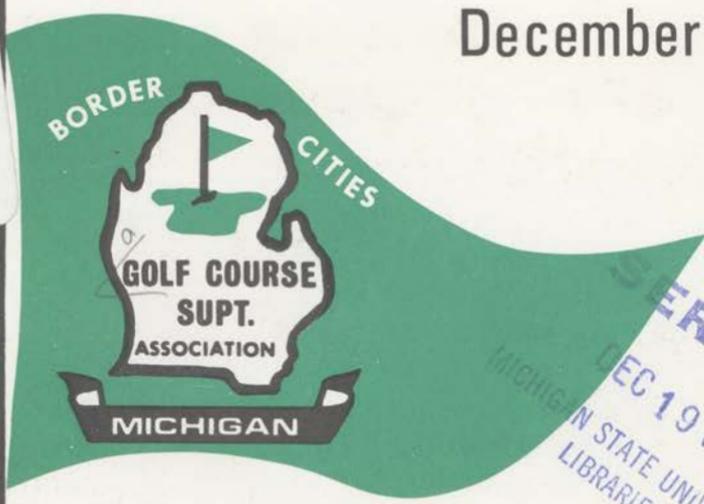


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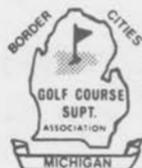
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Published monthly by the
**MICHIGAN AND BORDER CITIES GOLF
COURSE SUPERINTENDENTS ASSOCIATION**

Circulation: 1,250

Ted Woehrlie, CGCS, Oakland Hills C.C.
James Timmerman, Orchard Lakes C.C.
CO-EDITORS

Printed At

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BOARD OF DIRECTORS for 1978. (Left to right) Front row: Jim Timmerman, Ed Heineman, Jay DelCamp, Ward Swanson. Back row: Bruce Wolfrom, Vice President; Clem Wolfrom, President; Roger O'Connell; Wait Trombley and George Prieskorn. Missing is Secretary-Treasurer Robert Hope.



Newly elected officers and directors of the Michigan and Border Cities Golf Course Superintendents Association. (Left to right) Bob Hope, Secretary-Treasurer; Bruce Wolfrom, Vice President; Clem Wolfrom, President; Roger O'Connell and Ed Heineman, Directors.



Season's Greetings

from the
MICHIGAN AND BORDER CITIES
GOLF COURSE SUPERINTENDENTS
ASSOCIATION
and the Patch Of Green editors.

GCSAA Conference and Show Gives Participants "Economy thru Ideas"

The 49th International Turfgrass Conference and Show, sponsored by the Golf Course Superintendents Association of America (GCSAA), offers the world's turfgrass managers an exciting and varied program of education sessions, industry exhibits, a golf tournament, the GCSAA annual meeting and election of officers and a golf course tour.

The six-day event, for which a record number of participants is anticipated, will take place February 12-17 in the 130,000-square-foot San Antonio, Texas, Convention Center, home of the 1968 HemisFair.

"Economy thru Ideas" is the theme for the conference, which will be a fountain of ideas. Numerous suggestions to help provide the best golf course at the lowest cost in manpower, natural resources and fiscal expenditure will be shared with participants through education sessions and an industry show.

Seven education sessions will feature 38 speakers from universities, industry and GCSAA. Presentations will cover Management, Public Golf Owners and Operators, Research, Thinking Superintendent, Turf Management/North and Turf Management/South. Areas to be discussed include employee motivation, pesticides on the golf course, legal hiring and firing practices, working with civil service employees, using a stimp meter and common problems with zoning.

Besides offering participants a warehouse of knowledge through these education sessions, the conference and show will feature more than 180 exhibitors displaying millions of dollars' worth of equipment, tools and supplies for turfgrass management.

Earl L. Butz, secretary of agri-

culture under Presidents Richard Nixon and Gerald Ford, will deliver the keynote speech, entitled "I Don't Want to Live in a No-Growth Society," at the opening session on Monday morning, February 13. Butz is now the dean emeritus of agriculture at Purdue University.

The 39th GCSAA National Golf Tournament will be played at three Corpus Christi, Texas, golf courses on February 9 and 10. The courses are Padre Isles Country Club, Corpus Christi Country Club and Pharaohs Country Club. A victory banquet to honor winners will be held Friday night at the Corpus Christi Country Club.

The annual GCSAA membership meeting and election of officers will take place Wednesday afternoon in the Convention Center.

A tour of four area golf courses on Friday, February 17, will take some 500 golf course superintendents to Fort Sam Houston Golf Course (Dick Reardon, golf course manager); Oak Hills Country Club (Robert R. Wilson, superintendent); San Antonio Country Club (Roy Schneider, superintendent); and Willow Springs Golf Course (Harold A. Henk, superintendent).

More information about the conference and show can be obtained from GCSAA Headquarters, 1617 St. Andrews Drive, Lawrence, Kansas 66044.

GCSAA
49th International Turfgrass
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Iron Application - Rates, Carriers and Toxicity Comparisons

By J. B. BEARD, J. H. ECKHARDT, and GARALD HORST
Texas A & M

The micronutrient most commonly deficient on turfgrass areas is iron. Deficiencies appear as an interveinal yellowing of the youngest actively growing leaves. Under a continued iron deficiency, the chlorosis spreads to the older leaves and the plants become weakened. An iron deficiency occurs on the youngest leaves while yellowing from a nitrogen deficiency occurs first on the oldest leaves. Iron

deficiencies are associated with soils having high calcium and magnesium contents.

Correction of an iron deficiency can be accomplished by a foliar application of ferrous sulfate or ferrous ammonium sulfate. Soil applied complete fertilizers with iron and activated sewage sludge materials also contain significant amounts of iron. Reports of problems with foliar burn following applications of water soluble iron as a spray are not uncommon. Thus, this study was initiated during the summer of 1976 to evaluate the effects of iron rates, carriers, and environmental conditions during application on the proneness to turfgrass phytotoxicity. Four iron sources were utilized in the test; ferrous sulfate, ferrous ammonium sulfate, Chelated 138, and Chelated 330. Rates of application were 0, 4, 8, 12, 16, 20, and 24 oz. of material per 1000 ft². Applications were made by means of a hand sprayer to four square foot plots. There were three replications utilized in two tests during 1976 and one test during the 1977 growing season. Visual estimates of foliar burn to the bentgrass and bermudagrass were taken along with any positive responses to the iron application.

Results. No foliar burn or noticeable response was observed at the 2 oz. per 1000 ft² application of iron sulfate to creeping bentgrass. The 4 and 8 oz. rates showed a definite greening response with no foliar burn evident. There was a slight burning at the leaf tips from the 12 oz. rate with the extent of foliar burn becoming greater as the rate of application was increased above this level.

No burning or greening response was noted from the 2 oz. application

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Continued on Page 13



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Iron Application Cont.

of ferrous ammonium sulfate. The 4, 8, and 12 oz. rates produced a significant enhancement of green coloration with no foliar burn. However, phytotoxicity was evident at application rates of 16 oz. per 1000 ft² and above at temperatures of 75 to 80 degrees F. At warmer temperatures of 90 to 94 degrees F, foliar burn from ferrous ammonium sulfate was observed at a rate of 10 oz. and above.

Chelated 138 caused a distinct reddish coloration which persisted on the leaves and was fairly objectionable at application rates of 12 oz. per 1000 sq. ft. and above. Chelated 138 did produce a slight greening at the 2 oz. rate and substantial enhancement of green coloration at 4 oz./11,000 ft² and above. Foliar burn was first noticed at the 16 oz. rate of application and became progressively more severe as the rate was increased to 24 oz.

Chelated 330 produced a slight

greening at the 2 oz. rate with a major enhancement of green color at higher rates similar to that reported for Chelated 138. However, a slight foliar burn was evident at the 6 through 14 oz. rates. Objectionable degrees of foliar burn were evident at rates of 14 oz. per 1000 ft² and above.

Summary. Results from these investigations indicate that foliar burn is occurring at relatively high application rates compared to those commonly in use. Frequent reports of foliar burn at substantially lower rates, suggest that the iron is being applied with the other chemicals, which in combination, are causing foliar burn. The rate of application at which foliar burn occurred did vary among the four materials and increased as temperatures increased. However, with temperatures up to 95 degrees F. on a creeping bentgrass turf, iron applications can be made in the range of 4 to 8 oz. per 1000 square feet without concern for foliar burn.



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Hodas Renamed to Irrigation Board

Ernie Hodas of Berkley, Michigan was reelected to a three-year term on the Board of Directors of The Irrigation Association at its recent national convention in New Orleans, Louisiana. Hodas had previously been elected in 1976 to a one-year term on the 14-member body. He is President of Century Supply Corporation of Berkley, which also operates divisions in Southfield and Bronson, Michigan and in Elk Grove Village, Illinois. The firm is an irrigation equipment supplier to the turf and agricultural markets. Hodas has been active with the Association since assuming the Presidency of his company six years ago, and has served as Program Chairman for the organization's 26th Convention in 1975 and as a member of its Landscape Irrigation and Membership Committees.

Prior to his association with Century, Hodas was President of P-G Assco Corporation for 16 years, a firm which manufactured and distributed replacement appliance parts. During this time, he served as President of the National Appliance Parts Suppliers Association. He is an associate member of the Engineering Society of Detroit, the American Society of Agricultural Engineers, the Golf Course Superintendents

Association of America and other industry associations.

The Irrigation Association (formerly the Sprinkler Irrigation Association) is a 550-member organization with membership from throughout the United States and overseas. Its members are manufacturers, distributors, contractors, engineers and research personnel interested in the field of irrigation. The Association sponsors an Annual Convention and Technical Conference each year, as well as eight regional Irrigation Short Courses for the training of industry personnel and users in both agricultural and turf irrigation. It is a co-sponsor, with the University of Nebraska, of the first Correspondence Course on Irrigation Theory and Practices, and publishes a wide variety of technical material in the field of irrigation, including the world renowned 4th Edition of "Sprinkler Irrigation" and the new "Wastewater Resource Manual". The organization is also active in the field of setting standards for industry equipment.

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TOPICS

JANUARY 10

Research Reports

1. Resistant Dollar Spot Control
2. Growth Regulators
3. Nitrogen Carriers

Golf Course Session

1. Pros and Cons of Frequent Sand Top dressing
2. Aetenius Grubs on "Poa" Fairways
3. Panel: How to Prevent What Happened in 1977 from Happening Again!

Lawn Care, Park and Cemeteries Session

1. 1977, the Year of the Insect on Home Lawns
2. Ornamental Diseases
3. Panel: When Should Nitrogen Be Applied to Kentucky Bluegrass Turfs

Sod Session

1. Inheritance Legislation
2. Turfgrass Seed Supply Picture in 1978
3. Sod Production in New York State

JANUARY 11

General Session

1. How the Help Save Your Pesticides From Cancellation!
2. Management Practices and Turfgrass Stress
3. Irrigation with Limited Water Supplies

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Use of Sulfur to Reduce pH

By JAMES A. MCAFEE

Soil pH (soil reaction) is a term used to describe the acidity or alkalinity of a soil. A pH of 7.0 is neutral, while anything below 7.0 is acid and anything above 7.0 is considered alkaline. Most turfgrasses grow best at a slightly acid pH (6.2 - 6.5). As the soil pH deviates from this range, many of the plant nutrients in the soil become less available for plant growth. Therefore, maintaining the soil at the proper pH range is very helpful in the maintenance of quality turfgrass. Also, improper soil pH decreases the efficiency of applied fertilizers, thus increasing the cost of turfgrass maintenance.

Soils with a low pH can be corrected by the addition of limestone, while soils with a high pH must be corrected by the addition of some type of acidifying material such as sulfuric acid, acidifying fertilizers (ammonium sulfate, ammonium nitrate, etc.) or sulfur. Rates of lime needed to correct acid soils have been established. However, rates and types of acidifying material needed to correct alkaline soils are not fully understood at this time. Research is currently being conducted by several investigators to establish the best materials, rates, and timing of application to correct high pH soils.

Sulfuric acid will react the fastest to correct a high pH. However, it is too dangerous and corrosive to be used in most turf situations. One of the best materials for correcting high pH soils is elemental sulfur. Microorganisms in the soil convert the elemental sulfur to sulfuric acid. It is the oxidation process for this conversion that creates the acidity. Sulfur comes in three forms; (a) powder,

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Turf Topics

SEASON'S GREETINGS!

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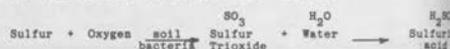
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(b) flake, and (c) granulated products. The fine powder reacts the fastest to correct the pH, while the flake product reacts the slowest. The different granulation products are intermediate between the powder and flake.

Last year, several golf courses in the Dallas-Ft. Worth area applied sulfur to their greens. Six months after application the soil pH had been lowered a little more than one unit in the top 4 inches and slightly less than one unit in the 4 to 7 range. Lowering the soil pH by one unit with 6 to 10 pounds of sulfur per 1,000 sq. ft. has also been observed on other turf areas in the region.

While sulfur has been shown to be effective in lowering the soil pH, it can also create other problems. Over application of sulfur can burn the turfgrass. Twenty pounds of sulfur or more per 1,000 sq. ft. per application to bentgrass caused extreme burning of the bentgrass at the Texas A&M University Turfgrass Research Plots. Application of 400 pounds sulfur per acre in the spring and 400 pounds per acre in the fall caused burning of bermudagrass in Dallas-Ft. Worth. Also, additions of sulfur to some areas caused an increase in salts, particularly sodium. It is essential that areas being treated with sulfur have good drainage. Otherwise, an accumulation of sodium could occur and cause problems.

Oxidation of elemental sulfur (S) to sulfuric acid in the soil.



**HAVE A
 MERRY CHRISTMAS
 AND A
 HAPPY NEW YEAR**



Season's Greetings

AND ALL GOOD WISHES FOR
THE NEW YEAR



Bob, Burt, Don, Gordie, John Mac., John K., Dave, Roy, Jim, Ed & Ron

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