

How I Spent My Summer Vacation

A few thoughts on what to do when your worst nightmare becomes reality.

by SCOTT CARPENTER

I WAS JUST BEGINNING to believe everything was in place for a great season, but on the evening of July 17th, someone felt compelled to lash out at Brooklake Country Club and its members. Vandals attacked and tried to destroy several of our greens. Using a form of industrial paint thinner and what we believe was a watering can, the vandals poured the material in wide, sweeping arcs on six different greens. Ultimately, they were successful in destroying the majority of the turf on our 2nd, 5th, 6th, 8th, 12th, and 14th greens. Hopefully, you will never have to deal with this type of a situation, but being prepared for the worst is always a good idea. The purpose of this article is to pass on some of the lessons we learned in dealing with our difficult situation.

The damage was discovered early on the morning of July 19th, 1996, and we quickly developed our initial plan of action. The following steps were taken to halt the damage and encourage recovery.

- The greens were triple cut with the goal being to remove as much contaminated leaf tissue as possible.
- Activated charcoal was applied in the hope it would act as a neutralizer and absorbent.
- The club president, board of directors, and golf professional were notified immediately and kept informed as to the extent of the damage and what we were doing to rectify the problem.
- Local law enforcement personnel and our insurance carrier were notified.
- Measurements and photographs were taken to document the depth and extent of the chemical damage.

The damage initially appeared minimal (slight yellowing in streaks, 1 to 2 inches in width); however, within 24 hours, the real damage became dramatically apparent. It was evident that the chemical applied was extremely mobile, as the plume of damage expanded in all directions. The initial thin streaks developed into much larger

areas, with the affected turf being totally destroyed. The loss of turf quickly affected playability, and by August 8th, three weeks after the incident, we were forced to close all six greens.

Overwhelmed by the nature and extent of the damage, we quickly realized that outside consultants would be necessary to help us with the unique challenge. We began speaking with experienced superintendents, our USGA agronomist, environmental engineers (specializing in soil remediation), the Rutgers University Plant Diagnostic Laboratory, soil scientists, and even our golf course architect.

Since characterizing the compound would greatly aid our efforts to neutralize it, our initial goal was to identify the chemical compounds through field testing with a Photo Ionization Detector (PID). These tests revealed elevated levels of volatile organic vapors and helped set parameters for further laboratory testing.

Composite soil samples were then taken from all six damaged greens, and laboratory test results revealed the presence of acetone, butyl alcohol, and methyl tert butyl ether compounds. These compounds are commonly associated with industrial paint solvents. Although the compounds were found in relatively low concentrations, they proved extremely toxic to the turfgrass.

The compounds identified are extremely volatile. This characteristic was considered beneficial since this would lead to reduced persistence in the soil. We assumed that opening up the soils through aerification would allow more of the chemicals to volatilize, so the affected greens were aerified on July 29th, August 5th, and again on August 26th. The cores were removed in each instance and our traditional 90:10 top-dressing material was applied in sufficient quantity to thoroughly fill the holes. The greens also were seeded at a rate of 2 lbs./1000 sq. ft. following the July 29th and August 26th aerifications. Additional samples were then sent to

the Rutgers University Plant Diagnostic Lab and placed in growth chambers for evaluation.

Base levels of contamination were established on August 1st. Weekly results of the PID scanning and composite soil samples analyzed thereafter revealed that contamination levels in the soil were dropping steadily. Some of the compounds were no longer detectable. Visible signs that our efforts were producing positive results included germination of seed and limited recovery of surrounding turf. Unfortunately, recovery was slow and somewhat inconsistent.

Membership pressure mounted in late August, and the board of directors became concerned about the prospect of losing outings and their associated revenue. Thus, a decision was made to sod the damaged greens.

With sound planning and excellent cooperation between our sod supplier and local installation contractor, the sodding project proceeded smoothly. The existing sod and approximately 2 inches of underlying soil were removed in the process. Additional topdressing was added to bring the surfaces back up to grade. Installation of the creeping bentgrass sod began on the 13th of September and finished on the 16th. The new sod established rapidly with cultural practices that included several rollings and weekly Hydrojecting and regular mowing beginning 2½ weeks after installation. Starting on October 7th, the greens were aerified twice on 3-week intervals. Deep vertical mowing also was performed. Following the first frost, geotextile covers were used to extend the growing season.

Sod establishment went well, though on several occasions that fall, *ghosting* appeared in the same patterns as the damage. The appearance of the ghosting seemed to coincide with turfgrass stress. This caused considerable concern, since it showed that some of the chemicals were still present in sufficient quantity to cause turf damage,

even though they were not being detected by the sampling methods. One possible explanation posed was that radical change in hydrologic pressure forced contaminants upward in the soil profile. Not wanting to cause unnecessary damage to the healthy turf, we decided to deep-aerify the affected areas only. This was done by hand, using hand drills equipped with $\frac{3}{4}$ " \times 14" ship auger bits and a template we manufactured from plywood with a

frustrating for me and the entire maintenance staff. Nonetheless, some valuable lessons can be learned from it all, and there are a number of things to do in the event a catastrophe occurs at your golf course. The following are a few of the strategies that helped us.

- Maintain an accurate *written chronology of events* and be sure to take plenty of photographs. This method was a very useful tool, which we referred to continually. All perti-

could effect a quick recovery. Professionals from all walks of life offered opinions and solutions. I tried to keep all discussions as polite, cordial, and positive as possible. However, repeated in-depth conversations can be very taxing, especially when combined with the stress and strain of a difficult situation. Detailed discussions are often best reserved for people directly involved in the decision-making process. Brief articles describing the situation and what you are trying to do to resolve it, even in outline form, can help keep the golfers informed. This also is a good means of reducing the wild speculation that frequently accompanies catastrophes.

- *Do not get tunnel vision.* Explore every possible option and scenario, and be sure to keep your contractors informed. Although reestablishment from seed was our first approach, we made tentative arrangements with a sod grower and golf course construction contractor in the event that our initial efforts proved unsuccessful. They were extremely cooperative, and little time was lost when the decision was finally made to sod the greens.

- *Communicate openly and honestly* with your board of directors, owners, etc. In our situation, there were many unknowns and the best course of action was rarely crystal clear. Having to state that "this appears to be our best option" was an unnerving and humbling experience.

- *Insurance: Real property* is a term used by insurance underwriting and it should be clearly defined. Make sure that in your policy greens, tees, and fairways are included as Real Property. Develop and discuss a specific protocol for repairing the damage with your insurance carrier up front. Even though we communicated with our carrier, problems still occurred when our claim was ready to be settled.

- Finally, *remain positive.* They say hindsight is 20/20. Our foresight through these trying times was just as good. On a personal note, try to keep everything in proper perspective. Try not to allow an overwhelming problem consume all your thoughts and cause you sleepless nights. Keep in mind that you, as the superintendent, are part of the equation for the solution rather than the problem, as some may make you feel.



A superintendent's worst nightmare is to deal with damage caused by the unknown. Vandals poured solvents onto several greens at Brooklake Country Club, causing tremendous damage to the turfgrass and contamination of the soil. The staff spent the following weeks with a combined arsenal of maintenance techniques trying to correct the damage.

2" \times 2" hole pattern. The soil brought to the surface was removed and the holes were back-filled with a 6:2:2 topdressing mixture of sand, soil, and compost. The intent was to remove soil with lingering contamination, increase aeration, and provide additional adsorption sites for any remaining chemicals. Essentially, we vertically mulched the areas where the ghosting had appeared. The procedure seemed to be successful, since little ghosting appeared thereafter. The greens were finally reopened on a limited basis on May 1st, 1997. They were returned to normal operation on June 1st.

It was not until the catastrophe was behind us that we had an opportunity to stop and reflect on all that had occurred. The vandalism was extremely unfortunate and it caused a tremendous amount of expense, not to mention disruption to the golf schedule. The experience was exhausting and

important events should be recorded, including remediation techniques and options, conversations with consultants, weather records, etc. It is essential to keep accurate records for a variety of reasons, and with everything happening so quickly, it is impossible to do so without a journal. Simply listing pros and cons was helpful in gaining perspective.

- *Use consultants* and pool their information. Our situation was not typical and there was no cookie-cutter solution. However, the free flow of information and ideas helped us to fabricate a solution that suited our needs.

- *Maintain a strong public relations campaign.* Within days, numerous members of the community and club members had questions and concerns as to how the disaster occurred and who might be responsible. After a week or so, the dialog shifted to how we

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