal with it is how you will define yourself as a superintendent. GCI

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