

Probing the Diseases of Turf Grasses

By DR. JOHN MONTIETH, JR.*

THE numerous pests of golf turf may for convenience be placed in two classes: animals and plants. Among the animal pests are earthworms, grubs, insects and various rodents, including, if you choose, the violent-tempered player. Among the plant pests are the weeds and the lower forms of plant life, fungi and algae. It is this latter group which will be considered in this discussion, for the big majority of plant diseases are caused by fungi.

Rusts and Smuts

The most destructive diseases of cereal crops are the rusts and smuts. Corn, wheat, oats and the like are closely related to turf grasses and it is therefore not strange that we find some of the diseases of these crops on turf. One frequently hears of heavy infestation of rust throughout our grain belt which may seriously affect the crop and thereby the grain market. Rust appears as circular or elongated spots on the stems and leaves of grain or grasses. In certain stages these spots have a reddish color, resembling rust on iron, but at other times the spots are dark brown or black.

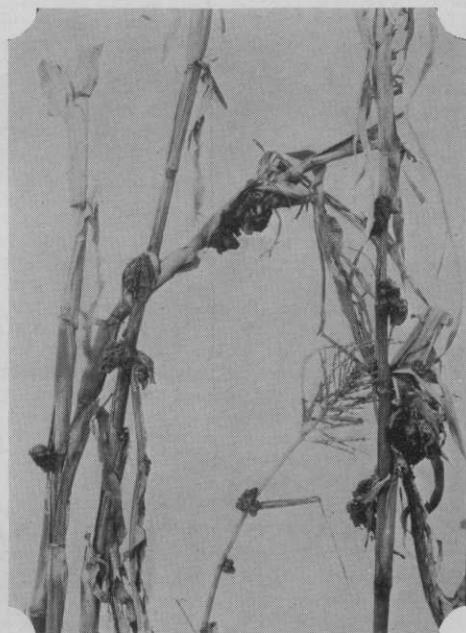
Smuts cause a swelling or distortion of the affected parts of the plant and when fully developed these enlargements break open and expose the mass of black, soot-like spores of the fungus. Probably every greenkeeper is familiar with the large swellings so commonly produced by the smut fungus on corn plants. On the turf grasses smut usually occurs as black, elongated, streak-like injuries on leaves and stems.

Both the rusts and smuts cause some dwarfing of plants but are of greatest importance in the effect they exert in reducing yields of seed. Therefore, although these diseases are frequently common on fairways and the rough, they usually are of little importance on golf courses.

Blue Grass Leaf Spot

Another disease common to cereals and turf grasses is that caused by a fungus called *Helminthosporium*. This disease

occurs as irregular spots on the grass blade. It is found on many grasses, but is particularly noticeable on Kentucky bluegrass. At times bluegrass fairways turn brown and appear dried out, even when there is adequate moisture in the soil. An examination of the plants in such cases frequently reveals the cause of this brown appearance to be due to the abundance of these dead spots on practically every leaf of grass. When one of these spots occurs across its base the entire upper part of the



Corn smut; a similar fungus sometimes attacks turf

leaf is killed. When such spots are sufficiently numerous the turf loses its healthy green color and growth of the plants is checked.

Powdery Mildew

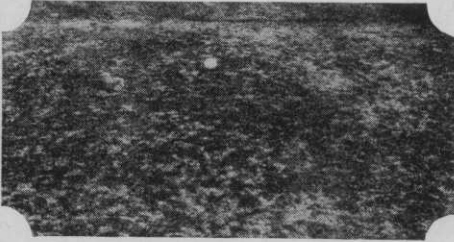
Mildew is a fungous disease found on a great variety of plants. It appears as a white powdery growth on the surface of the leaf, particularly the under side. In severe cases the leaf looks as though it had

*Address at National Greenkeepers' Association convention.

been dusted with flour. It is perhaps best known on roses, lilacs and other ornamental plants, occurring especially in the fall when the leaves are all matured. This disease is frequently found on grass, more frequently in shaded places, but except under unusual conditions it causes little serious injury to turf.

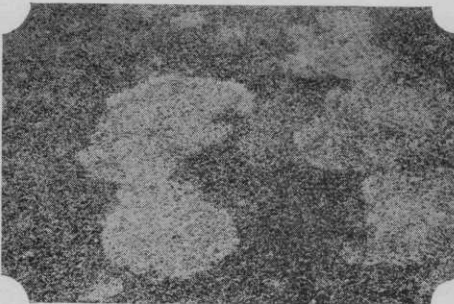
Slime Mold

There is a fungus growth widespread on turf grasses which is worth mentioning, but which should perhaps not be regarded as a disease since it apparently causes little damage to the grass it grows on except under unusual conditions. It is one of the so-called "slime mold" fungi which grows up suddenly and covers patches of



Small brown-patch can ruin a green overnight

grass with a steel grey covering. After a day or two this fungus breaks up and liberates multitudes of black powdery spores. If the hand is rubbed across one of these patches the tiny spores will adhere to the skin like so much lampblack. This fungus is common on courses throughout the country and is especially noticeable on approaches or bunkers in the vicinity of



Large brown-patch is equally destructive greens. It is usually merely a superficial growth which, although undoubtedly objectionable from the standpoint of appearance, it ordinarily causes no actual damage to the green and as soon as matured can

be readily removed by using a little extra force in watering these patches.

Brown-Patch

Since the two common types of brown-patch have been recently described in GOLFDOM, it is unnecessary at this time to give any detailed description. Small brown-patch is known practically everywhere in this country and may occur at almost any time during the growing season. It is recognized as more or less definite spots of different sizes, seldom exceeding the area covered by a silver dollar. The grass is killed in these spots and as it withers it turns the characteristic bleached, brown color. These spots may be so numerous that they join and thus destroy a large area of turf.

Large brown-patch, as the name implies, affects a much larger area than does the small brown-patch fungus. Frequently a single patch may be two feet or more in diameter. The affected grass blades are killed and as they wither and turn brown they give to the affected area the brown color so well known to most greenkeepers. Around the border of these patches one frequently finds a darker ring where the fungus is still active and spreading out into the heretofore healthy grass. This dark border is usually referred to by greenkeepers as the "smoke screen," and whenever it is apparent it indicates that the fungus is still active and spreading.

Pythium Is Probed

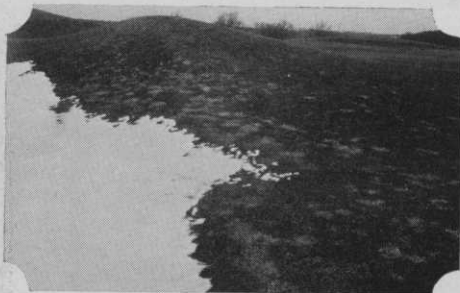
A type of brown-patch which has received little attention so far is that produced by a fungus called Pythium. This fungus requires a high temperature and plenty of moisture for its development. It is not likely to be a common pest on our northern courses, but it occurs frequently on the Arlington turf garden and will probably be found widely distributed on courses in that latitude or southward. It has probably been generally overlooked, due to confusion with large brown-patch, the symptoms of which are somewhat similar. Grass affected with Pythium turns a slightly different shade of brown than when affected with large brown-patch. This fungus usually kills every blade of grass within the affected area, whereas in large brown-patch there is usually a fairly large proportion of blades that escape uninjured. It is probable that much of the severe damage reported in the more southern regions as due to large brown-patch are in reality due to this more destructive fungus, Pythium. It is also probable that some of

the failures to control large brown-patch by the ordinary means may be attributed to some confusion with this other disease. However, it will be necessary to study the subject more thoroughly before we can draw any general conclusions.

There is another type of disease which is usually referred to as large brown-patch but which apparently is due to some other fungus. It occurs on greens as rings which in some aspects resemble small fairy rings. They behave like large brown-patch in many respects but the grass in the center is not affected. This injury is reported as common in New England, several mid-western sections and in California. No one has studied this type of brown-patch carefully and until it has received more critical attention we are unable to furnish much information concerning it. All indications lead one to believe it is caused by a different fungus than that producing either large or small brown-patch.

Snow-Mold

Snow-mold is another fungus of the brown-patch type which has recently been



Poor drainage during a thaw may result in a severe attack of snow-mold

recognized as a serious disease of golf turf. Much of the so-called winter injury reported on northern golf courses can undoubtedly be attributed to attacks by snow-mold. This fungus thrives at a much lower temperature than is favorable for growth of most plants. A covering of melting snow provides the conditions of low temperature and excessive moisture suitable for development of this fungus and, therefore, it has been usually associated with snow and has for that reason been called "snow-mold." Many have been confused by this common name. It should be remembered that this fungus is not dependent upon snow except in the indirect way of providing proper temperature and moisture. This diseases has been observed

repeatedly on turf which had not been covered with snow. In such cases, however, it developed during periods of thaws when light showers, heavy fog and cloudy weather maintained sufficient moisture on the turf for growth of the fungus for days at a time.

Fairy Rings

Fairy rings are frequently found on golf courses, especially on old fairways. These rings are produced by several different fungi which have grown from a center and spread out into new soil each year until



Mushrooms growing in a fairy-ring 17 feet across

the circle is perhaps 20 or 30 feet in diameter. Frequently these rings start from an old decaying stump or pile of manure in which the fungi make their initial growth. At times this fungus growth may be killed in a portion of the circle and the rest may continue to develop. In such cases instead of a complete ring one finds a crescent-shaped outline on the turf. The grass is often killed where the fungus is growing but just at the border of the dead ring the grass is usually a darker green and more vigorous.

Algae

On greens which are low and poorly drained, or even on well drained soil during wet weather, one frequently finds a green scum over the turf. It is especially noticeable where turf is thin or where it has been injured by diseases or chemicals. After a short dry period this scum turns dark and dries out to form a tough, paper-like sheet. In severe cases the grass beneath this covering is smothered and the putting surface is ruined. This green scum is made up of a heavy growth of fine microscopic plants known as algae. These plants are found in practically every stagnant pool and at times are a serious nuisance on larger bodies of water. They thrive only in the presence of abundant moisture and, therefore, excessive watering, rains, cloudy weather and poor drainage all contribute to encourage them.