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Official Organ of The National Association of Greenkeepers of America

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VOLUME I.

No. 6.

An Editorial

By G. A. FARLEY

"THERE is nothing mysterious about maintaining perfect grass on putting greens or anything else pertaining to a golf course. . . . The science of golf course construction and maintenance has been reduced to a point where any reasonably intelligent layman can pick it up readily without a great deal of study."

Here is the assertion of a Green committee chairman who is entering his second season of experience in maintaining a golf course.

Let us analyze his statements, as far as we can, one by one.

The details involved in the practice of any profession are for the most part a complete mystery to the layman. In greenkeeping there are few who will contradict the fact that experience is the most important factor in the construction and maintenance of a golf course. Theory has its recognized place, but practice makes perfection.

Take a mechanic, or a clothing salesman, or a railway mail clerk, any one of which is of average intelligence, but with no background of farm life or the handling of labor or of any standing as an executive, and place him in charge of the maintenance work on a golf course. Give him access to every printed guidance on the subject of greenkeeping to be had. Pay him a salary in accordance with the duties expected of him. Place over him a Greens chairman who will compare in knowledge and experience with any chairman of a Green committee in the country. At the end of one year's time, what are the probable results?

If the chairman of the Green committee is a business executive, as almost all of them are, it is probable that he has spent hours of valuable time on the golf course to the detriment of his business. He is constantly harassed by complaints of the members, and many times humiliated by the appearance of the course as it cannot fail to present itself in the hands of a greenkeeper who is not worthy of the name. He is confronted with labor problems, unnecessary expense, and seemingly endless confusion. Last, but indeed not least, he is never known to enjoy an uninterrupted game of golf on his own course.

Now to the so-called greenkeeper. Granted that he is an intelligent and earnest man, he finds himself constantly referring to the printed word, putting in emergency telephone calls to the over-worked chairman of the Green committee, and for months every day ends in physical and mental exhaustion. He gains knowledge through a series of expensive mistakes, and by wearing his Green committee chairman to the bone. Adding to his salary the cost of his inexperienced efforts, the irritation to which the membership is subjected, the time lost by the chairman of the Green committee, and the greenkeeper's inevitable sense of ineffectiveness (remember he is an intelligent man) and what have you?

Any reader is cordially invited to write the answer.

What Subject Would You Like to Read About in This Magazine?

Send Your Suggestions to the Office of THE NATIONAL GREENKEEPER, 405 CAXTON BUILDING, CLEVELAND

The Greenkeeper and the Bookkeeper

By E. W. DOTY Treasurer Westwood Country Club, Cleveland, Ohio

THE average greenkeeper is just human enough to be interested in his job. If he likes it, as most of them do, he is interested in keeping it or getting a better one of the same kind.

That being so, and it is so no matter how much bunk there may be interwoven about service and love of work, said greenkeeper ought to be careful as to what sort of a record is being written in the account books of his club as the history of his performance.

The greenkeeper works all season, directing men, buying material, mixing fertilizers, coaxing grass, renewing sod, tiling low places, planning, planning, planning. What he does in all these particulars is written finally in terms of dollars and cents in the account books of the club for which he works. He is vitally interested in what is written in that record; that is he is vitally interested that things that have nothing to do with the operation of the course shall be omitted from the record of his performance.

What Should Be Charged to Actual Maintenance

Many club accounts are so written that services, materials and operations are chalked up to course maintenance costs, that should not be so charged up. The result is that at the end of the season the greenkeeper shows a cost of maintenance far above what it actually is.

Surely the greenkeeper is vitally interested in the bookkeeping methods of his club. If the books of a greenkeeper's club show that he has expended \$1600 per hole for maintenance for a season, while other clubs are paying \$1200 per hole, the books prove that he is an extravagant manager. It may be, however, that the costs that should have been charged up amount to only \$1100 per hole, yet the record, which is the only information that others can have, is against him.

What rule ought to be followed?

In my own work of club bookkeeping I follow this rule: Charge to golf course maintenance the cost only of the labor and materials that are necessary to present the course ready for the game of golf according to the rules of the game. This ready condition is to be maintained at all times during the playing season. There are many things done on a golf course for the enjoyment of the game, that are not necessary for the playing of golf. For instance: Caddy masters, professionals, score cards, caddy cards, trophies, tournaments, annual club dinners, ball washers, ice for drinking water on the course, laundry for towels, and many other things.

All of these are necessary for the operation of a club so that the members will get more pleasure out of the game than they might without them, but they really have nothing to do with efforts of the greenkeeper to maintain the course ready for play. The costs for these services and materials should be separately carried on the books and not mixed up with the cost of maintenance. In my own work I dominate these costs "Green Service."

A Fair Basis for Comparison

It will be seen, therefore, that if the record of two greenkeepers is being compared for the same season and only costs allocated under the rule given above, such a comparison is at once valuable and illuminating. A difference of \$400 per hole, when the comparison is upon this basis, would indicate that one course was very poorly maintained, or that one was very extravagantly maintained, or that some of the costs in one course were much higher per unit than in the other, or that too many units were used in one or too few in the other. But if there are mixed in many costs that should not be there, and costs, too, that vary greatly in various clubs, comparisons when made mean absolutely nothing.

Therefore the greenkeeper is interested in the methods used in keeping the accounts of his club, at least to the extent indicated in the foregoing. He may not have the power to compel a change where it may be necessary, yet in the long run he will be able to bring about a proper method where necessary by keeping right at it and being himself prepared at the end of the season to show exactly what his expenditures for the real up-keep work has been. No bookkeeper is going to defend his methods by which maintenance costs are four or five thousand dollars per year higher than the greenkeeper shows it to be, and no green committee would long tolerate such bookkeeping methods.

Can You Identify Brown-Patch?

By JOHN MONTEITH, JR. Associate Pathologist, United States Department of Agriculture

N any group of greenkeepers there is usually a great divergence of opinion as to the cause of brown-patch. There are many who have by repeated observation learned to attribute it to the mold or fungus which they have seen growing over the grass in the early morning. There are others who maintain that insects are entirely responsible for brownpatch. Basing their argument on the observation that it is most frequent in the lower greens or in "pockets," others insist that the injury is simply due to defective drainage. Still others maintain that it is due to poisons generated in the soil or to gases given off in certain low sections of the green. There are a few who prefer to play safe and attribute it to the practically meaningless designation "natural killing out." From time to time one hears a variety of such theories advanced to explain brown-patch. In many cases the deductions are the results of keen observations and careful thought on the part of the individual offering the explanation, but unfortunately, in too many instances, it is merely the result of an over emphasis of "theorizing."



John Monteith, Jr.

John Monteith, Jr. Mr. Monteith's field in his connection with the U. S. De-partment of Agriculture is the investigation of forage crop diseases, and for several years he has been conducting experi-mental work on the identifica-tion, cause and cure of the diseases of golf turf on plots furnished by the United States. Green Section for this purpose. In a later article Mr. Monteith will describe the methods he has used in controlling Brown-patch and the results of his careful experiments. Prior to the scientific investigation for which Mr. Monteith is respon-sible, many putting greens were completely destroyed by this turf disease.

Be Sure it is Brown-Patch Before Treatment

Perhaps the most important reason for the conflicting ideas as to the cause of brown-patch is the rather general confusion among greenkeepers in certain localities as to just what brown-patch is. In any discussion of this turf injury it is well to start out with a warning remark that not every patch of browned turf is brownpatch. This is perfectly obvious to most greenkeepers but for the benefit of those who still fail to draw these distinctions it is well to point out that there are many other types of injury which are frequently lumped together under the heading "brown-patch." Among these may be mentioned: injuries produced by grubs or insects feeding on the roots or blades of grass; drying out, especially on knolls; poor drainage and too much water, especially where it settles in pockets and "drowns out" the grass; poor soil conditions; chemicals applied in excess; snow mold or other winter injury.

Naturally unless one distinguishes between these various types of browning he is unable to give a single explanation which will apply to all and is likewise prac-

tically helpless in fighting it for it is ap parent that the control for any of these turf injuries depends wholly on their separate causes. The general designation of "brown-patch" to cover all browning of turf may in a general way be likened to our term "sick" as applied to human ailments. Years ago, before the advent of medicine, a man who was not healthy was simply "sick" or "possessed with an evil spirit." He was submitted to the ceremony of driving off the evil spirit, or was later treated with the more advanced practice of "bleeding." Today we smile at those methods of cure in spite of the fact that their advocates no doubt were able to point to innumerable cases which were "completely cured" by those means. Nowadays a man may be "sick" but even in the popular mind that is not sufficient diagnosis; he is suffering from tuberculosis, diptheria, pneumonia or some of the various other human ills and the treatment is administered according to the disease. It is true that most of us can not recognize the fine distinctions between many of these human ailments but we have con-

fidence in the scientific methods at present available to distinguish between them. In greenkeeping there are many who still consider that any brown or "sick" grass is "brown-patch" and as a result the methods sometimes used to control the injury are in some respects about on a par with the ancient practice of "driving off the evil spirit."

Two Distinct Types, Large and Small

To the large majority of observant greenkeepers, in sections of the country where it is common, brown-patch means a definite kind of injury. There are two well recognized types which to most greenkeepers need no introduction; the large spreading one known as "large brown-patch" and the smaller one known as "dollar spot" or "small brown-patch." At times it is difficult to distinguish between them but as a rule the symptoms are entirely different and they offer little chance for confusion. Large brown-patch appears suddenly as circular or irregular areas which at times may be several feet across. Ordinarily they measure from two or three inches to two feet in diameter. In the early stages there



Large brown-patch showing the light, browned areas as contrasted with the dark healthy grass

is usually a blackened or scalded appearance and one can see fine cob-web-like threads spread over the grass. On close examination it is found that the majority of the grass leaves in this affected area have lost their normal green color, appear blackened or scalded and are no longer turgid. When exposed to the sun or wind the affected leaves turn brown and dry out, giving the area of dead leaves a brown color which has resulted in the name descriptive of the injury, "large brown-patch."

This browned area frequently continues to enlarge, in which case there is a dark border where the grass has just become affected. This dark border is frequently referred to by greenkeepers as the "smoke screen" due to its dark or smoky appearance as contrasted with the green of the healthy turf beside it. In mild cases the percentage of leaves involved may be so small that little injury is done and the normal color returns in a few days, as soon as new blades develop to replace those that have been killed. In severe cases most of the leaves are destroyed and recovery is necessarily much slower. If the turf is in a weakened or starved condition the recovery from an attack of brown-patch is slow, whereas if it is growing rapidly the scars are soon hidden by the new growth. In any but the most severe cases the stolens or buds of grass are not killed, which means that they are able to grow again and replace the injured turf as soon as brown-patch is no longer spreading.

Dollar Type Most Injurious

"Small brown-patch" or "dollar-spot," as the name implies, is much smaller, occurring as bleached or light straw-colored spots which usually do not become larger than a silver dollar. Frequently these spots are so numerous that they join and affect practically all the grass over a large area. The turf in these spots is as a rule more seriously damaged than in the case of large brownpatch, but in this type also the buds and roots may escape uninjured. Like large brown-patch, this injury appears suddenly and overnight the green may develop the "moth-eaten" appearance so well known to greenkeepers where dollar-spot is common.

Not All Fungus Denotes Brown-Patch

Before we can efficiently and intelligently prevent or control any injury it is essential that we know something about its origin. The causes of many turf injuries are perfectly obvious but others can be definitely traced only by means of modern scientific methods. Brown-patch belongs to this latter group. All the theories and observations of greenkeepers could not be expected to definitely determine the cause of brown-patch, since the actual proof involves the use of a microscope or other equipment not available on golf courses. For instance, the finding of a fungus constantly associated with the dead grass does not necessarily prove that the fungus killed the grass for everyone knows that if grass clippings are thrown in a moist place they will soon be covered with a mold, or fungus. The fungus in the latter case does not affect the grass until after it is killed by cutting and furthermore this fungus when placed on healthy plants even under the most favorable conditions does not in-



Dollar-spot or small brown-patch; showing the typical speckled appearance of turf affected with this disease. The pencil will serve to indicate the relative size of spots

jure growing grass. In the case of brown-patch, we are able, by means of a microscope, to see the fungus penetrating into the growing grass blade. By various methods used in the study of both animal and plant diseases it is possible to grow the fungus free from any other organism and to produce the disease by placing this fungus on healthy grass. In this way we can check up on theories by scientific methods and readily prove the cause of brown-patch.

Diseases of plants caused by fungi are by no means new. Every farmer is familiar with the rusts of grain, mildews of various crops and the numerous other injuries to plants caused by fungi. It has been shown by scientific methods that both types of brown-patch are also plant diseases caused by fungi, readily distinguishable when grown in the laboratory. Many greenkeepers have for a long time been aware that brown-patch is due to the cob-web-like growth of fungus which they see growing over the patches early in the morning although some have confused it with the harmless spider webs which are conspicuous on greens covered with dew. This article is written for the benefit of those who are not familiar with brown-patch or who have not observed the fungus on the grass where brown-patch is developing. If those who doubt this relationship will make a point of carefully examining turf early in the morning when the disease first appears, they will no doubt soon be able to distinguish the threads of the fungus and will observe the wilted leaves hours before they dry and turn brown.

A fungus is a form of plant life; the most familiar are mushrooms, toadstools and molds. As in the case of our green plants, there are thousands of different fungi. One need only be reminded of the numerous cases of poisoning due to eating poisonous mushrooms to realize that there is a distinct difference between fungi.

Brown Patch Fungi Live in Soil

Greenkeepers frequently notice a mold growing over their compost piles and become somewhat concerned as to whether this fungus is the same as that causing brownpatch. There is always a possibility that the brownpatch fungus may be present but the common forms growing over manure or compost piles are entirely different from those causing the two types of turf diseases. The brown-patch fungi live in the soil and under certain conditions may be entirely harmless. When conditions are right the fungus grows up over the grass and penetrates into the leaf. When once it has gained entrance into the blade it feeds on the grass sap and finally destroys all the portion that has been penetrated, therefore, the recovery of the browned turf must depend on the production of new leaves to replace those that have been injured. This has a direct bearing on the use of ammonium sulphate or other fertilizers to stimulate grass after an attack of brown-patch.

When it is stated that brown-patch is caused by a fungus which has been in the soil for some time the question is usually raised as to how it happens that the disease appears so suddenly and at other times there



The large brown-patch fungus grown by laboratory methods. (Magnified 5 times)

is no trace of any injury whatsoever. Also why does it affect one green and leave another on the same course untouched? Numerous similar questions are asked by greenkeepers who are interested in determining the "why and wherefore" of brown-patch.

In considering a disease of this type it must be remembered that we are dealing with two separate plants; grass and the disease-producing fungus. Each of these living things is influenced by its surroundings. Every greenkeeper knows that grass grows best at a fairly low or medium temperature. Although it needs plenty of water, too much is as detrimental as not enough. It thrives in a certain type of rich soil. The common putting green grasses usually grow best when they have plenty of sunlight; provided they are not allowed to dry out too much in sunny weather. A great many other factors might be cited which affect the growth of grass. The fungi causing brown-patch are likewise stimulated or retarded by moisture, sunlight, temperature, soil and many other factors. These conditions may affect both grass and fungus in the same way or they may have directly opposite influences.

Conditions Influence Growth of Fungus

As an example of the latter we may take sunlight. Every greenkeeper knows that if he covers grass with anything which keeps off the sunlight for a few days, the grass will become yellow and generally unhealthy in appearance. Furthermore, if the cover is left on long enough there will be a moldy growth (fungus) over the soil and dead turf. In other words, sunlight is a direct help to grass and darkness is helpful to growth of fungi. In prolonged periods of cloudy weather the absence of bright sunlight may have a direct bearing on brownpatch, for the grass is less vigorous and the fungus causing the disease has a chance to develop unchecked. Cloudy weather alone will not induce brown-patch, however, for there must be plenty of moisture for the fungus to grow. A cloudy day, with a good breeze which keeps the grass perfectly dry, does not provide conditions favorable for the fungus. If one takes two pieces of dry bread and puts one in a perfectly dry place and the other in a moist place he will soon see a difference. Even though both are in the dark and at about the same temperature, the one where there is plenty of moisture soon becomes covered with a mold whereas the dry . piece is not affected. The same influence of moisture



Brown-patch fungi grown on a gelatin-like material in glass dishes. The fungus at the left causing small brown-patch is readily distinguished from the large brown-patch fungus on the right