

Grubs in the Vicinity of Philadelphia

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In THE BULLETIN of December 16, 1921, Mr. Alan D. Wilson describes the troubles encountered by the Pine Valley Golf Club from the southern green June beetle, and asks for remedies. I can only extend to the management of that club a sincere sympathy deeply intensified by a fellow feeling and in return send out a call for help.

During 1921, in what may be called the golfing vicinity of Philadelphia few if any of the numerous golf courses have escaped serious damages from grubs of beetles. In the territory referred to—perhaps elsewhere—it has been a notable year for grubs. The resultant damage has been serious; what the future may be is alike problematical and foreboding.

Curiously enough, at Pine Valley the visitation has been from the southern green June beetle; at Merion and many other courses, the white May beetle, commonly known as the June bug; at Merchantville, N. J., the Japanese beetle; at Riverton, N. J., and Moorestown, N. J., both the May beetle and Japanese beetle.

So far as I am aware the only treatment that yet has been found reasonably effective to destroy the May beetle grubs is a solution of cyanide of sodium applied substantially as stated in THE BULLETIN of November 15, 1921; but it is doubtful whether that solution can be used on putting-greens in effective strength without serious injury to the greens, or can be safely used even on fairways with sufficient strength to kill the Japanese beetle grubs.

But assuming successful extermination of a high percentage of the grubs now infesting our golf courses, how are we to prevent or even discourage surviving grubs, as mature beetles, from depositing eggs next year?

I had occasion recently to remove turf from a portion of the lawn of my home at Moorestown and found the grubs under the turf, almost, if not quite, as numerous as on the fairways of our golf course. Other lawns in the vicinity are equally full of grubs, which in many places have practically destroyed the sod. Are these innumerable grubs to emerge next year as beetles and deposit their eggs in our golf courses and lawns? If beetles only deposit eggs before first emerging from the sod, obviously a destruction of a large percentage of the grubs on our courses would materially reduce the damages reasonably to be anticipated next year. But do not the beetles first emerge and later deposit their eggs where they find it most attractive for that purpose? If so, it would seem that the only possible means of substantial protection is to be found in the seasonal treatment of our greens and fairways by some preparation which will render them unattractive to beetles seeking a suitable spot for their eggs.

Mr. Wilson has concluded that the deposit of manure under the Pine Valley fairways has attracted the beetles. That may be true as to that particular variety of beetles; but it does not appear to be true as to our variety of beetles. I have been unable to find any substantial evidence of discrimination on the part of our beetles between soil rich or poor, high or low, dry or damp, level or on a hillside; they appear to be entirely

satisfied with almost any soil or conditions, and infest our putting-greens, fairways and rough alike.

Apropos of Wilson's geese, I take pleasure in stating that a flock of starlings, of magnitude that no one in these parts has before seen, visited our golf course for some two weeks in October and literally feasted on grubs.

Lest it be thought that the visitation of grubs in this vicinity may not be a serious matter, permit me to state that in lifting sections of sod the roots of which the grubs have detached from the soil, I have counted, on our greens and also on our fairways, twenty-five grubs in a space that could be covered by a hand. On sections of our fairways an acre or more in area, the grubs have not only detached the sod from the soil but have literally devoured all roots in the soil below, leaving the soil much like fine and clean powder. If in the future beetles are to continue to deposit their eggs on our courses to the extent of last year, it seems obvious that the maintenance of anything approaching a desirable course will become practically impossible.*

* Dr. W. R. Walton, who had occasion to read the manuscript of Judge Leaming's article before its publication, has kindly added the following comments.
—Editors.

"In his report on the white grub control work conducted on the Merion Cricket Club's links in Philadelphia, November 2 to 5, 1920, Mr. R. H. Van Zwaluwenburg says:

"While the white grubs are within four inches of the surface, an application of sodium cyanide solution, 160 pounds to 12,000 gallons of water, applied to one acre of ground, killed from 75 per cent to 100 per cent of the grubs present,' (the variation in the effectiveness of kill noted being due, in Mr. Van Zwaluwenburg's opinion, to the variable penetration of the soil). 'At the strength mentioned,' (which is precisely the same used by the Bureau of Entomology in Japanese beetle extermination work), 'there was some burning of the grass, but not enough to injure it seriously. New sod probably will suffer more than old grass.'

"It should be a very simple matter to determine the effect of sodium cyanide solution on putting-greens without any serious risk to the greens, by applying it to a square yard or two of surface and observing the subsequent condition of the grass. This procedure would be the wise course to pursue before attempting large-scale application on greens. Where it seems desirable to try such an experiment, the proper solution may be prepared by adding sodium cyanide to water at the rate of 10½ ounces to 50 gallons of water. This solution should then be applied at the rate of about 1 quart to the square foot of green surface. The important thing to remember is that the solution will not kill the grubs in satisfactory numbers unless the insects are within four inches of the surface; the closer, the better.

"In view of the general infestation reported by Judge Leaming, it may be necessary to treat the links every three years. May beetles consume from two to three years in completing their life-cycles, depending upon the latitude of any given region. In the vicinity of Philadelphia, there probably is a three-year cycle of abundance, coinciding with the periods of greatest injury by the grubs. It may transpire that the treatment mentioned above will not be necessary oftener than every three or six years, if the application is properly timed and thoroughly conducted.

"According to Professor J. J. Davis, 'The grub of the Japanese beetle is of no appreciable economic importance. It shows a preference for decomposing roots and compost of all kinds, and while it may and does feed somewhat on living roots, especially on sod ground, the active feeding period is at a time when little injury results.'"

Seventy-five per cent of putting-green troubles are due to insufficient drainage.