

## BioControls, BioStimulants, and Wetting Agents

With lofty goals and good intent, I dedicated this edition of Hands On to the discussion of programs involving products in the title above. A funny thing happened on the way to production of this issue, no one sent in any articles discussing their programs.

Some suppliers volunteered additional product information, but this space is dedicated to those comments and tips from superintendents about the topic at hand. Armed with my trusty tape recorder I ambushed a slew of superintendents attending the Poa Annuua in Naples and asked them point blank about these products and how they are using them.

The results of my interviews can be summed up rather quickly. First, practically everyone is trying or testing all of these products in some form or the other. I suppose the relatively new emergence of so many products has a lot of us taking a wait and see approach.

Practically everyone is using some type of wetting agent on "hot spot" and a few are on a regular program. More courses are cautiously trying the nematodes for mole cricket control. Some folks report success using products like Roots, Iron Roots, Panasea, and Sand Aid. There is also a product called Syn-Zyme Activator which has reported success in algae treatment on greens and in ponds.

At Disney, we have applied Proactant and Vector II for mole cricket suppression. We increased the coverage this year after seeing success on the Oak Trail fairways last year. Overall feeling is that although there still are hot spots emerging, the number and severity is less than last year at the same time.

We are also trying a consistent wetting agent program, by applying Aquatrol's Primer monthly to the greens. On the Palm course we are trying the Bio-Ject system for thatch reduction, and we are trying Toro's Bio-Pro on the Lake Buena Vista course.

While it is our fervent desire to embrace natural organic products to avoid

# Hands On

*Editor's Note: This edition of Hands On will take care of some old business and include articles on Professionalism that had to be cut due to size limitations last time out. And frequent contributor, Darren Davis, has some good input about the Golf Link computer service that needs to make it to print. Since everyone was bashful about speaking up on their "Bio" programs, we'll just partake of a mulligan stew of topics and clean up my files.*

using more potentially toxic products, there is some concern about the overall efficacy and benefit of some of the products. An article by Dr. Wayne Kussow follows and offers a dose of healthy skepticism. More importantly it points out the need for more independent research in this area.

Joel D. Jackson, CGCS  
Disney's Magnolia G. C.

## A Letter From IFAS

Enclosed are excerpts from a recently-published book chapter by Howard Frank which describes, in detail, our biocontrol efforts against mole crickets in Florida. I have highlighted important facts and concepts, but I urge you to read the entire thing to get the whole story. Although published in 1994, some important events have occurred since then:

The parasitic wasp *Larra bicolor* (pp. 469, 470, 473) collected from Bolivia was released near Gainesville in 1988-89. This population was discovered (in fall 1993) to be established near Gainesville and is apparently spreading quite well. 10% of tawny mole crickets collected from a local golf course were found parasitized.

The parasitic fly *Ormia depleta* is now known to be established in **all counties of the Florida peninsula at the latitude of Alachua County (Gainesville) and south** (except Monroe County where we have not looked at it). I have found as many as

25% of female tawny mole crickets, collected from a golf course, to be parasitized, although the fly does not perform equally well in all locations.

We are still having difficulty in rearing the predatory beetle *Pheropsophus aequinoctialis*; however, this has improved somewhat recently.

The nematode *Steinernema scapterisci* is now sold commercially as a biopesticide. It can provide control similar to chemical insecticides but is much more expensive and requires greater care in storage, handling and application. However, it can act as a classical inoculative biocontrol agent (p. 469) similar to *O. depleta*; once established in a mole cricket population, it will kill a certain percentage of adult mole crickets indefinitely and it can spread, via infected hosts, to untreated areas.

Future research needs include determining nectar sources (landscape and wild flowers) of adult flies so that their performance might be enhanced; determining host range of the beetle so that we may obtain permission from regulatory agencies to make field releases; and determining effects of the wasp on mole cricket populations. Currently **no** funding is available for such research which, of course, seriously hampers progress.

Best regards,  
Patrick Parkman  
Research Associate

## Humate and Humic Acid

BY DR. WAYNE R. KUSSOW

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Numerous products being sold for turf use as growth enhancers or growth stimulants contain humate or humic acid. Given the number of inquiries I've had about these products, the time seems right to assess their value in turfgrass culture. To begin, we need to understand something about humate and humic acid.

Humic acid can be extracted from any material containing well-decomposed organic matter — soil, coal, composts, etc. Extraction is by way of treatment of these materials with a solution of sodium hydroxide. This dissolves much of the organic matter present. If we then take this solution and add enough acid to drop its pH to about 2, organic material will begin to flocculate and can be separated from the liquid portion. The flocculated material is humic acid. What remains in solution is fulvic acid.

If we take the flocculated humic acid and dry it down to form a black mass that can be crushed and sized by dry sieving, we have humate. In other words, humate is humic acid in its solid state. Therefore, the chemical properties of humate and humic acid are basically the same.

Humic acid defies precise description except in very general terms. Black or very dark brown high molecular weight organic polymer is as good a description as any. The color of the material is effectively used as a sales or advertising attribute. Black organic matter conjures up

the image of dark fertile soils covered with lush plant growth.

Chemically, humic acid contains more carbon and less hydrogen and oxygen than does the plant and animal residues from which it has formed through extensive biological decomposition. It also contains about 4% nitrogen. But don't expect this N to be of any consequence as far as turfgrass growth is concerned. Because humic acid is one of the end products of the biological decay of organic matter, it has great resistance to further decomposition. Estimates of its microbial decay rate are often in the range of 0.3% per year under ideal laboratory conditions.

Two properties of humic acid that may have some benefit in turfgrass culture are its cation exchange capacity and its capacity to form chelates with the metallic micronutrients iron, copper, zinc and manganese. The cation exchange capacity (CEC) of commercially produced humic acid is in the range of 500 to 600 milliequivalents (me) per 100 grams. This is about 5 times greater than the CEC of good quality peat moss and twice as high as the CEC of soil humus.

To gain some perspective on the possibility of effectively making use of the high CEC of humic acid, we can examine the recommendations of one manufacturer that call for addition of 2 lb. humate per cubic yard of 80:20 sand-peat rootzone mix, or substitution of 3 lb. humate for the peat moss. By my calculations, assuming the pH of the rootzone mix and sand are near 7.0, 2 lb. of humate would contribute about 0.37 me CEC/100 g of the 80:20 mix. This would be in addition to the approximately 2.9 me of

CEC provided by the peat moss. That turns out to be a rather expensive 13% increase in the CEC of the rootzone mix. When substituted for the peat moss, you wind up with a rootzone mix with a CEC of about 0.55 me/100 g. Considering the fact that the potassium leaches readily from sand-peat mixes with 5 times more CEC than in the sand-humate combination, this doesn't seem like a wise substitution.

The chelating action of humic acid is sometimes used to produce chelated iron products. Without the addition of a nutrient such as iron, the claim is often made that humic acid has the ability to solubilize micronutrients already in the soil. This is a valid claim, but one has to realize that turfgrass roots themselves excrete organic compounds that solubilize micronutrients. Regardless, here in Wisconsin, where we've yet to confirm a deficiency of Fe, Cu, Mn or Zn on turfgrass, the chelating action of humic acid has to be deemed to be of little or not importance.

Now let's go to the research reports on the effects of humic acid additions on turfgrass. I have but one in my files. A search of the 17,000+ entries in the Turfgrass Information Center revealed no reports where "humate" was a key word, four reports with "humic acid" as a key word, and three reports with "growth stimulant" as a key word. Only two of the seven literature citations were of relevance to this article. Both were studies that demonstrate how strongly humic acid can absorb fungicides and herbicides. Indications are that surface applications of humic acid or humate can significantly reduce the effectiveness

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of systemic pesticides by reducing their absorption by plant roots and soil-borne pathogens and insects.

The single research report in my files is for a study in which 14 “non-nutritional growth enhancers” were applied to a creeping bentgrass putting green. Several humic acid and humate products were among those tested. The focus of the study was the effects of the products on rooting and root development. Data averaged over all rooting depths for the entire growing season revealed that none of the products significantly affected bentgrass root length or root to numbers.

Because so little research seems to have been done with humic acid products on turfgrass, there exists the possibility that there are situations where significant positive responses can occur. My assessment is that we should not expect positive effects over a wide range or conditions. Other than possible reductions in the effectiveness of pesticide applications when the humate or humic acid resides on the soil surface, the products are rather harmless when applied at rates recommended by the manufacturers.

There is, however, no justification at this time for using them on more than a small scale, trial basis. Humic acid will not compensate for poor turfgrass cultural practices.

*Editor's Note:* Reprinted from *The Grass Roots*.

## Linking Up with the World of Golf

BY DARREN DAVIS  
OLDE FLORIDA GOLF CLUB

Have you ever had a vendor come into your facility and try to sell you a product that you felt would be of absolutely no benefit to you? Later, after much thought or persuasion, you find your way clear to purchase or try the product. The months pass by, and each month you experiment with the product a little more or put more faith into it. Finally, a year goes by and you reflect back and ponder how you could have ever survived without this great product.

Sound familiar? Well, this is a true



Olde Florida Assistant Superintendent Scott Whorrall checks latest weather radar on Golf Link.

story and it happened to me recently. The product is Golf Link, a complete weather and information satellite service.

Like most of you, I am very picky how I spend my club's money, and I treat it as if it were my own. When a vendor came by with a demo of this product I wondered to myself how I could ever justify leasing a product like this. Then he told me about a trial offer that guaranteed me that if I did not like the system, I could return it. That sounded fair, and I trusted the vendor, so I checked a couple of references and agreed to the trial.

What is Golf Link? Among other things, Golf Link is an electronic weather system. Golf Link is a division of Broadcast Partners. Broadcast Partners supplies Golf Link with the electronic weather information. This information is also supplied to other similar companies, one of which is FarmDayta. This is the system I originally leased and which many other superintendents still have. The

FarmDayta system provides excellent weather information. However, some of the other information, such as the price of beef in Iowa or the stock market figures, had no bearing in my grass-growing world. I consider myself a well-rounded person, but I didn't find this information relevant to the golf course that is paying for this service.

One day I was thumbing through a copy of a trade magazine and came across an article on Golf Link. The article stated: "Golf Link is designed for the golf industry, providing subscribers with news that superintendents would enjoy. This includes turf tips, national and local association updates, research, new product information and commentaries. And, probably most importantly instant Doppler weather radar, weather forecasting capabilities and soon lightning strike maps." After reading the article on Golf Link, I thought it sounded just like my system with one major difference. The



difference is that instead of providing rarely used farm information, Golf Link provides information that relates directly to the golf course business.

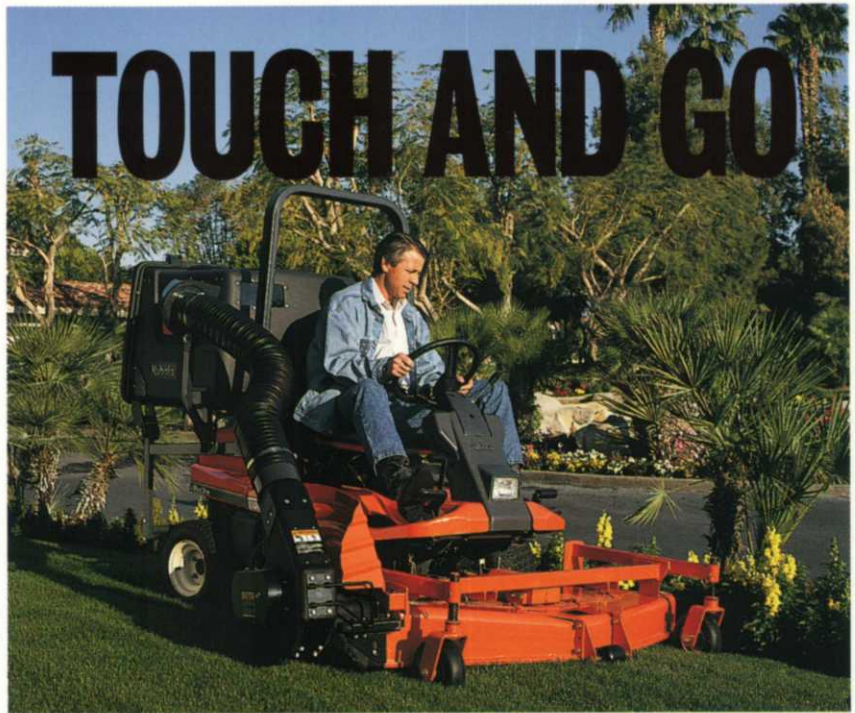
Golf Link provides access to the systems of the GCSAA, USGA, PGA, NGF, EPA, architects, builders and others. Also, recently the FGCSA Board of Directors gave permission to Golf Link to put published articles out of the *Florida Green* into the system.

As you can see, the benefits of the Golf Link system are numerous. However, I have found two main uses that my staff and I employ the system for, both of which have substantial financial rewards to my club. These benefits are both related to the weather functions the machine provides, including instant Doppler weather radar and various projected forecast maps that are updated continuously, 24 hours a day, seven days a week.

The hardware and monitor are located in the office of the office manager, who can be in radio contact with my staff and me at any time during the day. If adverse weather is approaching, the information is communicated by hand-held radio to the management staff, who can then make a judgment call on when to order the crew members off the golf course. Once the crew is in the maintenance facility, the Doppler weather radar is analyzed by the staff to help make a decision on whether to keep the crew at work or allow them to leave for the day. This helps us to save on labor cost that might have otherwise been wasted.

The other financial reward that we obtain by using the weather functions of the system is in planning applications of fertilizer or other compounds. We all know that one application of a product that is washed away by rainfall can be a costly mistake. By using the system in correlation to the application of compounds that could be potentially harmful it also signifies a commitment to being a conscious environmental steward.

The weather maps and radar are also used daily when determining whether or not to irrigate the golf course. We are fortunate enough to have a weather station that will cumulate all the factors that go into evapotranspiration and down-



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load this information to the computer to adjust the daily watering times. However, before we allow the computer to do this, we check the current radar and the forecast map to insure that rain is not imminent. Even though the irrigation system is hooked into a rain sensor, if the computer has already begun to run the nightly irrigation schedule the water that was applied might have been unnecessary.

I think the moral of the story, or the lesson I have learned, is that things are not always black and white. If you look hard enough into something you will find many functions or uses that are not always evident at first glance. We have a tough job that isn't getting any easier and every tool that we can utilize to help us accomplish our duties is of benefit to us.

## Professionalism, Part II — Is Your Image a True Reflection?

Do you consider your professional work responsibilities comparable to that of an airline pilot or a judge? If you answered "yes" then I like your attitude. If you said "no" then we've got something to discuss. Do think they are superior to you?

Just why do we look up to the profession of an airline pilot? When we see the pilot and flight crew walking to our gate, don't you expect to see a certain "image" in the pilot? A crisp neat uniform, confident attitude, walking tall, in command. How would you feel if instead you saw an unshaven, staggering, bleary eyed individual with alcohol on his breath. Would you be inclined to board the plane? Probably not! No matter what you do for a living shouldn't you have the expectation of positive traits and behavior that define a professional's career?

An airline pilot's or judge's image can be easily identified with life and death responsibility in their work. Have you thought about the golf course superintendent's responsibility for proper administration of pesticides. We have to guard against improper exposure to our employees, golfers and the environment

in general. How can our image presumed to be any less important? How can we afford to be any less professional?

On my return flight from the GCSAA Conference, we hit a patch of turbulence over the Rocky Mountains that sent the plane dropping, dipping and veering off course. The plane was stone quiet as we sat frightened to death as the "professional" in the cockpit fought to control the plane. In a few minutes the plane was stabilized and the pilot came on the intercom and apologized for the inconvenience. He explained that the unstable air we hit is caused by the mix of warm and cool air blowing over the mountains. It doesn't show up on radar. You can't see it coming. You just have to deal with it when it happens.

I didn't see a single passenger go up to the cockpit and chew him out or disagree with his answer. Why? Because we're not qualified to dispute his answer. It seems that we, as golf course superintendents, are always second guessed. Our explanations and answers are often disputed and challenged. Golfers seem to think because they mow grass they are qualified to pass judgment. They don't have much empathy for that "unseen turbulence" we experience like low oxygen levels in lakes that might cause a fish kill. They immediately point a finger at the "pilot" superintendent and think something incompetent has happened.

If we can form a visual image of that commanding pilot or a wise judge, what is the image of a golf course superintendent? More and more everyday we are being called upon to be leaders and stewards of a very valuable resource, the green space and wildlife sanctuary in the ever sprawling urban environment. The mantle of environmental responsibility is being placed on our shoulders.

Our professional image will be formed by our ability to provide thorough and accurate information that educates the public and dispels the negativism to golf that has been so widely publicized. Our image will also be reflected in the behavior and appearance of our staff from the rookie greensman to the Superintendent. It will be manifested in the cleanliness of our shops and equipment.

Professionalism has to come from the top. If you lead by example, that professionalism will trickle down to the most inexperienced person on your staff. Professionalism to the utmost is what every golfer expects of you whether you like it or not. What do they see? Is your image a true reflection of a professional?

*Mike Bailey, GCS  
Boca Rio C.C.*

## Professionalism, Part II — The Assistant's Role in Golf Course Operations

In recent times, the image and responsibilities of the golf course superintendent have greatly changed. In the early years, they were thought of as greenskeepers with little or no formal education. Today, many golf course superintendents hold a specialized degree in turfgrass management and are recognized as golf course managers. As challenges and opportunities for the modern golf course superintendent have changed, so has the role of the assistant.

Today, many golf course superintendents are busy with committee meetings, budget tracking and preparation, as well as dealing with numerous government regulations. For these reasons, a superintendent places greater responsibility on the assistant superintendent.

It is the assistant who carries on the day-to-day tasks of the golf course. He or she works directly with the golf course crew in scheduling, training and ensuring assignments are completed properly, efficiently and safely. Self-confidence in his or her abilities to supervise the golf course staff and deal independently with a variety of issues, without daily guidance from the superintendent, is necessary.

An assistant superintendent must display strong work ethics through hard work, honesty and dependability because he or she is a positive role model for the crew. The assistant must also project a professional image to other club employees as well as to the club's membership.



A good assistant will employ the ideas and philosophy of the superintendent. The assistant may not understand why some things are done the way they are, but he or she must trust and support the superintendent's judgment. You learn to use tact when inquiring about certain decisions the superintendent makes, not to question, but to learn.

A variety of skills are essential to be an effective assistant superintendent. One is good communication skills, not only with the crew, but also with the superintendent, vendors, other professionals and club members. It allows the assistant to effectively inform the superintendent on the status of the golf course, its employees and events that may directly or indirectly affect the golf course operations.

Problem solving is another necessary skill. Making the right decisions in the superintendent's absence, based on experience with the superintendent, the assistant will solve many small and less difficult problems. These problems can range from turf and pest practices to personnel issues. He or she will also be aware of the guidelines and limitations regarding certain types of decision that require the superintendent's input and final decision.

Computer literacy is yet another needed skill. The assistant is usually the one that operates, or assists, in the operation of a sophisticated computerized irrigation system. A data base management system may also be used to track pesticide and fertilizer applications.

Having a degree in turfgrass management, or equivalent knowledge, is a definite advantage for an assistant superin-

tendent; education plus experience is an even greater advantage. This combination provides knowledge not only for field diagnosis of problems and turf and pest management, but also in how to build resources and network with various agencies and peers. Resources, and an active network of peers having various degrees of practical experience, supply a vast pool of knowledge to draw from or simply exchange ideas.

In order for the assistant to be successful, it will take more than hard work, honesty and dependability. He or she must work for someone who has the same values and wants to see the assistant succeed. The superintendent must give the assistant guidelines to

work within. In most cases the guidelines are in the form of a job description. The superintendent and assistant should talk often to ensure they both share the same priorities (i.e., if the assistant has the responsibility of doing crew schedules). As more responsibility is delegated to the assistant, a good superintendent will support decisions the assistant makes because the superintendent will realize there is more than one way to get things accomplished. If the assistant makes a mistake, a good superintendent will inform the assistant, not in a condescending manner, but as a teaching experience. By so doing, the assistant will not be reluctant to make more decisions.

The assistant's role today is nearly as demanding and diverse as the superintendent's role. It can also be just as rewarding. Attitude, dedication, hard work and a superintendent who motivates and teaches his or her assistant su-

perintendent is what will make tomorrow's knowledgeable and confident superintendent.

*Matt Taylor*

Assistant Golf Course Manager  
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