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Injury From White Grubs in Iowa

Abstract

The serious outbreaks of white grubs that have occurred in northeastern Iowa during the past ten years are part of a general outbreak appearing in a number of more or less timbered areas in a belt running from Minnesota and Iowa east to New York, Connecticut and New Jersey. These grubs first appeared in unusual number in 1909, increased in severity in 1912 and reached a climax of injury in 1915. In 1918 the damage was considerably less than in the previous outbreak and it is probable that the parasites and other enemies of the grubs will reduce their numbers to a nearly normal amount by 1921 or 1924 at the latest.

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INJURY FROM WHITE GRUBS IN IOWA

E. D. Ball and E. V. Walter

The serious outbreaks of white grubs that have occurred in northeastern Iowa during the past ten years are part of a general outbreak appearing in a number of more or less timbered areas in a belt running from Minnesota and Iowa east to New York, Connecticut and New Jersey. These grubs first appeared in unusual number in 1909, increased in severity in 1912 and reached a climax of injury in 1915. In 1918 the damage was considerably less than in the previous outbreak and it is probable that the parasites and other enemies of the grubs will reduce their numbers to a nearly normal amount by 1921 or 1924 at the latest.

THE WHITE GRUB AREA

June bugs and white grubs occur in all parts of Iowa every year, but usually in small numbers. These insects require three years for their development, but there are three different broods, one appearing each year.

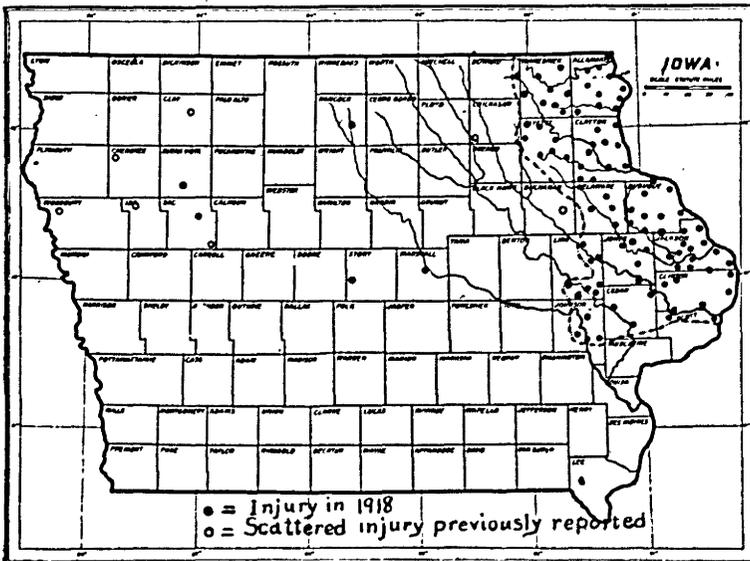


Fig. 1—Showing region in which white grub injury may be expected

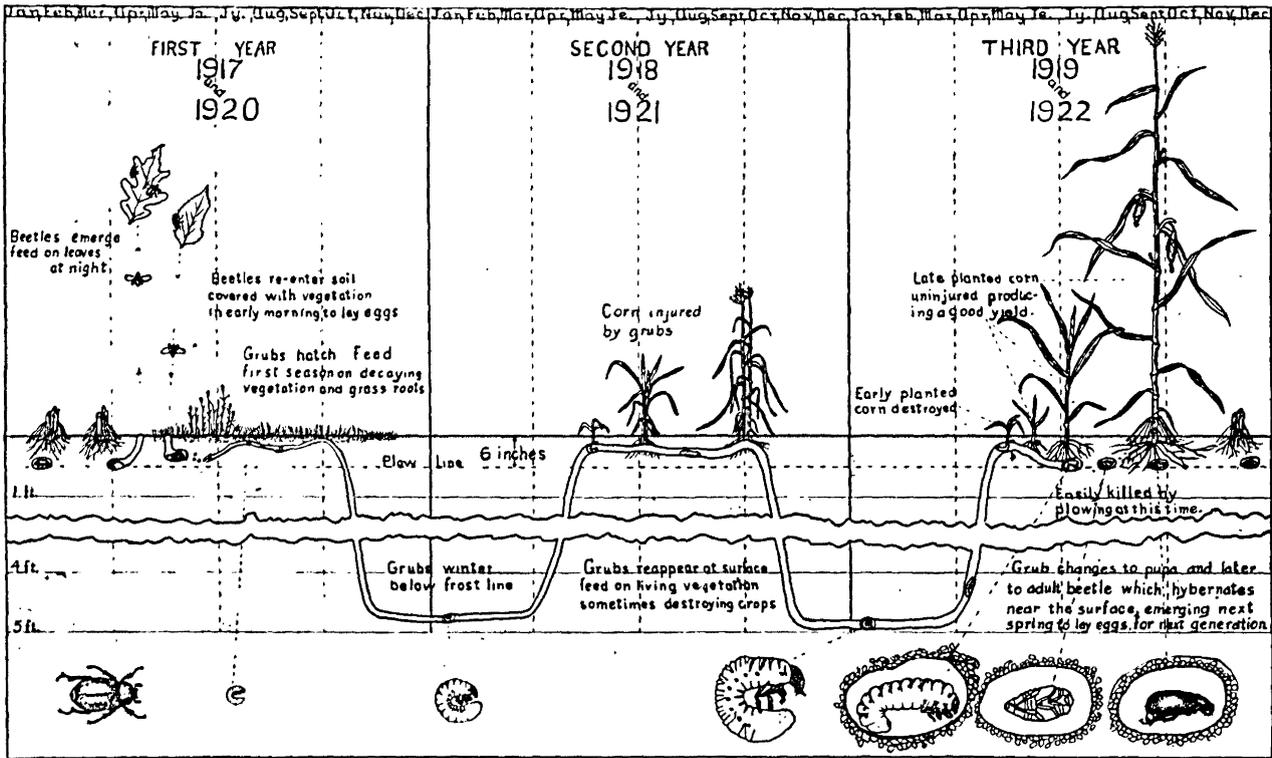


Fig. 2—Showing the three-year life cycle of the white grub

In the wooded area of northeastern Iowa one of these broods has become enormously abundant, while the other two have not increased materially in numbers. Figure 1 shows the area in which this increase has occurred and also a few scattering places in other parts of the state where damage has been reported.

It must be remembered in using this circular that it applies only to the area shown on the map and to the brood occurring every three years as shown in figure 2, and that bad infestations seldom occur very far from timber.

CROPS INJURED

These grubs, under natural conditions, are found only in grass sod. They live three years in the ground, but never travel from one field to another. When sod that is infested with them is plowed up and put into other crops, the grubs are compelled to feed upon whatever they find there. The crops that suffer worst are corn and potatoes. Small grains are seldom injured severely because of their abundant root system and early maturity. Buckwheat and the leguminous crops, such as clover, alfalfa and the various forms of beans and peas are not natural food plants for the grubs and are seldom damaged.

THE LIFE CYCLE

The life cycle of the white grub can be readily seen by referring to figure 2. This insect should not be confused with the large grub so often found in manure piles and stack bottoms. The two differ in both life history and feeding habits.

The clumsy brown May beetle or "June bug" so often seen about the lights in the spring, is the parent of the common white grub. These beetles emerge from the ground in the evening during May and early June, as shown in figure 2, to feed on the foliage of many species of trees and shrubs. They return to the soil in the early morning to hide during the day and to deposit their eggs. The eggs are deposited in rather compact soil, preferably grass sod or a good stand of small grain. Eggs are seldom deposited in loose cultivated ground or in a heavy stand of pure clover or alfalfa.

The eggs hatch in three or four weeks and the young grubs feed that summer on the grass roots and decaying vegetable matter in the soil, doing little damage. About the middle of October, as shown by figure 2, they begin to burrow deeper into the soil. The winter is passed below the frost line, from four to six feet below the surface. They reappear at the surface in May of the second year and by the end of the season have attained nearly their full growth. It is during this year that the greatest amount of damage is done.

The second winter is also passed deep in the soil. The grubs feed only a short time during May and early June of the third year, then they go down to a depth of about five or six inches

and construct an oval earthen cell within which they transform to a pupa and, in August, to the adult beetle. They remain in this cell until the following spring, when they come out to fly to the trees and later to lay eggs for the next generation.

CONTROL

When the grubs are in the field there is no practical method by which we can get rid of them without injury to the crops. They can probably be best controlled by proper crop rotation. Fields that are intended for corn or potatoes in 1921 should have a good stand of one of the clovers or alfalfa or be in some cultivated crop in 1920. Fields known to be badly infested with small grubs in the fall of 1920 should be left in grass or sown to some small grain that will stand up well on that kind of soil.

FALL PLOWING

Fall plowing is of importance in the control of the grub, during the year when it changes to the adult form (1919 and 1922). If done early, while the pupa is soft and helpless, merely breaking the cell means the death of the insect. If the plowing is done later, the beetle is soft and tender and cannot readily construct a new cell in which to pass the winter and so will perish.

WHAT TO DO IN 1919 AND 1922

Figure 2 shows that the large grubs will come up to the surface in the spring of 1919 and in 1922 and feed greedily a short time only, then they stop feeding suddenly and form an earthen cell, in which they later change to a beetle.

Early corn will suffer, but can be replanted. Later corn may be slightly injured at first, but will recover and make a good crop. All sod land intended for cultivation during the next two years should be broken in the fall of 1919 or the spring of 1920 before the "June bugs" fly and lay eggs. If this is done, the land will be free from grubs.

WHAT TO DO IN 1920 AND 1923

These will be "June bug years," as shown in figure 2. Trees may be defoliated by the beetles, but there will be no injury to the crops. Do not plant small grain on land intended for corn the next year. Alfalfa or clover may be broken up in the fall for corn land.

WHAT TO DO IN 1921 AND 1924

These are the "grub years." Corn should not be planted on land that was in grass or grain the previous year if small grubs were present in the early fall. A corn field that is being injured should not be replanted to corn, but may be planted to buckwheat, beans or peas. Millet or cane may be used if the grubs are not too abundant.