OBSERVATIONS ON THE OCCURRENCE OF A MILKY DISEASE AMONG LARVAE OF THE NORTHERN MASKED CHAFER, *CYCLOCEPHALA BOREALIS* ARROW [1, 2]

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The larvae of the northern masked chafer, *Cyclocephala borealis* Arrow, occur frequently among the roots of grasses in organic soils of the Everglades. They do not frequently cause noticeable damage to pastures but often distress the sod grower when he harvests his product. The sod pieces tend to fall apart as a result of root pruning and loosening of the soil when lifted from the soil surface. Under drought conditions root damage has resulted in the death of the grass.

On October 12, 1958, the author visited two pastures, one in pangolagrass, *Digitaria decumbens* Stent., at Clewiston and the other in St. Augustinegrass, *Stenotaphrum secundatum* (Walt.) Kuntze, at Belle Glade that were heavily infested with northern masked chafer larvae that were causing brown areas. At each site there were approximately 8 to 10 grubs per square foot.

At the Belle Glade pasture five (17%) of thirty chafer larvae collected appeared to be diseased. Some of the sick larvae were flaccid and more opaquely white than healthy grubs, whereas others were darker and even more limp denoting a more advanced stage of the disease.

Diseased grubs were sent to Dr. S. R. Dutky, Beekeeping and Insect Pathology Section, U. S. D. A., Beltsville, Maryland. Dr. Dutky replied: "The specimens were examined and all were found to be milky diseased. The organism present in all specimens closely resembles the *Cyclocephala* strain of *Bacillus popilliae*."

Dutky (1940) described and named the organism, *Bacillus popilliae* Dutky, that is the causitive agent of type A milky disease of the Japanese beetle, *Popillia japonica* New. Dutky (1941) stated that *Cyclocephala borealis* Arrow larvae were susceptible to type A milky disease infection by injection and puncture inoculations and that a few instances of natural infection with type A milky disease had been found. White (1947) found northern masked chafer larvae in the field that were naturally infected with the milky disease. In most instances the causative agent was an organism similar to that causing type A milky disease. The milky disease was designated originally as atypical type A but later called type A (*Cyclocephala* strain). White reported an instance of northern masked chafer grub control with atypical type A milky disease at a site where the Japanese beetle grubs were infected with regular type A milky disease. He cited this as an indication that both organisms were present and working independently. A full description of the disease, the causative agent, and a review of the literature are given by Steinhaus (1949).

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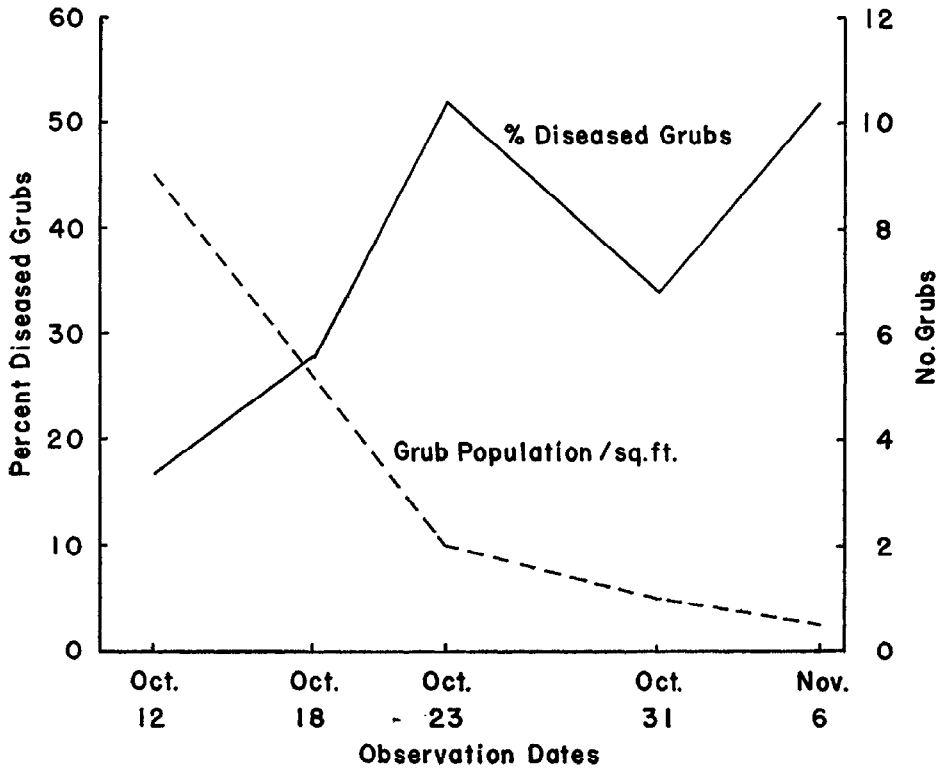

Fig. 1. Northern masked chafer grub population and incidence of milky-diseased individuals on several dates in a St. Augustine grass pasture.

The Belle Glade pasture was visited at 6 to 8 day intervals and examinations were made to obtain an estimate of the average number of grubs per square foot and the percentage of grubs that were diseased. Observations were hampered by difficulty in finding grubs that had decomposed after death. The area of soil examined gradually became larger as it became more difficult to find grubs because of the decreasing population. The number of grubs examined on each date was as follows: 12 October—30; 18 October—50; 23 October—52; 31 October—53; 6 November—21. The area of pasture soil examined on October 18 was not recorded so no estimate of the grub population per square foot is recorded for this date. In less than one month the number of grubs per square foot fell from 9 to 0.5 at the Belle Glade pasture (Figure 1). The percentage of diseased grubs increased from 17% on October 18 to 52% on October 23. It fell to 34% on October 31 but rose to 52% on November 6.

The pasture at Clewiston was not examined periodically, but Mr. W. G. Genung visited this location in late October and observed that there was a high incidence of diseased individuals and the grub population was greatly reduced.

It seems that the dry summer exaggerated the damage done by the grub and was unfavorable to the dissemination of the disease organism and inoculation of grubs. The wet soil caused by heavy rains during October and November probably accelerated dissemination and inoculation.

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