Turf Diseases and Their Control

By John Monteith, Jr., and Arnold S. Dahl

The constantly rising standard of excellence in the maintenance of golf turf continually confronts the greenkeeper with new problems. Not the least of these is the problem of turf diseases, which often evidences itself so unexpectedly that the greenkeeper is for a time at a loss to understand the real nature of the difficulty with which he must cope. It is the purpose of this number of the Bulletin to present material which may be of aid to the greenkeeper in diagnosing his turf troubles, and to suggest remedies which, in the light of our present knowledge, appear to be the most practical, the safest, and the most economical. Previous results of, and reports on, the study of turf diseases have appeared in this and other publications from time to time. It is hoped that this number of the Bulletin will meet the demand for a handy reference booklet by consolidating the old and the new information available. The subject will be treated by first presenting such fundamentals of plant pathology as may aid the greenkeeper in understanding turf diseases, then by describing common methods for controlling them, and lastly by discussing in turn the diseases and suggesting remedial measures.

In presenting this material the authors are aware that in many respects the study of golf turf diseases is still in its infancy. In some cases little or nothing is known of the causes of a disease or of the treatments likely to be effective. In some cases the possibility of injury to turf from an existing disease is recognized although its actual workings can not as yet be traced. Without a doubt there are also many hitherto unrecognized diseases at work the effects of which are being attributed to an incorrect source. In this sense, therefore, our present study must be considered as only preliminary and in no way final, but it is hoped that, by this presentation of information available to date, the disease problems confronting the greenkeeper will be clarified and encouragement will be lent for further study.

Turf Diseases Existed Before the Origin of Golf

The question as to when diseases first appeared on golf course turf will probably never be settled. Among the older golfers there are many who insist that turf diseases never appeared on golf courses in the good old days. Other golfers of equally long experience testify that they observed browned areas of turf similar to the modern turf ailments when they first played the game. Some of the old cuts showing players near the cup indicate that the putting greens of early days were by no means exempt from thin and perhaps dead patches of turf which were possibly the result of diseases. It has been demonstrated many times that memory is not dependable for recording information of this type. From all information available it is entirely safe to assume that turf diseases date back much further than the origin of golf. It is quite apparent, however, that early golfers were not as critical of the turf on which they played as are the golfers of today, and consequently the question of disease was to them of little importance. The artificial conditions of growth to which turf has been subjected on golf courses have undoubtedly increased the damage caused by turf diseases. At the same time, the improvements in turf have tended to make the modern golfer far more critical and have increased the demand for turf of quality kept free at all times

from any damage caused by disease or other agencies. A single small dead patch of grass on an otherwise perfect carpet of closely-clipped putting turf may be much more noticeable and arouse far more objections than would a dozen or more larger patches on a poor green of coarse grass improperly maintained.

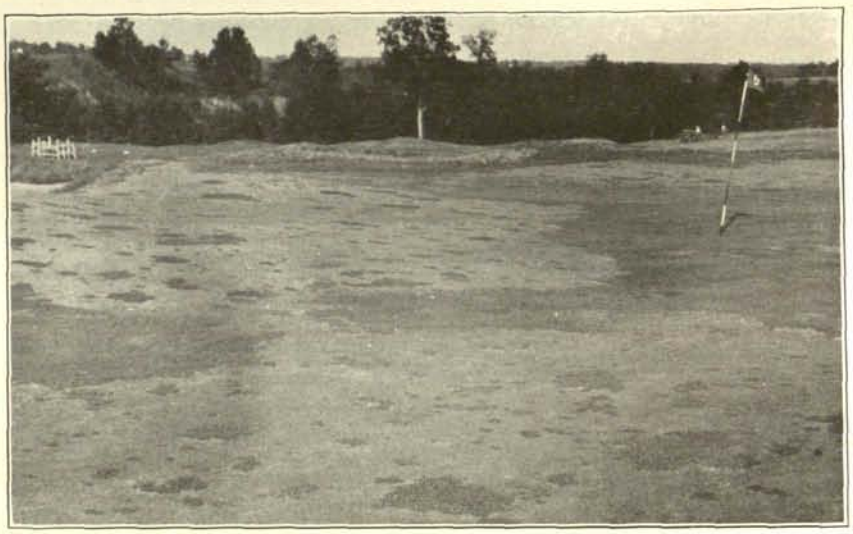

Figure 1.—An example of how turf diseases may ruin expensive putting greens. The light areas in the illustration represent the dead, browned turf resulting from different diseases. Most of the dark patches of green which remain are chiefly clover or other weeds. Such a condition necessitates replanting, results in much inconvenience to players, and adds greatly to maintenance costs.

From the practical standpoint, the discussion of whether turf diseases occurred twenty or fifty years ago on golf courses is of no importance. The important thing is that present-day golfers are constantly demanding improvement in turf and are becoming less tolerant of poor or dead patches of turf anywhere on playing areas of a golf course; consequently, to those charged with the care of turf, injury or damage at all seasons becomes a problem, and the problems of preventing injuries to turf increase as the demands of the golfers make it necessary to impose more artificial and exacting cultural methods.

We First Hear of "Brown Patch" in 1914

The modern interest in turf diseases seems to trace back to the definite recognition of a disease in the turf garden of Fred W. Taylor at his home in Philadelphia in 1914. In 1915, from browned patches of turf, a fungus was isolated which later was proved to be the cause of this injury. From that time there has been a constantly increasing interest in turf ailments of all kinds.

The disease recognized on turf in 1914 and 1915 was given the descriptive name "brown patch" which led to much confusion. Another disease was later recognized which was designated "small brown patch." Any casual student of turf knows that when turf grasses are killed by any means they usually turn to some shade of brown; therefore, if a sufficient percentage of grass is killed in an area it is

likely to form a browned patch. Consequently a great many injuries which produced browned patches of turf have been designated "brown patch" without recognizing that the term was intended to apply to two definite injuries. The designations "large brown patch" and "small brown patch" have proved unsatisfactory in view of the fact that size of the affected area is not the important characteristic in diagnosing these diseases. With the more general recognition of the limitations of these two names there has resulted less confusion. Many individuals who do not keep well informed on these questions are still confused by these two misleading descriptive common names. In order to minimize this confusion the Green Section recommends that the designation of size be omitted from the name "large brown patch" and that the disease hereafter be designated simply by the compound word brownpatch. Further, that the name "small brown patch" be discontinued and replaced by dollarspot, which has already been applied to this disease. These small changes may avoid some confusion. It is well recognized, however, that unless fundamental principles are well understood, mere changes of names do not avoid misconception and futile arguments.

Basic Principles Must First Be Understood

In order to understand turf diseases and to be in a position to treat them intelligently one should have an understanding of some of the basic principles of plant growth and the manner in which diseases develop. One frequently finds injured turf on golf courses being treated with expensive fungicides in an attempt to check a loss due to chemical injury, poor drainage, or some factor other than a fungus. Such treatments are not only wasteful but often they actually aggravate conditions and result in still greater loss. In other instances, elaborate sprinkling systems have been installed which, by careless use, have resulted in great loss of turf, and, instead of correcting the misuse of water, expensive applications of fungicides have been made. If any careful observer understands some of the fundamental factors which at one and the same time influence the growth of grass and encourage the growth of fungi, he is better able to understand why it is that disease develops at certain times on one green and not on the rest of the course, and why a certain treatment will work under a certain set of conditions and not under others. For these reasons there is included in this number of the Bulletin a brief discussion of fundamental factors affecting plant diseases and their treatments.

PARASITIC DISEASES

For centuries botanists have recognized the existence of two distinct groups of plants, (1) those which are green or contain green material and (2) those which do not contain green material. This latter class includes the fungi and bacteria, and to them can be traced a host of diseases which destroy the vegetation on which man and beast depend for sustenance, as well as many serious ailments which arise to afflict man and beast directly.

Plants which contain green material are self-supporting and those which do not contain green material are dependent. The former, through the agency of light, are able to build up organic food from comparatively simple inorganic chemical compounds. They are the only living things which have this ability. The green matter in these plants is chlorophyll. All animals, and all plants of the second group,