

# Diseases of Turf Grasses and the 1942 Fungicide Trials

By SPENCER H. DAVIS, JR.

As we looked over the past year's reports on turf diseases and attempts to control them with fungicides we come to the realization that the fungi causing the diseases and the fungicides used to control them are of very low intelligence. And I will add, even in the face of anticipated criticism, that in some instances those of us who worked with diseases and fungicides may not display our best judgment. Let's break this down into the three elements involved and look at each one individually.

First, the fungi causing disease are certainly a lowly lot which have no understanding of the world in which they live. **Rhizoctonia**, the organism responsible for brown patch, could perhaps be considered the king of this band of gypsies. And who will disagree but that he came from a long line of bachelors. True, he knows that he prefers hot, humid weather for greatest activity, but then he suddenly appears on a cooler and drier night than one sometimes anticipates. Then too, look at the range of susceptible and non-susceptible turf hosts. Colonial bent may be a favorite host with 100% disease, compared with a 5% outbreak on Seaside bent the same night. But when we examine this 5% we find that it is made up of very large areas measuring perhaps 3 or 4 feet in diameter. Who then can say that Seaside is less susceptible.

Again, take the Dollar Spot disease. We know that it is not too severe on well fertilized greens but **Sclerotinia**, the organism causing this disease, does not know it and will occasionally give an awful outbreak on these well fertilized greens. Not often, true, but on occasion. Merion bluegrass which is not normally a pleasing diet for the **Sclerotinia** organism came down with several bad outbreaks in New Jersey in 1951.

Scatter a few dead leaves from shade trees around a newly seeded turf nursery and see how quickly the organisms which cause damping-off will forget the fact that the nursery is on a well drained soil.

Not a single blade of grass will damp-off except under the cover of a few errant tree leaves.

## Look at Fungicides

Secondly, let's look at the fungicides in their state of non-compos mentis. Everyone "knows" that the inorganic mercury compounds are the best controls for snow mold caused by **Typhula**. We "know" that this is due in part to the fact that the liquid phenyl mercury compounds do not stand up under as much rain as do their inorganic mercury cousins. And yet, in 1951 tests conducted by Jack Meiners in Pullman and in Spokane, Washington, the two best treatments of 15 test materials including inorganic mercury were Pura-turf and PMAS—the liquid Phenyl Mercuries.

In the March 1951 issue of the Golf Course Reporter (results of 1949 and 1950 tests) Dr. Engel and I had an article entitled "A New Material Shows Promise for Brown Patch Control." This new material was Orthocide 406 which had shown itself to be equal to the best material for the control of Brown Patch plus enjoying the features of low price plus complete safety on greens in mid-summer even when applied at double strength. Alas, in 1951, while still giving good control it was not at the top of the list. Another instance in which a fungicide could not make up its mind whether it was the best in the field or just very good.

The use of Actidione was discontinued in the Pennsylvania turf tests in 1951 due to its poor showing against Dollar Spot in that state in 1950, and yet the same fungicide responded so well in Michigan tests in 1951 that it was given top rating. Even this new antibiotic fungicide seems to have trouble ascertaining its own value.

We all know too, that  $\frac{1}{2}$  plus  $\frac{1}{2}$  equals 1 and does not equal 2, 4, or 8. And yet the fungicides are not aware of this. As the result of kindly agitation by Sherwood Moore of the Hollywood Golf Course in New Jersey we finally tried his suggestion of using  $\frac{1}{2}$  the recommended rate of both Calo Clor and Tersan in the same tank

mix with which he claimed good results. The years 1951 and 1952 showed that while these fungicides cannot count, Mr. Moore was right in having faith in them. Let us look at the disease control results on Copper Spot.

Material	Rate	1951	1952
Calo-Clor .....	1	7	9
Tersan .....	1	17	36
Calo-Clor + Tersan	$\frac{1}{2} + \frac{1}{2}$	1	6

The scientists will explain this as due to several possibilities among them being that of synergistic (or complimentary) action, but I am sure the fungicides do not know the meaning of the word synergism.

We know that there are a number of species of *Helminthosporium* causing melting-out, but since it is so difficult for the pathologists to recognize these different species I doubt that the fungicides can distinguish them apart. And yet we see that Dr. Howard had a complete control of *Helminthosporium* using Puraturf and little control using Tersan in his 1949 tests. While in Georgia in 1951, Dr. Robinson found that his Puraturf did not know that it was supposed to be so much better than Tersan—resulting in little control.

#### Human Factor

And third, let's examine our human factor and see where some fail in their examination of intelligence.

Many golf course superintendents do not accept the results of the national cooperative turf fungicide trials. Each year a number of states and plant pathologists devote part of their summer to a study of diseases and fungicides. The individual cooperators run statistical analysis on their own results which prove without question which is the best material for each disease. For about the last six years these results have been compiled by a coordinator each year and the results published. Some years several of the states even agree as to which material they think best. And still the golf course superintendent reads the results and does not switch his entire golf course over to the recommended material. He continues to use some material which has proven successful for him through the years.

Some chairmen of greens committees look at the list of prices on various materials which are recommended by the manufacturer to give absolute control of all diseases plus weeds and poison ivy. Depending upon finances of the particular club the decision on the product is then

made. The millionaire club may select the highest priced material and the clubs working on a shoe-string select the cheapest material, regardless of any other factor. And it is quite probable that neither material is the best for that particular club. Along these lines let us picture two adjoining courses on which different fungicides are used. The one uses a good material which is very insoluble and is not affected by rain, whereas the neighboring course uses an equally good fungicide but one which is broken down and becomes useless after a one-inch rainfall. Now in looking into their spray schedule we may find that the schedules are reversed. The one with the stable compounds goes to the unnecessary work of applying it immediately after each rain whereas his colleague (or competitor, however you wish to word it) applies his non-stable material on a regular ten-day schedule regardless of weather.

And so you could follow on indefinitely comparing methods and techniques of various workers and find loop holes in many of them. So let's forget all of this discussion of the non-intelligent disease, fungicides and men and think for a moment on the practical and intelligent approach.

First, if you have a method or compound for combatting a turf disease and it works and you are satisfied with the price—forget about all the advertisements, national results, and newest recommendations. You are the best qualified to determine your own needs.

And in reading over the results of the various cooperators in the National Turf Fungicide Trials, remember that these data came about as a result of several different factors in each case, namely, fungus + cultural conditions + soil conditions + weather + time of application = results. Thus, if any given factor is different on your course, the results may be different. True, if all the states show that one particular compound is rated near the top and another is constantly near the bottom you are foolish to try anything other than the one which gave best results throughout.

#### Consider Weather

Consider the weather as you apply fungicides. Remember that some have proven to be washed-out quickly while others remain active longer regardless of rainfall.

Think of the price of the fungicide, but

*(Continued on page 79)*

elected vp, and Donald P. Steinberg, Jr., of Appleton was re-elected sec.-treas. Frank Murphy of Manitowoc, Frank Cornelisen of Green Bay and Richard Johnson of Waupaca were elected directors-at-large for the coming year.

The annual meeting and clinic will be held at Riverdale, Sheboygan; the Best-ball tourney is scheduled for Riverside, Marinette; the amateur for Butte des Morts, Appleton; the ladies tourney for South Hills, Fond du Lac; and the Open at Riverdale, Sheboygan.

West Bend C.C. was voted to membership.

About 120 men representing 21 member clubs attended the gathering.

### DISEASES OF TURF

(Continued from page 68)

think of it only when you add the various factors of number of applications necessary; the residual material after a rain; and the labor cost of added applications. As an example of this I would take two compounds which to me offer excellent control of Brown Patch. Calo Cure is excellent, long lasting regardless of rain, but high priced. If you are short of labor,

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wish to stay on a set 10-12 day schedule and have ample funds for chemicals, I would say that it is your best selection. On the other hand Orthocide 406 (now offered under the general name of Captan) is an equally good fungicide, is very low-priced but will not hold up under more than  $\frac{3}{4}$  of an inch of rainfall. Incidentally the latter material also offers you absolutely no control for Dollar Spot or Copper Spot, whereas the former does a pretty good job of both. Thus, it is up to you to determine your own need.

Do some experimental work on your own golf course rather than looking to your agricultural experiment station for all the tests. This merits consideration on two points. First, the results you get do apply to your course, whereas the results from the agricultural station may not, since they may have a different soil, culture, turf strain, etc. And secondly, there is nothing so convincing as seeing green and brown results on the grass rather than black and white results on printed data sheets. As an old farmer told me when I worked in Delaware, "I don't give a darn for all of your statistical analysis proving that a treatment is good, what I want to do is to walk

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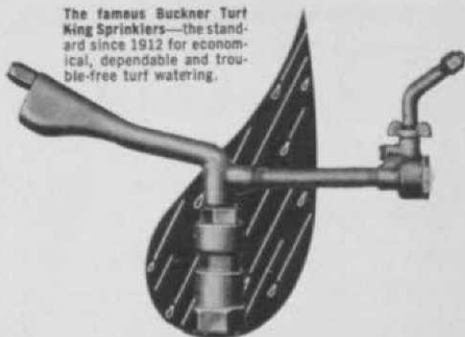
through my orchard and see more apples with my own eyes. If I can see more apples I know the treatment is better." No one showed analyzed data to Sherwood Moore that proved that  $\frac{1}{2}$  Tersan and  $\frac{1}{2}$  Calo Clor were good. He just tried it on a small scale, liked it and now uses it completely. Your practice green may be a good place for your tests. It may not look so good that near to the club house but at least no one will blame you if he gets a poor lie there.

#### Consider Types of Fertilizer

Consider using different rates and types of fertilizer on your turf nursery. On one nursery at a golf course in northern Jersey the superintendent had used the standard commercial fertilizer on one area and one of the organic materials on the other. We saw it the day after a bad Brown Patch outbreak and the part with the organic material was almost completely clean in comparison with severe disease on the rest of the area. In our tests at Rutgers using standard fertilizer versus organic ones, the indications have been in favor of the latter, even though the results have not been so clear-cut as the ones the superintendent accomplished.

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spraying rather than preventative spraying, I would invite into the membership of the latter fraternity. Even though you have gone through the years with a modicum of success by spraying the day after disease appears or those forecasters who attempt to time it to the day before they think an outbreak is going to occur, add this test to your experimental green. For the coming year try part of it on a regular ten-day schedule and treat the rest of it in your accustomed manner. Our tests at Rutgers as well as other parts of the country have so completely convinced us of the superiority of the preventative on a regular calendar date that we cannot recommend anything else. It is true that some control was had with the curative method and the cost of the material and labor was less, but not enough less to be worthwhile when the results were taken into consideration. And finally, for this part, identify your disease before you try to combat it. I realize that most of you men can recognize your common troubles in the light of the moon but there are also some of you who cannot recognize a few troubles in broad daylight. A number of superintendents passed off all small circular dead spots as Dollar Spot. Perhaps that is the reason why the recommended materials are not giving you complete satisfaction. If you have any question at all get out to those spots the first thing in the morning before the greens are poled. Rub a white handkerchief across 2 or 3 spots and look at it. If you have a bright orange spot on the white cloth your disease is Copper Spot rather than Dollar Spot and you don't need a microscope to prove it.

Publications containing good descriptions of your turf diseases are not too prevalent, but certainly the few which we do have are excellent. Any man who claims to have an interest in knowing as much as possible about turf diseases but who cannot claim ownership to the excellent Rhode Island publication on Fungus Diseases of Turf Grasses by Dr. Howard and others, should secure it immediately. And if, after trying to identify your problem for yourself you are not sure of your own diagnosis, pull a few sample plugs and get them to your agricultural experiment station as soon as possible. If this means mailing it, mail it on the dry side rather than wet. Too often a package wrapped with excessive moisture arrives in final stages of secondary mold growth so that your research

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men cannot identify the original trouble.

### Turf Fungicide Trials

And now a few words about the National Turf Fungicide Trials of 1952.

Dr. John Vaughn of Michigan State College, was coordinator of the National Trials last year. You will find the following notes and tables of interest to all parts of the country among these excellent and detailed results.

Dollar Spot data are reported from California, Michigan, Ohio and Rhode Island as affected by 21 fungicides. While the majority of the materials gave adequate control the commercially available products which seemed most outstanding were Actidione, Cadminate, Cadsol, Calo Cure, Mercadmene, PMAS, and Scutyl. Others which controlled Dollar Spot well in some states but which were only fair to poor in other states or which could be listed only as second best in the only state in which tested were Calo Clor, Special Semesan, Tat-C-Lect, and Vancide 51. Orthocide 406 gave no control in the single state which tested it and Tersan 75 proved itself good, fair and very poor in three respective state tests.

Along with the standard assaying or testing of fungicides for Dollar Spot control, Dr. Miller in California made an interesting study comparing 8 fungicidal treatments, each applied with three different rates of nitrogen fertilizers, namely, 6, 12 and 24 pounds of nitrogen per 1000 square feet per season. On unsprayed check plots, this increasing rate of nitrogen alone resulted in a decrease in Dollar Spot from 760 on the 6 pound rate to 550 on the 12 pound rate to 260 on the 24 pound rate. No fungicide gave complete disease control on lowest nitrogen rate plots although control was good with Actidione, Cadminate, Calo Clor, Calo Cure, Mercadmene and PMAS and all of these fungicides gave complete control at the medium and high rates of nitrogen. Tersan and Vancide failed to give satisfactory control compared with the other materials. Residual action, as indicated by disease control two months after the last spray application was made, was particularly good with Cadminate, Mercadmene and PMAS at the highest nitrogen rate.

The only state having sufficient Brown Patch to record was Rhode Island, where Dr. Howard had good control with some of the old faithfuls: Calo Clor (both sprayed and "seeded" dry), Calo Cure, Crag 531, Scutyl and Tersan 75. Cadsol,

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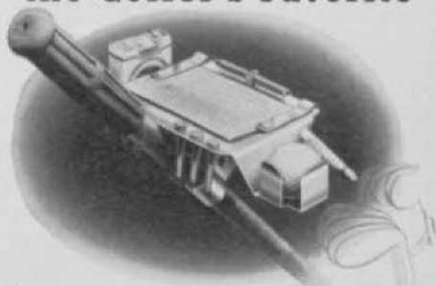
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a newcomer in the turf fungicides, proved fair, while Actidione and Cadminate gave no control.

Melting-out (Helminthosporium), which seems to be getting more serious in a number of sections in the country appeared in test plots in only Michigan in 1952. Dr. Vaughn had extremely good control only with Actidione while Calo Cure, Tersan and Tat-C-Lect showed only fair.

Copper Spot was serious only in New Jersey where our tests showed Calo Clor, Calo Clor + Tersan, PMAS, Puraturf, Crag 531 and Cadminate gave satisfactory control. Low rates of Calo Cure, Calo Clor and Tersan, plus standard rates of Orthocide 406 and Actidione gave poor control. It was of particular interest to us that while  $\frac{1}{2}$  the standard rate of Calo Clor or Tersan gave very poor disease control the combination of these two at the  $\frac{1}{2}$  dose rate gave exceptional control—better than either one at the standard dose rate.

#### Report from England

We welcome into the 1952 project a report from England where Dr. Smith reports upon a disease which is not usually too severe in the United States, but does give us considerable trouble on occasion. His data on Red Thread (known to some of you as Pink Patch) show excellent control with Tersan, Crag 531, a mixture of Malachite Green and Bordeaux Mixture, and a copper material new to most of us known as Coppry. Very good control was also obtained with Puraturf.

Finally, I would make this comment. It is occasionally heard around the clubhouse that "from the looks of the greens they must have a plumber acting as the greens superintendent." May I say that this statement can no longer be based upon fact. First, the plumbers nowadays are getting such high wages that no club could afford to hire one for the salary they pay their greens superintendent and second, no plumber is smart enough to handle all the problems in the fast moving world which is the domain of the golf course superintendent.

#### American Playground Restores Nahma (Mich.) Course

When the American Playground Device Co. purchased the former sawmill town of Nahma, Mich. in the fall of 1951, the Anderson, Ind. manufacturer of swings, slides and other recreational equipment also bought 4,300 acres of wooded land, including a 9-hole golf course.

American has installed its swings, slides, see-saws and Castle Towers at many golf clubs and now can show its playground equipment, park benches and picnic tables on its own golf course.

The Bay de Noquet Co., which had engaged in lumbering operations in Upper Michigan since 1881 and whose Nahma mill sawed its last log on July 26, 1951, built the Nahma course in 1927. The site was an 80-acre farm, where the company pastured the horses used in its early day logging before the advent of truck and tractor.

The idea for a golf course in a sawmill town of a few hundred inhabitants developed from the enthusiasm for the game displayed by Dr. Ferris Summerbell, then the company physician, William H. Acker, company manager at Nahma, and Pearce Cameron, manager of the community's only general store. The trio played golf whenever they could get away to the Escanaba CC, 35 miles from Nahma. But finding the distance oftentimes inconvenient, they improvised three holes at the Nahma baseball field, where they practiced for a couple of seasons.

Supported by interest shown by other Nahma residents, they induced the Bay de Noquet Co. to transform the old company farm into a course. A club was organized, and at one time it had nearly 50 members, including some residents of nearby Manistique and other communities. After the sawmill ceased operations in 1951, membership declined. Now efforts are being made to obtain new members. It's a bargain. Membership fees are only \$10 per year. Wallace Bennette is the acting secretary.

#### Course "Good Selling Point"

The golf course always was maintained in good condition by the Bay de Noquet Co. Charles E. Good, president of the lumbering firm, always felt that the golf course would be a good selling point whenever the company was forced to suspend operations because of a vanished timber supply.

Since it was acquired by American, the Nahma course has undergone a number of improvements.

When the course was built, the entrance and No. 1 tee were located at the south end. A few years later, it was relocated at the north end of the course. This year, the fairways were restored to their original numerical order.

A parking lot was established and a white-painted gate erected at the south end of the course, not far from the relocated No. 1 tee. Comfort stations were installed and other improvements made.

Another shelter is planned near the No. 1 tee to supplement the present shelter midway in the course. The latter, inci-