greens when it is properly watered and otherwise cared for. The thickness of 1/2-inch was found to be the minimum thickness practicable with bent sod.

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Fighting the June Beetle with Caddies


On July 1, 1925, I noticed that the June bugs were boring into our greens to deposit their eggs. I found them forming around the greens, and nowhere else. We offered the caddies a bounty of 50 cents a hundred for the captured bugs, male or female. From that time until July 8 we paid $25 for 5,000 captured bugs. We found each female bug was prepared to lay about 40 eggs. Presuming that half of the captives were female, we have exterminated what would amount to 100,000 grub worms that would become pests the latter part of August and September. In combating the grubs the preceding year we found that two men, working continually, extracted from the greens about 200 grub worms a day apiece, at a cost of $8 per day. Eight days after we put the caddies on the job practically no June bugs were to be seen on the premises. Of course, we did not get all of them, but I am sure that in this way we have saved ourselves a lot of expense and trouble for August and September.

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July Experiments For Control of Brown-Patch On Arlington Experimental Turf Garden

By John Monteith, Jr.

During the first two weeks of July there was a severe attack of large brown-patch in the vicinity of Washington. At the same time it was reported unusually prevalent in numerous other sections of the country. After the 15th there was practically no active large brown-patch on the Arlington experimental plots. The small brown-patch, however, continued to develop throughout the month on the more susceptible strains of grasses. These attacks offered an opportunity to test the effectiveness of the various disinfectants in controlling the two types of injury and also showed to what extent previous treatments could be relied on to prevent new attacks of the diseases.

The promising control obtained during the last two years at Arlington and elsewhere with various organic mercury compounds and the contradictory results reported from different clubs induced us to lay special emphasis on rates of treatments with these compounds. The chlorophenol mercury under the trade names of "Semesan" or "Uspulun" is the form which has been most generally advertised and distributed among golf clubs and for that reason received priority in the experiments this year. In these tests the chemicals have been applied at different stages in the development of the disease; on numerous strains of grasses; under various weather conditions; at different times during the day; and in general the tests were planned to give as much variation as it is possible to obtain at any single station. The results have been often contradictory, and indicate why clubs have found that in some cases the applications have not given the results expected. Some of these failures are no
doubt due to the exaggerated claims made by those who are selling the chemicals. In other cases the failures may have been due to faulty application.

The results of our experiments so far are by no means conclusive. It appears that there will be much variation in the treatments found to be effective on different courses, since soil type, composition of the turf, amount of rainfall, climate, and other factors will no doubt be found to influence the degree of control or period of protection for any single treatment. It would be advisable to make preliminary experimental treatments to determine the best method of application for each particular course before making a general application on all the greens. Many of the clubs have already done this. The results obtained thus far at Arlington are given here, not as a general recommendation but as a guide to help clubs determine the method best suited to each set of conditions.

Our results with Semesan and Uspulun have been practically identical, and results with either or both will be referred to here together as the chemical chlorophenol mercury. The solution we found most efficient last year continues to be most reliable this year; that is, the dilution of 1 to 400, or 1 pound to 50 gallons of water. For treatments using 1 pound to 1,000 square feet or larger areas, the best results have been obtained by using the spray method with a good uniform pressure. Sprinkling cans, barrel sprinklers, and other devices may be used for heavier application provided they are handled to give a uniform application.

For checking an attack of large brown-patch we found that 1 pound in 50 gallons applied as a fine spray to an area of 3,000 to 6,000 square feet was effective. However, in severe cases the area covered should probably be limited to not more than 3,000 square feet for 1 pound of the chemical. Lighter applications while frequently giving good results will often prove only partially effective. Applications of a pound or more per 1,000 square feet will give protection for a longer period, but this period of protection seems to vary greatly with weather conditions, especially rainfall. Under our conditions we have not observed any long periods of protection such as have been frequently claimed for the chlorophenol mercury treatments. These heavy applications should be well tested at different times before a large expenditure is made in treating all the greens on a course. It is true that where such a treatment was made about July 10 the grass has been free from large patch to date (August 7). But the check plots which received no treatment except the usual topdressing and ammonium sulfate recovered soon after the treated areas and have been free from the disease ever since, as the weather conditions have been favorable for growth of grass and unfavorable for the development of large brown-patch. The lighter applications have under these conditions been equally effective in controlling the disease, and much less costly. Also the discoloration of the grass resulting from treatment is much less severe and of much shorter duration with the lighter treatments. For control of large brown-patch with these compounds our results strongly favor the application of 1 pound in 50 gallons for about 3,000 square feet. This is to check the disease, and it should be followed by topdressing and ammonium sulfate to increase the vigor of the grass so as to enable it quickly to recover from the injury.
For controlling small brown-patch it appears necessary to use somewhat heavier applications, or to give light treatments more frequently. One pound per 1,000 square feet gave good results and held the disease in check for about a month in some cases. An example of this control is shown in the accompanying photograph. The plot in this case was spotted with small brown-patch during the latter part of June. On July 1 it was divided into four sections and treated with chlorophenol mercury spray. One quarter was given the 1 pound per 1,000 square feet treatment; the second received it at the rate of 1 pound per 3,000 square feet; the third had 1 pound per 6,000 square feet; and the fourth section was left untreated. The heavy application held the disease in check for three weeks, and by July 30, when this photograph was taken, there were only a few minor patches starting to develop in the quarter receiving this treatment. The spots continued to develop in the untreated area and new patches developed. By the end of the month the spots had joined in many places and pro-

![Treated portion. Untreated portion.  
Small brown-patch control with chlorophenol mercury.](image)

duced very serious injury to the turf. This photograph shows one section along the line between the treated and untreated section. On the left the healthy grass shows the effect of the fungicide, as compared with the untreated area on the right where the disease had been allowed to continue until a large part of the grass had been killed. Allowance should also be made for the fact that when treated there were several small brown-patches within the area of the sprayed turf shown in the photograph. The sections receiving the lighter treatments also showed complete control of the disease during the first ten days or more, and after a month they were in much better condition than the untreated section. Similar applications at different times during the month on other plots were not always as striking as on this particular plot. However, the spray of 1 pound per 1,000 square feet regularly gave at least temporary control.

One objection against these compounds is the injury to the grass which sometimes appears after their use. The grass becomes yellow or brown and in some cases may remain discolored for two weeks or more, depending on the rate of application. The discoloration caused by the 1 pound per 1,000 square feet treatment does not usually dis-
appear with the first cutting, as has been claimed for it. Neither have we been able to avoid it by making the application at any one time of day. On the other hand, it has never been permanently injurious to the grass in any of our tests. The grass gradually recovers its healthy green color, and with this recovery it usually also covers up the scars of the brown-patch.

Our tests with the chlorophenol mercury dusts have not been encouraging. Certainly the dust applications of 1 pound to as much as 10,000 square feet, as has been recommended by some of those selling the material, have been practically ineffective at Arlington. They have controlled the disease in a few cases at a rate of 1 pound to 2,500 square feet, but the same amount of material in solution usually gives much better results. A serious objection to the dust method of application is found in the danger of severe burning in cases where too much dust is put on the grass. A slight clogging of the material in the dust gun may result in an accumulation at the nozzle which, when released, results in an unusually heavy dose, which will often cause bad scars on the turf. Of course this objection is removed if one can find a reliable dust gun.

The closely related compound of nitrophenol mercury has so far failed to show much value as a control for either type of brown-patch. Bordeaux mixture has regularly proven effective in controlling the large brown-patch, but its effect is only temporary. It has been of no value in checking the small brown-patch.

Various other compounds have been tested and some have shown much promise. Results with these will be reported in another number of the BULLETIN.

Some confusion has been evident as to the effectiveness of ammonium sulfate and topdressing as a control for brown-patch. This treatment supplies food for the grass and induces a vigorous growth. It does not in itself control nor check the disease. When the disease is checked by cool weather or by fungicides, an application of topdressing with ammonium sulfate will prove of great value in restoring the turf, as it will aid the injured grass in recovering from the attack of the disease.

The Coconut Mat Teeing Surface.—The idea of using coconut mats as teeing surfaces seems to have originated in British Columbia, where they have been used for a number of years. The Tualatin Country Club, of Portland, Oreg., has been using coconut mats for the past six months, and reports very satisfactory results. The mats are imported from India and come in various sizes. The size used at the Tualatin Club is 5 by 6 feet. The mat is laid down loose in a rather substantial wooden base flush with the surface of the ground. It is then heavily sanded, and watered, and in the course of time will absorb a considerable amount of sand. In this way the mat has considerable resistance to all kinds of weather, providing a dry and smooth teeing ground at all times.

The Twenty-ninth Women's Amateur Golf Championship will be held September 28 to October 3, 1925, at the St. Louis Country Club, Clayton, Mo. Details may be obtained from United States Golf Association, 110 East 42d St., New York City.