

The Effect of Watering on Brownpatch

THE development of brownpatch on greens is influenced by a number of soil and climatic conditions, including texture and fertility of soil, drainage, temperature, humidity and rainfall. Many of these conditions cannot be controlled, but some which affect this disease can be controlled or at least somewhat modified. Probably the most important of this latter group is watering.

From the standpoint of the health of grass, most greens are overwatered. A good share of overwatering is due to the demands of golfers for excessively soft greens.

A few years ago the Green Section conducted tests on watering greens at different times and with varying quantities of water. Records were kept of the development of brownpatch in connection with the different treatments.

It was found that where only sufficient water was used to keep the grass in good condition, brownpatch could be readily kept in check. Where heavy watering was practiced (five times the quantity used in the lighter watering), the disease was from three to seven times as serious as in the areas receiving the light watering. Where only a small amount of water was used,

twice as much disease developed where the water was applied in the evening as compared with turf watered in the early morning. Where an excessive amount of water was applied, the disease was about equally severe in the areas receiving the water in the evening and in the morning.

Therefore, where greens are watered moderately, early-morning watering is preferable to evening watering. On the other hand, where greens are watered in excess, it doesn't make much difference at what time of day the water is applied.

Much damage caused by brownpatch could be avoided if water were used more sparingly. Reduced watering schedules should be started, however, in the spring. If greens are overwatered early in the season the roots will remain shallow and the greens will therefore quickly suffer in dry periods. On the other hand, if a moderately dry green is tolerated during the spring months there is a tendency for the grass to develop a stronger root system, with the result that less water will be required to keep the turf in good condition during the summer.

Prolonged periods of excessive rainfall during the spring or the summer months make it necessary to adjust watering schedules to take care of the reduced root systems. Contradictory though it may sound, it is advisable to water more frequently after long excessive rains than during periods of normal rainfall.

Spread of the Japanese Beetle

IN THE past 22 years since the Japanese beetle is supposed to have been first introduced into the United States, it has spread until it now continuously infests an area about 11,400 square miles, most of which is in New Jersey but extends into New York, Pennsylvania, Delaware and Maryland. Isolated colonies occur in many other States.

Turf on greens and fairways often has been ruined in the continuously infested areas. Arsenate of lead is applied to the soil either to control this pest or as a safety measure to prevent an almost certain infestation and resulting injury to the turf. This treatment is expensive, costing from \$20 to \$50 an acre, and may have to be repeated after four or five years. In many instances this arsenate of lead has been used as a precautionary treatment against Japanese beetles

on golf courses where there was no immediate threat from these insects. It is therefore important to know something about the distribution of this pest before applying the remedy.

The natural spread of the pest is by the short flights of the adult beetle. Thus, the spread of the continuously-infested areas is only a few miles a year. Isolated infestations scattered in the other States presumably were started by a few beetles that were carried there in shipments of fruits or vegetables.

During the past few years the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture has enforced strict regulations on the shipments of fruits and vegetables from the infested areas. This Bureau also keeps a careful lookout for adult beetles in different parts of the country. Insect traps baited with substances that give off odors attractive to the beetles are set up in various sections. The

traps are not expected to reduce noticeably the number of beetles, but serve to give an idea of the relative abundance of the insects in any particular area. In 1937 111,000 traps were set in 25 States scattered from Florida to Vermont.

On the basis of the past three years of trapping, it seems that the abundance of beetles in several of the locally-infested areas has decreased. This is especially noticeable in the middle western States. In St. Louis in 1934 the catch was 1,351 beetles; in 1935, 1,232; in 1936, 88; and in 1937 only one lone beetle, despite the fact that the trapping was more intensive than ever and that more than 12,000 traps were in use in that one region. In Detroit the catch fell from 128 in 1936 to 67 in 1937. In Chicago there were 3,740 beetles trapped in 1936, but only 384 in 1937.

This great reduction in the number of Japanese beetles trapped is a good indication that the number of beetles and resulting larvae in these particular areas is decreasing.

Treatment of turf with arsenate of lead is a necessary part of turf maintenance in the areas of continuous infestation and isolated places where the turf is definitely known to be infested by the Japanese beetle larvae. However, the above examples of reduced infestation indicate that there need not be any haste in poisoning golf courses as a precaution against Japanese beetle damage merely because the insects have been observed in the neighborhood.

An instructive article on the Japanese beetle and its habits is contained in a bulletin issued by the United States Department of Agriculture in December, 1934.

Chinch Bugs

CHINCH BUG injury to golf course turf has been recognized for many years. Recently this pest has become increasingly troublesome in eastern States, especially in rather restricted areas of New York, New Jersey, Connecticut, Pennsylvania and Ohio.

Three common varieties of chinch bugs—the common chinch bug (*Blissus leucopterus*), the hairy chinch bug (*Blissus leucopterus hirtus*) and the southern chinch bug (*Blissus leucopterus insularis*) — cause extensive damage to turfed areas and farm crops in the United States.

Until a few years ago these were all regarded as one type, but recent work has disclosed that the variety which causes severe injury to turf in the eastern States is more hairy in appearance and more difficult to control than the common one which attacks farm crops in the Middle West. Because of its hairy appearance it is commonly called the hairy chinch bug. This type is more vigorous, less susceptible to insecticides and able to withstand more moisture than the common farm chinch bug.

The common variety which is found in the Middle West, especially in the regions drained by the Mississippi, Missouri and Ohio Rivers, frequently causes severe damage to grain crops. However, injury to pastures and other turfed areas has been reported. The hairy chinch bug has been reported in the States along the Atlantic Coast, being abundant in Long Island and surrounding areas of New Jersey, Pennsylvania, Connecticut and occurring westward to Ohio.

The southern variety occurs in the extreme southeastern United States, especially in Florida, where it severely injures lawns and fairways.

Since the general distribution, life history, habits and methods of control when attacking turf are much the same, they will be discussed collectively.

Description and Habits

These pests are native to the United States and probably infested the native grasses when the white man first settled here. Chinch bugs are probably present in grassland every season, but escape attention because of their small size and habit of feeding near the ground. Unfavorable weather conditions may prevent serious outbreaks, and since the pest is not easily noticed its injury is usually attributed to other factors.

The adult chinch bug is slightly less than one-eighth inch long, and about one-half as broad as long, being oblong-oval in shape. The insect is black in color, with fine white markings. Its general appearance is a black fore part with the rest of its body dark gray. Its legs, beak and antennae are dark yellow to brown. The wing covers are white with brown veins. There are two adult forms, long-winged and short-winged. The short-winged, which is incapable of flight, is by far the more numerous, especially in the eastern variety.

Chinch bugs over-winter as adults under the shelter of grasses, leaves or other cover. In the spring after several days of warm weather the adults leave their winter quarters and settle in turfed areas. After a short period of feeding and mating, the females lay their eggs. Each female is capable of laying several hundred eggs