green world

AN INDUSTRYWIDE PUBLICATION OF THE NEW JERSEY TURFGRASS ASSOCIATION

VOL. 14 No. 2 September/October 1984

MISTING EFFECTS ON BENTGRASS TURF REVIEWED

In 1982, I published results of misting water on bentgrass turfs that were grown in both indoor and outdoor tests *(Golf Course Management Journal).* A summary of this paper may be of interest in conjunction with Dr. DiPaola's paper in this issue. The study was part of Richard Rathjens' work for his graduate degree.

The following is a summary of results: (1) The wettest cultures did not show an increase in superficial rooting; (2) Of the moisture regimes used, maintaining soil moisture at FC-field capacity (less than soil saturation) gave the poorest bentgrass growth and root development; (3) As misting treatments were used no deleterious effects on rooting were observed and increased root development was common; (4) Bentgrass suffered readily from both extremes of wetness and dryness; (5) Apparently, best growth of bentgrass is hindered by "low" moisture before signs become available to the eye; (6) Better turf quality was a common benefit of misting; (7) Misting of bentgrass turf appears to hold less risk to the root system than we have commonly expected. It is not proposed that mist applications should be the exclusive method of watering bentgrass. There are times when more water is needed for such things as deeper rewetting of the soil, carrying oxygen into the soil, moving some unwanted chemicals below the surface and for greater cooling purposes.

In spite of the positive benefits

continued page 4

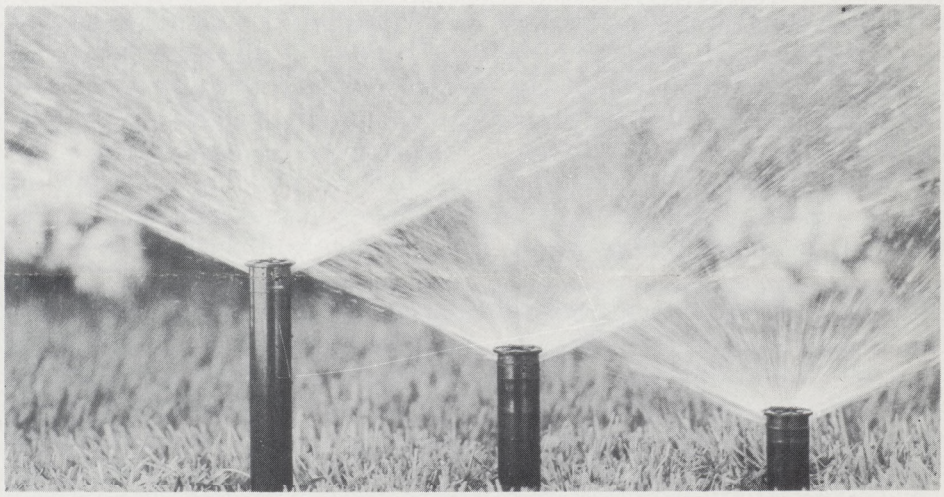
MOISTURE MANAGEMENT OF BENTGRASS GOLF GREENS

Joseph M. DiPaolo[1]

Syringing of bentgrass golf greens is a very controversial cultural practice. A survey of golf course superintendents would likely result in as many definitions of syringing as there were individuals queried. Despite this, golf greens are routinely syringed during the summer months throughout the United States. Unfortunately, only limited research has been thus far conducted on this area of turf management.

Syringing is *not* a single purpose cultural procedure. Syringing is the application of a *small* volume of water to a turf canopy for the purpose of a) removing dew, frost, exudates and/or foreign matter from the turf leaves, b) cooling the turf through the evaporation of the applied water from the leaf surface, and/or c) preventing or correcting wilt. The amount of water applied during syringing should not be enough to wet the soil beneath the turf. As a turf management tool, syringing is not equivalent to a midday application of irrigation quantities of water. Understanding syringing is critical for superintendents if the benefits of this practice are to be maximized and the undesirable results minimized.

continued page 3



Research and experience indicate mist watering of bentgrass can be an important phase of the program for this turf. Application can be achieved by various equipment that range from small mist heads to a fine-spray, hand-held hose nozzle.

It is no use saying, "We are doing our best." You have got to succeed in doing what is necessary.
Winston Churchill

[1]Turf Research, North Carolina State University, Raleigh, N.C. 27650

Comments and Opinions . . Yours and Ours

CHOOSING JAIL OVER MOWING

A man from Kenmore, New York, who refuses to mow his lawn, says he is prepared to go to jail rather than pay a fine or mow his lawn. He refuses to mow because "it is an environmentally unsound practice and against my basic principles" . . . "It (my lawn) is not a breeding ground for mosquitos or other obnoxious pests. The plants represented here do not emit noxious fumes, produce dangerous allergens, or attract vermin." Mr. "No Mow" may have some beautiful tall wild flowers some weeks a year, but his yard will contain more insects (ticks and mosquitos included), more noxious pests, vermin and more dangerous allergens than the average lawn. He will not have fumes from a lawn mower; but preventing unwanted poison ivy, honeysuckle, thistle and other noxious plants will provide enough hand work and perspiration so that he may be fuming and tempted to buy some power tools and a modern herbicide to keep nature's growth under control. Anyone with an unmowed lot in this northeast climate must work to keep the area passable for foot traffic. With his concern about "allergens," he will find they usually increase with a greater assortment of plants and insects. Lawns have comparatively few people troubles of this type. Also, Mr. "No Mow" can claim his right to grow a no-mow lawn, but it seems fair to say that if he wishes to develop a community that does not mow yards, another community of people who enjoy turf and dislike indiscriminate uncontrolled plant growth should have the right to develop a neighborhood with mowed lawns. Possibly, our society should permit organized groups to form the types of landscape communities they like as long as they do not commit felonies, inflict gross injustice or destroy the land. Mr. "No Mow" can find a number of people who would like to develop or already have his type of home grounds.

REE

MINIMUM TILLAGE FARMING

For those who do not know or follow modern agricultural trends, minimum tillage of crops such as corn and soybeans that were intensively cultivated in the past, has become a valuable and major change. In the 1930's Dr. Frank Duley, a USDA Agronomist stationed at the Nebraska Agricultural Experiment Station studied what he dubbed "trash farming." The technique involved leaving plant material on the surface to reduce erosion and hold moisture. Dr. M.A. Sprague, who retired earlier this year from Rutgers, started the use of herbicides to destroy old crop plants, weeds or cover crop to convert or start a new crop. (Confidentially, he was inspired by knowing about fairway renovation with sodium arsenite in the 1950's.)

Killing unwanted vegetation with a herbicide and leaving the residue on the surface are the main features of this different approach to age-old procedures of cultivated crops. Two of the great benefits are smaller soil erosion losses and reduced energy requirement for tillage. Some of the subtle or peculiar features of minimum tillage were discussed at a recent Northeastern meeting. Fields can be tilled sooner than with clean cultivation. Paraquat has been a popular herbicide. Usually, two treatments are used for vegetable kill. Special planting machines are required to plant seeds through the surface residue. Slug activity has been a surprising problem. Three species slither through the damp soil of the planter slits and chomp on the germinating crop seed. Has anyone tried no-till on a corner of the lawn for tomatoes?

To GREEN WORLD Readers:

This is the place for you! If you have one or two words or one or two paragraphs to say about any turf topic, let us hear from you. Comment is welcome on articles in *Green World*, and your opinions *do* count. Send comments and opinions to Ralph Engel, New Jesey Turfgrass Association, P.O. Box 231, New Brunwick, NJ 08903.

Green World is published three times a year by the New Jersey Turfgrass Association, P.O. Box 231, New Brunswick, NJ 08903. Ralph Engel, consulting editor; Veronica M. Malone, managing editor. Please address inquiries concerning advertising to William Nist, Lebanon Chemical Co., Dayton, NJ 08810. (201) 329-4011

Moisture Management continued from page 1

The removal of dew, frost, exudates, or other foreign matter from a turf is often readily apparent following syringing. It is not surprising then that this is a readily accepted and frequently used cultural technique. Similarly, the relief of water stress can often be observed following the syringing of "hot" spots on a golf green. Turf research has yet to answer the question of how to use syringing and irrigation regimes most effectively for the prevention of turf wilt and water stress, particularly for intensely trafficked sites such as golf greens.

The potential value of syringing for the purpose of cooling a turf has been discussed for many years. Syringing is of much concern in regions where climatic conditions are not well suited for the growth and durable performance of bentgrass greens. However, summer humidities and temperatures often reach stress level for bentgrass throughout the United States.

Duff and Beard investigated the syringing of Toronto creeping bentgrass greens under Michigan conditions during the mid 1960's. Syringing at noon with 0.25 inches of water resulted in a 1° to 4° F. drop in turf canopy temperature. Presyringing canopy temperatures were not reached for two hours. Ward (1959) observed an approximate 20° F. reduction in the temperature near the soil surface of a Kentucky bluegrass sod following syringing. However, Hawes (1965) applied 0.1 inches of water to an Astoria bentgrass green between 11:30 a.m. and 3:00 p.m. and reported turf canopies to be 8° F. cooler two minutes after syringing and 1.5° F. cooler after ten minutes. Presyringing canopy temperatures were reached within 15 to 30 minutes after treatment.

There remains a clear need for further research into the effects of syringing bentgrass golf greens. The temperature of the turfgrass canopy is dependent on many environmental parameters which can also influence the success of syringing for wilt control or leaf temperature moderation. Reducing canopy temperatures by syringing occurs through the evaporation of water from the leaf surface. Environmental conditions that favor the evaporative process should therefore enhance reductions in the canopy temperature following syringing. Air and turf canopy temperatures, relative humidity, wind speed, sunlight, amount of water applied, timing of water application(s), and water temperatures are all factors which can influence syringing efficiency.

High air temperatures impose a stress on bentgrass turf and increases its water use. Canopy and air temperatures are not always the same. Canopy temperatures are typically lower than that of air in the morning, and higher by midday. However, this relationship is affected by other conditions such as wind speed and cloud cover. Afternoon canopy temperatures are likely to be lower than that of the air under windy and/or overcast days. Clear days typically result in afternoon canopy temperatures some 10° to 15° F. above that of the air.

Relative humidity is a measure of the amount of water held in the air. The relative humidity is typically highest during the early morning hours and then declines during the day. Although not always the case, increasing relative humidity decreases the potential for water to evaporate from the surface of turf leaves. Increasing air temperature increases the water holding capacity of the air for a given relative humidity.

The evaporation of water from a turf surface is also influenced by wind speed. Wind speed is usually greatest at midday, and can have a marked effect on canopy temperature. A 3 or 4 m.p.h. wind can lower the canopy temperature 10° to 15° F. in a few seconds. The impairment of air movement over a green by surrounding vegetation results in increased humidity of the entrapped air and reduces the potential evaporation of water from the surfaces of the turf leaves. Bentgrass greens enclosed by vegetation cannot fully benefit from cooling by the wind. Air flow across a bentgrass green should be considered and maximized for bentgrass greens likely to experience summer stress conditions.

Passing cloud cover can result in a lowering of the turf canopy temperatures some 10° to 15° F. While shaded turf is usually cooler, this must be balanced against the inherent shade tolerance of the turf and increased disease problems. Too much shade is a more typical problem for turf.

Syringing studies were intiated at N.C. State University during 1981. These investigations were supported, in part, by the Carolinas Golf Foundation and sought to determine the influence of syringing on the canopy temperature moderation of bentgrass golf greens. A 'Penncross' creeping bentgrass golf green located in Raleigh and con-

continued page 4

Moisture Managment
continued from page 3

structed in 1979 according to USGA specifications was utilized. Irrigation was maintained at a rate of 1/3 inch of water every 1.5 to 2 days. The turf was clipped every other day at a cutting height of 0.25 inches during the summer months. Treatments included water application rates ranging from 0 to 0.22 inches of water, applied between 11 a.m. and 5 p.m. during 1981 and 1982. The syringing treatments investigated included single hourly and repetitive hourly application times between 12 noon and 5 p.m.

Observations show a slight drop in the turfgrass canopy temperature on the order of 1° to 3° F. can be obtained for a brief period (up to 1 hour) following syringing. These observations are consistent with the previously noted studies which were conducted in the northeastern United States. Environmental conditions at the time of syringing do appear to have a noticeable influence on canopy temperature moderation. As expected, the chance of achieving a significant leaf temperature reduction via syringing on very humid, overcast days appears to be negligible.

Under the conditions of these studies, bentgrass canopy temperatures were not markedly affected by the volume or timing of syringing applications. In particular, temperature moderation of the bentgrass canopy for longer than one hour following treatment was not observed. Syringing treatments did not result in deleterious effects to the turf during the course of these investigations. However, disease problems, particularly from *Pythium* would be expected as water application rates were increased, later syringing times during the day were utilized, and if syringing was practiced for a series of humid days.

Syringing for canopy temperature moderation is distinctly different from syringing to prevent or correct wilt. The canopy temperature of turf is elevated as it wilts under water stress. Syringing can relieve wilt and result in a measurable lowering of the turf canopy temperature. In the absence of wilt, the routine syringing of bentgrass golf greens for canopy temperature moderation must be reevaluated considering the substantial economic cost of syringing from the standpoint of water and labor investment alone.

Misting Effects
continued from page 1

obtained from misting, it is expected that conditions exist when misting or syringing is harmful. Most likely this would occur with extreme wetness that encourages greater disease incidence and algae development. However, when bentgrass is "tired" in mid- to late-summer and there is an urge to water because of signs of impending wilt, do not let fear of root inhibition block occasional misting. Misting or syringing means wetting the surface lightly with a fine spray without creating free water at the surface of the sod. Late summer is a good time to review the watering program. If you have a small area where misting seems needed, consider a trial misting installation for next year.

REE.

ABSTRACT: Rates of Soil Replacement by a Combined Hollow Tining and Topdressing Programme. S.W. Baker. *J. Sports Turf Res. Inst.* 59:146-147. 1983.

Little consideration has been given to rates of soil replacement using this method (Hollow Tining and Topdressing) so in this Technical Note a theoretical calculation of replacement rates is presented. Under the assumption that the surface area removed by each tine is equal to the cross-sectional area of the tines between the cutting edge, calculations are based on four tine sizes (6.4, 9.5, 12.7 and 15.8 mm internal diameter) and two tine spacings (50 and 100 mm centres).

The surface area of the turf removed per pass for each combination of tine size and spacing is given in Table 1. After the initial pass there is a probability that subsequent tine holes will overlap with previously replaced soil, the probability of contact rising as the proportion of new soil is increased. In consequence the rate of soil replacement rising as the proportion of new soil is increased. In consequence, the rate of soil replacement decreases over time.

Over-use of hollow tining can produce a soft, easily-worn surface, so on fine turf areas a hollow tine treatment once every three years is a typical frequency (Escritt 1978). At this frequency and using tines with an internal diameter of 9.5 mm it would take 33 and 126 years respectively to replace 25% of the existing soil with tine spacings of 50 and 100 mm. Even if the operation was carried out at yearly intervals, it would take either 11 or 42 years to remove 25% of the existing soil, depending on whether the 50 or 100 mm spacing was used.

Where Has EDB Gone?

The recent EPA ban on the chemical EDB concentrated on agricultural uses. One of these was use for some soil crops. Yet nearly all the EDB production at that time was and is presently used in gasoline. What is the automobile doing with it? How much from spillage and exhaust is on adjacent fields and roadsides?

Ralph E. Engel

ABSTRACT: Some Viruses Infecting Amenity Grasses in the United Kingdom. J.L. Cooper, Natural Environment Research Council, Institute or Virology, Mansfield Road, Oxford OX1 3SR. *J. Sports Turf Res. Inst.* 59:151-152.

To get an indication of the extent of virus infection in amenity and wild grasses, samples were taken from 11 sites including botanic gardens and natural habitats such as water meadows, hedgerows and woods including S.S.S.I's in England, Scotland and Wales. Approximately 1,000 specimens from 91 genera representing 203 species/cultivars were tested.

Nevertheless, evidence for virus infection was found in about 5% of the specimens tested. Sap transmissible agents that have yet to be identified but experimentally infected barley, wheat, oats, maize or *Chenopodium* spp. were found in 16 specimens from botanic gardens and six from natural sites. An additional three viruses were identified serologically. The one-year survey revealed numerous viruses that seem distinct from any that were recorded previously; their characterisation will require several years of additional research.

Canadian High Court Clears 2,4-D, 2,4, 5-T.

Recently, the Supreme Court of Nova Scotia cleared the way for the use of phenoxy heribides in that Canadian province.

Justice D. Merlin Nunn, author of the decision, wrote, "I am satisfied that the overwhelming currently accepted view of responsible scientists in that there is little evidence that, for humans either 2,4-D or 2,4,5-T is mutagenic or carcinogenic and that TCDD is not an effective carcinogen, and further, that there are no-effect levels and safe levels for humans and wildlife for each of these substances."

The Supreme Court had heard scientists from both environmental groups and industry present their case, and clearly he could see a difference between them: "There was a noticeable selection of studies by the plaintiffs which supported their view and a refusal to accept any criticism of them or contrary studies." "I had the opposite impression of the scientific witnesses offered by the defendant (industry). I did not detect any partisanship. They related their work, their involvement with the substances, the results of their studies, and their considerations of other studies in a professional, scientific manner and I, therefore, found their opinions to be reliable and, indeed, I accepted them as such."

Abstracted from *Crops and Soils Magazine* 1983

GOLF THERAPY . . . . . YOU MUST BELIEVE!

In our society of many opinions the New Jersey Pinelands Commission uses every kind of excuse to prevent development of golf courses; but they do not believe or have not heard a story like George Broome's. George is a 62 year old Navy pilot of World War II era who cured his depression with three weeks of golf after checking into the Lyons Veterans Hospital in April. He has convinced 20 veterans to take up the game. In a letter to Vice-President Bush, George wrote, "It saddens me deeply, Sir, to daily see so many of our courageous veterans lying on hospital lawns" (Home News August 24, 1984). George states "within an hour or two, I can have someone hitting a ball. I am not saying it will be more than 100 yards, but it will be straight. When they complain about their shots, I say, just think of the guys up there with no legs. Be grateful you can be here."

If you will pardon me, I will humbly add the comment, if we can set aside vast acreages for 'some kind of' frog and all kinds of endangered species, why can't the USA use another million acres for those who need the therapy golf courses give. I firmly believe that golf courses are one of our best preservers of things natural and a better purifier for our populous sites that have not or will not be used for food production.

Good luck with your style of help, George.

REE

Who Needs 2.4-D?

Mr. Fred Nessly, clear out in Seattle, reads *Lawn Care* and sends this suggestion for putting Plantain out of business: "I dip a sharpened hardwood stick into sulphuric acid and thrust it into the center of the plantain. It kills the roots immediately and does not injure the grass. Several weeds may be killed before it is necessary to dip it again." Thank you, Mr. Nessly.

Lawn Care—1929

Sustaining Members

Aabar, Inc.
A-L Services, Inc.
Aquashade, Inc.
Blue Ridge Peat Farms
Brickman Industries
Brower Turf Equipment
Burton Landscaping
Chemlawn Corp.
D & J Landscaping
Double Eagle Equipment Co.
DuBrow's Nurseries
Farmstead Golf and Country Club
Florence Landscaping Svc. Inc.
G & G Lawn Service, Inc.
Garden State Goodall
Garfield Williamson, Inc.
Green Grass Lawn Maintenance
Green Hill Turf Supply
Hoffmann-LaRoche, Inc.
Hummer Turfgrass Systems, Inc.
Jade Run Turf & Sod Farm
JEP Sales, Inc.
Keystone Lawn Spray
Leon's Sod Farm
Limestone Products Corporation
Lofts Seed, Inc.
A. Lombardi Landscaping
MacAndrews & Forbes Co.
Wilfred MacDonald, Inc.
Metro Milorganite, Inc.
Montco/Surf Side
National Chemsearch
Newton Country Club
Rapp Sod Farms
Reid Sod Farm
Rockland Chemical Co.
O. M. Scott and Sons
Seacoast Laboratories, Inc.
Somerville Equipment Co.
Storr Tractor Co.
Sweeny Seed Co.
The Terre Co.
Tuckahoe Turf Farms
Turf Seed, Inc.
Vaughan-Jacklin Corp.
Andrew Wilson

Democracy demands that all of its citizens begin the race even. Egalitarianism insists that they all finish even.

Roger Price

A WREATH OF GRASS

The captain "Don't Apply Insecticide Until Needed" from a commercial supplier wins a Wreath of Grass Award for 1984. This headline was followed by statements of two state university entomologists such as: "If you're in the lawn care industry or a golf course superintendent, play it smart this year. Apply insecticide only when pressures warrant it — not before." . . . . . "Insect pressure may vary from year to year . . . . . It's wiser to wait and determine whether you have a damaging level of insects," . . . . . "If pressures develop, they are often localized" . . . . . "treat the hot spots of activity".

These remarks published by a commercial firm are fairness that we appreciate greatly. I would like to publish the name of this company, but that would not be fair to all the other commercial organizations that serve turf faithfully. Do we show enough appreciation for the business man who sacrifices profit for fair play to the turf grower and turfgrass budgets?

REE

It's what we value, not what we have, that makes us rich.

J. Harold Smith