



- On the Road - Quarterly Bulletin

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Composted Organic Fertilizers

Organic fertilizers have long been utilized in the turf industry throughout the years. The stable source of nutrients, combined with the long-lasting effect from the applications, have made the products a popular choice. The amount of material used to deliver the desired amount of nutrients has been one of the downfalls of this class of products. Ease of application has also been an issue.

Organic products have a wide array of sources, ranging from sewage-based byproducts to animal waste byproducts to plant byproducts, as well as other sources. Frequently, these byproducts need to be composted to get the raw ingredients broken down into a more stable and user-friendly form. More and more superintendents are using these composted organic



Superintendent Steve Fackler operates the forklift with a one-ton bag of composted organic pelletized fertilizer, while irrigation tech Scott McCullough assists with the loading. (Inset) a close-up of the product.

products as an integral part of their fertilization and soil amendment programs.

Mark Mahady, President of Mark M. Mahady & Associates, Inc., an independent turfgrass consultant, thinks organic composted materials have a place in golf course fertility programs. "If a quality local source can be identified and the product is available at a reasonable cost," Mahady says, "superintendents should take a long look at their fertility program and see where these types of products may enhance their existing program."

Mahady also advises superintendents to do their homework. "Some organic fertilizer products can exhibit elevated salinity levels," he says. "Request a salinity analysis from the manufacturer to evaluate the salt levels of the product." Other items that Mahady counsels turf managers to look into include: how dusty is the product, what type of volumes of the material are

required and how quickly does the product breakdown in the field. Mahady has also noticed a trend in combining organic materials with soil amendment applications.

One company that has made inroads into the market is Bull Enterprises Inc., of El Centro, Calif. Owner Garry Fornay worked with a group of Palm Springs-area superintendents to develop the synthetically enhanced composts. This group of "Founding Fathers" helped Fornay diversify his business from strictly agriculture by breaking into the golf business.

The primary business of Bull Enterprises, located 10 miles north of the Mexican border, is supplying the agriculture and more specifically the small fruit and vegetable industry with bulk amended compost or pelleted composted products. Large bulk orders are the norm for those high-dollar specialty crops. Golf courses typically utilize less product than their ag customers, but fortunately the product can be delivered with some of the larger bulk orders of agriculture users.

A unique objective of Bull Enterprises is to tailor a product for specific golf course needs. One of the key ingredients for the 30-employee company's compost is laying hen poultry waste. This product can be easily mixed with auxiliary products such as gypsum, SOP or KMag to give superintendents an organic product with a kick.

Frank Zamazal of Tamarisk CC in Rancho Mirage, Calif., (one of the host courses for the Bob Hope Chrysler Classic) has utilized Fornay's products for several years and says that the products are a "beautiful foundation for a fertigation program."

Steve Fackler of The Ridge in Auburn, Calif., has been using organic products since the course opened 6 years ago. The native heavy clay soils were very low in organic matter with only a 2.6 % OM content average in the fairways. Fackler has seen the OM content in the fairways rise to the high 5.0% with hope that they can increase a little more over the next few years.

Fackler's staff, currently prepping for the LPGA's Longs Drugs Challenge event in September, has had the composted pellets custom made to fit his needs. His standard blend includes SOP, KMag and a 1-2 percent iron component. It's all about "soil balancing," Fackler says.

One problem with the organic products that Fackler has run into is odor. "Managers in the restaurant don't like to seat customers on the patio after we have made a fertilizer application," Fackler laments. However, a new reduced-odor product is currently being evaluated.

One company Fackler utilizes is True Organic Products, Inc. based out of Salinas, Calif. The company also offers a customization package for golf course end users.

Overall, superintendents throughout California have purchased similar types of products. Most contend the products not only help in reducing the sodium levels in their soils via the gypsum in the product but also boost existing soil microbe populations with a beneficial food source via the compost.

As with any bulk material, spreading it throughout the course can be tricky. Custom applicators have been hired by some superintendents while others have utilized in-house equipment or borrowed neighbors' equipment to get the job done.

PAPA Seminar

Pesticide Applicators Professional Association (PAPA) will be offering a Hands-On Seminar at Salinas Golf & Country Club on Monday August 2, 2004. The Seminar will start at 7:30 a.m. and conclude by 12:30 p.m. All events will be held outside.

Featured speakers and topics include: Mark M. Mahady: New Products For Controlling English Lawn Daisy in Golf Courses (w/ test plot demonstration), Bob Costa: Water Conservation As Part Of An IPM Program, Dick DuBey: Injection Spray Equipment Demonstration, Glen Foth: Common Problems Found In The Landscape, Bob Raabe: Disease Identification In Trees and Shrubs and Jeff Phillips: Weed Identification and Control.

If you would like to attend this seminar you can contact the PAPA office at (831) 442-3536 or you can register on line at www.papaseminars.com.

Certified Golf Irrigation Auditor Training Class

Superintendents can learn to perform field tests on golf course irrigation systems to determine efficiency, via the Certified Golf Irrigation Auditor Training Class. They can also get information on combining plant water use, soils and local weather data to calculate accurate watering schedules for irrigation systems.

This class deals directly with the issue of wise water use on the golf course. Following the workshop, the optional Certified Golf Irrigation Auditor (CGIA) exam will be administered for an additional fee. Class attendance is required before taking the exam. The fee for the exam (\$125) must be arranged through the Irrigation Association office in Virginia. They can be reached at 703-536-7080 or www.irrigation.org.

The day-and-a-half class requires a basic understanding of sprinkler system operation. Basic math skills are also required. The class will be held at the Irrigation Training and Research Center on the campus of Cal-Poly San Luis Obispo. ITRC can be reached at 805-756-2434 or online at www.itrc.org. The dates for the class are Aug. 30-31. Cost for the class is \$195 which includes lunch and a class manual. Classes start at 8:00 a.m. each day. A calculator, pencil and notepad are recommended. Dress is golf casual and early arrival is suggested.

The meeting is jointly sponsored by the Irrigation Association and Cal-Poly SLO. One comment from a recent class participant stated "This is an excellent course to help anyone understand their plant water requirements based on actual watering characteristics of their irrigation system."

(Editor's note: I took the class and passed the exam in February. In my opinion, it should be mandatory for every superintendent, assistant superintendent and irrigation technician.)

Irrigation Pump Testing/Repair Incentive Program

The Center for Irrigation Technology (CIT) has developed and implemented a program for improving the efficiency of agriculture and large turf irrigation pumps. (Funding is from California utility ratepayers under the auspices of the California Public Utilities Commission.) This program pays for pump effi-

ciency tests as well as providing incentive rebates for selected pump retrofit/repair procedures. Golf courses will be allowed to apply for the reimbursement pump test and repair program but funding is limited. Eligibility extends to electric and natural gas utility account owners paying the Public Goods Charge (normally customers of PG&E, SCE, SCG, and SDG&E) used for production agriculture or large turf irrigation (non-residential accounts of 5 horsepower or more for turf irrigation accounts). Not all pump test companies are participating in the program, so check with the regional offices for program details. Contact numbers for courses throughout California are: San Joaquin Valley - 1-800-845-6038 (main office), Northern California - 1-866-333-8938, and Central Coast - 1-866-473-0847. The program website is www.pumpefficiency.org.

Coffee Shop Talk

Superintendents in and around the north shore of Lake Tahoe have been meeting every week on Wednesday morning for almost six years to talk shop, discuss current events and critique industry trends. The number of superintendents can vary from 3 to 8 people per week depending upon personal schedules, etc. This small and informal meeting has helped superintendents get to know each other on a more personal basis as well as act as a

sounding board for issues on their respective courses. Another way the group has connected with their peers is the formation of a round robin golf tournament. Each superintendent picks another person from the course or company to play an opposing two-some in a 18-hole scramble format. A bracket is drawn and the superintendents are responsible to connect with the other team for a time and place to conduct the match. The matches rotate around the different venues to let the teams play the other courses in the area. It makes for some good fun and bragging rights during the extended down time in the winter.



(L-R) Scott Bower, Tom Neaudea, Dave Lori, Greg Bleik, Kevin Breen and Brad Gorsuch. Regular attendees not pictured include Joel Blaker and Andy Wallace.

Shameless Plug for the Boot Camp

The dates for the fourth annual Assistant Superintendent Boot Camp have been set for October 3-5, 2004. The event will again be held at the Asilomar Conference Grounds in Pacific Grove, Calif. The cost of the Boot Camp is \$260. This includes two nights lodging, all meals (6) and a golf shirt. For those participants who want to play in a golf tournament after the conference, the total fee is \$310. Topics for this year's Boot Camp include tips for networking in a social environment, how develop and implement a budget, the importance of drainage on a golf course, an On-Course Rules Seminar, how to create an unforgettable PowerPoint presentation and more. Continuing ed hours from CA Department of Pesticide Regulation are pending. Class

size is limited to the first 40 individuals. For more information, go to www.ncga.org/turf/bootcamp.htm

Sad but True

These pictures are of surveillance equipment taken at a golf course maintenance building. Theft was becoming a major problem for the club and it had to nipped in the bud. There were also allegations that cars in the employee parking area were being damaged by machinery. Requests by the maintenance staff to club officials were made to reimburse employees for the damage to their vehicles.

Once the cameras and the video recorder were installed, all of the thefts and perceived damage to the automobiles stopped.

The cost for the cameras (4) and the recorder was less than a \$1,000. The video tapes can last up to 5 to 6 weeks. I guess it pays to have documentation.



"On-Site Reclamation" Feasibility Study Update

As discussed in an earlier Bulletin (Volume 3, No. 1), the Southern California Golf Association (SCGA) and their consultants were seeking funding for three economic feasibility studies for On Site Reclamation (OSR) at Southern California golf courses. The Metropolitan Water District (MWD) of Southern California approved funding for studying one location under their Innovative Supply Program. The SCGA is now preparing a memorandum of understanding (MOU) with the City of Coronado to conduct the study at their municipal golf course.

Once the MOU has been signed, the SCGA's consultants, Dana Ripley (Ripley Pacific Company) and Mike Huck (Irrigation & Turfgrass Services) will begin assessing water supply requirements, projected recycled water quality, various OSR plant designs, options, and other pertinent issues. Since the Coronado Golf Course is located on an island and OSR is dependent on a number of site-specific factors, both Ripley and Huck feel Coronado to be an ideal site for this first study. Their final report will compare the site's current costs and quality of irrigation water to that of what an OSR plant could deliver.

"Coronado must pay for and pump every drop of water they receive from across the bay in neighboring San Diego. The same applies for sewage disposal, so by reclaiming some of that as recycled irrigation water, we will reduce both costs for the city," said Huck. Ripley added "Being located on the bay also allows the opportunity to compare the long term costs & energy requirements of the OSR concept to those of desalinization."

The team will still seek additional sources of funding with hopes to study two additional inland sites, each with different microclimates and differing irrigation demands. This will allow them to produce a more comprehensive "how to" manual for the SCGA that can provide guidance to course owners and superintendents on how to approach the economic evaluation and implementation of the OSR concept. For additional information regarding the OSR concept contact Mike Huck at 949-388-5097.

The Pathologist's Corner

By Frank P. Wong
Extension Plant Pathologist
UC Riverside



Rapid Blight and Medicinal Leaches for *Poa annua* Greens

Recently, the U.S. Food and Drug Administration approved the use of blood sucking leeches (*Hirudo medicinalis*) for marketing and use for medicinal purposes. Leeches have been used for thousands of years in medicine and can prove valuable in today's world for surgical purposes, especially the reattachment of missing body parts, limbs and digits. For this summer, superintendents should be also thinking about leeches, not saying that I expect anyone to need to have a body part reattached for any reason, but "leeches" as in getting rid of excess salt in the greens. Why? Good question. It's because as seen in 2003, Rapid Blight is popping up in the state like gangbusters. Approximately 18 cases have already been diagnosed in May and June, from San Diego to Monterey.

As you may remember, Rapid Blight (*Labyrinthula spp.*), appears to have been a marine slime mold that was associated with dying eel grass (*Zostera marina*) in North America. Somehow, somehow, it appears to have made its way onto golf courses throughout the southern U.S., and here in California, and can cause significant problems on Annual Bluegrass (*Poa annua*) greens. University of Arizona researchers have found that the organism can't actively grow at salt levels below 2.0 dS/m. Here in the diagnostic lab, we've seen salt levels in samples testing positive for Rapid Blight no lower than 2.15 dS/m (with a high of 9.1 dS/m). Rapid Blight can also affect creeping bentgrass as well, but I've only seen it one time in the lab since 2003. Our next door neighbors in Arizona do get the disease on *Poa trivialis* and perennial ryegrass, but so far we haven't confirmed that in any samples here in California. I'm still considering it primarily a problem on *Poa annua* in California.

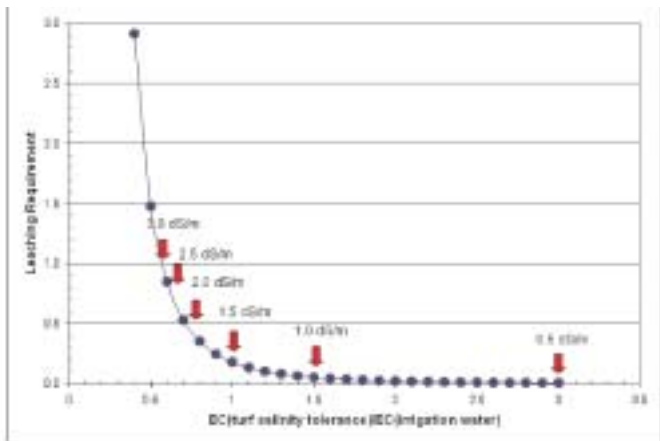
Not only do high salt levels foster the growth of this marine slime mold on *Poa annua*, but salt levels themselves can put the hurt on this turf type as well. According to data presented by Professor Bob Carrow (Univ. of Georgia)¹, *Poa annua* has an average ECw tolerance of about 2.25 dS/m (or ECe of 1.5)[†]. Salt levels on some greens can routinely surpass this level, and the current drought conditions in the state (going on 5 years now with less than average rainfall), is making salt management tough all over for a number of superintendents.

That brings us back to leaches and leaching. The basic concept is to flush out soluble salts from greens with excess water to keep salt levels below that which would physiologically weaken the turf or promote disease development, which is often easier said than done.

Theoretically, how much water to use is based upon the leaching requirement (LR), or fraction above and beyond the ET needs of the turf needed to flush out the salts (e.g. an LR of 0.1 means you have to apply 110% of ET in the irrigation to prevent salt build up). The LR based upon a model for high irrigation situations¹, where $LR = 0.1794 / ((\text{crop salt tolerance, expressed in ECe}) / (\text{electrical conductivity of irrigation water, expressed in ECw}))^{3.0417}$, can be graphically seen below.

Of course, the saltier the irrigation water, the larger the leaching fraction needed, and let's face it, some superintendents have some pretty bad water. Specifically, for *Poa annua*, setting

the tolerance for salt and rapid blight at an EC_w of 2.25 dS/m, we can see how much LR we need with irrigation water at 0.5 to 3.0 dS/m (Figure 2). Ok, I know many locations don't include the leaching fraction in daily irrigations to prevent soggy greens, but the graph does illustrate a few important things. Light, frequent irrigations below the ET plus the LR will allow for salts to build up quickly in the soil. If your water quality is bad and water movement is poor, it gets even worse as (i) the LR required gets larger and (ii) the amount of total water you can apply before getting water logged soils is reduced.



Relationship between leaching requirement, salt tolerance and irrigation water salinity. LR values highlighted for *Poa annua* with a salt tolerance of 2.25 dS/m using irrigation water with EC_w values of 0.5 to 3.0 dS/m.

Improving water quality by mixing saltier water with cleaner sources such as potable water is one solution. Dr. Larry Stowell at PACE Consulting suggests no higher than 1.2 dS/m for water quality. Again, this is often something easier said than done.

Leaching by flushing greens periodically can also work. Approximately 50 to 70% of the salts can be flushed from a 12 inch depth of sandy soils using 6 inches of good quality water. Two to three times more water is required for compacted or clay soils, and even more is needed if water salts are high.

Taking into account the water volumes needed to leach out the salts, if greens have poor water movement, life gets even more difficult. Adequate water movement through greens requires three things: infiltration, percolation and drainage (I-P-D!), or in other words: IN, THROUGH and OUT.

Reasons for poor infiltration may include:

- mismatched topdressings that are smaller in particle size than the layers below it
- high organic matter in the greens surface, 1 to 1.5 inches deep

- algae and moss
- localized dry spots
- excess thatch
- compaction

- sloped areas where water runs off

Proper and frequent surface cultivation (core aeration, solid tines, slicing, spiking) and the use of wetting agents can improve water infiltration.

Reasons for poor percolation through the root zone and water drainage include

- clay soils
- compaction
- soil layering of particles of different sizes, or buried thatch

layers

- sloped areas that channel water away from vertical movement

Subsurface cultivation to a depth of 10 to 24 inches are often needed to improve percolation. These methods may include verti-drains, sand channeling, deep drilling deep slicing, and air or water injection. Improving overall drainage from the greens can often involve the installation of tiles and drain lines. Often the drainage systems of older greens become unable to handle changes due to shifts in volumes needed based on changing water quality or just simply get old and need to be replaced.

The bottom line is that if you don't have good I-P-D (infiltration, percolation and drainage), leaching is going to be a pain in the fanny.

Okay, back to Rapid Blight. Salt management is the front line of defense against this disease, but fungicide applications are part of the strategy. They should be viewed as tools to help prevent and shut down outbreaks, but should not be relied on exclusively for Rapid Blight management. Fungicides active against Rapid Blight are listed below.

Fungicide (Class)	Trade Names	Use Rate per 1000 sq ft.	Notes
mancozeb (EBDC)	Fore, Protect T/O	4 to 8 oz Protectant only.	Best when used before outbreaks.
pyraclostrobin (QoI)	Insignia	0.5 to 0.9 oz	Best when used at high rate, can be mixed with mancozeb for added effectiveness
trifloxystrobin (QoI)	Compass	0.15 to 0.25 oz	

If a Rapid Blight event occurs, pyraclostrobin or trifloxystrobin tank mixed with mancozeb should be used to arrest the outbreak. If possible, greens should be leached before the application. Follow up applications then could be made as needed, but salt management needs to occur for full recovery, e.g. stop the disease with fungicides, and cure it by leaching and salt management.

Protectant applications can be made before practices are performed that damage or abrade the turf (i.e. topdressing, aerification, verticutting, etc.). The middle or high rate of mancozeb applied prior to mechanical damage is suggested.

If you can't get on top of the salt problem on *Poa annua* greens, you're likely to be in for a long summer, or at least until some decent rainfall appears. In this case, it may be advisable to apply mancozeb every two weeks to keep Rapid Blight populations in check if soil salt levels are above 2.25 dS/m, while putting together a plan to solve the water and I-P-D issues.

I guess the only good news in this article is that if you lose a finger anytime soon, there's a good chance that you can have it reattached successfully with the help of FDA-approved blood sucking animals.

That's about it for now, good luck and keep an eye out for those diseases!

Notes

1 R.N. Carrow and R. R. Duncan. Salt-Affected Turfgrass Sites, Assessment and Management. Ann Arbor Press. Chelsea, MI. 1998

† ECE is the electrical conductivity of soil-paste extracts from soil; EC_w is the electrical conductivity of an aqueous solution. 1 ECE is equivalent to 1.5 EC_w and is adjusted for in the LR formula presented above.