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Soil Effects from Nitrogen Sources

Fertigation

Pest Control

FLORIDA RESEARCH

What effect on a sandy soil low in both organic matter and clay does heavy nitrogen fertilization cause? What are the prospects for "fertigation?" Weed control in Bahiagrass? New nematicides?

These questions were among discussions at the recent 18th annual Florida Turfgrass Management conference. About 400 turf specialists attended.

Dr. G. C. Horn, department of ornamental horticulture, University of Florida, reported on a nitrogen source study in 1970 on Tifgreen bermudagrass maintained under putting green conditions. The soil had been amended, he said, with 20% vermiculite, 5% colloidal phosphate, 10% peat and 10% fired clay (by volume) to a depth of six inches.

One-half pound of N applied every other week had a "pronounced effect" on soil pH, the magnitude of which was determined by the nitrogen source, he said.

"Urea and ammonium nitrate, when applied at ½#N per 1,000 sq. ft., every other week has less effect

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on soil pH than either ammonium sulfate or calcium nitrate. Both ammonium nitrate and urea were slightly acid-forming but not nearly so much as ammonium sulfate.

The equivalent of two tons of dolomite limestone per acre was added in July to all plots. Ammonium nitrate and urea left the pH at 6.4, but ammonium sulfate changed it to 4.8 and calcium nitrate to 7.2.

When twice the amount of nitrogen was added, Dr. Horn reported, the soil pH was affected differently. Application of ammonium nitrate \( \frac{1}{2} \# N \) weekly lowered the pH more than \( 1\# N \) applied every other week. The reverse was true for urea and ammonium sulfate. Calcium nitrate weekly at \( \frac{1}{2} \# N \) per 1,000 sq. ft. lowered the soil pH one unit lower than \( 1\# N \) applied every other week. (Table 1) The effect on pH of applying one pound of N weekly throughout the year is shown in Table 2.

Data on effects of organic sources of N showed that sewerage sludge, at all rates, maintained soil pH at an optimum level. The pH ranged from 6.5 at lower rates to 6.2 for higher rates. Ureaformaldehyde sources were acid forming at low as 4.0, more so than ammonium sulfate (5.7). Dr. Allen's true organic had a tendency to increase the pH (to 7.0) throughout the year, Dr. Horn reported.

Nitrogen source affected levels of calcium, but with the rate of application rather than source bringing the greatest change. Dr. Horn found that both source and rate of N affects magnesium levels. As the rate of N was increased, the level of available magnesium found in the soil decreased. Ammonium sulfate and calcium nitrate were more detri-

### Table 1. Effects of 2#N per month on soil pH.

<table>
<thead>
<tr>
<th>Source</th>
<th>1/8W</th>
<th>1/2#W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Nitrate</td>
<td>5.6</td>
<td>5.4</td>
</tr>
<tr>
<td>Urea</td>
<td>5.8</td>
<td>6.1</td>
</tr>
<tr>
<td>Ammonium Sulfate</td>
<td>4.3</td>
<td>4.7</td>
</tr>
<tr>
<td>Calcium Nitrate</td>
<td>7.4</td>
<td>6.2</td>
</tr>
<tr>
<td>Average</td>
<td>5.78</td>
<td>5.60</td>
</tr>
</tbody>
</table>

### Table 2. Effects of 1#N weekly on soil pH.

<table>
<thead>
<tr>
<th>Source</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonium Nitrate</td>
<td>4.2</td>
</tr>
<tr>
<td>Urea</td>
<td>4.4</td>
</tr>
<tr>
<td>Ammonium Sulfate</td>
<td>4.4</td>
</tr>
<tr>
<td>Calcium Nitrate</td>
<td>5.9</td>
</tr>
</tbody>
</table>

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will concentrate near the soil surface, whereas some nitrogen may be lost into the air when applied with irrigation water.

5. Improper handling of the fertilizer may damage the irrigation system.

"Just as some of the advantages could be voided by improper management, so could some of the disadvantages be overcome by proper management," summarized Dr. Snyder.

"Fertilization of turf through the irrigation system is potentially a labor-saving device which should result in the production of quality turf with minimum of fertilizer loss through leaching. However, this will be dependent upon a well-designed irrigation system."

Weed Control Research

Dr. Evert O. Burt of the Plantation Field Laboratory, summarized other research:

—weed control in bahiagrass. Atrazine at 2 lb. ai/a on sandy soils, or 4 to 5 lbs. ai/a on organic soils has continued to give good control of broadleaf weeds, except creeping beggarweed and oxalis. For controlling this pair, use silverfox or dicamba. Research during the past three years has shown that many grassy-type weeds were controlled with paraquat. This treatment, Dr. Burt emphasized, gives complete top kill of all vegetation, including bermudagrass, but bahiagrass resprouted quickly. Two light applications were better than one heavy dosage, he said.

If the stand is thin, and not to be reseeded, he advised using a pre-emergence herbicide, such as Azal, Balan, Daethyl, Presan, or Betasan.

—Two new nematicides, Tippara and Nemacur, have given excellent control of nematodes and are safe for use on the five warm-season turfgrasses. Label approval, however, is still pending.

—Bermudagrass mite is becoming an increasing problem in south Florida, found primarily on coarse textured bermudas, such as common, St. Lucie, Ormond, and Tifway.

—In 1969 and 1970, six experiments were conducted on the germination and stand of bermudagrass and ryegrass as affected by depth of seeding. Four were given adequate moisture; two under drought conditions. Seeds were planted at 0, 0.5, 1.0, 1.5 and 2.0 inches. Deep planting gave as good, or better, germination as shallow planting. Under dry conditions, the surface and half-inch depth resulted in poor germination. Under good moisture, the half-inch gave germination equal to greater depths.

New Officers

Leroy Fortner succeeded Bill Colburn as president of the Florida Turf-Grass Association. Other officers are: Vice-president — William F. Lewis; secretary-treasurer, Charles G. Mascaro; and directors—Charles Butlerworth; supplier; John Parker, cemeteries; C. David Peeling, landscape; Robert B. Sanderson and Joseph F. Yuzzi, golf; Guy W. Smith, public turf; and Michele W. Valletta, mobile parks.
When these sprinklers were turned on, a new era began

Jerry Palmer is one of the first to have total control of his watering system.

When he put in new sprinklers at Chula Vista Municipal Golf Course, he put in Buckner's new CP-2 Dual Central Programmer. It makes all previous central controllers seem like crude prototypes.

Because the CP-2 Dual Central Programmer is so sophisticated, it doesn't require expensive conventional field controllers. The less expensive, less complex FC-10 Field Controllers, along with the CP-2, give him complete control of the system from his "doghouse," but cost less than a conventional automatic system would have. He doesn't have to make the rounds of remote automatic sprinkler controllers, except for inspection. So he'll save time and labor costs as well.

The revolutionary Buckner CP-2 Dual Central Programmer incorporates two independent sets of controls which operate up to 30 Field Controllers each. Palmer can operate it automatically, semi-automatically, or manually with 14-day programming and adjustable station timing.

On frosty or dewy mornings, he'll be able to syringe the greens in 20 minutes. In about an hour, he can syringe the entire course — it's ready for play. The syringe cycle of the CP-2 is infinitely variable, 1.7 to 5.0 minutes, and overrides all timing programmed in Field Controllers.

What if it starts to rain? With the "omit" switch, Palmer can stop all sprinkling, whether the CP-2 is on programmed irrigation or the syringe cycle. All Field Controllers will automatically return to "off."

Learn more about how the amazing CP-2 Dual Central Programmer can give you total control of your watering. Call your Buckner distributor or send in this coupon, and we'll arrange a demonstration.

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TURF INSECTS
A BILLBUG
(Sphenophorus phoeniciensis)
CALIFORNIA: Adults 15 per square yard in Tifgreen lawn at San Diego, San Diego County.

A MARCH FLY
(Dilophus orbatus)
CALIFORNIA: Larvae heavy in lawns at Santa Maria, Santa Barbara County.

INSECTS OF ORNAMENTALS
A CONIFER APHID
(Cinara tujafilina)
OKLAHOMA: Increasing on Payne County arborvitae. Older, undisturbed colonies range up to 75 aphids each and many small, newly formed colonies found in favorable locations. Numbers of alate aphids increased slightly but this stage still not common.

WHITE PEACH SCALE
(Pseudaulacaspis pentagona)
VIRGINIA: Severe and widespread on Kwansan cherry in City of Alexandria.

IVY APHID
(Aphis hederae)
OREGON: Nymphs and adults spotty, mostly adults found on young shoots of English ivy at Salem, Marion County. This is a new state record.

TREE INSECTS
PEACHTREE BORER
(Sanninoidea exitiosa)
TENNESSEE: Infestation light but tree damage heavy on flowering almond in Warren County.

AN ERIOPHYID MITE
(Eriophyes canestrinii)
OREGON: Heavy under leaf scales of boxwood at Corvallis, Benton County. This species forms small flower gall but generally not considered injurious to host. This is a new state record.

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PINE TUBE MOTH
(Argyrotaenia pinatubana)
MISSOURI: Larvae collected from white pine at Chesterfield, St. Louis County. This is a new state record.

PITCH PINE TIP MOTH
(Rhyacionia rigidana)
MISSOURI: Collected at Licking, Texas County, on loblolly and shortleaf pines. This is a new state record. The following are new county records: Elsberry, Lincoln County; Willow Springs, Howell County; Eugene, Miller County; and Gladden, Dent County on shortleaf pine.

ASIATIC OAK WEEVIL
(Cyrtepistomus castaneus)
MISSOURI: Adults collected from oak in Dallas County. This is a new county record.

ENGRAVER BEETLES
(Ips sp.)
CALIFORNIA: Infested knobcone pine saplings and poles in two stands of 1,000 to 1,500 acres in Coffee Creek area, Shasta National Forest. About 5,000 trees involved.

What makes "The Drip" effective and the SAFEST way for weed control?

With ordinary sprays and mists, coverage is inconsistent and dangerous at best, especially in confined areas where flowers, shrubs and other foliage is vulnerable. But "The Drip" utilizes a continuous film dripped onto a roller to make application. This direct contact gives you positive control and superior coverage, and avoids drift of spray. "The Drip" is available in 3 models for covering any area. A self propelled hand model, a model "101" pull-type as illustrated, or the King-size gang of three 101 units which covers a big 9-foot swath. Write today for literature and complete details. Rubber covered rollers are available for special applications.

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REFERENCES FOR WEED CONTROL

Information is a commodity that always seems to be in short supply. This new feature is designed to alleviate that problem. WEEDS TREES and TURF has compiled a list of 400 references that relate to various aspects of weed control—species identification, herbicides, equipment, control techniques, successful programs, and so on. The references have been gathered from universities, industry, government, professional associations, book publishers, and from the back issues of WEEDS TREES and TURF. Complete addresses of where to obtain the information are listed. Prices are included, if they are known. Attempts have been made to secure sources of information from all parts of the country. If you have found a source that has proved helpful and it is not listed, let us know. Extra copies of this reference index for weed control are available at $1.00 per copy. Write WEEDS TREES and TURF, 9800 Detroit Ave., Cleveland, Ohio 44102.

Weed Identification

And Control Methods

References carrying an asterisk (*) indicate these are not available to out-of-state residents.

**ALGAE**, An easy way to keep a pond free. WTT article. Xerox copy 75¢.

**ALGAE CONTROL IN INLAND WATER** by S. J. Toth and D. N. Reimer, Department of Soils and Crops, Rutgers University. WTT article. Xerox copy 75¢.

**ALLIGATOR WEED** and the Agasticles flea beetle by Robert N. Hambrick, aquatic biologist, Texas Parks and Wildlife Department, Houston, WTT article. Xerox copy 25¢.

**ALLIGATOR WEED** eradication by William R. Clark, Visalia, Calif. WTT article. Xerox copy 75¢.


**AQUATIC WEED CONTROL**, carbon dioxide laser. WTT article. Xerox copy 75¢.

**AQUATIC WEED CONTROL**, Hydrocyanic Method for controlling weeds in running water, by Robert W. Hyde, Crystal River, Fla. WTT article. Xerox copy 75¢.

**AQUATIC WEED CONTROL** in potable water by Raymond V. Corning, Virginia fish biologist. WTT article. Xerox copy 75¢.

**AQUATIC WEED CONTROL** of Stockbridge Bowl by Jason M. Cortell, aquatic biologist, Allied Biological Control Corp., Wellesley, Mass. WTT article. Xerox copy 75¢.

**AQUATIC WEED CONTROL**, USDA report on hydrilla verticillata by Robert D. Blackburn and Lyle Weldon, Agricultural Research Service, Ft. Lauderdale, Fla. WTT article. Xerox copy 75¢.

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