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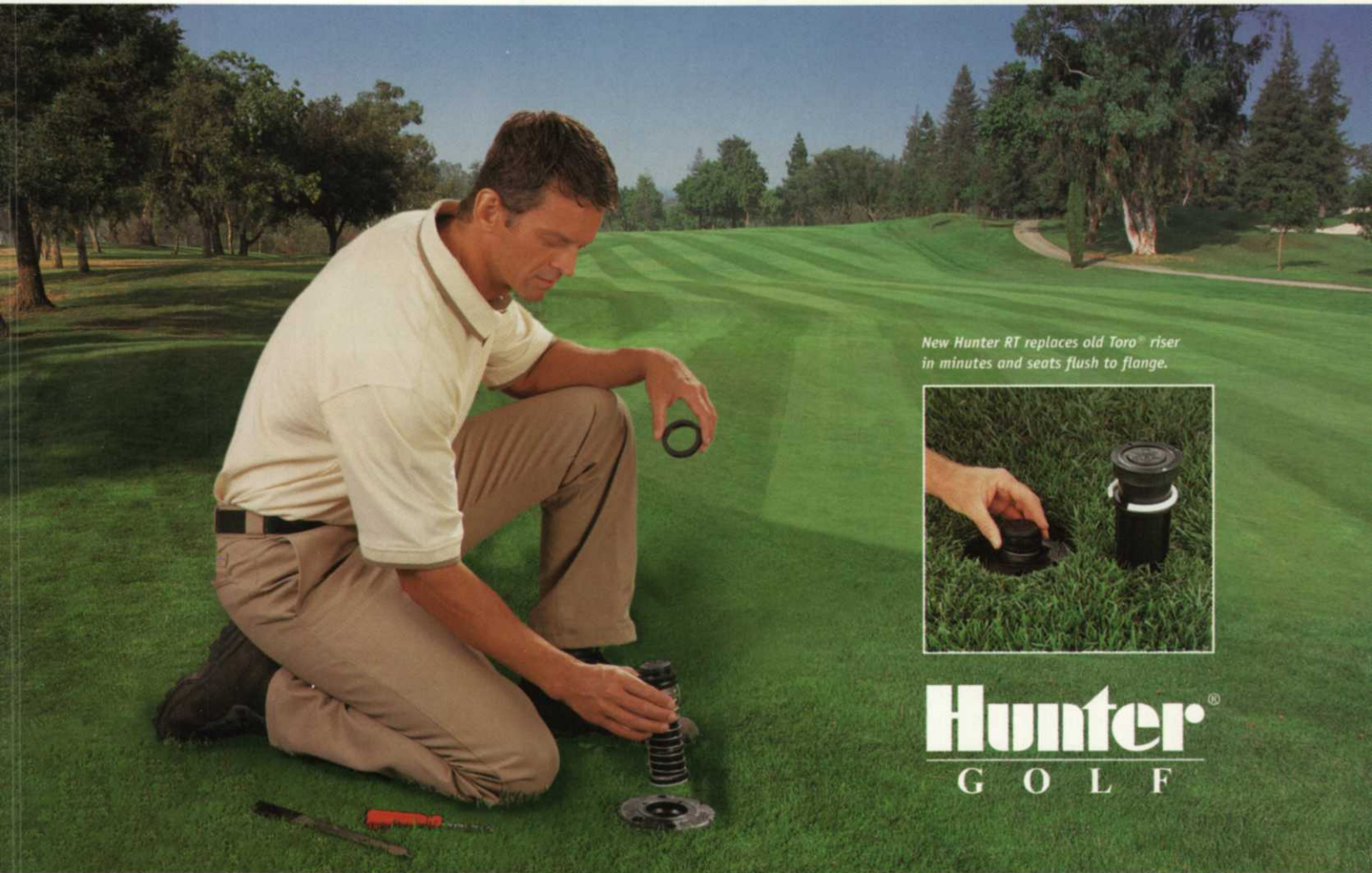
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## Fertilizing the 'Green' Way

BY JOEL JACKSON, CGCS

**C**hemicals today. Fertilizers tomorrow. There are groups taking dead aim on the use of fertilizers in today's environmentally sensitive climate. Nitrate and phosphorus pollution are the focus of some of these initiatives. With TMDLs and nonpoint-source pollution standards being drafted as we speak, people who use fertilizers are going to have to make sure they are not part of the problem.

Enough research has been done to show that golf courses can use products and practices that will not create excessive nutrient leaching or runoff. In this issue, learn how nutrients are managed on a variety of courses from a high-volume public course to a multi-course resort complex. Florida's newest USGA Agronomist Todd Lowe also pitches in with some facts to help you spread the truth about turf fertilizers.

### Winter Pines GC Fertility Program

#### Granular & Liquid Program for Greens

**O**ur granular fertilization program on greens maintains a 1-0-1 or 1-0-2 ratio of N-P-K depending on the greens and their grass variety. We have some different strains of Tifdwarf on some greens as we rebuild them a few each year. All granular applications are made with a Scott's R8A walking spreader.

Some of the analyses we use are 19-0-16 with IBDU and sulfate of potash (SOP) in the winter for a slow feed at .5 lbs of N/1000 sq. ft. applied biweekly. We also use Lesco Novex 18-2-16 at the same rate. Milorganite is used at overseeding time and when cold nights are expected also at .5 lbs N/1000 sq. ft. Certain greens are supplemented monthly with Sul-Po-Mag at 5.0 lbs/1000 sq. ft. monthly and 0-0-50 at 2.0 lbs. K/1000 sq. ft. based on soil test results.

During transition we use "hotter" mixes at .5 lbs N/1000 sq. ft. weekly like Harrell's 12-4-12 or 14-2-14 and some ammonium sulfate (21-0-0) also at the .5 lb rate per 1,000 sq. ft.

We use a weekly liquid program during the winter months to supplement the dry fertilizer. All applications are made with a Smithco Spray Star 1600 with 8008 TeeJet nozzles. Our two basic programs: 1) 2.5 gal. of 12-0-12 plus 1.25 gal. 2-0-25 plus 1.25 gal. 7-0-0 plus 2 qts. 6-20-5 per acre per week and 2) 2 gal of 28-0-0 plus 10 lbs. 13-0-44 plus 10 lbs. 0-52-34 plus .5 lbs. Microplex per acre.

During transition or on weak greens we will help extend a granular application by applying 1.25 gal. of Lesco 12-0-0 + Iron or 1.5 gal. 18-3-6 from Growth Products as needed.

#### Program for Tees

Our granular program for tees consists of monthly applications of 9-2-9, 15-0-15, and 6-2-0 at 1.0 lbs. of N/1000 sq. ft. High traffic areas

are done at the same time to minimize wear damage to the turf. Since our tees only average 1,500 sq. ft. keeping the nutrition levels high is necessary to help them recover more quickly.

Most of the granular applications are made with the Scott's rotary spreader, but occasionally we will use our Massey Ferguson 230 tractor with a 600 lb. capacity hopper to cover tee tops, teeslopes and wear areas in one pass.

We use liquid applications of 1.25 gal. of 12-0-0 + Iron or 2 gal. 16-4-8 at 2.0 lbs./acre to supplement the granular applications or for better color on problem tees.

#### Program for Fairways

All fairway applications are made with our tractor and 600 lb. spreader. For a good spread pattern and coverage applications are made at 250-330 lbs of product per acre. We use a 9-2-9 fairway blend with Milorganite and Sulfur Coated Urea (SCU) in the winter to help green up the turf since we don't overseed our fairways and we don't have wall to wall cart paths.

In the spring we use Scott's 32-3-10 to get our fairway turf going before we renovate. Some years we will apply a 15-0-15 blend with Ronstar on the fairways if we have been having a weed problem. But spot treating with today's herbicides has made post emergent control a lot easier. A 4-2-23 fairway blend is used in the summer to start preparing the turf for cool weather in the fall, then when fall is here we usually apply 15-0-15 with Barricade to control Poa annua and "walked off" ryegrass from our overseeded areas.

The only liquid nutrient used on the fairways is the addition of iron to our Primo growth regulator applications to avoid any yellowing or bronzing of the turf.

#### Natural and Bio Products

We have tried some of the natural products on our new greens and problem areas on the older greens but there was nothing I saw that made me say, "This stuff really works!" Most of the time we quit using it after 3-4 applica-

tions if we didn't see any significant results. I'm willing to try something new if its not too expensive, hoping to see some benefit, but after reading Dr. Elliot's report on testing being done on biologicals, I go back to the basics and with a little help from Mother Nature everything comes back.

#### IPM Considerations

IPM is always taken into consideration no matter what we are applying. All big tractor applications of fertilizer maintain a setback or buffer zone along the water hazards. We fill in with walking spreaders or sprayer for better control. Additionally we apply Primo and iron along the lakes and canals to keep flymow work to a minimum so less fertilizer is needed.

We select our fertilizer blends to keep the amount of quick-release nutrients to a minimum to avoid any runoff problems from an unexpected downpour. We allow our last fertilizer application on our tees and greens to run out and we make a "spoon feeding" liquid application to hold color until the next granular application kicks in.

Soil tests are done once a year on six greens, tees and fairways and on any problem areas. Tissue testing is done periodically on any greens where the products do not appear to be working and the turf remains weak.

#### Summary

Winter Pines is a public golf course which is open 365 days a year from sunup to sundown. We try to work around our players as much as possible. Most of our morning players are regulars so they understand what we are doing when we might have to hold them up to water something in.

Every year we evaluate all the fertilizer products we use and we stick with what has given us the biggest bang for our bucks. New products come out every year and we will try some to see how they perform for us. All in all, how our turf looks and responds to what we do is the bottom line.

BY JOE ONDO, CGCS

## The Nitrate Truth Shall Set You Free

I am preaching to the choir when I say that golf courses are good for the environment. We have known for years that turf is a filter for pollutants and loose sediments (dust) even though in some instances chemicals must be ap-

plied to support its growth. If it were not for turf, many of our waterways would be environmental hazards.

The USGA remains the largest supporter of turfgrass research. To date, we have funded over \$20 million in research and will continue to provide this support into the next millennium. Protecting the environment is the major goal of our funding by producing improved turfgrass

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varieties, supporting the Audubon Cooperative Sanctuary Program and creating the Wildlife Links Program (visit [www.usga.org/green/turfgrass/](http://www.usga.org/green/turfgrass/) to learn more about each of these).

Fertilization is a key factor to producing quality turfgrass. Turfgrass requires nitrate for growth; however, excessive nitrate in the environment is harmful. Nitrates pollute water sources and are a potential human health threat causing the condition known as "blue baby syndrome" in infants.

Through the years, research has shown that much of the nitrate is a byproduct of other industries like agriculture. Even so, golf courses are still popular targets of attack from environmental advocates.

Ignorance is bliss for some individuals but the USGA feels that it is best to learn as much as possible about the fate of chemicals applied to golf courses. A series of studies funded by the USGA was conducted throughout the previous decade in order to determine the environmental fate of fertilizers and pesticides.

These studies are too numerous to list but some of the findings from these studies include:

- Nitrate leaching was negligible (<0.2%) in a bluegrass rough at a depth of 4 feet and the concentration was at least 10 times below EPA standards for drinking water (Michigan State University).

- When turf was maintained under a high level of management, nitrate leaching from a tall fescue rough and bermudagrass fairway was very low. A total of 1% or less of the applied nitrogen

*There is freedom in knowing the truth, and the USGA will continue to fund necessary research for providing the best playing conditions while also protecting the environment.*

was lost in leachate (University of Nevada).

- A bermudagrass fairway and a bentgrass putting green utilized most of the nitrogen applied — even with over irrigation. Under the conditions of the study (biweekly applications of urea and sulfur-coated urea), little nitrate leaching (1%) was recorded (University of California).

- More leaching occurred in a newly planted bentgrass fairway than in a mature established turf but did not exceed EPA drinking water standards (Cornell University).

- Irrigation had to be doubled (6-inches/hr.) in ryegrass and bentgrass fairways in order to produce any runoff. All nitrogen and phosphorous concentrations in the runoff were less than EPA drinking standards (Penn State University).

- Addition of organic matter to a sand

rootzone mix proved to be the most important factor for reducing nitrogen leaching. Spoon feeding every 14 days significantly reduced nitrogen leaching from young greens compared to 28 days.

As putting greens matured, nitrogen fertilization rate was the most important factor affecting leaching. Light applications of slow-release sources on a frequent interval provided excellent protection from nitrate leaching (Washington State University).

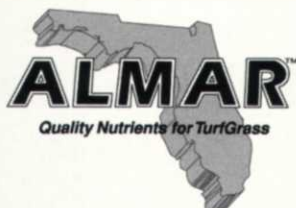
- Bermudagrass buffer strips are an effective means for decreasing the amount of nutrient and pesticide runoff that reach bodies of water. Longer strips (8 to 16 feet) and increased mowing heights (3-inches) are more effective than shorter strips (4 feet) and mowing heights (0.5 to 1.5-inches) (Oklahoma State University).

- At downstream sites of golf courses, nitrate concentrations were lower than upstream sites. Also, an overall increase in the number of invertebrates occurred downstream of two golf courses (University of Maryland).

In addition to the benefits of turfgrass, some of the information also pointed out the negative effects of poor management.

Applying more soluble nitrogen (>0.5 N per 1000 sq. ft.) than the turf can utilize at any one time leads to nitrogen loss. Also, applying fertilizer just prior to a major rainfall or irrigation cycle (7-inches/hour) may lead to runoff.

Immature root systems are also much more inefficient at utilizing nitrogen as compared to mature, dense roots, and



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great care should be given to not applying too much fertility to newly establishing turf sites.

Once the facts are known, informed decisions about fertilization can be made. There is freedom in knowing the truth, and the USGA will continue to fund necessary research for providing the best playing conditions while also protecting the environment.

BY TODD LOWE  
USGA Agronomist

## The Legacy Club's Fertility Program

John Kopack, superintendent of The Legacy Club at Alaqua Lakes shares his fertility program with *The Florida Green*. The Legacy Club was only the third public course to be built as an Audubon Sanctuary Signature Course.

Kopack says, "We maintain 30-foot unfertilized bahiagrass and cordgrass

buffers around the lakes to ensure there is no runoff into the water bodies. Additionally, our irrigation system is designed so that no sprinklers throw water into lakes, wetlands or other natural areas. We also store all the storm water runoff from the development: it moves through staging ponds to the irrigation lake and is then recycled onto the course."

"We do soil testing three times a year. I check four greens, tees and fairways each time and I keep three greens as permanent control sites and vary the other three choices for each test. I personally do the tee and fairway granular fertilizer applications with a two-ton capacity Lely spreader pulled by a tractor. On our greens we cut the rate in half and go two directions with Lesco rotary spreaders."

### Greens Program

Granular — six applications a year of 12-2-12 with 50% sulfur coated urea.

Liquid — Sprayboom applied 2 times

a month in the cool season with Peters 20-20-20 at 1/4 lb. of nitrogen per 1,000 sq. ft. We also include soluble iron in with our fungicide applications in the winter time. Coronas 12-0-0 or 15-0-0.


### Tees and Fairways Program

Granular — two applications a year spring and fall. Usually a 15-5-15 blend with 70% slow release nitrogen.

### Fertigation Program

Warm season — 2-3 applications of 11-0-8 with 50% slow release N. Each application takes 5-7 days with meter set at 30%.

Cool season — 2 applications of 20-0-0 with a unit of iron. These are usually made prior to our member-guest and invitational tournaments for special event green up.

Special — We apply a 0-34-0 that comes in a mini bulk container during our overseeding process to help the new seedlings get rooted. 



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Growing Solutions in Turf



## Easy Scraper for Clean Rollers

**S**olid rollers on walking mowers can be a saving grace for turfgrass managers during periods of the year when your turf is under stress. However, the build up of wet clippings, fertilizer and sand on the solid roller can drastically affect the height and smoothness of cut as well as becoming a nuisance for the operator who must often stop mowing and clean the debris stuck on the front roller.

This problem can occur at various times throughout the year especially during cold winters when heavy rates of Milorganite were applied to help draw in heat. The Milorganite can become caked on the front roller for several days after the application is made. I have also seen the problem during grow-ins and after seasonal renovations when there are a lot of clippings, fertilizer and sand present on the surface. This past summer when the problem arose again during the grow-in of our newly renovated greens I asked my equipment and facilities manager, Joe Stefanick, to help me solve this problem once and for all.

It was decided we were not looking for a quick fix that would be short lived. We had tried one such temporary solution which failed, using fishing line tied to the roller brackets and stretched tight against the roller. While it was effective in the short term, it became a nightmare to keep them installed for any length of time. Therefore, I set Joe free to use his creativity with the charge of, "Do it cheap but make it effective and durable." I don't ask for much do I? What he created was very successful and durable.

The roller scrapers that Joe constructed are attached to our 1993 John Deere 22-inch walking greens mowers. The scraper itself is a 1-1/4-inch wide by 3/16-inch thick piece of flat stock cut to a length of 22-1/2 inches that rests (floats) on top of the solid front roller. This provides a 1/4-inch overhang on each side of the 22-inch-wide roller. A 3/8-inch by 2-inch metal pin was then welded on the upper third of the flat stock on both ends. This pin rests freely in the height-of-cut-brackets above the roller. By welding the pin to the top third and in the front of the flat stock scraper, the scraper rests at an angle on the top of the roller. The weight of the flat stock holds it against the roller and keeps any material cleaned off so it can't accumulate and become a nuisance.

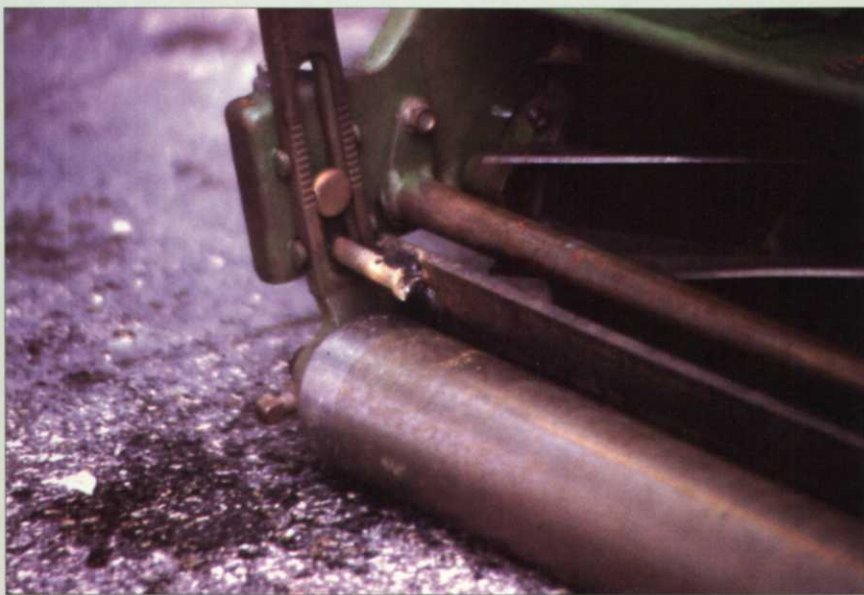
The roller scraper that Joe designed and constructed for us took less than 10 minutes to install and cost around \$5 to build. The total weight is just 1.6 pounds. We would expect this time-saving device to easily last the life of the equipment that it is mounted on.

DARREN J. DAVIS

Olde Florida Golf Club



Front view of roller scraper mounted on walking greens mower. Photo by Darren Davis.



Close up view showing scraper orientation to the roller and mounting pin resting in height of cut bracket. Photo by Darren Davis.



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I hope this is the first of many columns that I will be writing to keep you informed of the latest happenings and viewpoints from the Florida Turfgrass Association.

Like many of you I have just returned to sunny Florida from the rain and cold weather in Dallas. I think the weather gods wanted to show us what rain looked like. They overdid it though as some areas around Dallas had flash floods and went under water. Seeing cars stalled with water up over the roofs is a sight we seldom get to see.

While in Dallas, Paul Crawford, superintendent of the Palm Beach Country Club and myself were joined by Marie Roberts and Joel Jackson in a meeting with Hannes Combest, GCSAA director of education and Sherri Kohler, senior manager of chapter seminars.

**Together, We Are Making a Difference**

We were meeting to see how the GCSAA could help improve the annual FTGA Conference and Show at Gainesville this coming August.

There have been informal discussions in the past with GCSAA about the impact on the FTGA Conference by having the national conference in Orlando every two or three years, and GCSAA has been receptive to discussing how they might assist overcoming that impact. This year we started talking turkey and we are going to work together to see what we can do this year to start making some improvements. GCSAA has a lot of conference and show expertise and we are trying to tap into that with their cooperation to help attendance at our own annual conference and show.

The meeting in Dallas is just another example of the FGCSA and the FTGA working together and getting on the same page with the University of Florida. The University is committed to conducting pertinent, up-to-date research that you as superintendents can use. Water and environmental pressures have put us all together in the same boat. We need research on how much water is filtered and returned to the water supply by golf courses.

We need that research done here in Florida with our soil conditions to prove to others what we already know: golf is good for the environment and superintendents are among the best and most informed environmental groups in the state of Florida.

**Benham's Beat**

Don Benham  
FTGA Director  
of Public Affairs



**The Regulators Are Listening; Are You Speaking Up?**

The time is ripe for industry to take its case to the state and federal regulators. I have witnessed three meetings where regulators are listening to industry's concerns on environmental issues and the regulators are offering advice and guidance on how to find solutions that will satisfy everyone as much as possible.

I sat in on a meeting in Tallahassee in early January with Gregg Storey and Pete Coody of the Bayer Corporation as they discussed a proposed ground water study that would monitor the use of Nematicur on Florida's sandy soil profile.

Members from the Florida departments of Agriculture and Consumer Services and Environmental Protection, working with the Bayer representatives, hammered out a draft that was agreeable to both parties and could be submitted to the U.S. Environmental Protection Agency for the reassessment of Nematicur. The object was to find a method to determine if Nematicur truly posed a threat of ground water contamination.

It was a great example of give and take and compromise that addressed the need to protect the environment and to scientifically and realistically assess the true effects of a properly applied product that is the only effective weapon we have against high nematode populations.

Later in January, at the request of Mike McDavit of the US EPA, I was able to

organize an informal face-to-face meeting of Florida superintendents and McDavit who is in charge of the Nematicur reassessment team in Washington. Dennis Howard of Florida DACS was also present along with a representative from EPA's Region Four office in Atlanta.

What ensued was an honest and open discussion of real-world uses and concerns about Nematicur use, application methods, worker exposure risks, golfer exposure risks and environmental impacts. McDavit openly admitted that it was essential for EPA representatives to get this kind of information to modify and/or validate the assumptions they are using to determine risk.

How effective and valuable are these kinds of stakeholder meetings? I can only tell you that in a follow-up call from Pete Coody a few weeks later, he indicated that EPA's tone and level of cooperation was 180 degrees different. They approved the draft of the Nematicur ground water study with some acceptable modifications and Coody was pleasantly surprised by the level of support and encouragement from EPA.

Meanwhile on another front, we are dealing with growing water restrictions as drought conditions hang on. The FGCSA is working with the Southwest Florida Water Management District with the help of Stuart Bozeman of the Seven Rivers GCSA. Bozeman has vol-



unteered to sit on the SWFWMD's Green Industry Advisory Committee and the Water Conservation Task Force.

The FGCSA is supporting Bozeman's initiative to get SWFWMD to change the language of its water restrictions to abandon the old arbitrary day-of-the-week method of regulating water use. We are advocating a percentage reduction of the consumptive-use permits which will guarantee water conservation, but will allow superintendents the flexibility to water when and where its needed.

We still have some work to do, but the take-home message is that once again the regulators are listening. We are proposing common-sense solutions which are fair, meet the district's need to conserve water and allow golf courses to conduct business for everyone's benefit. The regulators are listening. Are you speaking up. Now is the time to be heard.

JOEL D. JACKSON, CGCS

#### IFAS UPDATE

## Concept Plan Released for UF's New Turf Research Plots

The consolidation of UF/IFAS plant science research in the Gainesville area to the Pine Acres Plant Science Research and Education Unit south of Gainesville provides our turfgrass program with the opportunity to develop state-of-the-art-and-science turfgrass plots.

The new turfgrass plots, when combined with the Turfgrass Envirotron, will give the University of Florida in Gainesville outstanding facilities for research dealing with all aspects of turfgrass (sod producers, golf course superintendents, athletic field managers, pest control operators, landscape managers, homeowners and governmental regulatory agencies) and will expand the potential cooperative programs with faculty in Ft. Lauderdale, Belle Glade, and Milton.

Further, addition of ornamental

## 2001 Florida Plants of the Year - Part 2

**Editors Note:** The Florida Plants of the Year program was launched in 1998 and has been beneficial to both consumers and growers. Purchasers are introduced to under-utilized but proven Florida plant material. This program is sponsored by the Woody Division of the Florida Nurserymen and Growers Association (FNGA). This group of plants deserves consideration for their drought and stress tolerances and wildlife attraction.

### COMMON NAME: Mexican Sage

**BOTANICAL NAME:** *Salvia leucantha*

**HARDINESS:** Zones 7-10

**MATURE HEIGHT AND SPREAD:** 5' x 4'

**CLASSIFICATION:** Perennial

**LANDSCAPE USE:** Long lasting color in perennial border or accent plant

**CHARACTERISTICS:** A drought tolerant perennial with gray foliage. Does best in sun or light shade, has some salt tolerance and is a butterfly and hummingbird attractor.

Blooming for a long time with fuzzy purple/white inflorescence, the velvety leaves are fragrant and unappetizing to insects and disease.



### COMMON NAME: Fringe Tree

**BOTANICAL NAME:** *Chionanthus virginicus*

**HARDINESS:** Zones 4-9

**MATURE HEIGHT X SPREAD:** 25' x 15'

**CLASSIFICATION:** Large shrub or small flowering tree

**LANDSCAPE USE:** Small specimen tree, good as and understory tree

**CHARACTERISTICS:** Showy white flowers appear on this Florida native plant before the narrow dark leaves in the spring, spreading a sweet fragrance. The black fleshy drupes (fruit) are wildlife attractors. Half or full sun gives the best growth of this drought tolerant and cold hardy tree.



### COMMON NAME: Tropical Wisteria

**BOTANICAL NAME:** *Millettia reticulata*

**HARDINESS:** Zones 7-10

**MATURE HEIGHT X SPREAD:** vine 20' x 30'

**CLASSIFICATION:** Vine

**LANDSCAPE USE:** Best use on a trellis, fence or gazebo

**CHARACTERISTICS:** Fast growing and deciduous woody vine is a late spring/early summer bloomer that does well in full sun of light shade. The compound leaves are cupped and leathery. Pendulous clusters of dark purple flowers resemble wisteria blooms and rebloom often if deadheaded.



### COMMON NAME: Emerald Gem

**BOTANICAL NAME:** *Homalomena 'Emerald Gem'*

**HARDINESS:** Zones 9-11

**MATURE HEIGHT X SPREAD:** 8" x 24"

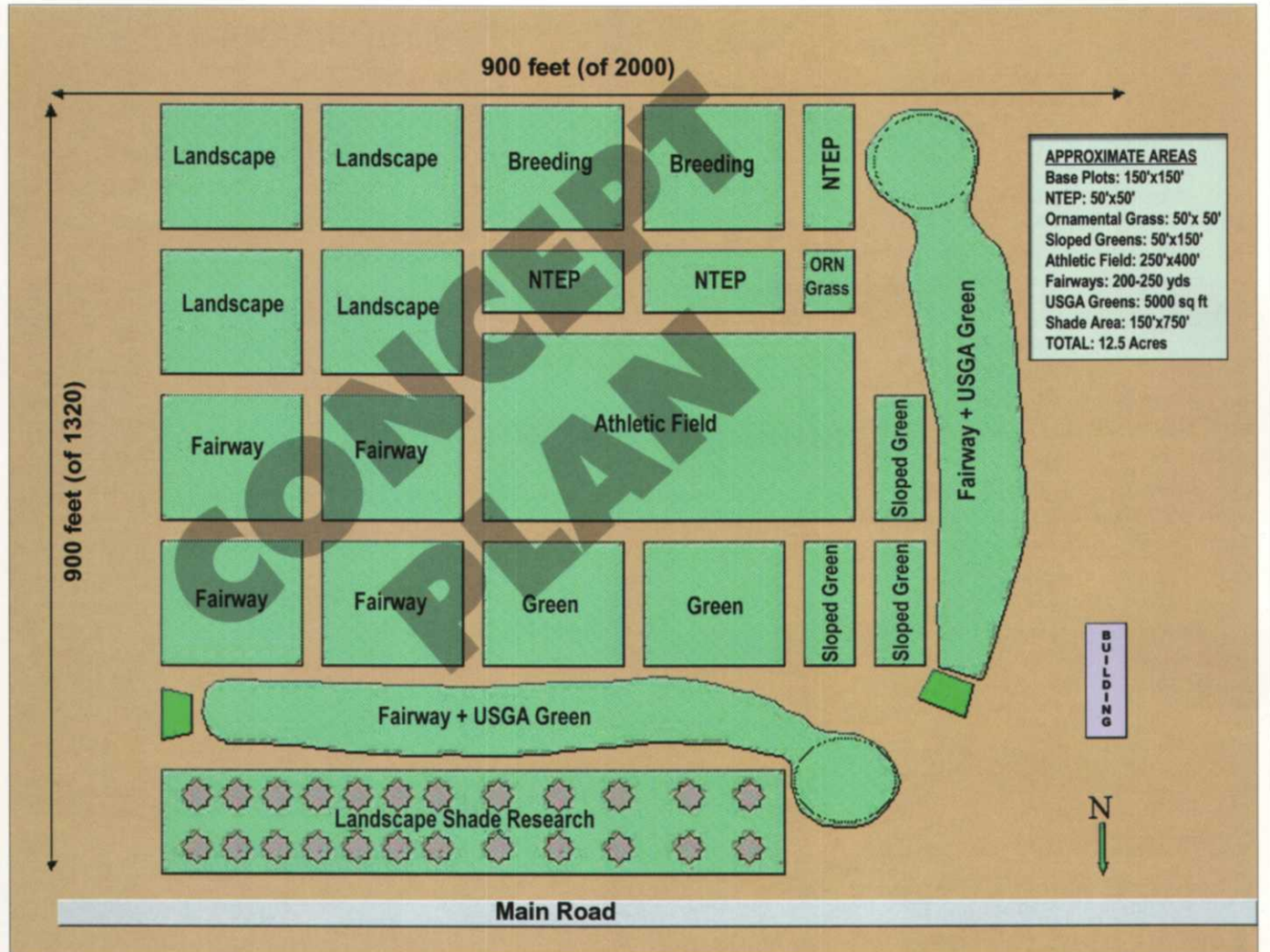
**CLASSIFICATION:** Aroid foliage plant

**LANDSCAPE USE:** Can be used in warmer climates in areas with medium shade

**INTERIORESCAPE USE:** Excellent for interior applications due to its compact shape and durable foliage - also tolerates low light conditions

**CHARACTERISTICS:** Compact, symmetrical growth habit. Non-vining, self-healing. Foliage is dark green and has a waxed appearance. Heart shaped leaves are 4 inches in diameter. can be grown in 6 through 10 inch containers. Emerald Gem has proven to be disease resistant and tolerant of stress conditions





landscape and urban tree research and extension programs to this site will allow us to bring new landscape management strategies to turfgrass professionals.

Keeping in mind that the following diagram is only a draft proposal, the potential for the Pine Acres Plant Science is boundless.

With ample space to include golf holes and sloped turf areas to scientifically study runoff, real practical, hands-on research can be accomplished on a large scale.

Especially intriguing is the concept of having governmental regulatory agencies getting involved in turf research. What a fantastic opportunity to bring real-world science and fact into the equation when making deci-

sions about the environment.

This initial phase is only about 12.5 acres of a potential 120 acres being considered to be dedicated to turf and ornamental research.

An adjacent 40-acre headquarters and conference facility site is also being proposed to make education and research a one-stop visit for meetings, seminars and hands-on observations. Stay tuned for more news to come out of Gainesville on the Pine Acres Plant Science and Education Unit and how we can all be a part of this great endeavor for the turfgrass industry in Florida.

*This executive summary written by Drs. L. E. Trenholm, G. L. Miller and T. A. Nell.*

***Especially intriguing is the concept of having regulatory agencies getting involved in turf research. What a fantastic opportunity to bring real-world science and fact into the equation when making decisions about the environment.***