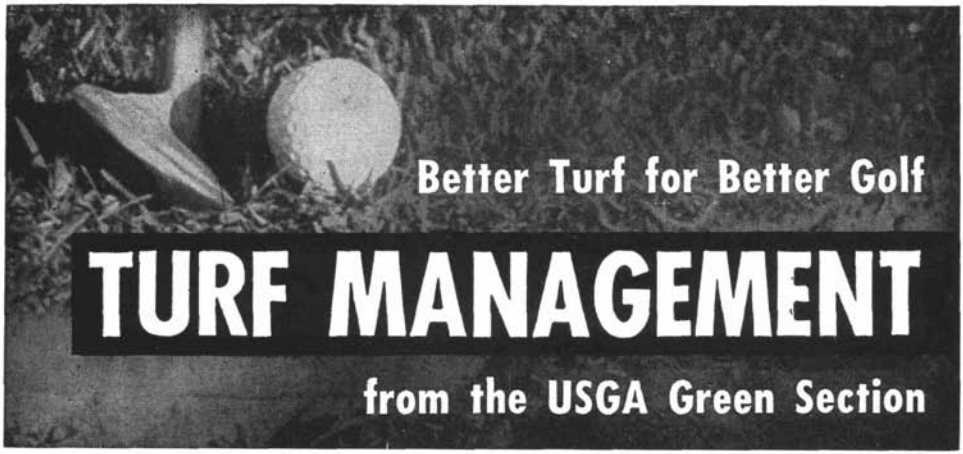

Spring Dead Spots of Bermudagrass

By D. F. WADSWORTH AND H. C. YOUNG, JR.
Department of Botany and Plant Pathology, Oklahoma Agricultural Experiment Station, Oklahoma State University, Stillwater

ABSTRACT

A disease of bermudagrass turf called spring dead spot has become prevalent in Oklahoma. During the past three years bermudagrass has suffered extensive damage which is characterized by dead areas of turf that are apparent only after the grass begins to grow in the spring. The cause of the disease is not known, but it appears to be due to fungi which attack the root system while the grass is dormant.

A disease, which is now called spring dead spot, was observed in a bermudagrass (**Cynodon dactylon**) lawn at Stillwater, Oklahoma during the spring of 1954. Since that time, this disease has been found throughout much of the State on lawns, golf courses and many other public and private turf areas. The prevalence and severity of spring dead spot has steadily increased and during the past 3 years has become the most important disease of bermudagrass in Oklahoma.

Conversation and correspondence with golf course superintendents and other turf grass area managers has led to the conclusion that this disease may have been present, at least locally, for many years. The only concrete information, however, came from Mr. Bob Dunning of Tulsa, Oklahoma, who believes, in the light of present investigations, that he observed spring dead spot as early as 1936.

Reports which indicate the distribution of the disease are rather vague. It was reported from Kansas in 1959, and was observed by the senior author in the turf plots at the University of Nebraska, Lincoln, Nebraska, the same year. Following a discussion of the disease at the Annual Conference of the Oklahoma Turfgrass Association in December, 1959, various individuals reported that this, or a similar disease, has been seen in Pennsylvania, Missouri, and Arkansas.

Symptomatology

When bermudagrass begins to grow in the early spring well defined, circular, dead spots may be present. Individual spots vary in size from a few inches to 3 or 4 feet in diameter. The margins are usually even but may become irregular when spots have coalesced to form large, dead areas several feet across. Foliage of the dead grass is a bleached straw color, while the stolons and roots are black and rotted. These plant parts characteristically appear to have been dead for some time, and there is no obvious indication at any time during the year that the causal agent of the disease is active. In other words, there are no obvious preliminary symptoms. The damage appears to occur while the grass is dormant; therefore, the appearance or spread of

the disease can be observed only each spring when grass resumes growth.

With few exceptions all of the grass in the affected spots is dead. Occasionally a tuft of grass may survive in the larger spots and, where this occurs, the affected area is doughnut shaped. The dead area of such spots may fill from the inside to the outside in 3 or 4 years. Usually, however, the larger dead spots will remain void of bermudagrass for a number of years and other grasses and weeds become well established in the affected area during this time. The presence of this disease often can be detected by this particular pattern of plant invasion.

There is a tendency for the surrounding grass to fill in the smaller spots when conditions are favorable. This occurs if the stolons bridge the dead spots and become rooted on the far side. Stolons that fail to bridge eventually die as the new, small roots rot away.

The disease has not been associated with any particular type of soil or topography.

Host Range

Spring dead spot has been observed only on bermudagrass. It is known to occur on the varieties African, U-3, Common, Tiffine, and Tifgreen; however, the most extensive damage has occurred on U-3. A number of other bermudagrass varieties have been introduced in recent years but their reaction to this disease has not been determined.

Spring dead spot on bermudagrass has been observed only under conditions of management which produce a high quality turf and not under conditions with a pasture grass type of management.

Etiology

Bermudagrass sometimes suffers from winter injury, snow mold, and insects, and these types of damage are commonly mistaken for spring dead spot. The true cause of the disease now known as spring dead spot, however, is not known. Fungi are found consistently associated with the disease and on extremely rare occasions white grubs and/or plant parasitic nematodes are present in small numbers. Isolations from diseased tissues yield many fungi; however, only certain unidentified species of **Helminthosporium** are consistently obtained.

African, U-3, Sunturf and Common varieties of bermudagrass have been inoculated with eight different isolates of **Helminthosporium**; some of the inoculations have been in the greenhouse and some in the field. No symptoms of spring dead spot developed in any of these tests.

Bermudagrass taken from the periphery of dead spots and transplanted by various methods into flats of sterilized or screened soil and subjected to intervals of growth and dormancy over a 3-year period failed to develop symptoms of the disease.

Spring dead spot occurs most frequently in areas where high quality turf has been established; consequently, it was thought that certain fertilizer practices may influence the development of the disease. However, after comparing the fungicidal-*fertilizer, calcium cyanamid*, and ammonium nitrate for 3 years, there appears to be no difference in their effect on disease development.

Further studies on etiology and control of spring dead spot area are in progress.

Discussion

It seems likely that the recent importance of spring dead spot is due to greater prevalence than in previous years. The increase in disease prevalence may be the result of a greater use of bermudagrass turf for home lawns and public areas, and since spring dead spot is found only in well-cared-for turf, it is possible that the disease will continue to increase in prevalence and importance.

The cause of spring dead spot is not yet known. However, observation of the disease since 1954 leads to the conclusion that is it due primarily to root-rotting fungi. The damage appears to occur during the winter season while the grass is dormant, which might suggest that the causal agent involved is a cool weather pathogen. This suggestion may be misleading, however, since there are frequent warm periods of short duration throughout the winter, at least in the southern and southwestern areas of the United States.

Many fungi have been obtained by isolation from the rotted root systems and stolons but the only fungi found consistently were **Helminthosporium** spp. Several species of this genus have been isolated and any one or all may have

been involved in the disease. If one or more of these species of **Helminthosporium** were involved, however, the conditions favorable for infection and/or disease development were not easily reproduced.

White grub worms and plant parasitic nematodes have been found associated with spring dead spot also but not with sufficient regularity to be considered as primary causal agents. When either or both of these agents were associated with the disease they probably only enhanced the damage already done.

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WAYNE ALLEN CALLED TO ACTIVE MILITARY SERVICE

W. Wayne Allen, agronomist, who has served for two years in the USGA Green Section's Southwestern Office, began a tour of active military duty on October 15. Mr. Allen is a member of the 49th Armored Division which was one of the two divisions called up for the purpose of strengthening our nation's active military force. He has been granted a military leave of absence and it is expected that he will return to the Green Section staff upon completion of his tour of duty.

Why Keep Records?

By MARVIN H. FERGUSON
Mid-Continent Director, and National Research Coordinator, USGA Green Section

The most obvious reason for a golf course superintendent to keep records is that of enabling him to account to the members of his club for **their** money which he has expended in the process of maintaining **their** golf course. This alone is reason enough for adequate records. It is the club's property. It is their money. The members have a right to know how their money was spent and what was accomplished through its expenditure.

There are many additional dividends to be gained from the keeping of adequate records. Good records help the superintendent to gauge the effectiveness of his operations, to accurately estimate costs of future work, to prepare a sound budget, to be able to predict machinery and equipment replacement needs, to evaluate the performance of men and equipment, and to compare maintenance costs with others (on a valid basis).

Measuring Effectiveness of Work Done

The turf around trees near tees and alongside fairways has been nicely trimmed and provides a pleasing appearance. Most club members like it that way and usually no questions are asked. But suppose an economy-minded member inquires about the cost of this trimming. He is entitled to know. Can you give him the answer?

There is some evidence of grub damage on fairways. This damage will not be excessive but it could be cleared up completely with an application of a soil insecticide. Is it worth the cost of treatment now or should the operation be postponed until next year? How much will it cost for materials and for application? The answer to the first question must be based upon one's budget position and the attitude of his club with respect to standard of maintenance. It is a question of judgment. The second question is one of fact, however, and can be answered rather precisely on the basis of records kept in the past.

Grass in fairways is growing rapidly. Clippings are so heavy they are lying on top of the turf. They are unsightly and they stick to one's shoes when they are wet with dew. Why have these clippings become so heavy? Has rainfall been heavier than normal? Has the night irrigation man been spending more time than usual on the fairways? How much fertilizer was applied? When? Good records will provide this information and perhaps give a clue to the factors contributing to the excessive growth.

There is excessive **Poa annua** in the collars of greens—more than in other years. Could a weed control treatment, which eliminated some existing vegetation, have coincided with the period of **Poa annua** germination? Or was there a