

# Cadmium is Base of New Method of Dollar Spot Control

By H. W. THURSTON, JR.

In theory there are three possible ways by which diseases of fine turf may be controlled.

1. By growing disease-resistant strains of grass.

2. By regulating environmental factors, such as moisture, acidity, fertility and vigor of the grass in such a way that these factors favor the grass, and are unfavorable for the disease producing fungi.

3. By the use of fungicides, i.e., chemicals designed to kill or inhibit the disease producing fungi without injury to the grass.

In actual practice on the green, the greenkeeper is seldom able to rely on either of the first two methods. His choice of varieties and strains of grass is usually dictated by considerations other than disease resistance alone. Even if he attempts to take disease resistance into account, he finds no grass that is resistant to all of the common diseases. If he chooses a strain for resistance to dollar-spot, he will probably find it susceptible to large brownpatch, or vice versa and thus he is forced to consider other methods of control.

The regulation of environmental factors can frequently be of great help and value in reducing the severity of attack or warding off an attack of disease. For example, where some simple factors such as soil acidity can readily be changed by the judicious application of a little lime, we may discourage a fungus such as the one responsible for large brownpatch which prefers an acid soil. The temperature factor, which is an important one so far as fungus diseases are concerned, is usually beyond control, and moisture, especially the humidity of the air, is more dependent on the weather than on artificial watering. All of this amounts to saying that in spite of everything else he may do the greenkeeper is usually confronted with the necessity of using fungicides to keep grass diseases under control.

## No Control Yet for Some Diseases

Disease control thus becomes a problem of what chemical fungicide to use and how to use it. Unfortunately there is no single chemical which may be applied to fine turf that will prevent or control all

or even a majority of the known disease producing fungi. In some instances several chemicals are known which will more or less satisfactorily control certain diseases. For other diseases chemical control is indifferent at best and for a few diseases such as the *Helminthosporium* leaf spots and "melting out" disease, no chemical so far tried offers much hope of success.

Prior to the war, mercury in some of its forms was almost the only chemical fungicide used on turf. In the familiar calomel-bichloride mixture, and less frequently in some of its organic combinations, it was for many years relied upon for the control of such diseases as dollar-spot, large brownpatch and snow mold. Against these diseases it was and is quite effective, but has always been somewhat tricky to use especially in hot weather, since it frequently retards growth of the grass, and produces an undesirable yellow color, from which the grass is slow to recover. When improperly used, its effects may be almost as bad as those of the diseases it is designed to control.

The war brought about shortages of mercury, which together with high prices threatened to leave the greenkeeper helpless. The chemical industry, however, came up with tetramethyl thiuram disulphide which came into widespread use during the war years. Experience has since shown this chemical to be less effective than mercury for the control of dollar-spot, although it is considerably safer so far as injury is concerned. For the control of large brownpatch, however, it is probably the most widely used chemical today, and has the added advantage that it can be used to fortify reduced dosages of mercury, and thus eliminate some of the danger of injury.

When weather conditions are highly favorable for large brownpatch as they were in 1947 throughout the Eastern United States, the inadequacy of mercury fungicides and of the improved material for the control of this disease became noticeable.

For the past two years the fungicide testing programs of the Pennsylvania and Rhode Island Agricultural Experiment stations have focused attention on two

# DOLLAR SPOT CONTROL

Number of Spots Per Ten Square Feet; Season Average 1947

Material and Dosage per 1000 sq. feet	(no treatment)	Philadelphia Country Club	Pennsylvania State College	Merion Golf Club
		10 weeks average	7 weeks average	8 weeks average
Check		172	67	9.2
Tetramethyl thiuram disulfide	5 oz.	65	—	3.9
2-1 calomel bichloride of mercury mixture	3 oz.	6	30	0.75
"Crag" 531	3 oz.*	1.5	9	0.08
"Puraturf" 177	1½ oz.*	3.9	3	0.12
PMAS	20 c.c.	27	—	5.3

\*Approximately equivalent cadmium content.

new fungicides of particular interest for the control of dollar-spot. The new materials contain cadmium as the active fungicidal ingredient. One is an inorganic complex containing several other metals in addition to cadmium and is known as Crag Turf Fungicide 531. The other is an inorganic complex containing phenyl amino cadmium dilactate and is known as Puraturf 177.

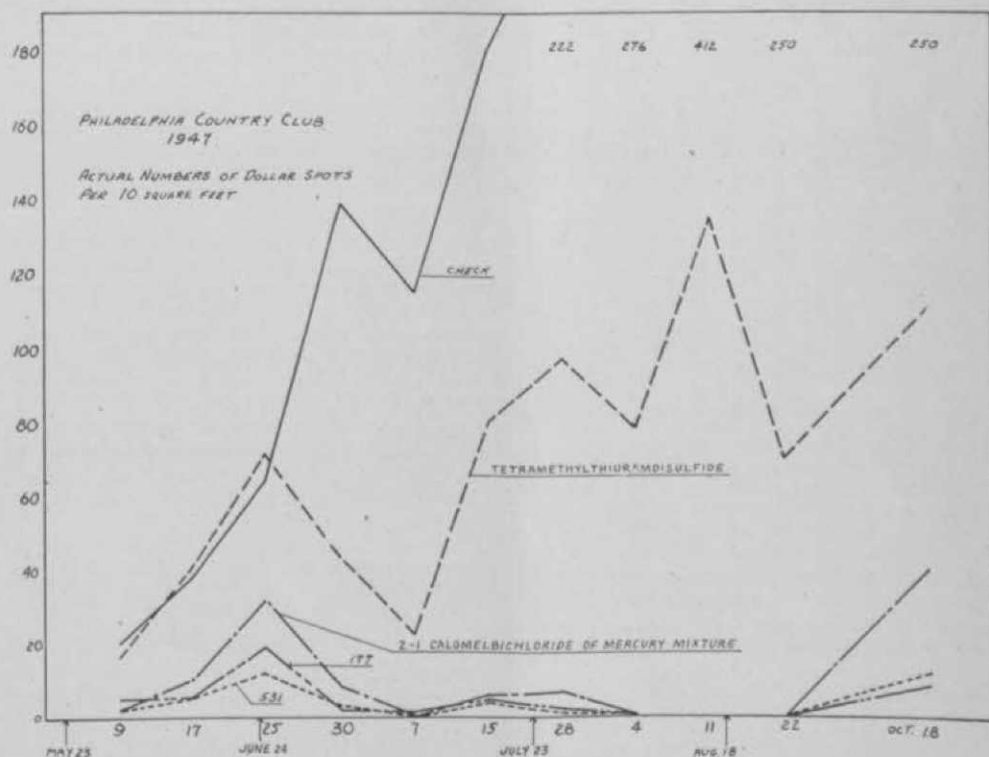
Some of the 1947 tests in Pennsylvania are shown in the accompanying table, where these cadmium fungicides are compared with both mercury and Tersan.

The table illustrates different levels of

disease in the three localities, but in all three places the new cadmium fungicides gave control of dollar-spot equal to or better than previously developed fungicides. Since the figures are averages, the seasonal incidence of the disease and progress from week to week are better shown in the accompanying chart.

Both the table and the chart illustrate the effectiveness of the control obtained, but neither one tells the complete story. The injury factor cannot be brought out in figure or diagram, but it is reported from both Pennsylvania and Rhode Island

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cease. Mowing until August prevents the development of seed stalks. The close cutting causes the plants to branch considerably which, in connection with topdressing operations, increases the number of plants in the soil and results in more stolon production.

Stolon development before the first of September will be slight. Growth increases rapidly as cool weather comes on. By late September a good vigorous crop of short well branched stolons will be available. Cutting and planting should be delayed as long as possible but October 15th is about the latest date for successful planting.

Cutting the crop is an expensive operation. The usual method is by hand with a short carving knife of not too good quality. The blade should be soft enough to permit quick sharpening with a file or scythe stone. Frequent sharpening is necessary. The cutting should be close to the ground. Not so close as to cut off the crown of the plant nor so long that the nursery cannot be cut with the lawn mower after the stolons are removed.

Cutters should work on their knees making short fast strokes with the knife and sweep the cuttings backward into windrows. Keep the cut stolons picked up and piled loosely in the shade. Cover them at night, in the field, if not to be used the day they are cut. Covering keeps the dew off but keeps the cuttings in a moist atmosphere which helps preserve the softness of the stolons. Soft green shoots are what is wanted, not dried hay. Water the stubble each day after cutting. At the end of the harvest season the whole nursery should be cut to lawn length regardless of whether or not all stolons have been removed. If the nursery is cut to lawn length after harvest, supplied with food, water and topdressing it will maintain itself in good health.

## CADMIUM

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that these cadmium fungicides do not discolor the grass or check its rate of growth.

The preferred method of use is to apply the fungicide as a preventative treatment before the time when dollar-spot normally makes its appearance and to continue applications at intervals of approximately ten days to two weeks. Even when applications are not made until after the appearance of dollar-spot the cadmium fungicides will stop the spread of the disease and permit early and rapid recovery of the grass.

While observations and tests have not been so numerous or widespread as for

dollar-spot, there is evidence that the new fungicides, will also control pink patch and copper spot, and where they have been used in regular preventative applications for dollar-spot control they have shown a marked tendency to reduce the damage caused by large brownpatch.

## NEGLIGENCE

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down on the ground near one end of the flagpole that lay across the driveway, and leaned back against the pole.

Shortly a limousine purred up the driveway, the owner sitting beside his chauffeur. Viewing the surroundings for a place to park, and clothed in the aloof dignity of his profession, the chauffeur inattentively failed to observe the flagpole until the car was almost upon it. Then he attempted to swerve around it, but hit it instead with one wheel. In a peculiar quirk of inexplicable fate, the blow caused an upward flip of the end of the pole against which Jim Steenbock was sitting, and it struck him in the back and on the head inflicting grievous injuries.

Jim sued the country club for his damages, claiming he had been injured because of the negligence of its employe in laying the flagpole across the driveway. But he was out of luck. The Nebraska court ruled that the ill-considered act of the workman was not the direct cause of the injuries. The chauffeur's negligent driving was responsible for the accident.

One more account of an episode from real life will complete the present picture of what the law may have in store for golf clubs or owners when things go amiss around clubhouses or their environs.

The Mohawk CC was promoting a social affair at night for its members and their friends. Goldie Cummings had arrived and was gayly participating in the festivities. Goldie was not a member, and she had never before been on the premises. How she came to be on hand was a mystery to some, who raised wondering eyes. What they did not know was that she was a friend of a friend of an assistant manager, and hadn't really barged in.

As a part of its plans in entertaining, the club had erected a tent some 20 or 30 feet from the clubhouse, and a hedge row was in between. Guy ropes, fastened to stakes, held the tent up. The outside scene was in darkness, but within clubhouse and tent 200-watt bulbs made them brilliantly aglow.

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