duty work. We do rent a dump truck for any super heavy duty projects.

One of the GX800's is used full time by our landscape person for all his work. The other (older) one is used for transportation, dragging-in topdressing and miscellaneous light duty jobs.

The two Club Car Carry-Alls are used by the superintendent and cup cutter in the morning or by the person fertilizing greens, tees or other various hand work or irrigation jobs.

We get the use of these vehicles in an agreement with Club Car for buying our golf car fleet. After one year we turn in one vehicle and get a replacement. All of our vehicles have lights because our regular dew-sweeping golfers tee off at the crack of dawn and we have to get out ahead of them, which means working in the dark almost every day.

The Carry-All I is an electric vehicle and is used in the clubhouse area for trash hauling and for hauling range balls from the range picker back to the clubhouse. We chose the quiet of electric power so we won't disturb our guests, because this vehicle will be working around the 1st and 10th tees, the range and clubhouse constantly.

We recently purchased a Smithco Spray Star 160 for all spraying needs. We change the nozzle sizes as needed to fit the various applications from greens to fairways.

Joe Ondo, CGCS
Winter Pines GC

Managing a Large Fleet
Leasing Can Make Sense for Vehicles that See Heavy Use

For our project work we have two Toro Workman 3200s.

Specifications: Made of steel. Gas powered. Load capacity of 4,000 lbs.

Added options:
- Roll bar lights for special-event preparation work done at night.
- Dump body for ease of hauling and placing materials.
- Toro topdresser attachment for topdressing greens, tees and approaches after aerifying. Selected mounted topdresser versus pull-behind for easier turning and traction.
- Hydraulics used only for the topdresser.

Uses: Transportation for course setup. Hauling topdressing, project debris and clippings. Pull hand mowers, greens rollers and drag mats.

Lease strategy: These vehicles are leased because they are constantly used in heavy-duty situations due to their payload capacity. Therefore the wear and tear on them after a couple of years would require a great deal of repairs that would not be cost effective if the vehicle were purchased.

For general transportation and light-
Observations from the Open

There are some who might have the perception that little can be gained by serving as a volunteer crew member at a major golf tournament. After all, isn't it true that these host clubs begin preparations years in advance, they increase the operating budget, and have a commitment from the membership that allows them to do whatever is necessary to shine for that one week in the spotlight? Well, yes, while all of that is true, serving as a volunteer at a major tournament can still be a very rewarding, educational experience.

A couple of small super tips that I learned while working at the U.S. Open at Congressional a few years back have helped my staff shine when we host our annual Member/Guest or Club Championship. Both of the following tips deal with preparing the putting surface for play.

The first tip is the use of a piece of plywood by the individual who sets the pins. The lightweight piece of plywood that was used at Congressional measured approximately four feet by four feet and had a round opening removed to insert the cup cutter where the new hole location was to be placed in the green's surface.

The biggest value of the board is to help prevent any dents, scuffs or other irregularities from being accidentally made on the green's surface. Without this board, as the operator works on the cup, the weight of their body could potentially result in indentations or scuffs and tears on the surface.

The board also allows the employee to place items such as a sand bucket, painting supplies, or the hole liner on the board while they work, without fear of the items causing indentations, or leaving debris on the green's surface.

The second useful tip that I picked up from the "Open" and have initiated for our special events, is the use of fine sieved green sand to help mask and smooth poorly repaired ball marks on the greens. By dotting a small amount of green sand in the small voids on the putting surface, there is an aesthetic improvement as well as a smoothing effect, so a golfer's putt is less likely to stray off line.

No, these little tips will probably not make your bermudagrass golf course comparable to a northern golf course with striped bentgrass fairways and four-inch bluegrass roughs with huge stands of large leaf deciduous trees. Nor will they make your greens roll like a finely manicured, tightly mowed bentgrass green; but I am a big believer that the little details such as these go a long way to the enjoyment of a round of golf.

Darren Davis
Olde Florida Golf Club

Adding fine, sieved green sand to ball marks can clean up the appearance of our greens for a major club event. Photo by Darren Davis.
duty work we have 11 Club Car Carryall II XRT vehicles.

**Specifications:** Gas powered. Aluminum box bed with a load capacity of 900 lbs.

**Added options:**
- Roof and windshield on two units for assistant superintendent transportation. We often have to inspect the course during wet weather, freezing cold weather and at night.
- Manual dump body for dumping clippings, debris, sand, soil, etc.

Uses: Cup cutting and course set up. Pulling hand mowers and rollers. Hauling punster. Dragging clippings debris.

**Innovative Modifications:** A drag net was attached to the bed to scatter clippings around bunkers, greens, and tee complexes where a tractor blower may not be practical or have access. It also works well to drag fairways with excessive and hard-to-scatter clippings debris.

**Leasing options:** These vehicles are also leased due to the daily use and wear and tear 365 days a year. Keeping them repaired after two or three years of use would not be cost effective.

Our spray rig is a John Deere Pro Gator.

**Specifications:** Steel body and frame construction. Diesel powered.

**Options:** Lights on the roll bar for night spraying.

Uses: The Pro Gator is used only for spraying. It is mounted with a Chem Pro 160 sprayer that is equipped with its own Kohler engine. It has a 160-gallon capacity.

The separate engine is a definite plus, allowing the sprayer to maintain full power and pressure. We selected a diesel engine so the Pro Gator would be able to maintain constant speed up and down our mounded areas better than a gas engine.

**Leasing options:** This vehicle was purchased because it is not used on a daily basis which limits the wear and tear on the vehicle.

**TREVOR BRINKMEYER**
Assistant Superintendent
Olde Florida GC
Wetting Agents Effective in Battling Drought Stress

Water on many Florida golf courses is becoming scarce, and superintendents are forced to prioritize the water being applied.

Localized dry spots are worsening with the drought and are becoming more apparent on many of our Turf Advisory Service visits.

These brown spots range in size from one to two feet on greens, and up to 10 or more feet on tees, fairways, and roughs. Decreasing the amount of water at each irrigation cycle exacerbates the problem and reestablishing adequate soil moisture becomes difficult.

Wetting agents are effective tools during these dry times and preventive applications are much better than curative. Fertigation units can efficiently apply preventive treatments. However, granular wetting agents also are successful.

It is very important to keep an eye on the winter overseeding during this dry period. The overseeding has been transitioning over the past few weeks, but some courses (central to north Florida) still contain 50 percent to 60 percent overseeding.

Several courses experienced rapid transitioning as the ryegrass/bluegrass became too dry during a recent warm spell. The overseeding burned out before the bermudagrass was actively growing, and this created thin spots on several putting greens. Ample water and fertility should continue on putting surfaces to allow for a smoother transition and to encourage sustained bermudagrass growth.

Although forecasts are not optimistic, we’re all hoping and praying for a normal rainy season this summer.

TODD LOWE
Agronomist, Florida Region
USGA Green Section
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Credit: USGA Links On Line
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Drought conditions are again predicted for much of (our area). Below-average precipitation this spring has (us under) water restrictions. Developing a plan early could help mitigate widespread damage across the golf course if water will be a limiting factor.

1. Develop a traffic control program if one is not already in place. Drought-stressed turf will not tolerate traffic very well.

2. Evaluate your irrigation system. Inefficient operation wastes water.

3. Use water sparingly during spring. Deep and infrequent watering will promote strong root development, and deep roots will allow for water conservation later in the season.

4. Employ a judicious fertility program to avoid excess top growth in the early part of the season.

5. Consider plant growth regulator use if you are not using any already. PGR use can improve root development and conserve soil moisture through top growth reduction.

6. Evaluate irrigated areas and determine which portions of the course are most important to play, i.e. up the middle from tee to green.

7. Establishing more drought-tolerant species across the golf course may be an option for the long haul. (When regrassing in-play or out-of-play areas, check with the University of Florida for possible drought resistant alternatives)

These are but a few tips to keep in mind heading into this season. Trees and other plantings also need attention during drought. Some species of trees require considerable amounts of water and may slowly go into decline during years of drought. Assess tree conditions regularly. Deep soaking periodically may be necessary to save desirable trees.

MATT NELSON
Agronomist, Northwest Region,
USGA Green Section

USGA PACIFIC AND THE NORTHWEST

Seashore Paspalum Looks Very Promising

Editor’s Note: You may be wondering what in the world news from the Northwest Region has to do with Florida. Read on and check out the comments on Paspalum in Hawaii.

What are the two words heard most often when the following question is asked, “What is the biggest challenge facing golf maintenance in the fu-
Covering the vast and distinctly different regions of the Pacific Northwest and Hawaii, both of these topics are of utmost importance.

At this writing, the western Washington area has experienced approximately 60 percent of normal rainfall and snow pack in the Cascades.

This may impact golf courses that are coming under increased scrutiny for water issues and our beloved salmon. Despite the negatives of a rainy day, the Green Section office in Gig Harbor has done its rain dance.

Across the ocean, Hawaii continues to deal with its own water issues. Starting this summer, the entire Ewa plains (a large area near Pearl Harbor) will begin delivering all of the golf courses treated water.

This will be interesting to watch since a golf course on the North Shore (The Links at Kuilima) has been dealing with this issue since the time of construction in the early 90s. Effluent water-use on golf courses is not earthshaking news, but The Links at Kuilima may become the poster child for environmentalists and the golf course industry.

What makes this golf course so different? Tell me the last golf course you played or visited that had gone more than four years without fertilizing some of its fairways? Show me the fairways that have not received any fertilizer and also never had a herbicide or other pesticide applied? Then let’s see what kind of playing quality these fairways provide for the players.

As you may have already guessed, the grass is seashore paspalum and the effluent water provides all of the nitrogen necessary for regular growth. Superintendent Mike Honma reports that this grass is rapidly taking over the entire golf course, including the greens. The more I see of this grass, when it is managed properly, the more exciting it becomes. Is seashore paspalum the grass of the future? No, it is the grass of today!

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**Larry Gilhuly**
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Credit: USGA Links On Line

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SPRING 2001
Environmental Complacency

As an industry, we cannot rest on our laurels. We must be vigilant in our efforts to inform golfers about the price of what they are demanding. Why do the golfers appear no more involved than they were a decade ago? Why isn't every course in the Audubon Program?

FRANK S. ROSSI, Ph.D.
Cornell University

When Rachel Carson penned the now-famous Silent Spring, she addressed an aspect of American life wrought with ignorance regarding pesticide use and environmental quality. The outrage stirred by Silent Spring provoked the anger created by the "cranberry scare" of 1959.

Cranberry growers applied a pesticide during the growing season in defiance of Food and Drug Administration (FDA) restrictions. The pesticide found at low levels in the cranberry supply was suspected of causing cancer. These events had a profound and enduring effect on the public consciousness. In many parts of the country, this concern persists today.

The golf industry experienced a similar Silent Spring event with publications from the United States Government General Accounting Office in 1988 asking the question, "Are the Hazards of Lawn Care Pesticides Underestimated?"

Then in 1989 the Attorney General of New York published "Toxic Fairways; The Risk of Groundwater Contamination from Golf Courses." Jay Feldman and his organization, National Coalition Against the Misuse of Pesticides (NCAMP) and other activists seized the moment to confront the golf industry.

The initial response from the industry was defensive. The 1992 GCSAA conference held a packed session for thousands of golf course superintendents to hear from Mr. Feldman and officials from the EPA. The following year the GCSAA invited Michael Fumento, author of Science Under Siege who reported the results of his topical searches he conducted on "golf courses" and "cancer."

"Golf courses fight cancer, as professional tournaments raise funds" Fumento proclaimed with the results of his search. The crowd erupted and you could sense that the golf course superintendents wanted this crisis over. Still, information was lacking regarding the fate of pesticides and nutrients applied to turf.

The United States Golf Association embarked on an important research initiative to more thoroughly understand the influence of golf turf management on environmental quality. The environment under investigation was air and water quality.

Concurrently, Ron Dodson was introducing a program to the golf industry that assisted the golf course superintendent with environmental management. Ron was also the driving force behind the Wildlife Links Research Program that investigated the influence of golf turf management on wildlife. The research information was on its way, and now there would be a mechanism for implementation.

Environmental Evolution

The USGA held a symposium at a 1998 meeting of the American Chemical Society to discuss the decade of USGA-funded environmental research. As a member of the Research Committee at the time, it was a unique experience to hear from the leading researchers in our field and then to have their work in a Symposium Book published in 2000.

The opening chapter authored by Mike Kenna and Jim Snow provides an excellent overview of the research. In the concluding section they state, "university research shows that most pesticides used on golf courses have a negligible effect on the environment." This has been the cry of golf course superintendents since the research has been completed.

Audubon International programs for new and existing golf courses has grown over the last decade, but still represents about 10 percent of all courses in the US. In fact the number of fully certified courses is well below 5 percent of all courses. Most courses are either not involved or if they have paid the entry fee ($100), have not actively pursued full certification. Yet, in many states, the Audubon Programs are actively embraced by government agencies as a means of ensuring environmental quality when a new facility is proposed.

Many golf courses throughout the country continue to face public opposition to pesticide and fertilizer use. Several communities in California have banned the use of most pesticides and this trend is actively underway in New York. The turfgrass industry has responded by mounting significant lobbying efforts to combat the legislative agenda of advocacy organizations. At the same time, the industry faces new pest problems such as bentgrass deadspot and gray leafspot that require substantial pesticide inputs to maintain expected quality.

Another Level

Millions of dollars have been invested to research the environmental fate of applied chemicals. These studies attempt to
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GCSAA Environmental Management Program
Stephen W. Wood, CGCS, El Conquistador C.C. in Bradenton has earned an environmental management specialist certificate from GCSAA for completing a specialization program in Integrated Pest Management.

determine the role that specific management practices may play in minimizing off-site movement and often use EPA concentrations to evaluate success. In general, these levels are established from toxicological research that determines concentrations that might cause human health concerns. But what if the levels we have been using were harmful to other species vital to aquatic ecosystems.

Environmental researchers from Canada published an assessment of nitrogen pollution influence on amphibians in a 1999 issue of Environmental Health Perspectives. The paper is a review of available water quality information for the Great Lakes region of the US and Canada. Of the over 8,000 water-quality samples collected in areas surrounding the Great Lakes, 20 percent of them were found to have concentrations that cause sublethal effects in amphibians. Nitrate levels as low as 2.5 par per million have been shown to affect amphibians.

The nitrate in the water appears to disturb the digestive process in tadpoles in a way similar to the mechanism in humans. The nitrate is converted by the bacteria in the infant’s gut and then severely restricts the blood’s ability to become oxygenated. There is a significant lack of information

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