

mat of grass acts the same way on greens. It impedes or prevents absorption of water. Localized dry spots and sometimes the entire green becomes dry. Forking or aerifying then becomes necessary before the soil can be re-wetted. Removal of the surplus grass is the permanent solution. This can be done by cross-raking followed by close cutting or with one of the machines made for that purpose. Turf should be kept tight after that by close cutting along with brushing if necessary.

Tree roots in greens are responsible for much bad turf. They deplete the soil of all its moisture to a depth of several feet. Greens become hard and the soil refuses to accept water. The surface becomes sopping wet after each watering. Grass thins and algae puts in an appearance. Trenching between the trees and the green to sever the tree roots, or root pruning with the Haines tree root pruner, is the best answer. In order to obtain and keep good grass, tree roots must be controlled.

How to water is always a debatable question. Some favor sprinklers, others hand-water, and still others use a combination of both methods. It is not easy to water severely contoured greens with sprinklers without overwatering the low areas. That is why some superintendents water one time with the sprinkler and the next time by hand during hot weather. The man who does the hand-watering is taught to direct the water to the high spots.

The necessity to keep the soil on the banks and slopes of the green moist seems obvious, yet is not appreciated by everybody. Dry banks will rob the green of moisture. Then wilting occurs around the edge of the green and the bruising effect of the driving drum on the power mower takes its toll.

The amount of water to apply at one time is important. That can be judged by pressing the soil between the thumb and forefinger. Whenever water can be squeezed from the soil several hours after sprinkling stops, the indication points to overwatering.

When to water is another popular question. When overwatering is practiced, time of watering does not matter. There is some evidence in favor of early morning as the best time when the proper amount of water is used. This applies to humid areas where grass is apt to be laden with dew in the early morning. Sprinkling destroys the drops of dew and dries the grass so disease is less severe. In areas of low hu-

midity, there is no difference between night and daytime watering because turf gathers no dew during the night.

Infrequent watering is the goal to strive for and is best practice when there is an extensive and deep root system. Yet the necessity for frequent watering in times of stress when root systems are shallow must be recognized and followed. The use of a little water during the daytime is inevitable when grass is in severe wilt and the day is hot and/or windy. This practice saves and does not kill the grass as some believe. Watering soon after heavy rains may seem ridiculous to some, but it may be the difference between saving and losing grass which is in an advanced stage of wilt. Metallic blue color and footprinting are unmistakable signs of wilt if you do not know it.

### **Duration of Insecticides in Soil Not Known**

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**B**EGINNING in 1943 experiments have been carried out at the Japanese Beetle Laboratory at Moorestown, N. J. to determine how long a single application of the newer chlorinated insecticides, including DDT, chlordane, toxaphene, aldrin, dieldrin, and heptachlor, would persist in different soils under various conditions, and how long each of them would be effective in controlling larvae of the beetle in established turf.

The treatments were applied at rates required to control the fully grown larvae. The residual insecticide in the experimental plots was determined periodically by chemical analysis and bioassay.

The investigation is still in progress but, so far as information is available, it appears that when the percentages of the insecticides remaining in the soil are plotted against the periods of weathering, the resulting curves were of the sigmoid (curved in two directions, like the letter S) type.

DDT has been under investigation for 9 years, chlordane and toxaphene for 6 years, aldrin and dieldrin for 4 years, heptachlor for 2 years, and treatments with isodrin were applied this year. During these periods the treatments have been effective in eliminating the annual broods of larvae that hatched in the treated soil. The duration of the effectiveness in controlling the larvae and the persistence of these compounds in soil have not been determined.