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THE MEXICAN COTTON-BOLL WEEVIL.

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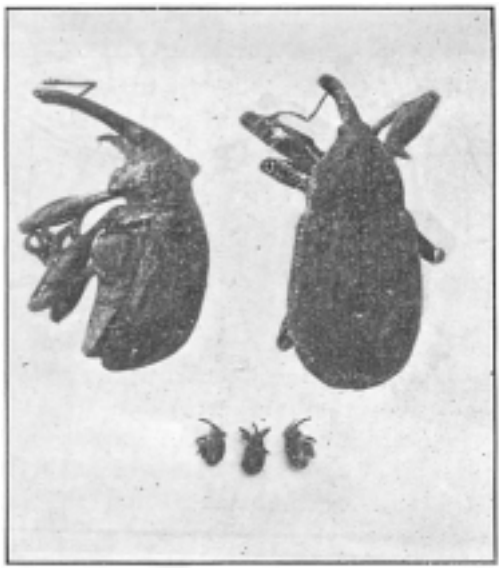

FIG. 1.—Adult weevils; natural size below, much enlarged above.

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MEXICAN COTTON-BOLL WEEVIL.

(ANTHONOMUS GRANDIS.)

Probably no pest has appeared on cotton within the last twenty years that has caused so much general uneasiness as the Mexican Cotton-boll Weevil is now causing. Every indication points to the fact that this is the most serious insect pest that has ever attacked the cotton plant in America. Moreover, the weevil is spreading over the cotton growing area of the United States with alarming ease and rapidity. Dr. Howard, in speaking of the spread of this insect says, "At the close of the season of 1903 it had practically reached the northern border of the State (Texas) and had, in two instances, at least, crossed the Louisiana border on the northwest."

The value to this State of the cotton crop and the fact that the weevil is now in the State of Louisiana make it almost imperative that every cotton grower should know something of the boll weevil, its appearance, habits, and life history. The following brief account of this insect is drawn from bulletins and circulars issued by the Division of Entomology of the United States Department of Agriculture.

Where the weevil came from.—It is well established that the weevil came from Mexico into the United States, probably by being carried across the Rio Grande River. It appeared in Texas in ~~1901~~ 1892 or ~~1902~~, and soon attracted considerable attention because of its destructiveness. Since then it has become more widely distributed over that State, until now its range extends to the Louisiana line.

Amount of damage caused by the weevil.—It is difficult to arrive at a satisfactory estimate

of the value of the cotton destroyed by this insect. Estimates of the damage done in Texas in the year 1903, range all the way from eight to twenty-five millions of dollars. Mr. W. D. Hunter says, "It seems well within the bounds of conservatism to state that during 1902 the insect caused Texas a loss of at least ten millions of dollars." At this rate, when the weevil becomes distributed over the cotton belt, the losses caused by its ravages will be enormous.

Appearance of the adult weevil.—The Mexican boll weevil belongs to the group of insects known as the beetles, therefore, the body is hard and well protected. It is about one-fourth of an inch long; but the size varies considerably owing to the amount of food the larva, or grub, obtains while it is growing. The weevil has a rather long, blunt snout, as shown in figure I. When the weevil first emerges it is whitish all over. Later, it becomes reddish-brown or chocolate in color. The back, sides and legs become covered with fine, reddish hairs; but as the weevils grow older, the hairs often wear off and the insect looks much darker, almost black.

Life history.—Like other beetles, this insect passes through four distinct stages to complete its life history, namely: egg, larva, or grub, pupa and adult.

Egg.—The female weevil makes a hole, with her snout, in a square, form, or boll and then turns around and with her egg-guide deposits an egg in this hole. She then seals the hole with a small drop of gluey substance to protect the egg from ants, rain, &c.

Grub or larva.—The egg hatches in two or three days, producing a very small, white, footless grub, or larva. This is the form of the insect that does the greater damage. The young grub, or larva, immediately begins to eat out the tender inside portions of the square, form or boll. The squares, in which grub-like larvæ are living, "flare" and fall to the ground. It takes from fourteen to seventeen days for the larva to become full grown.

Pupa.—When the larva is fullgrown, it changes to a quiet form known as the *pupa*. In this stage, the wing-pads, legs and snout appear and become visible to the eye. The pupa eats nothing, is whitish in color, and remains in its hiding place from seven

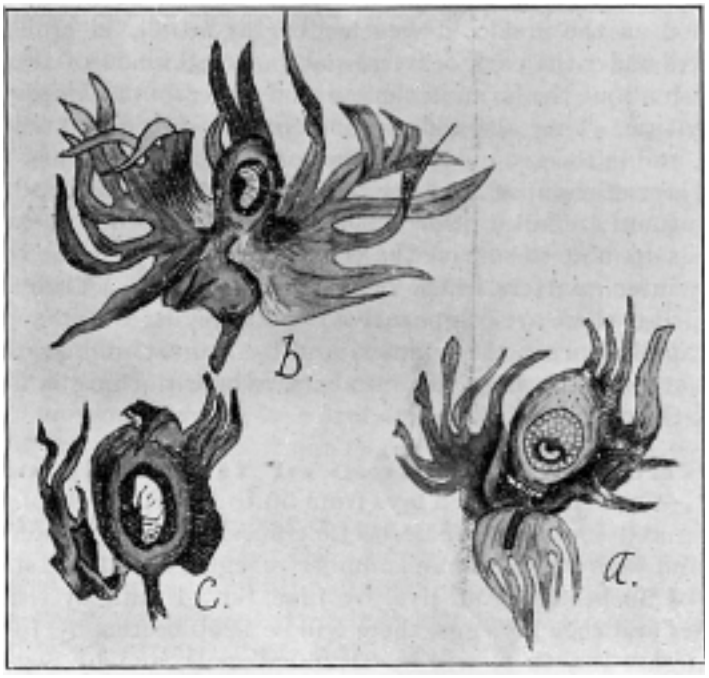

Fig. 2—a, newly hatched larva, or grub in young square; b, nearly full grown larva *in situ;* c, pupa in young boll picked from the ground. (After Howard.)

to ten days, and then changes to the adult weevil, which comes forth and in a few days lays the eggs for another brood of weevils.

Notice that the eggs, larvæ and pupæ are all inside the squares, forms, or bolls where nothing can reach them (Fig. 2).

How the weevils pass the winter.—The weevils pass the winter as adults, by hiding away, as soon as the first cold weather begins in fall, in cracks and crevices under the bark of trees, and under all kinds of trash and rubbish about the farm, in the gin and other outbuildings of the plantation. They also hide among cotton seed, in partially open bolls, and in the ground about the roots of cotton stalks. All the eggs, larvæ or pupæ that may be in the squares, forms, or bolls in the autumn are killed before spring by the frost. Only the mature weevils are able to survive the winter and many of these that go into winter quarters in the fall die before spring. Therefore, in the spring, there are comparatively few weevils; but they multiply rapidly during the summer, and by August and September, they are present in great numbers, where nothing is done to check their increase.

Rate of increase of the boll weevil.—One female weevil lays from 50 to 150 eggs. Prof. Mally has figured that if a female beetle comes from her winter quarters and lays her minimum number of eggs, 50, May 1st, there will be 50 beetles, if all live, by June 1st. If half of these are females and they lay eggs, there will be 1250 beetles by July 1st. By August 1st, there will be 31,250 weevils, and by September 1st, there will be 781,250 weevils that have sprung from one pair of weevils in the beginning. It must be remembered in this connection that he figured on the basis that each female weevil laid only 50 eggs, when she might have laid two or three times that number.

Feeding period.—The adult weevils feed most actively during the day. They travel and fly but little at night. In early spring, when the weevils come from their hiding places, they travel around actively in search of young cotton and are voracious feeders at this time. They climb to the ends of the young

stalks of cotton and eat the seed-leaves and developing bud. Later, before the squares are formed, the weevils eat small holes in the growing portions of the stalks and branches. In the autumn, the weevils become sluggish and feed much more sparingly.

"It has not yet been definitely established that the boll weevil will feed upon any other plant than cotton."

Rate of migration.—Under ordinary conditions, it is quite evident that this insect spreads slowly. The adult weevils do not fly actively or for any great distance at any time. They usually fly from row to row and spend considerable time when they alight. Prof. Mally says, "Their spread over the field is a slow process during the growing period of the cotton, and the egg-laying season of the weevil." No doubt high winds and hurricanes aid in enlarging the range of this pest. Their active search for growing cotton in the spring leads them over quite an area and they spread more at this time than later. Then again, in the fall, after the frosts come, they wander widely in search of winter quarters. It is probable that the weevil migrates farther in the spring and autumn than at any other time during its life.

The danger of importing this insect.—We have seen that the adult weevil hibernates among cotton seed, baled hay, and around gins and outhouses. How easy for the mature insects to be carried in shipments of cotton seed, hay, and baled cotton! Prof. Mally says, "The egg is deposited so late in the season that the larva barely has time to eat into the seed before the boll opens. Hence the cotton is sometimes gathered and ginned before the larva has become full grown. *It consequently often happens that the adult weevils are found in the seed later on.*"

In the face of the above facts, the need of an efficient svstem of quarantine is too obvious to need discussion.