



- On the Road - Quarterly Bulletin

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Alternative Water Options (Part 1)

Last year's California Golf Course Water Use Efficiency Survey could be labeled as a success. Eighty-four Northern California Superintendents and 61 Southern California Superintendents spared a few minutes out of their busy summer schedules to fill out the survey. The 145 replies constituted a 16% response rate based on the National Golf Foundation's count of 912 golf courses in the state of California. Thanks to all those superintendents who took the time to complete it.

One question that generated some interesting data was identifying the primary water source for each golf course. The percentages for Northern California include 17% potable, 29% groundwater, 18% recycled water, 13% blended water supplies and 24% surface water. Southern California percentages include 23% potable, 34% groundwater, 18% recycled water, 21% blended water supplies and 3% surface water.

Obviously Northern California has more surface water usage, which can be linked to more yearly precipitation and mountainous regions. However, it is surprising how similar the other percentages are when comparing water sources in Northern California to those in Southern California.

An interesting note concerning golf courses using recycled water: According to a recent industry report the percentage of golf courses using recycled water was below 20%. The NCGA/SCGA survey also came up with the same percentages as the independent research report.

Several golf courses are exploring the possibilities of using recycled water. For courses in Northern California, 11% are scheduled to receive recycled water within the next two years, while 5% are to go to with recycled water within three to five years and 1% has set their sights on a recycled water source 5 to 10 years down the road. In Southern California the breakdown is as follows: 5% within 2 years, 7% within three to five years and 2% 5 to 10 years later. The statewide average for golf courses looking to recycled water within the next 10 years is 14%.

For courses that use some type of recycled water when blending with another water source, the percentages for Northern California increased to 24% and Southern California improved to 28%, for a statewide average of 26%. That is very encouraging news. On the other side of the coin, the courses that do not use recycled water or blend with recycled

water are without alternative water sources.

When those remaining clubs were asked if they were scheduled to go to recycled water, 83% of Northern California golf courses stated they were not scheduled to go to recycled water at all. Of the remaining Southern California courses surveyed, 77% were not scheduled to go to recycled water. Combining the number of courses that are not scheduled to receive recycled water from Northern California and Southern California and dividing that by the total number of surveys received, the statewide average for golf courses not scheduled to go to recycled water is 60%.

Looking for alternative water sources is not economically feasible for most golf courses. The costs associated with using recycled water can be prohibitive. Construction and production costs and distance to pipe the recycled water are three of the biggest reasons why more golf courses are not using recycled water for irrigation purposes.

This bulletin will highlight a couple of ways golf courses are looking to tap into a source of water that will be reliable for many years to come (pun intended).

Recycled Water Demonstration



The 13th green at Bayonet GC in Seaside.

BSL, a golf course management company from Texas that operates the Bayonet and Black Horse golf courses in Seaside, Calif., teamed up with the Monterey Regional Water Pollution Control Agency to set up a demonstration project using recycled water to irrigate a small portion of the Bayonet course. The 13th green and a small landscape area near the 14th tee were chosen for this experiment. A 10,000-gallon storage tank was placed in the maintenance



The storage tank and equipment for the demonstration project. (Inset) A separate irrigation controller.

facility, which is roughly 75 yards from the 13th green. To ensure complete separation of the recycled water from the existing irrigation system, a new dedicated recycled water system was installed to both of the experimental sites. Truckloads of recycled water were delivered on a regular basis during the irrigation season to keep up with the demand. A small

booster pump was put in place to maintain adequate pressure while the areas were being irrigated. A flow meter was installed to measure the amount of water that was used. A small controller was also installed to control the irrigation programs for the demonstration project.

According to Bob Jaques, Director of Engineering for the Monterey Regional Water Pollution Control Agency, this project had two principle objectives: 1) to evaluate the compatibility of using recycled water with the demands of high quality putting green turf and landscape plantings and 2) demonstrate the suitability of recycled water for irrigating golf course turf and landscape areas. The Agency supplied the tank, booster pump, a hydro pneumatic tank, signage, electrical components and other miscellaneous supplies. The total cost to the Agency, including operation and maintenance for one irrigation season, was \$28,000.



Tom Bevan

BSL incurred \$2,300 worth of expenses for supplies to the project. Tom Bevan, Superintendent of Bayonet Golf Course, also noted some observations during the experimental project.

It is widely known that recycled water contains small amounts of Nitrogen. The constant dispersion of Nitrogen throughout the growing sea-

son kept the project green lusher in appearance when compared to the other greens. Even with the use of turf growth regulators, the 13th green continued to produce more clippings when compared to nearby greens. The green also played slower than the rest of the greens. Bevan confirmed this by taking Stimpmeter readings. Admittedly, the differences were not major, but lower Stimp readings were consistently produced.

Bayonet hosted the Nationwide Tour's Monterey Peninsula Classic in late September. The project green had not been flushed prior to the tournament. Cultural practices performed on putting greens leading up to a major tournament can be very stressful. After the tournament the project green was flushed with well water to help leach away any salt buildup in the rootzone. Even after the flushing, Bevan noticed that the project green was slower to recover from the tournament stresses than the other greens.

Soil and water sampling was conducted on a periodic basis during the initial year of the project and will continue into next season. In situ electrical conductivity measurements were taken starting near the end of the first irrigation season and will continue on a regular basis throughout the irrigation season next year.

The Agency will prepare a summary report with the data, findings and conclusions of the demonstration project. This report will be available to any interested parties by contacting Mr. Jaques at 831/645-4607.

On Site Water Reclamation (OSR)

By Mike Huck

The primary constraint to expanding use of recycled water for golf course irrigation is the lack of pipeline infrastructure needed to transport recycled water from existing treatment plants to golf course locations.

Developing on-site water reclamation (OSR) facilities is a potentially viable alternative for urban golf course sites that are beyond the pipeline network of existing water recycling systems.

The OSR concept routes surrounding residential sewer line flows to a small treatment facility located at the irrigation site. There the solids are separated from the liquids and returned to the main waste stream for treatment. The water is harvested and treated to tertiary levels as required for irrigation use.

To bring the water to tertiary quality, new treatment technologies such as micro-filtration and ultraviolet light disinfection are used. These processes eliminate conventional treatments with chemicals and salt-adding disinfectants. Additionally, automated residential regenerative water softeners can also be installed in the surrounding sewer shed and set to back-flush harmful salts during specific hours when reclamation



The Upland Hills Water Reclamation Plant in Upland, Calif., is an enclosed treatment facility immediately adjacent to a residential development. The plant has been in operation for almost 20 years.



Influent waste water (left) coming into the plant and treated effluent leaving the plant. An air-control system is utilized and odors are generally non-detectable at the plant's property boundaries.

mation is not occurring, further reducing the total salt load of the recycled irrigation water.

These combined technologies offer the opportunity to provide a

superior quality recycled irrigation water over what is normally delivered from regional treatment facilities.

In the past the limitation of the OSR concept has been the economic feasibility relative to alternative existing water sources. However, as the reliability of existing water sources decreases and costs increase over time, economic viability of on-site water recycling is expected to be realized in the not-so-distant future. Additionally, the previously mentioned water treatment technology advancements are also expected to benefit the economic viability of OSR.

Economic viability of OSR is dependent on a number of factors, many of which are site-specific to any particular golf course considering this as an alternative water supply. The Southern California Golf Association (SCGA) has partnered with Dana Ripley, (Ripley Pacific Company) and Mike Huck (Irrigation & Turfgrass Services) to seek funding to conduct three feasibility studies at Southern California golf courses. The three studies will be used as a basis for preparation of a "how to" manual to provide guidance to course owners and superintendents on how to approach the economic evaluation and implementation of the concept. For additional information regarding the OSR concept contact Mike Huck at 949/388-5097.

USGA/NCGA Green Section Meeting

The Annual USGA/NCGA Green Section will be held on Monday, March 15 at Castlewood CC in Pleasanton, Calif. Topics for the morning speakers include bunker reconstruction, choosing the right grass for your course, the challenges of renovating a golf course with ocean views to water use survey statistics. Lunch and golf is included in the \$75 registration fee. Registration Deadline for the event is March 5.

Equipment Technician University

The third annual Equipment Technician University will be held on Feb. 18 at Castlewood CC. The event, which is scheduled to start at 8 a.m. and finish up by 3 p.m. is open to both superintendents and equipment technicians. The \$25 registration fee includes lunch and a copy of the conference proceedings. Topics to be covered at the event include: leasing versus purchasing maintenance equipment, reel science and concurrent sessions with major manufacturers reps. The deadline for registering for the event is Feb. 16.

NCGA Intern Program Vacancies

The NCGA is taking applications for four openings in the Golf Course Superintendent Internship Program. The postgraduate paid internship requires participants to complete 10 blocks of instruction that include managerial skills, irrigation systems management and equipment maintenance to name a few. Applicants must have at least a two-year degree (four-year degree preferred) with course work that includes agronomy, horticulture or turf management. Applications can be obtained online at www.ncga.org. All applications must be received by Feb. 13

Management of Common Northern California Turf Diseases Correction

Late last fall, the NCGA sent out a flyer that highlighted six common turf diseases. An error was noticed in the text next to the Rapid Blight photo on the lower left hand section on the first page. The text reads mancozeb and/or trifloxystrobin applied in 2 gallons/100 sq. ft. The correct statement should read mancozeb and/or trifloxystrobin applied in 2 gallons/1000 sq. ft. Sorry for the mistake.

NCGA Rules Schools

Superintendents who want to learn more about the Rules of Golf take notice. The NCGA is offering five Rules Schools at various locations throughout Northern California. These two-day intensive workshops are lecture-based PowerPoint presentations. An exam is administered on the third day and is optional. Fees for the events are \$175, which includes continental breakfast, lunch and appropriate materials. Dates and locations are as follows: March 1- 2 at Diablo CC in Diablo; March 13-14 at the Piccadilly Inn in Fresno; March 28-29 at Round Hill CC in Alamo; April 18-19 at Marriott Hotel in Rancho Cordova; April 28-29 at Round Hill CC in Alamo. GCSAA has approved 1.55 CE credits for this event. You can contact Molly Orsetti at the NCGA for more information at 831/625-4653.

Cal Poly Alumni Gathering

Both Cal Poly schools are joining forces in order to

reach alumni. A gathering is being planned prior to the opening of the California Room on Feb. 12 at Dick's Last Resort. The event will start at 5 p.m. For more information, Southern California Superintendents can email Paul Cushing at pcushing@meadowsdelmar.com, Central California Superintendents can email Michael Scott at miscalc_2@hotmail.com and Northern California Superintendents can reach Thomas Bastis at tbastis@msn.com.

NCGA Course Marking Report Card

As a member service, the NCGA provides a golf course marking review that is conducted by a Rules Certified volunteer or an NCGA staff member. A written report is provided to the club at the conclusion of the review that includes recommendations for markings boundaries, hazards and environmentally sensitive areas in accordance with the Rules of Golf. This service is complimentary and should be conducted prior to a Course Rating visit. For more information on the course marking service please contact Molly Orsetti at 831/625-4653.

Another Turf Disease Reference

The University of Kentucky Cooperative Extension Service has recently released the publication, Chemical Control of Turfgrass Diseases 2004. This document can be viewed at www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.pdf. The publication covers a host of diseases and provides a really useful fungicide efficacy rating system for the different fungicides. Be sure and check to see if the listed chemicals are registered in California.

The Pathologist's Corner

By Frank P. Wong
Extension Plant Pathologist
UC Riverside



Winter Diseases, New Fungicides and Rapid Blight City

Things have certainly slowed down this winter as we moved away from a disease-filled summer and fall and it seems like a lot of superintendents have finally had a chance to step back and take a deep breath with the coming of the new year. Two diseases that should be popping up now in the cooler, wetter weather would be pink snow mold and yellow patch.

Pink snow mold, a.k.a. *Microdochium* Patch or *Fusarium* Patch (pathologists love changing the names of diseases) caused by *Microdochium nivale*, can be active at temperatures from 32°F to 65°F, especially if the weather is wet or foggy. It is most damaging on annual bluegrass and creeping bentgrass greens. In most locations, the disease pretty much disappears when air temperatures consistently go above 70°F in the spring, although chronically moist areas on the coast can battle it year round. Signs and symptoms of the disease are easy to spot; diseased areas typically are small circular brown to bronze colored spots of dead grass up to several inches in size.

Commonly, fine white to grayish mycelia with a pink tinge can be seen in the early morning, and up close, pink, gelatinous spore masses can be seen on dead and dying plants. In 2003, some late spring outbreaks of pink snow mold were mistaken

for anthracnose basal rot (ABR) on some courses - the pinkish tinge of the diseased areas should be a sign that it's pink snow mold. If you see black acervuli or black rotted crowns, you might indeed have ABR. Some of the "standards" that do a good job of controlling the pink snow mold include PCNB, Chipco 26GT, Cleary's, Compass, and Banner although other products are labeled for the control of the disease. One of the new products in California that appears to be very effective in university trials is Medallion, a phenylpyrrole fungicide that has been available for over a year now.

Yellow Patch (*Rhizoctonia cerealis*) is also easy to spot and is most problematic on annual bluegrass or creeping bentgrass greens at air temperatures of 50°F to 65°F. It causes yellow patches or rings up to a few feet in size, although yellow rings are the most common. These rings are frequently mistaken for fairy ring, but yellow patch won't have the telltale signs of fairy ring: a greenish edge to the ring, thick white mycelia in the thatch layer or hydrophobic areas where the turf dies out.

Fortunately, yellow patch rarely kills the affected plants and tends to just make greens look like hell. Prostar and Heritage appear to be the best bets for its control, although Medallion, Banner and chlorothalnil containing products like Daconil work to some degree.

Speaking of fungicides, Emerald is a new dollar spot - specific fungicide that was very recently registered here in California. It works only against dollar spot (*Sclerotinia homoeocarpa*) and appears to be very effective in UCR and other university fungicide trials. Emerald is a carboxin-like fungicide that shuts down cellular respiration in dollar spot. Since it has a new mode of action, you should be able to add it into your dollar spot fungicide rotation this spring to help manage resistance for some of the older chemistries like the benzimidazoles or SI-fungicides.

Got salt problems? Next stop, Rapid Blight City, population: you. Rapid Blight continues to pop up throughout the state on annual bluegrass greens although the number of diagnoses sent in had declined since last summer. Almost all of the samples sent in had salt readings above 2.7 dS/m (0.7 on the TDS-meter) with some as high as 4.6 dS/m. Recently, in November at the Crop Science Society of America meetings in Denver, Mary Olsen, the extension pathologist from the University of Arizona, showed data that indicated that the *Labyrinthula* pathogen that causes the disease cannot grow in the laboratory at salt levels lower than 2 dS/m. This is a clear sign that salinity management goes hand in hand with the management of this disease.

Also, Bruce Martin and Paul Peterson from Clemson University in South Carolina are asking for your help to complete a USGA-funded survey to examine the role of soil fertility and water quality and Rapid Blight development, and they are very interested in what is going on out here in California. In exchange for samples and a quart of water, you should get back a detailed analysis of your soil and water quality. If you have Rapid Blight, and are interested in sending samples, please contact Paul Peterson (843/662-3526 or ppeters@clemson.edu).

Here's wishing a happy and disease free new year to everyone in 2004. Until next time, good luck and watch out for those diseases.