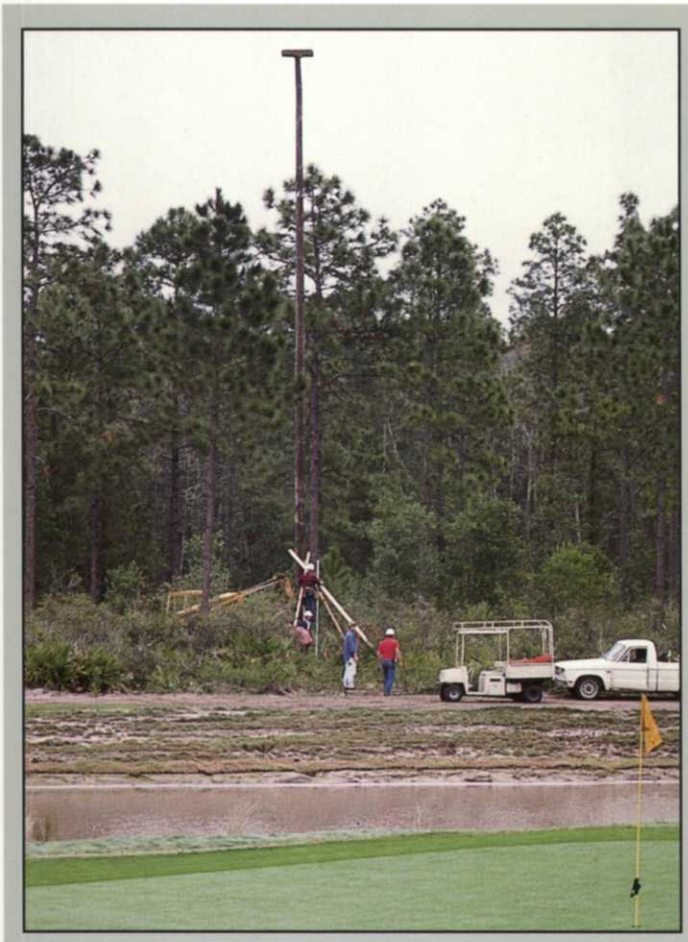

Fish Stocking at Bonnet Creek

Top, *Transporting the young fry;*
Middle, *Acclimating for water temperature differences.*
Bottom, *Release!*
Photos by Joel Jackson

Largemouth bass, sunfish (bream) and catfish were released.

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Wildflowers at Bonnet Creek Golf Club

Landscaping by Mother Nature

Wildflower Identification Key

1. ?
2. Tickseed
3. ?
4. Primrose Willow
5. Tickseed
6. Lantana
7. White Sabatia
8. Grass Pink
9. ?
10. Lobolly Bay
11. Dayflower
12. Tarflower
13. Rattlebox
14. Spreading Dayflower
15. Caesar Weed
16. False Foxglove
17. Cypress Vine
18. Butterfly Pea
19. Cypress Vine
20. Bitter Sneezeweed
21. ?
22. ?
23. Deer Tongue
24. ?
25. Tarflower
26. False Foxglove

from Page 46

Two things happened to shatter that theory.

(1) Pine straw harvested and baled elsewhere, and then scattered on the ground in an artificial application did not hold up to traffic and required frequent replacement.

(2) Sudden heavy thunderstorms moved the pine straw off of slopes and caused large mats of the pine straw chaff to clog drain basins.

To correct the tremendous labor impact of restoring these areas after a heavy rains and traffic, Pete concurred with the plan Scott, Pat, and Larry devised to reduce the pine straw area down to 25 acres.

Elevated sloping areas were sodded either with bermuda or bahia depending on the location and irrigation capability. Other areas were converted to sandy "waste areas."

Pete came back several times to view the handiwork and to report that he was still using pine straw areas, but this time he put them only where existing pine trees could naturally replenish the straw and the slopes were not a factor.

There is another design element that has proven to have its shortcomings. Pete used a lot of Delmar variety St. Augustine to surround the bunkers. It has proven to be very susceptible to uncontrollable patch diseases during the warm season. I understand that it may not be for sale any longer. If it is, stay away from it. It is a poor performer at least for us. Long range plans call for a phase out to Tifway 419 to eliminate management problems.

It's nice to know that even the old masters keep learning. That's what makes the best stand out. Along their way they leave us an Osprey Ridge and an Eagle Pines to enjoy. And so the tale is told. Perhaps not complete for the work is never done, but enough I hope to hold you till the next course is begun.

Editor's note: *The author served as Superintendent of the Osprey Ridge Course from June 3, 1991 until his transfer to the Magnolia course on March 1, 1994.*

Eagle Pines and Osprey Ridge crews. Photo by Joel Jackson

Osprey Ridge Golf Course

Designed by: Tom Fazio. Assisted by Dennis Wise and Steve Masiak

Constructed by: Fore Golf/Devcon.

Opened: December 1991.

Acreage: Total turf = 130. Lakes = 32 acres.

Greens: 4 acres, Tifdwarf. HOC = .141 - .172. Average size = 8,200 square feet. Overseeded w/Poa trivialis @ 16-20 lbs. per 1,000 square feet. Green speed 8'6" - 10'.

Tees: 3.6 acres, 419 Bermuda. HOC = .438 - .5. Overseeded w/Perennial Rye @ 15-20 lbs. per 1,000 square feet.

Fairways: 40 acres of 419 Bermuda, HOC = .5.

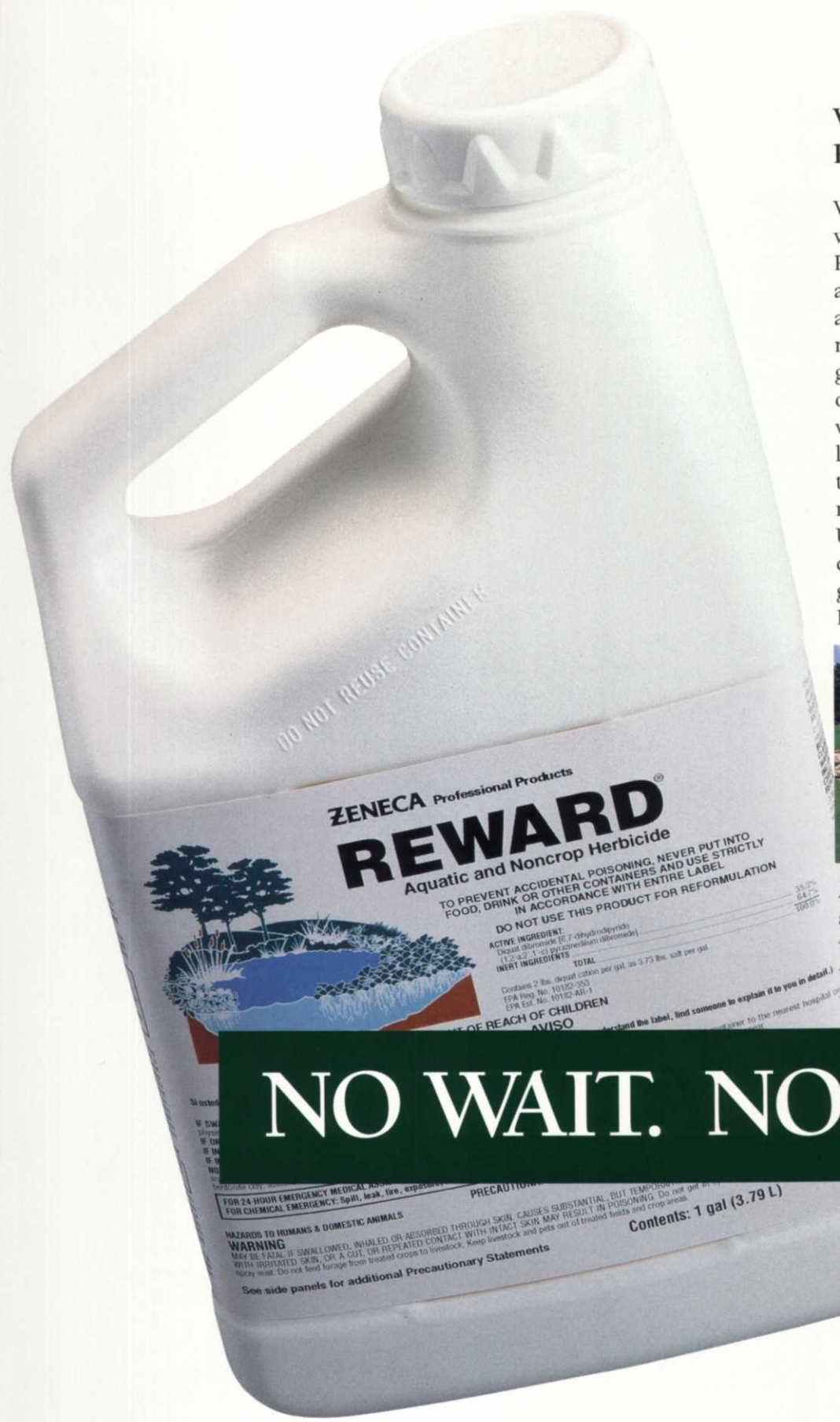
Roughs: 60 acres of 419 Bermuda, HOC = 1.5 - 2.0. Overseeded w/Perennial Rye.

Irrigation: Source: Re-use. Equipment: Flo-Tronex Variable Speed Pump Station, Controls: Rain Bird Maxi 5.

Total Staff: 20, including superintendent.

Wildlife Inventory: Addition of osprey "nesting platforms". This year will have "first born" on the platforms. Platform between Osprey #7 and Eagle #15 has 2 eggs. Whole range of wading birds and song birds from A to Z. Bird of prey include Eagles, hawks, ospreys and owls. Everything else from alligators and armadillos to panthers and turtles.

Playing characteristcs: Can be stretched to 7000 yards. Elevated tees and ridges influence shot making. Wide fairways keep the ball in play. Large greens place premium on approach shots and putting skills. Gentle undulations on greens. What you see is what you get, but there's lots to see! Reachable, gambling par 5's.



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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.*

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 Annua 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 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 bicontrol 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
DEPARTMENT OF SOIL SCIENCE
UNIVERSITY OF WISCONSIN-MADISON

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 or 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

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.*

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

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 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 it if 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