JULY 1967

USGA GREEN SECTION RECORD

A Publication on Turf Management
by the United States Golf Association

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VOL. 5, No. 2 **JULY 1967**

Cover Photo: Preventive disease control begins and ends with the right material, applied uniformly at the right rate, at the right time to a measured area of turf.

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Fungicides — Forever More?

"The operation was a success but the patient died." Note the straight line pattern of turf loss on this green. Someone erred in application techniques.

by LEE RECORD, Agronomist, USGA Green Section

Today, fungicides are a must in every golf course superintendent's management program. Unnecessary turf loss on greens from disease is no longer accepted. Preventive and/or curative control programs should be established on every golf course.

Broad spectrum fungicides are in common use for programs of preventive disease control. Selective fungicides, used for one particular disease, or at a particular time of the season when a disease is more active, can be used on a preventive or curative basis. The frequency of application depends largely upon weather conditions. It is not unusual to find a normal program in the Northeast to call for applications every 5 to 7 days on a preventive schedule.

The more common diseases found in the Northeast, the active temperature (F.) and period of the season is as follows:

Disease	Active Temp. (F.)	Period
Brown Patch—**Rhizoctonia solani**	77-86°	June-August
Dollar Spot—**Sclerotinia homoeocarpa**	68-86°	June-August
Red thread—**Corticium fuciforme**	65-73°	May-June-August-Sept.
Copper Spot—**Gloeocerospora sorghi**	81-86°	June-August
Pythium—**Pythium spp.**	93° +	July-August
Helminthosporium—**H. vagans, sorokinianum**	68° +	April-August
Fusarium Blight—**Fusarium roseum**	———	April-September
Fusarium Patch—**Fusarium nivale**	68-70°	November-March
Typhula Blight—**Typhula itoana**	46-54°	November-March

For fungicidal control of the above diseases, check with your local State Agricultural Experiment Stations or noted authorities in the turfgrass field. They will be able to discuss with you the material best suited for your location.

When applying the fungicide to a given area, such as a green, tee, or fairway, the exact area must be known in order to achieve adequate protection. The normal amount of carrier (water) is between three to 10 gallons per 1,000 square feet at a pumping pressure above 200 pounds per square inch. Uniform coverage must be obtained if the fungicide program is to be a success; nothing should be left to chance.

Green Measurements

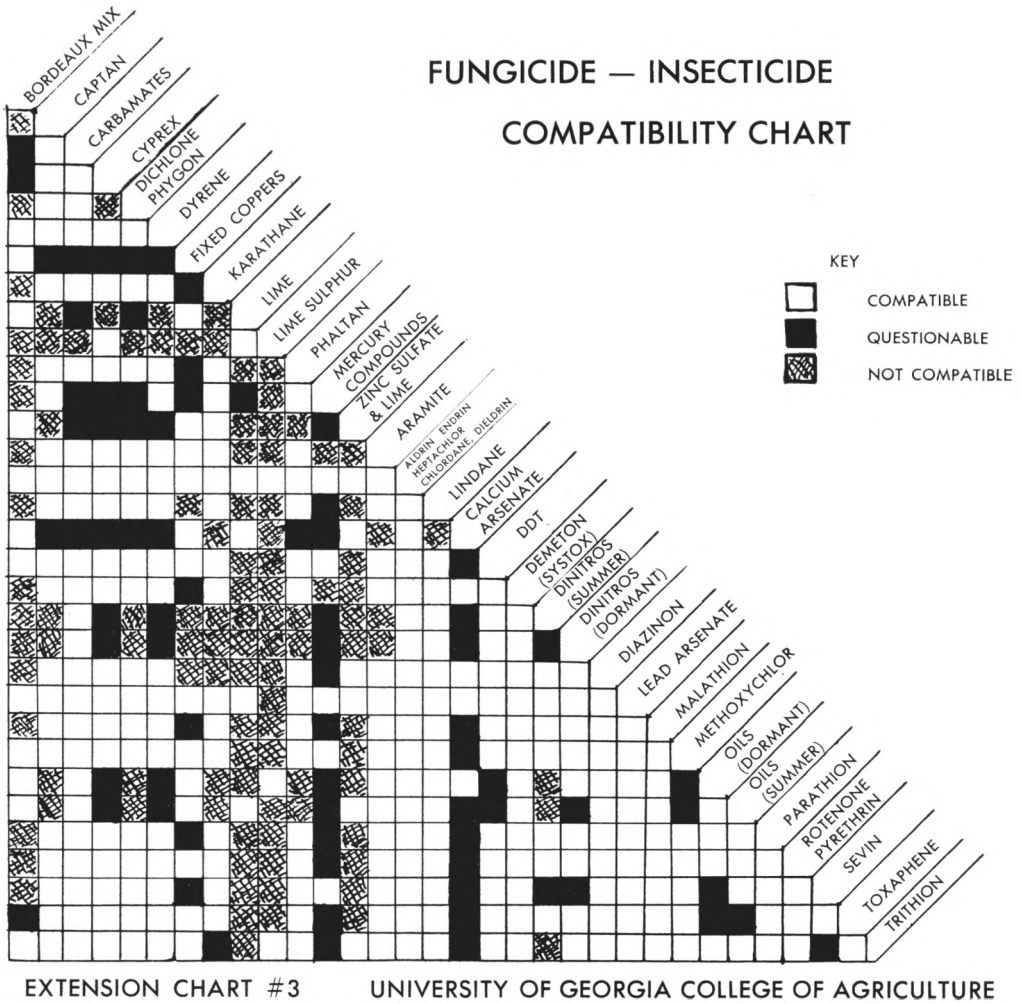
Let's look to the important factor of knowing exactly how much area (in terms of 1,000 square feet) will be treated with each spray application. After all, fungicides, insecticides, herbicides, and fertilizers are not inexpensive, and with today's tight budgets, each dollar must count.

Have you measured each green to determine exactly how many square feet you have under treatment, or has this requirement slipped by for several years? Greens may have been enlarged. More collar area is being treated today, or should be, and maybe the man who always sprayed has become noticeably older and doesn't walk as fast as before. No matter the reason, it is important to know how many square feet of putting green and collar area you are actually treating.

Some of the standard means of determining these areas are as follows:

Rectangular Green—Square the corners to exclude an area equal to the amount of fringe inside the rectangle. Multiply length by width.

Irregular Green—The long axis has to be determined. Lay a string along this axis and



EXTENSION CHART #3 UNIVERSITY OF GEORGIA COLLEGE OF AGRICULTURE

place stakes at ten-foot intervals. Using a T square, measure to the edge of the green at right angles to the axis at each stake. Multiply the individual measurements by 10; the sum of those figures equals the area.

Circular Green—Four steps are needed: (1) find the diameter, (2) divide by 2 (this is the radius), (3) multiply radius by itself, (4) multiply this by 3.14.

Proper Distribution

Learning how to apply material evenly is an art. Uneven distribution may result in ineffectiveness or chemical burns. Rhythm in walking back and forth is needed in order to judge the approximate gallonage for each 1,000 square feet. Not all fungicides are applied in a liquid state. Some are applied dry using many different forms of carriers. Some superintendents choose to do all the fungicide spraying themselves. They realize a putting green, once lost, can never be replaced at the height of the season. Applying the fungicide material at half-rate, but making two applications at right angles, is a sound practice. Other practices vary from high pressure mist booms which shoot the material across a green without walking on it, to vehicles that ride across and around greens. Many methods of accomplishing the fungicide program have been tried and have met with varying degrees of success. Your method may not be the same as your neighbor's method. However, if your program shows results and you are satisfied with it, stick with it and continue with it. It's difficult to argue with success.

Fairway Measurements

Fungicide applications are not uncommon on fairways today. Again we come to the problem of determining how much area there is in any given fairway. Remember, there are 43,560 square feet in an acre.

By knowing the average width of any fairway, the following chart will give you the approximate fairway acreage involved:

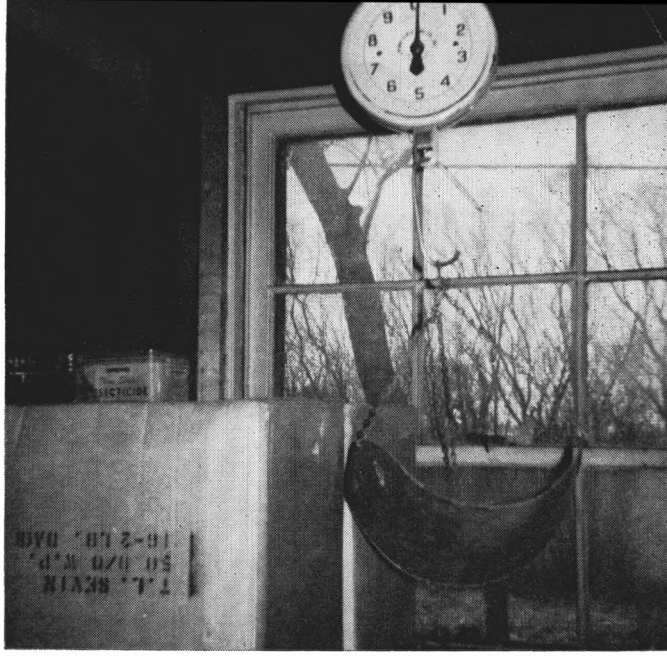
35 yards wide, each 140 yards in distance = approximately 1 acre.

40 yards wide, each 120 yards in distance = approximately 1 acre.

50 yards wide, each 100 yards in distance = approximately 1 acre.

60 yards wide, each 80 yards in distance = approximately 1 acre.

70 yards wide, each 70 yards in distance = approximately 1 acre.



Measuring fungicides can be done in a number of ways. Just be sure your method has been accurately calibrated and closely followed.

Using the right nozzle at the recommended height for an even pattern or degree of spray application is important on fairways. To determine this, first look at your nozzle. The first two numbers represent the degree of spray. If your spray boom is set 17 to 19 inches above the ground, an 80-degree nozzle is suggested. From 19 to 21 inches, a 73-degree nozzle will do the best job, and from 21 to 23 inches, a 65-degree nozzle is necessary.

A new disease? Not really. It was reported in 1932 by Monteith & Dahl in The Green Section Bulletin. Nevertheless, Ophiobalus graminus *has been reported more frequently on Pacific Northwest fairways in recent years.*

The numbers on the nozzle also act as a guide to the g.p.m. (gallons per minute) the nozzle will deliver at 40 p.s.i. (pounds per square inch). Count three spaces from the left, place your decimal; the remaining numbers will determine the g.p.m.

Sprayer Conditioning

Keeping your power sprayer in top condition at all times is essential. A suggestion would be to have one power sprayer for fungicide use only and a second sprayer for your herbicides. Should you not have two, be cautious in cleaning out the tank after using herbicides. A standard cleaning suggestion is one using a quart of household ammonia in 25 gallons of water. Wash the tank, hose, and boom thoroughly. Then run another 25 gallons of clean water through the tank, hose, and boom.

Having a clean piece of spray equipment available is just another step in today's good turf management practices. For those wooden barrel spray tanks, when they are out of use in the winter, put 4 to 6 soaked burlap bags inside the tank before sealing it up. This should keep adequate moisture in the tank, allowing little, if any, of the wood to dry out.

The Fungicides

Fungicide materials containing mercury can be classified as organic or inorganic. The reason is simple. When mercury is combined with an inorganic acid it is termed an inorganic mercury compound, and when it is combined with an organic acid it is termed an organic mercury compound.

Mercurial fungicides should be handled carefully. Air temperatures at time of application play an important role. Normally it is advisable to build up the resistance in a plant by beginning early in the season with a mercurial fungicide. When temperatures exceed 80° F., mercury materials can cause a grass blade burn. It would be best to cut your normal rate by ¼ or ½ the dosage and apply the fungicide more frequently when temperatures exceed 80° F.

Timing

The actual time for beginning a preventive fungicide program is determined by weather conditions, grass species, or early evidence of the disease. Fungicides are more effective when fungal populations are low.

Actually, the preventive fungicide gives a coating to the external leaf surface, preventing infection by fungal parasites. This type of protection stops the diseased area from spreading. It will not cure diseased plants. A preventive fungicide program may leave a coating on the plant surface for a week or more. This will depend upon mowing practices and weather conditions.

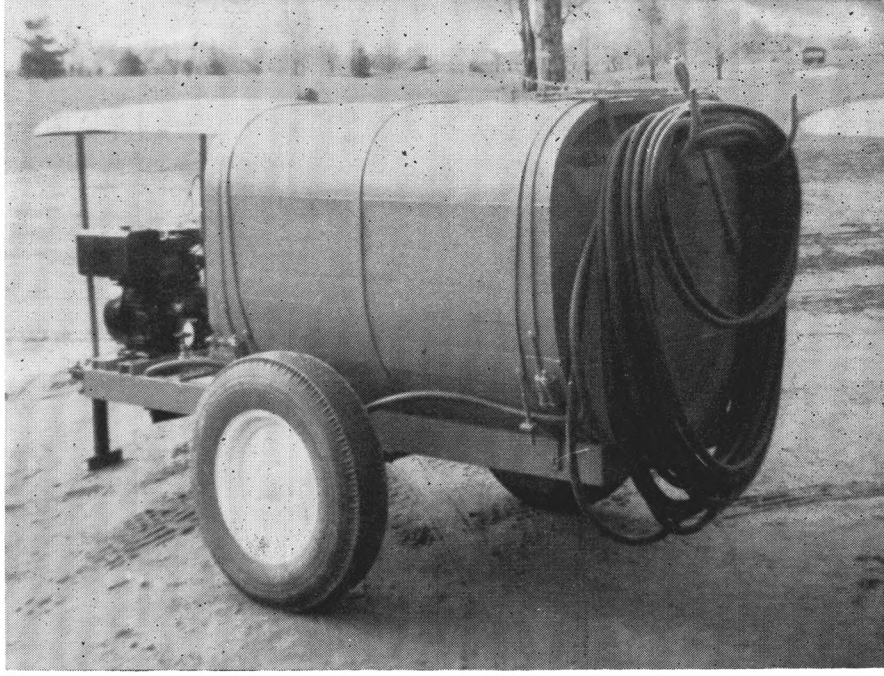
Measuring Materials

Fungicides can be damaging to plants if they are used at higher than recommended rates. Every caution should be taken at time of application to be sure that the exact amount is being applied to the given area. Different measuring devices are used; beakers, bottles, tin cans, scales, etc. Any measuring device is acceptable so long as you know it has been accurately calibrated and is being properly used.

Keep a chart or log of the dates, temperature, and time of application, and also the fungicidal material used. Practice using mixtures of fungicides, or alternating specific fungicides of your choice. Fungi may become semi-resistant to a particular fungicide, and if mixtures or alternate fungicides are used, additional protection is given to the turf plant.

Mixing With Other Materials

At the time of fungicide applications, fertilizers, insecticides, iron and a host of other materials are sometimes added to the con-



"We would be lost without it." Four to six wet burlap bags placed in wooden spray tanks prevents drying out during winter storage.

coction. This is not the most practical method of applying the different materials. Frequently there is a wide difference in the amount of water carrier recommended. Although it is a poor maintenance practice, it is being used occasionally, and is justified because of high labor costs, heavy traffic, time available, etc. Should you ever find it necessary to use a mixture, by all means know the compatibility of each material.

Contributors To Diseased Turf

Many factors influence the activity or incidence of turfgrass diseases. Some develop under low soil fertility conditions. If overfertilization is practiced, soft, succulent turf results and it is equally, if not more susceptible to disease.

Temperatures, available moisture and humidity play key roles. Poor water management must place high on this list. Inopportune thunderstorms with high humidities, heavy fog and dew, and 'casual' water caused by poor surface or internal drainage all take their toll. Different fungi respond to different temperature ranges as pointed out on an earlier chart. All of these factors are influenced by air movement through turf areas and point up the importance of good air drainage.

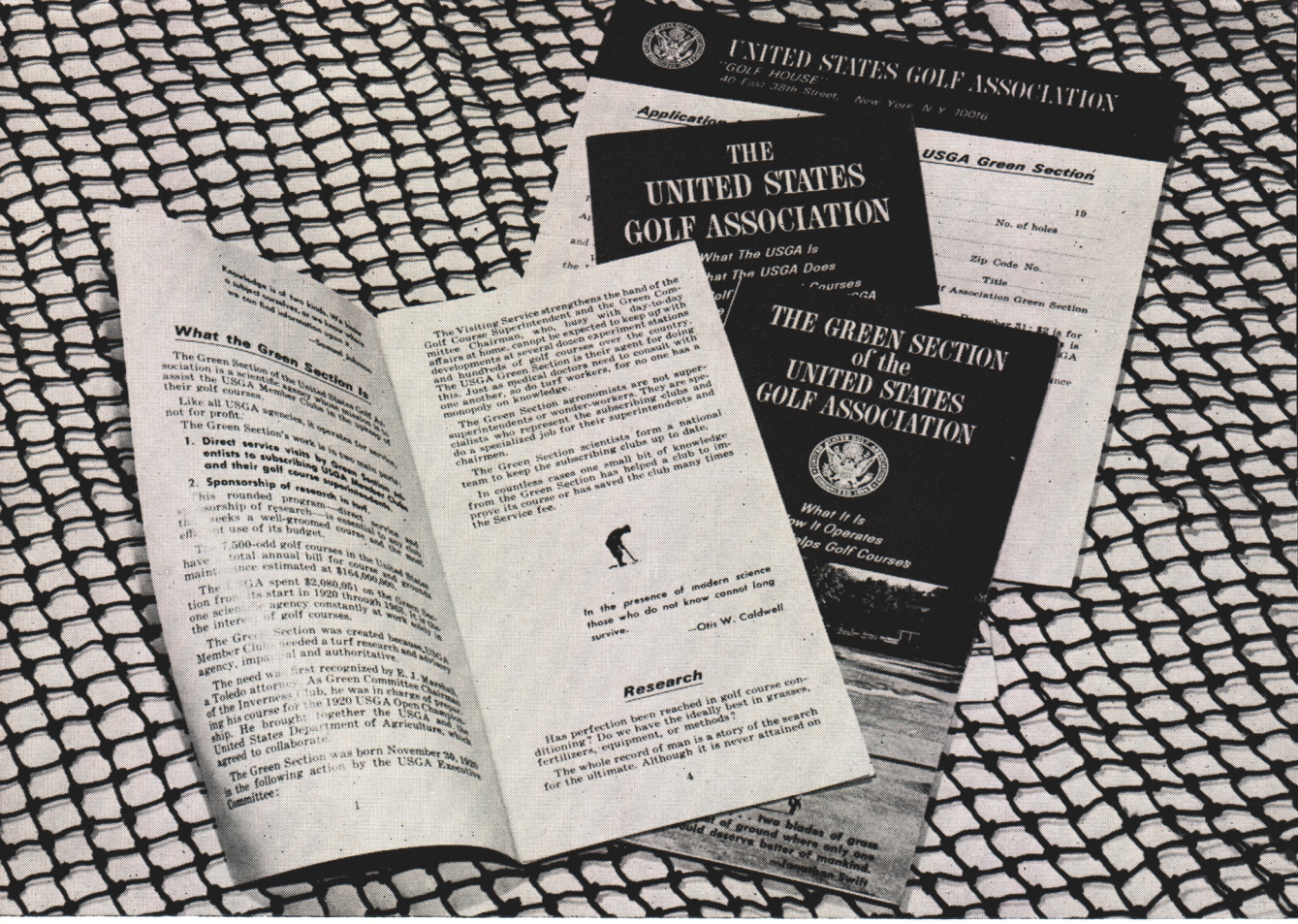
Thatch accumulation invites fungi activity in several ways. Excessive thatch retains considerable moisture and high humidity develops within its micro-climate zone. Disease-producing spores thrive and multiply and finally become epidemic is proportions. Thatch accumulation also reduces water, air and nutrient movement into the soil and root zone, thus weakening the grass plant. Of course, some thatch is necessary. From ½ to ¾ inch on any green can be managed with today's machinery. But when thatch is in excess of this, one must become concerned and consider corrective measures.

Physically bruising or damaging turf, whether by machinery or by golfers, can also spur a disease attack. Frequent mowing under stress conditions, or removing excessive clippings leave the plant in a weakened condition and open to disease attack.

In fact, **any practice** or condition that weakens the grass plant and places it under severe stress contributes to turf loss through disease.

A strong cultural program will do much to guard against and prevent disease activity. Careless management practices have no place on today's golf courses. Educate your employees. Keep greens firm. Have adequate surface and internal drainage. Watch your water management practices closely; indeed very closely. Aerate, vertically mow, and keep the thatch zone within manageable reason. Plan and follow a good fertilizing program. Keep mowers sharp and never bruise the turf by turning machinery on greens or tight collars. Provide adequate air drainage and, above all, set up a strong preventive fungicide program this year!

With present machinery; with the excellent fungicides now supplied to us by the chemical industry; and with today's know how in turf management, we never have been in a better position to develop a sound turf management program free from disease.



Report on The Green Section Survey

by HENRY H. RUSSELL, Chairman, USGA Green Section Committee

Early in 1966 the USGA Executive Committee authorized a comprehensive survey of the Association's Member Clubs to assist in evaluating the services of the Green Section's Visiting Service program.

The substantial operating deficits incurred by the Green Section ($50,564 in 1966) prompted the Executive Committee to decide in the interest of prudent management to explore all possibilities for reducing the amount of the deficit short of impairing the quality of the services to the subscribing member clubs.

Three questionnaires were prepared and mailed to:

1. Subscribers to the Visiting Service.
2. Non-subscribers.
3. Committee Personnel.

The results in condensed form are as follows:

1. Subscribers:

Over 25 per cent of our Subscribers replied: 95% stated the Visiting Service was "useful" and suitable for their needs; 5 per cent rated the Service as "fair"; 3 per cent wanted more consultative visits; and 7 per cent preferred visits on an "if and when we want them" basis at a fee-plus-travel expense.

Thirty-three clubs indicated they were availing themselves of other consulting services, of which 21 were public agencies and 12 were private consultants.

2. Non-subscribers

The number of replies was approximately 2 per cent. This percentage, while disappointing, is comparable to the rate of replies experienced by professional opinion samplers. Twenty-eight

per cent indicated they could not afford to subscribe; 14 per cent indicated they would subscribe in the future; 28 per cent stated they were availing themselves of private and public consultants in lieu of the Visiting Service. The remaining 30 per cent gave various reasons for not subscribing, but the following reply from one superintendent was particularly memorable: "I have found that there is very little to do on a golf course that wasn't covered in my Superintendent's course at college."

3. Committee Personnel:

Approximately 30 per cent replied. All rated the service as "good"; 84 per cent thought more USGA Clubs would subscribe to the Visiting Service if convinced of the benefits; 15 per cent indicated the service is "too costly"; 35 per cent stated that member clubs do not subscribe because of consulting services offered by public institutions and private consultants.

The survey demonstrated conclusively that:

1. 95 per cent of the subscribers are satisfied with the Visiting Service as presently operated.

2. A more effective job of selling member clubs on the advantages of the Visiting Service is necessary if more subscribers are to be obtained.

3. A substantial number of member clubs are relying on the consulting services of various private and public agencies.

With respect to the problem of selling its services, the Green Section is faced with the dilemma of encouraging Member Clubs to subscribe, knowing in advance that each new subscriber adds to the increase in the annual operating deficit. Measured in terms of fees charged, the Visiting Service offers real value if recognition is given to the fact that the USGA subsidizes the Visiting Service to the extent of $39 per visit.

Almost without exception, the comments contained in the replies were constructive. Some of the suggestions have already been adopted and many others are being studied to determine the extent of their usefulness. Some of the more noteworthy suggestions, paraphrased, are as follows:

Provide emergency visits as well as service on a when-and-if-desired basis.

Print and disseminate articles and reports on turf and turf management published in previous editions of the **Green Section Record.**

Distribute newsletters on a regional basis.

Increase the number of articles and reports on turf and turf management authored by the Green Section Staff.

Provide more frequent USGA Green Section-sponsored meetings on local levels for Club Committeemen and their Superintendents.

Analyze products, supplies, and provide member clubs with recommendations pertaining to same.

Provide recommendations for the most effective use of labor and equipment; emphasize preventive instead of corrective advice.

Change the name of the Committee from "Green Section" to "Golf Course Section."

In retrospect, we believe the time and money expended in preparing the survey and evaluating the replies were more than offset by the information received.

Whether it be called Green Section, Golf Course Committee or The Weed and Seed Division, your Committee and its Staff pledge their continued efforts to provide our Subscribers and Member Clubs with a thoroughly professional and effective turf and turf management consulting service on the most economical basis possible.

ABOUT THE AUTHOR

Henry H. Russell has been a member of the USGA Executive Committee and Chairman of its Green Section Committee since 1960. He is also a member of the Board of the Southern Golf Association, the Florida State Golf Association and former President of the Metropolitan Amateur Golf Association of Miami, Florida.

The 11-acre lake used for irrigation and recreation at Athens Country Club. The golf course crosses the lake four times.

Forty Years With A Drainage Problem

by JAMES W. DUDLEY, Athens Country Club, Athens, Georgia

I suppose the background of our golf course is a little bit unusual in that it has had only two superintendents since it was founded in 1926. My father organized and built the course with the aid of Donald Ross, the noted golf course architect, just before the depression years of the early 1930's. My father died in 1947, and since that time it has been my pleasure to be golf course superintendent.

We are situated in northeast Georgia, near the Smoky Mountains, in an area that receives 40 to 50 inches of rain each year. The abundant rainfall at times creates real problems; occasionally we are subjected to monsoon downpours. An example occurred last April when nine inches of rain fell within a 24-hour period, and most of it within four hours.

We have a beautiful 11-acre lake that is used for irrigation as well as for recreational purposes. Our course crosses the lake four times. For 40 years, we have lived with the problem of what to do with the runoff water during a heavy rain. The drainage area above our course is approximately 300 acres of open uncultivated land and timberland.

To correct the situation, an earthen dike was constructed around the lake, which was subject to receiving this runoff water when the course was constructed. This dike was built at great expense in 1926, and it served the purpose of diverting flood water and of keeping the lake clear for recreational purposes.

The real problem occurred at the lake dam where the diversion water had to be lowered approximately 25 feet to the creek bed below the dam. Four times during depression years my father made attempts to lower this water through different types of raceways built of rocks, logs, and other inexpensive materials. Each time floods spoiled his efforts. Then again in 1950,

when the club was in a better financial position, the Soil Conservation Service gave us plans and specifications, and a dike and concrete raceway were constructed. We thought we had the problem solved.

Then the 9-inch rainfall destroyed this dike. We almost had a disaster since the dam along the diversion ditch came within a couple of feet of breaking and destroying our lake and golf course.

This time, I secured the help of J. G. Beacham, for many years the city engineer of Athens, who gave us plans and specifications designed to overcome the problem. His approach was as follows:

1. A complete study was made of the drainage area surrounding the club property from U.S. Coast and Geodetic Survey maps. This included anticipating urbanization of the area in the future. All calculations were based on federal highway specifications of four inches rainfall in one hour, with a frequency of once in 25 years.

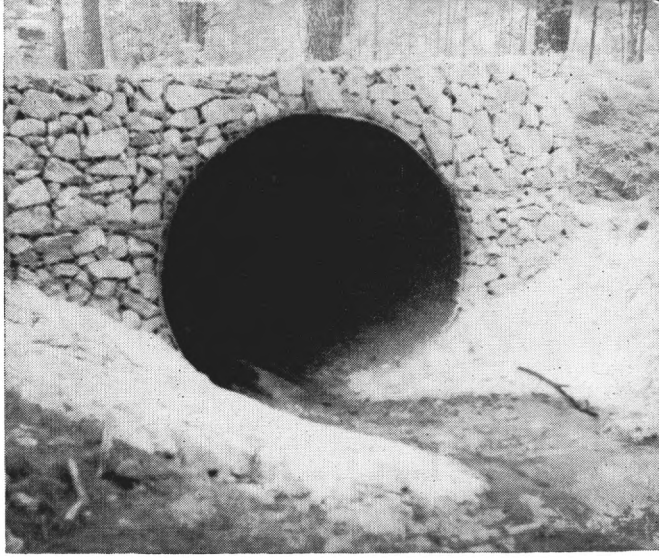
2. Since the drainage ditch had always been a maintenance problem, we decided to pave the bottom of the ditch approximately five feet wide with 24-inch slopes to carry normal water flow. This will allow all of our equipment to maintain slopes without hand work.

3. New stone and concrete bridges were built to carry golf carts and equipment traffic at all fairway locations to speed maintenance and play.

4. For the trouble area around the dam and lake, Beacham designed 640 feet of 84-inch metal drain pipe, fully asphalt coated, with a paved invert. This was set on a 2.5 percent grade and included two drop catch basins of concrete that serve to dissipate the force of water, and also as cleanouts in case debris collects during floods.

5. The terminal catch basin also includes a 30-foot section of gabion wall and floor as added protection to the banks of the creek. This material, a series of galvanized metal baskets filled with stones, was chosen since it is flexible enough to change positions due to settling without the danger of cracking.

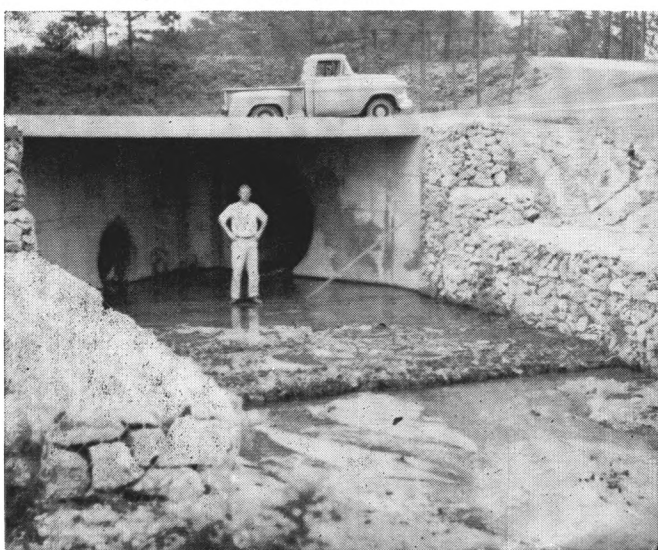
The project required six months to complete and cost our club $45,000. We hope it serves the purpose of protecting our lake, providing ease of maintenance, and speeding up play along the diversion ditch for our 650 members for many years to come.



The beginning of the 640 feet of the 84" metal drain pipe laid at 2.5% grade with two reinforced concrete catch basins.

The drain ditch is covered and the metal pipe in underground. Major floods can go to the extreme left if pipe is too small.

The outlet with gabion shows the end of a 40-year drainage problem.



Reviving A Controversy — Bentgrass Overseeding

by WILLIAM H. BENGEYFIELD,
Western Director, USGA Green Section

Summer overseeding may be slow. It may also be a countermeasure to Poa annua*'s constant reseeding.*

It was an old and accepted custom during the 1920's and 1930's. Overseeding greens with creeping bentgrass was just the thing to do. During and after World War II years it fell into disrepute and today has all but vanished from the tricks of our trade. But it is not quite dead and this article will not end the controversy.

Contrary to the thinking of most turfgrass men today, annually overseeding greens that are predominately **Poa annua** may not be such a wasteful practice after all! This is particularly true in the light of new equipment, new chemicals and accepted techniques. At least it offers a chance, a hope—long range though it may be—of re-establishing bentgrass in our northern greens.

Timing Is Important

If you were asked, "What is the best time for overseeding with Seaside?" you would probably reply, "fall or spring," and usually in that order. Experiment stations over the country agree that seeding is best accomplished at these times. But please take note: we are not discussing ordinary seeding, such as seeding a bare piece of ground to develop a brand new turf. Rather, we are concerned here with 'overseeding,' i.e., seeding into an already established turf. There is a very real difference in the problems involved.

Shocking and controversial as it may be, a good case can be made for overseeding with bentgrass in the early and mid-summer months! For example, **Poa annua** growth is so strong, so aggressive during the cool spring and fall months that outside competition doesn't have a chance. However, during the warmer summer season, **Poa annua** is not at its best and bentgrass seedlings have a competitive edge. Furthermore, summer management practices today favor bent seedling establishment. Irrigation levels are generally more constant. Preventive disease control operations are in full swing. Soil temperatures are up and conditions for bent germination are usually good.

The "Catch"

Even under the best of circumstances how-

ever, overseeding mortality is extremely high. If the "catch" is even 2 or 3 per cent, you will be most fortunate. It is absolutely essential therefore to establish some kind of seed bed prior to summer overseeding. Aeration is probably the best method and, since it is summertime, ¼ inch spoons are suggested. The soil cores should be removed. In addition, several runs with a spiked disc or slicing machine will contribute much to the preparation process.

The aeration hole and slice mark will provide an ideal 'bed' for any incoming bent seeds lucky enough to land or be washed into them. There is usually enough moisture present within their confines to encourage germination and drying out is far less likely than on the putting green surface.

There is another advantage to aeration and spiking. If greens have been treated with lead arsenate, Betasan, Presan or other inhibiting agent, the aeration and spiking process will enable seedling establishment at a lower depth, out of the inhibitive or protective zone.* This is especially important on greens where **Poa annua** and bentgrass co-exist. Bent overseeding may still be accomplished during the summer season while **Poa annua** controls may be carefully practiced in the fall and winter season if conditions warrant.

Seeding Rates

What about the seeding rate? "The heavier the better" might be good advice, but of course there is an impractical limit on both ends of the scale. Generally, two pounds of Seaside or one pound of Penncross per 1,000 square feet is a standard. Of course if the budget can stand it, higher rates and even two overseedings annually (perhaps late June and August) are desirable and will introduce that much more bentgrass.

Instant Success??

No one can argue the high rate of overseeding mortality. No one need fear instant success from this program. It is strictly a long range proposition. Expect at least three to five years to pass before you "see" any progress and are visually rewarded. As with so many phases of agriculture, the program must be a continuing one to be successful. It will do little good to start it this year and discontinue it next. Consider it an annual operation for at least the next five years. Then make up your mind as to its value under your conditions.

It is unlikely **Poa annua** will ever be collared by a single practice or management technique. However, when the right combination of techniques is put together, then it will yield. Summer overseeding may well be one of the techniques. Annual bluegrass is constantly reseeding itself. Continual bentgrass reseeding (at the proper time) may be a good countermeasure. Results to date would at least indicate this as a possibility.

Don't fool yourself! The practices of the old timers were not all bad. Overseeding has possibilities. Think about it.

Two hundred pounds of Seaside a year should be adequate for most 18-hole courses.

Some type of 'seed bed' preparation will be needed. Aeration is a good first choice.

*Be sure to read the article by Dr. V. Youngner, University of California in the September, 1967 Green Section Record.

What's Your Line In Irrigation?

by CLIFFORD A. WAGONER, Superintendent, Del Rio Golf & Country Club, Modesto, California

Considering a new irrigation system? If so, you —the maintenance superintendent—should first search out all the facts well before installation begins. Is it to be galvanized steel, cast iron, plastic, cement asbestos, automatic, semi-automatic or quick coupling? The trend has turned to automation, but because it may be good for your neighbor, it might not necessarily be feasible for your course.

What is the length of your irrigation season? How much water will be needed for the area you wish to cover? What of the availability of labor; the number of golfers, and the time available for irrigation each day? Will the water supply be adequate?

These are just a few of the questions that must be considered before making decisions about the new system.

The golfer, your customer, should be given primary consideration. If your present watering schedule delays starting times and if you must water throughout the day, causing inconvenience to the golfer, you should seriously consider automation. If labor is not available for night watering, automation is a "must." Unionization is steadily making its way into golf course maintenance and therefore every superintendent should closely check the restrictions and added costs it places upon management.

It is important to select the correct equipment for your installation, particularly if you are going automatic. Hydraulic or electric valves, cam, gear or impact heads and the type of controller setup are a few more of the decisions that must be made. The terrain, water supply, soil, and climatic conditions should be taken into consideration when deciding on hydraulic or electric. Purity of water will have an effect on the lasting qualities of sprinkler heads. Wind, terrain and desired coverage will determine whether your design should be a two-or-three row system. Soil porosity will be a guide to nozzle sizes and controller design.

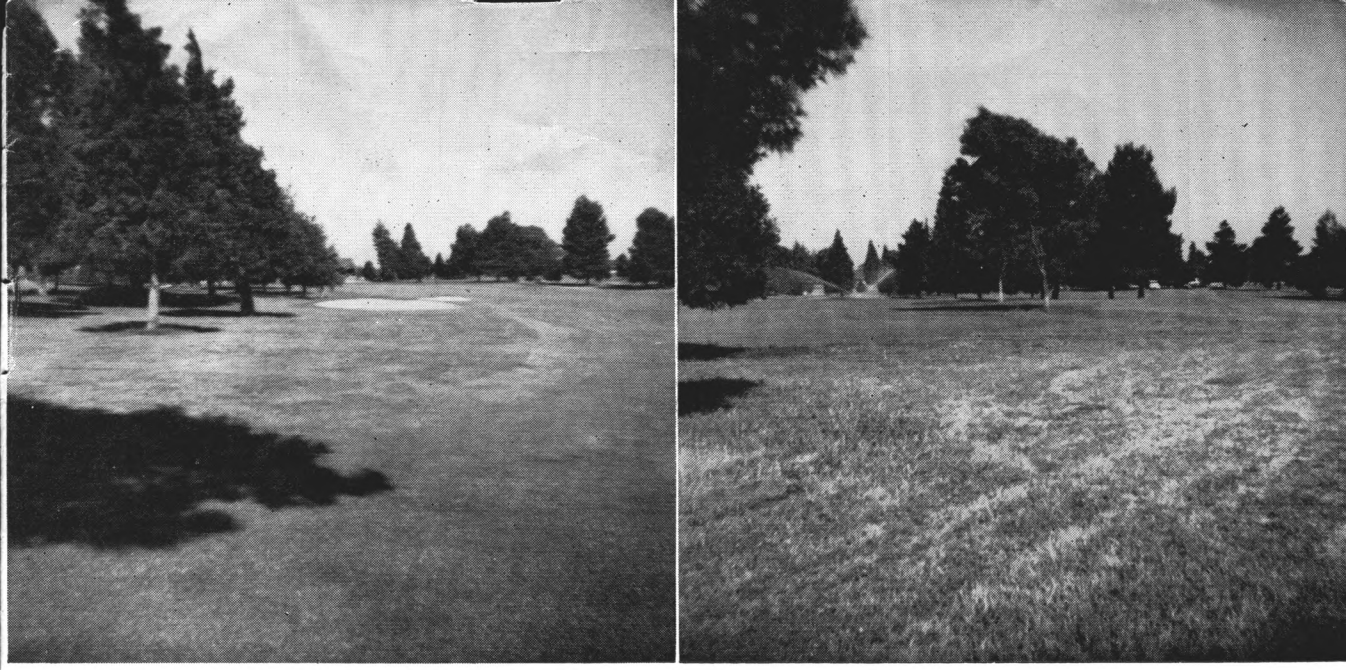
Suppliers of equipment should be selected carefully, not only to assure prompt delivery on initial equipment, but for future service as well. I have found the best service exists when the supplier has a close liaison with the manufacturer.

Once a decision has been made as to the type of system, its design and the equipment to be used, the greatest task still lies ahead: hiring and controlling the installation contractor. The very best design and the very best equipment is of no value unless they are properly laid out and installed. Some very successful systems have been installed by golf course maintenance crews, but this should not be undertaken unless you are absolutely certain you have qualified help and have had experience in irrigation installations.

Very exact specifications must be drawn up

ABOUT THE AUTHOR

Since 1952, Clifford A. Wagoner has been Superintendent of Del Rio Golf and Country Club, Modesto, Calif., where automatic irrigation has played a vital role in course development. He has been a member of the USGA Green Section Committee for eight years and is now serving for the second time as President of the Northern California Golf Course Superintendents Association.



An irrigated rough (1) compared to a non-irrigated rough area (2) at Del Rio Country Club. With little summer rain in the San Joaquin Valley, total irrigation is essential.

for a contractor and he should be notified as to the inspection procedure. You, as superintendent, should have the authority to stop the installation at any time if the specifications are not being followed closely or if changes must be made in the field. Assuming you are assigned the inspection job, no pipe should be laid until depths of ditches are checked; no wire or tubing laid until pipe is bedded in; no ditches filled until blueprints are checked making sure all fittings, wires and valves are correctly in place; and no sod laid until back-fill is compacted to avoid settling. Every length of pipe should be checked for cleanliness, no foreign matter should be allowed in the inside to lodge in sprinkler screens or valve parts. During installation you, as superintendent, should devote full time to make certain that no corners have been cut by the contractor. The success of the system very definitely depends upon exactness of installation. An "as installed" blueprint should be in your hands within 30 days after job completion.

Putting the system into operation is simple if wiring or tubing has been connected properly, if the stations at the controller are marked correctly, and all the foregoing items are completed.

It is now that you will really appreciate your search for facts at the project's outset. It is now that your decisions on the type of system, the make and type of equipment, the method of installation, and the careful inspection procedures will pay off. And the decision of the governing body to have selected you, the superintendent, to be responsible for the system's success will be most gratifying and rewarding. You will have made a substantial and long-lasting contribution to your golf course.

COMING EVENTS

Texas Turfgrass Field Day

July 11, 1967, Texas A & M University, College Station, Texas

U.S. Dept. of Agriculture Turfgrass Field Day

August 3, 1967, Department of Agriculture Plant Industry Station, Beltsville, Maryland
Chairman—Dr. F. V. Juska

Northwest Turfgrass Conference

September 20-22, 1967, Harrison Hot Springs Hotel, Harrison Hot Springs, British Columbia, Canada
Chairman—Dr. Roy L. Goss

Arizona Turfgrass Conference

September 25, 1967, Universitiy of Arizona. Tucson, Arizona
Chairman—Dr. W. R. Kneebone

Texas Turfgrass Conference

December 4-6, 1967, Texas A & M University College Station, Texas

Cornell Turfgrass Conference

February 26-29, 1968, New York State College of Agriculture, Ithaca, New York
Chairman—Dr. J. F. Cornman

USGA GREEN SECTION RECORD
40 East 38th Street, New York, N. Y. 10016

TURF TWISTERS

BAR THE "S"?

Question: Would you please settle an argument for us? I have a friend who says the term is 'greenskeeper' while I say it is 'greenkeeper.' Who is right? (California)

Answer: You are, although the Golf Course Superintendents Association of America prefers the term "superintendent" for the man in charge of golf course maintenance. But the term 'green' refers to the entire course and not solely to the putting greens.

AUTOMATIC OR NOT?

Question: What type of golf course irrigation system do you recommend—automatic or manual? (Illinois)

Answer: During the past couple of years the trend is toward installation of completely automatic watering systems where funds are available. Primarily, there seem to be three reasons for this: 1) Economy of water use or better control over exact amounts of water applied; 2) Ease of operation. Any given area of the golf course can be watered with much less effort. Such operations as syringing are much simpler; 3) Labor. It is becoming more and more difficult to obtain golf course labor, and especially the more conscientious or intelligent type needed for watering with a manual system. Nonetheless, there are still many semi-automatic or manual systems being installed and where competent labor is available, results continue to be satisfactory.

BUBBLES

Question: When mixing PMA and a wetting agent in a sprayer we have encountered excessive foaming. How can we eliminate this problem? (New Hampshire)

Answer: One method of reducing foam is by the use of soap flakes. Fill the tank half full of water and add your materials. When foam builds up, sprinkle soap flakes over the top. Be sure to use **soap** flakes and not detergent. There are also some commercial anti-foaming agents on the market.