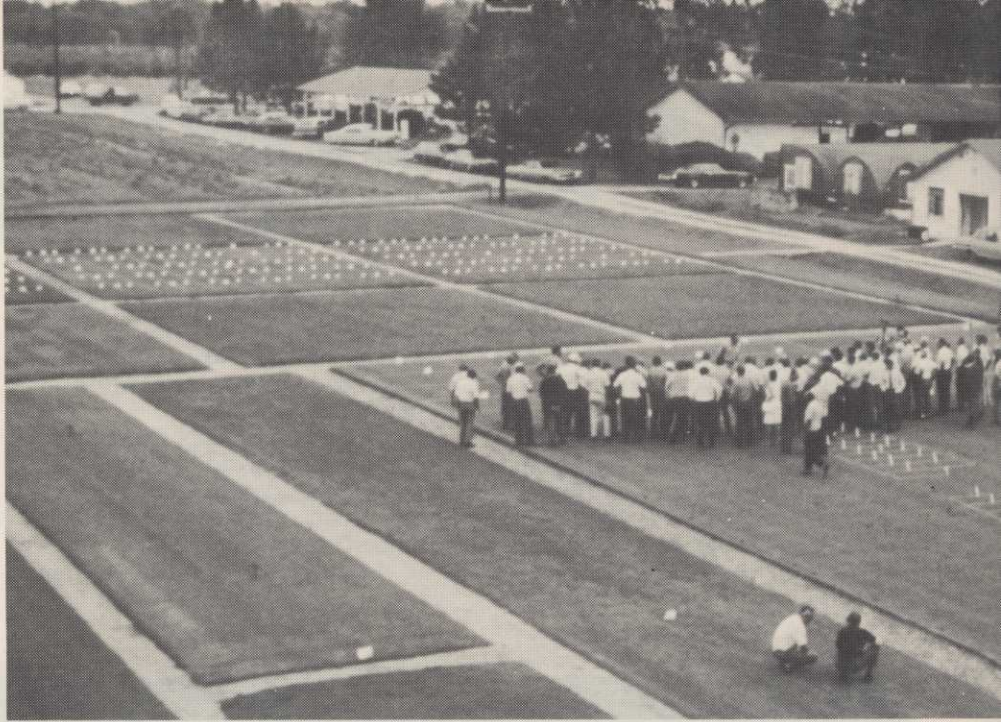


Soil Effects from Nitrogen Sources

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 $\frac{1}{2}$ #N per 1,000 sq. ft., every other week has less effect



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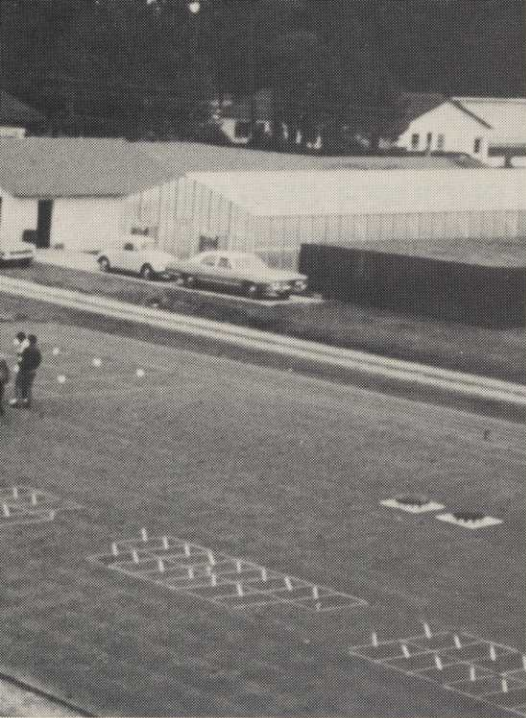
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Turf management specialists inspect research plots at the University of Florida.

mental, he said.

Ureaformaldehyde forms of N lowered available soil phosphorus more than other sources, he continued. Highest levels of soil potassium were found when sewerage sludge was added. Ammonium sulfate resulted in the next highest level of available K.

Pros and Cons of "Fertigation"

A study of applying fertilizer through the irrigation system has been initiated at the Plantation Field Laboratory, Ft. Lauderdale. The purpose will be to verify presently claimed advantages and disadvantages and to perhaps discover others. Dr. G. H. Snyder listed these advantages:

1. Labor needed for fertigation is only slightly greater than for irrigation alone.
2. Good surface distribution will be obtained.
3. Good control on depth of placement of certain fertilizers, such as nitrogen, is possible.
4. Nutrients already in solution will become available to plants sooner than when applied dry on the soil surface.
5. It is much easier to control leaching of fertigation-applied fertilizer.

6. Less fertilizer may be required. Dr. Snyder said the disadvantages include:

1. An improperly designed irrigation system will not give equal fertilizer distribution to an entire turf area.
2. If rain occurs in sufficient quantity for the turf at a time when fertilization is needed, it may be necessary to over irrigate just to apply fertilizer.
3. Often the lower cost fertilizer materials cannot be used.
4. Certain phosphatic materials

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

Source	1#BW	1/2#W
Ammonium Nitrate	5.6	5.4
Urea	5.8	6.1
Ammonium Sulfate	4.3	4.7
Calcium Nitrate	7.4	6.2
Average	5.78	5.60

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

Source	pH
Ammonium Nitrate	4.2
Urea	4.4
Ammonium Sulfate	4.4
Calcium Nitrate	5.9

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 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 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-

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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 St. Augustinegrass. 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. Usually good control of water sedge is obtained. Good to poor control of annual

grasses, such as crabgrass and bullgrass is obtained when atrazine is used prior to seed germination. Control of grassy weeds in St. Augustine can best be achieved by three or four applications of atrazine at the recommended rate over a 12-month period.

Some atrazine injury had been reported, but Dr. Burt said it most likely occurred on turf under stress for other reasons.

—weed control in bahiagrass. 2,4-D gives good control of most broadleaf weeds, except beggarweed and oxalis. For controlling this pair, use silvex 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 bahiagrass, 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 Azak, Balan, Dacthal, Presan, or Betasan.

—Two new nematicides, Tirpate and Namacur, 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 bahiagrass 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 Butterworth; 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.

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