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salt). Ammonia gas is highly caustic. I've seen putting greens destroyed when hydrated lime and sulfate of ammonia were applied simultaneously. Hydrated lime may be used safely with ureaform nitrogen. Only ground limestone, however, may be used safely with inorganic nitrogen fertilizers.

Q—When a fungicide is applied where is the contact with the pathogen—in the leaves, roots or in the soil? Will a dry application, lightly watered in, have the same effect as a spray? After mercury, what is the most effective fungicide for snowmold, dollarspot and brownpatch?

(Ontario, Canada)

A—Fungicides attack pathogens by: 1) direct contact whether on leaves, roots or in the soil and 2) fumigation wherein the material "gasifies" and penetrates in all directions. Another word is sublimate whereby a solid moves into gaseous state without becoming liquid.

Long before sprayers were used, fungicides were doing their job by dry applications. In 1931 at The Green Section lab at Arlington Turf

Gardens I used to help Dr. Arnold Dahl crush lumps of Calomel and bichloride of mercury and blend the powder with sand. The big problem of dry applications is obtaining uniform distribution. This is a big plus for sprayers. Both work equally well if coverage is the same.

With mercury bearing chemicals "under a cloud" we must look to dyrene, tersan, OM, daconil, actidione, thiram and dithane M-45 for dollarspot and for brownpatch control. There may be others. At the present I cannot come up with alternative materials for snowmold.

Q—We live in a small town in western Kansas where the golf course has sand greens because there is not enough water for grass greens. Can you give us information relative to synthetic turf for greens and name the companies that produce it?

(Kansas)

A—In the mail you will receive a booklet that points out the pros and cons of both natural and artificial turf. Two companies that produce synthetic turf are Monsanto in St. Louis and the 3-M Company in Minneapolis. When you investigate

costs, include base preparation and subsequent maintenance. Then take a look at drought tolerant grasses, consult with Dr. Ray Keen at Manhattan and compare costs.

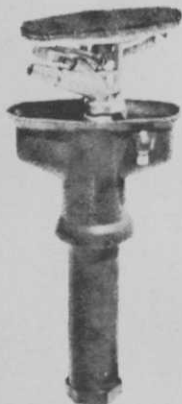
Q—At times you have referred to "wildflowers" in relation to highway plantings. Should our club be concerned with wildflowers on the grounds? (Massachusetts)

A—Why not? We try to please the members by having flowers near the clubhouse, neat shrubbery and handsome trees. On the course there are many spots where native wildflowers would thrive if we could just get over the idea that every square foot of property has to be mowed or sprayed. I believe that many golfers would enjoy seeing clumps of natural beauty out on the course. □

CORRECTION

A word was inadvertently omitted in the last sentence of Dr. Grau's answer to the question entitled "Grass on a Pinch-Penny Budget" on page 26 of the October/November issue. The corrected sentence should read: "I've never seen crabgrass choke a good turf of tall fescue."

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Now Du Pont gives you a fungicide that's non-mercurial—but by far the most effective available. And here's why...

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The systemic action of TERSAN 1991 also means long lasting control. Pays off with fewer applications for greater economy.

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With any chemical, follow labeling instructions and warnings carefully.

We'll have big news at the GCSSA Convention. Get all details on new TERSAN 1991 and the new Du Pont TERSAN 1-2-3 Total Disease Preventive Program. Look for us at Booths C-1 and C-2.

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by Ken Emerson

ACCENT ON MANAGEMENT

NCA Conference highlights

Clubs who have been trying to operate under the Tax Reform Act of 1969 during the past year have a keen appreciation of the problems of the man who comes into a strange city, rents a car and tries to find his way around town without the benefit of a street map.

Lacking the long awaited Internal Revenue Service guidelines and regulations, it has been exceedingly difficult for clubs to anticipate the requirements which the IRS may ultimately demand. Indeed, it has often been necessary for clubs to expend considerable time, money and effort to institute procedures which may never be needed.

However, the long vigil is apparently about to end. Within the next few weeks—perhaps by the time this is read—the IRS's proposed regulations will be made available to the industry. A detailed analysis and review of the regulations and their effect on the private club industry, both tax paying and tax exempt, will be an integral part of the National Club Assn.'s 10th Annual Conference in London, England, January 17th and 18th. The effect on the industry of both the Tax Reform Act of 1969 and its accompanying regulations was the principal factor controlling the planning of the program for the London conference as can be seen from the schedule set up by NCA.

January 17th

NCA Board Meeting—9:00 a.m. to 4:00 p.m.

Membership Reception—5 p.m. to 7 p.m. (host: Arthur Guinness, Son & Company and Guinness-Harp Corp., N.Y.)

January 18th

9:30 a.m.—“Advantage of Retaining Profit Exemption”

10:30 a.m.—“Problems of Private Clubs and Rights of Private Association”

12 noon—Cocktail Reception

12:30 p.m.—Luncheon and Annual Meeting

2:30 to 4:30 p.m.—Tax Clinic—“Rules and Regulations Affecting Compliance with the Tax Reform Act of 1969”

6:30 p.m.—Opening Activities of the Club Managers Assn. of America Conference

A special message to club presidents

The single individual most responsible for the success of your club's day-to-day operations is the club manager. You depend on his ability to work with the members, club staff, you and your board of directors, and on his knowledge of club problems and possible solutions.

He in turn needs to know what is going on in the club world. One of the best sources of information available to him is the annual conferences of his professional association, the CMAA and your trade association, NCA.

However, club managers are often so dedicated to their clubs that they are reluctant to ask them to provide the funds necessary to allow them to attend these meetings. If this is true of your manager, we urge you to correct the situation.

CMAA's conference will be held in London, January 19th to January 23d, immediately after NCA's. Although such club policies as “Advisability of Retaining your Non-Profit Exemption,” “Your Rights of Private Association,” and the “Tax Clinic” will be discussed during NCA's meeting, CMAA's program will allow your manager the unprecedented opportunity to hear such speakers as Dr. Robert Beck, Dean of the Cornell School of Hotel and Restaurant Management and Dr. James Taylor,

(Continued on page 26)



Photographed at The Homestead,
Hot Springs, Virginia.

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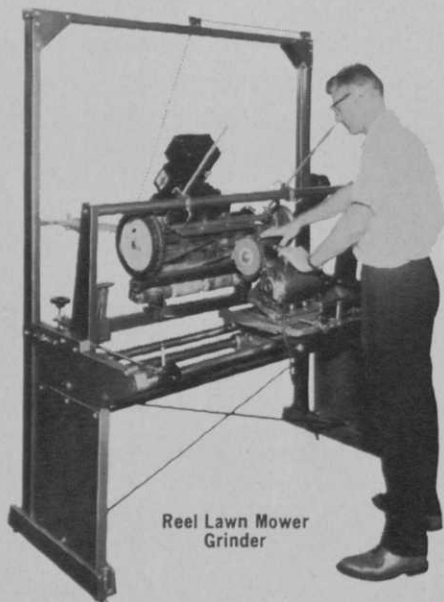
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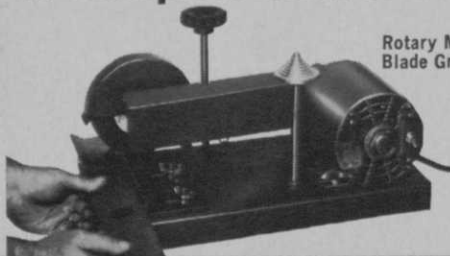


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This once-a-year opportunity also provides the manager with an even more important source of information: the chance to discuss his problems—your problems—with his peers. Several hundred other club managers represents many years of administrative experience.

Special charters and room rates have place this conference within the reach of every club budget. If your manager has not already been authorized to attend, tell him to sign up. He'll know how, and you'll find that the club dollars spent on the meeting will be returned many times in ideas, know-how and a fresh viewpoint.

Other activities

The NCA hosted the fourth meeting of the Alliance of Clubs and Golf Organizations in Washington, D.C., on November 30th, 1970.

One of the major topics of discussion at this meeting of the principle associations of the club and golf industries was the recent series of articles on the vanishing greenbelt appearing in GOLF Magazine (October issue) and in GOLFDOM (September issue).

In dealing with this and other pressing problems facing the industry, members of the Alliance considered plans to coordinate their efforts to best utilize their resources in seeking solutions. A full report on their activities will be made public in a few weeks. □

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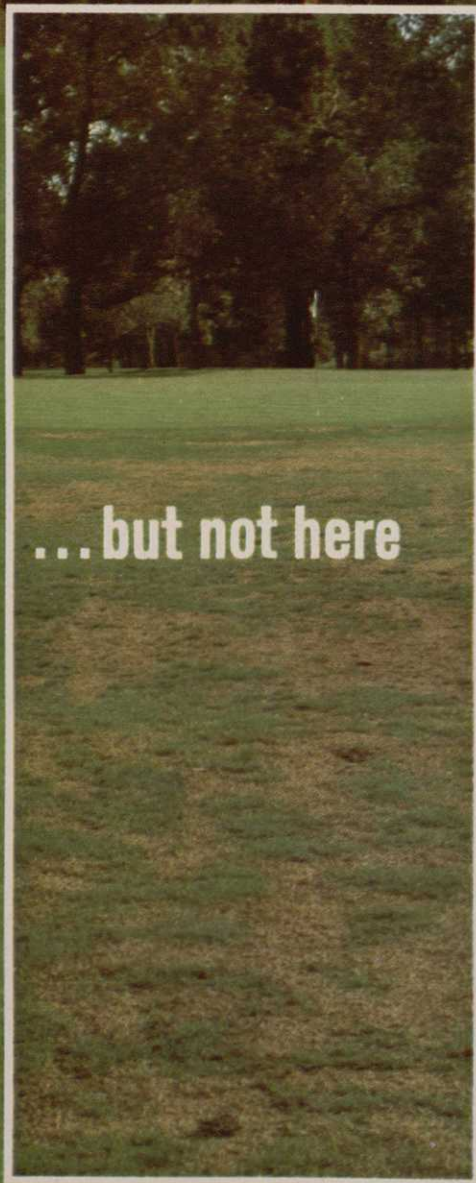
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**Your golf course
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when you have
healthy turf**

The unretouched photographs on the opposite page were taken the same day at golf courses less than 40 miles apart. The relative conditions of the two courses show what a difference diseases can make.

When you invest up to \$50,000 a year in fertilizer weed control, water and management practices (verticutting, aerifying, mowing and the labor they require), your investment deserves the protection of a complete disease control program.

Many superintendents have discovered fairway disease control programs actually pay their own way by keeping golfers happier and by eliminating the problems and costs which arise when fairway turf is lost. The increased play from growing numbers of golfers is too much of a challenge for anything less than healthy turf.

The same basic principles and practices used to control disease on the greens apply to tees and fairways, even though the level of control on fairways is not so critical as that required on greens.

Although Acti-Dione turf fungicides can eradicate many turf diseases, prevention is always less expensive than cure. You should start your fairway spray program in the spring as soon as possible after the first mowing and continue the program on a scheduled basis—usually an interval of 21 to 30 days.

TUCO has both the proven products and the experienced personnel to help you in your scientific turf management program. Just a call will put one of our highly trained and expert field representatives to work explaining how you can maintain healthy tees, greens and fairways.



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C-1686



by Dr. James B. Beard

TURFGRASS RESEARCH REVIEW

Chances for turfgrass survival during flooding

Influence of water temperature on submersion tolerance of four grasses. J.B. Beard and D.P. Martin. 1970. Agronomy Journal. 52(2):257-259. (from the Department of Crop and Soil Sciences, Michigan State University, East Lansing, Mich. 48823).

The relative submersion tolerance of four turfgrasses to three water temperatures was investigated. Five year old, actively growing, disease free sods of Toronto creeping bentgrass, Merion Kentucky bluegrass and annual bluegrass were utilized. Four-inch diameter by three-inch deep plugs of each species were collected July 15, 1969. The intensity of culture of the four turfgrasses prior to sampling was typical for each species. The Toronto creeping bentgrass had been cut daily at 0.25 inch; the Merion Kentucky bluegrass and Pennlawn red fescue every four days at 1.5 inches and the annual bluegrass every three days at 0.5 inch.

Three replications of each species were completely submerged in separate constant temperature water tanks having water temperatures of 50, 68 and 86° F. The water tanks had thermostatically controlled heating and refrigeration units, an aerator and a circulating water pump for maintaining a uniform water temperature throughout the tank. The sods were maintained at a submersion depth at which the uppermost portion of the

turfgrass leaves was two inches below the water surface.

Three replications of each turfgrass species from the 50 and 68° F. water treatments were removed at five day intervals and from the 86° F. water treatment at 24 hour intervals. The submersion experiment was terminated after 60 days. After removing the sod plugs from the water they were drained and placed in a 70° F. greenhouse for evaluation of survival.

No visual evidence of injury to the turfs was evident when removed from the flooding treatments. However, death generally occurred within 48 hours after removal. A brownish discoloration would first appear on the leaf sheath followed by death of the leaf blade which progressed from the tip toward the stem. The cells in submerged leaves and stems were generally larger than in nonsubmerged tissues with the protoplasm coagulating near the cell walls as injury developed. Submersion injury of turfgrasses would initially appear in the old leaves whereas the youngest leaves were generally the last to show visible symptoms of injury.

The relative submersion tolerance of turfgrasses was directly related to (a) water temperature, (b) duration of submersion, (c) turfgrass species and (d) depth of submersion. The duration of submersion tolerance decreased as the water temperature was increased. For example, a Merion Kentucky bluegrass turf was completely killed after eight days of submersion at 86° F. and after 41 days submersion at 68° F. but was not completely killed by 60 days submersion at 50° F.

In comparison of the submersion tolerance among turfgrass species, Toronto creeping bentgrass possessed superior tolerance and Pennlawn red fescue the least tolerance whereas Merion Kentucky bluegrass and annual bluegrass ranked intermediate. For example, approximately 18 days of continuous submersion at 86° F. was required to kill Toronto creeping bentgrass whereas Merion Kentucky bluegrass was killed after eight days, annual bluegrass after five days and Pennlawn red fescue after two days.

Several small associated studies were also conducted. The authors found that partial submersion in which some leaves extended above the surface resulted in substantially

(Continued on page 39)

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