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The Colorado potato beetle in Mississippi

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THE COLORADO POTATO BEETLE IN MISSISSIPPI.

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AGRICULTURAL COLLEGE, MISS.

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The bulletins of the Station are sent free of charge to all farmers in Mississippi who apply for them.

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The Colorado Potato Beetle in Mississippi.

(*Doryphora 10-lineata.*)

For several years past the Station has received frequent inquiries regarding this insect and specimens of it from localities in the northern portion of the state, and from year to year it was noticed that the inquiries came from localities further south than those which had been previously received. Last year many more inquiries regarding the insect were received than ever before, and in fact nearly one-third of the inquiries sent to the Station relating to insects were in regard to this species, in many cases several being received from different persons in the same locality. As this insect is as new to many of the farmers of this state as it was to the farmers of Illinois and adjacent states in the early sixties, this bulletin has been prepared.

HISTORY AND DISTRIBUTION.

The Colorado potato beetle receives its common name from the fact that its native home was at the eastern base of the Rocky Mountains, where it fed upon a species of wild potato quite common to this region, known as the Sand-bur (*Solanum rostratum*). It was collected there and described by Thomas Say in 1824. It was first mentioned as an injurious insect in 1859 when some of the early settlers of Western Nebraska reported it feeding in large numbers upon the Irish potato. We thus see that the species changed its food from a wild to a cultivated plant, as has been the case with many of our injurious insects.

From western Nebraska in 1859, the species travelled eastward from year to year at the rate of about eighty miles a year. Iowa and Missouri were first invaded, Illinois and the states east of it soon afterwards, and it finally reached the Atlantic coast in 1874. Here the ocean stopped its progress eastward, and although for a time it was feared that it would soon appear in Europe, and specimens were even reported as having been collected in various European localities, yet it does not occur in Europe at present, nor is it known, according to Dr. Howard, in any foreign country.

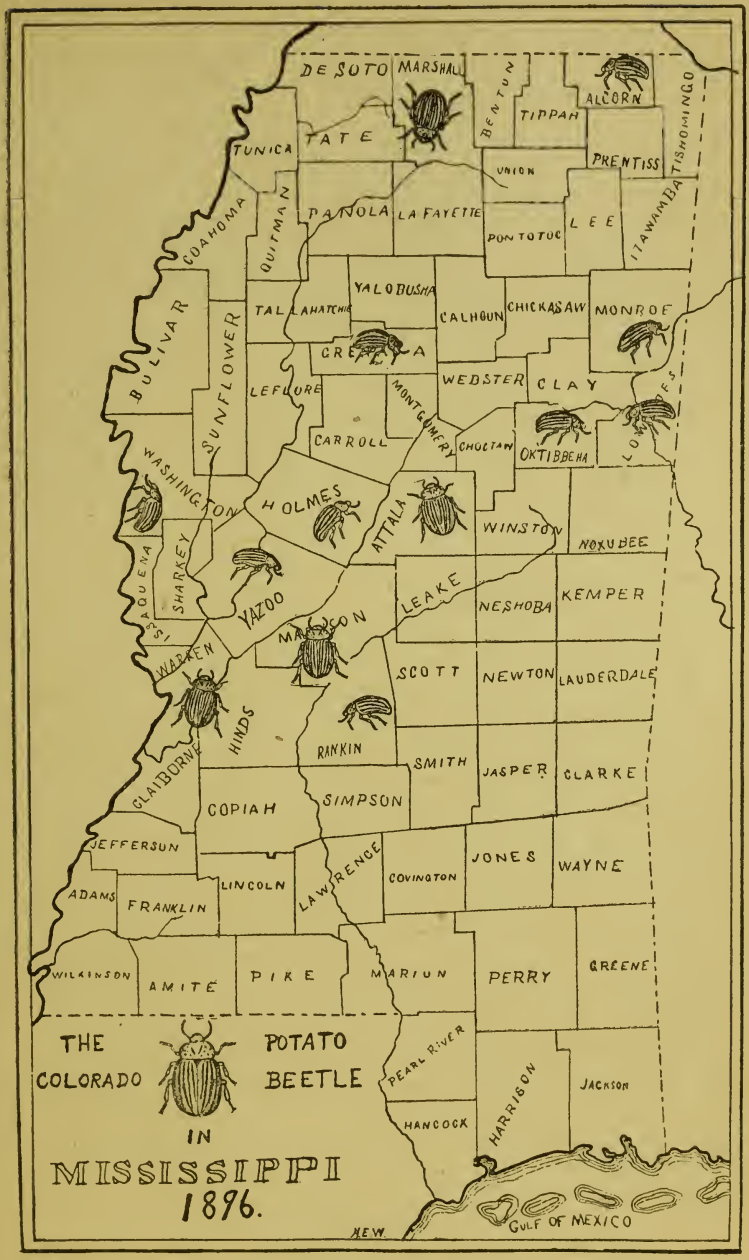
In the United States at present it occurs in injurious numbers in all the northern states east of the Rocky Mountains and as far south as a line drawn from Fort Worth, Texas, to Savannah, Georgia. Prof. Morgan of the Louisiana Experiment Station reports it as occuring slightly south of this line in that state. In 1875 the species did not occur in any localities south of the northern boundry of Tennessee and its spread southward has been rather slow, doubtless owing to two causes: (1) the natural home of the species being a colder climate, and (2) but few Irish potatoes having been heretofore grown in the south.

DISTRIBUTION IN MISSISSIPPI.

Near the northern border of Mississippi the species has been known for the past five years, and last year was found throughout the northern and central portions of the state. The accompanying map shows the localities in this state from which the insect was reported to the Station as occuring in injurious numbers last year. The species was reported in small numbers in other localities, and doubtless occured all through the northern portion of the state, but was not reported to the Station. Owing to the large increase in the acreage devoted to Irish potato growing in this state and throughout the South, it is probable that the species will continue its southward spread to the Gulf of Mexico.

DESCRIPTION AND LIFE-HISTORY.

While it is needless to describe in detail the appearance of an insect so well known to many farmers of the state, yet the following facts are given for the benefit of those who are not so familiar with the Colorado potato beetle. The mature insects make their appearance in the spring at about the time the potatoes are up, and lay their reddish eggs (*a* Fig. 1) upon the underside of the leaves.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LAFAYETTE
PONTOTOC
LEE
ITAWAMBA
BOLIVAR
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ATTALA
WINSTON
NOXUBEE
SAQUENA
SHARKEY
YAZOO
LEAKE
NESHOBA
KEMPER
MADISON
WARREN
SCOTT
NEWTON
LAUDERDALE
HINDS
RANKIN
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The eggs are laid in clusters of from ten to forty and, according to Riley, the females have been known to dig into the ground before the potatoes are up in order to lay

FIG. 1.—COLORADO POTATO BEETLE.

aa, eggs; *bb*, larvæ; *c*, pupa; *dd*, beetle; *e*, wing of beetle, enlarged. (From Riley.)

their eggs. A single female usually lays about 500 eggs and in some cases twice that number. In a few days the eggs hatch into soft dark red larvæ (*b* Fig. 1) which soon become lighter in color with a double row of black spots along each side of the body, the legs and head being black. They feed upon the leaves and in from two to three weeks become full grown when they form pupæ (*c* Fig. 1) in the earth near the plant. In about ten days they come forth as perfect beetles as shown at *d* in Fig. 1, *e* showing the right wing case or elytra of a beetle, much enlarged.

DESTRUCTIVENESS.

Both the beetles and the larvæ feed upon the potato leaves, and unless some means are taken to destroy them, will soon devour every leaf. For several years before the general use of Paris green and other insecticides for the destruction of this insect, its ravages largely affected the market price of potatoes, in 1873 the wholesale price in the St. Louis market being, according to Riley, two dollars per bushel. But while the beetle has been and is very destructive, its occurance in the United States has not been altogether a curse, for to its ravages we very largely owe the introduction and extended use of insecticides. Soon after it was found that the beetles could be killed by the application of various poisonous substances,

attention was given to the use of these substances for the destruction of other insects. Experiments were made regarding the effect of many substances upon different injurious insects, and through these experiments and the improvements in the apparatus for the application of these poisonous materials which followed, the modern methods of combating our injurious insects have been developed.

THE BOGUS POTATO BEETLE.

A beetle very similar to the Colorado potato beetle known as the bogus potato beetle is shown in Fig. 2 and this should not be mistaken for the former. The wing cases of the two beetles differ as may be seen from the figures, the third and fourth dark stripe, counting from the outside, of the Colorado potato beetle are united behind, while in the bogus potato beetle, it is the second and fourth dark stripe from the outside which are united. The larvæ of the bogus beetle have but one row of dark spots on each side of the body, while the larvæ of the Colorado beetle have a double row of spots. The bogus beetles, however, never occur upon potatoes but are not uncommon upon the horse nettle (*Solanum carolinense*), a plant quite common in this state. The Colorado potato beetle will also feed upon the horse nettle as well as many other plants, especially tomato, upon which it even occasionally occurs in injurious numbers.

FIG. 2.—THE BOGUS POTATO BEETLE.

aa, eggs; *bb*, larvæ; *c*, beetle; *d*, wing, and *e* leg of beetle, enlarged. (From Riley.)

REMEDIES.

As both the mature insects and the larvae feed upon the potato leaves, they are easily killed by the application of any poison, and as the leaves are rather rough anything applied to them is retained much longer than upon leaves having a smooth surface. Of the many substances used for the destruction of these insects, Paris green in some form is the standard. It may be applied in the form of a spray by mixing with water at the rate of a teaspoonful of the green to a bucket of water, or in a dry form mixed with flour or lime. A common practice is to

mix the green with lime and water to the consistency of a thin paste and apply with a whitewash brush.

London purple is cheaper than Paris green and will do equally as well. Slug shot and other special preparations, most of which are effective in destroying this pest,

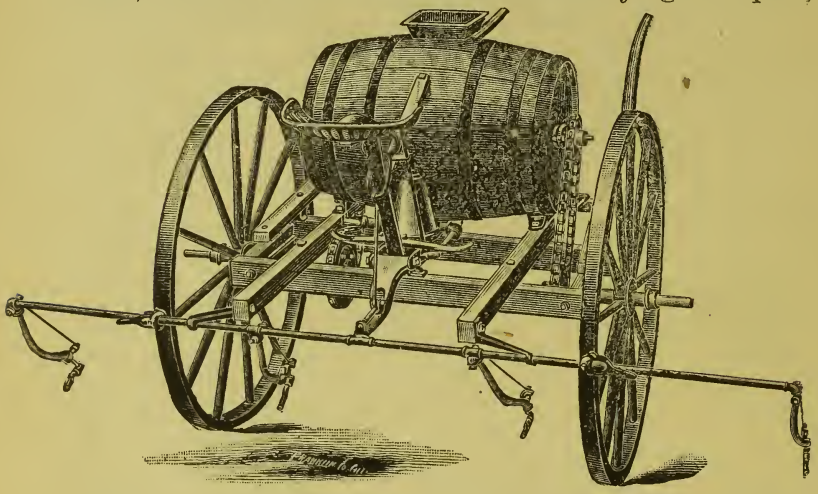

FIG. 3.—THE ASPINWALL POTATO SPRAYER. (From the manufacturers.)

have been upon the market for several years. In fact there is perhaps no injurious insect that is more easily combatted than the Colorado potato beetle. If the insecticide is applied in the form of a spray, the knapsack pump is a convenient apparatus with which to make the application. Where potatoes are grown upon an extensive scale, however, a larger form of apparatus such as is shown in Fig. 3 is necessary. When the insecticide is applied in a dry form, a common flour sack, some form of powder bellows, or a seive-like apparatus, such as shown in Fig. 4, may be used.

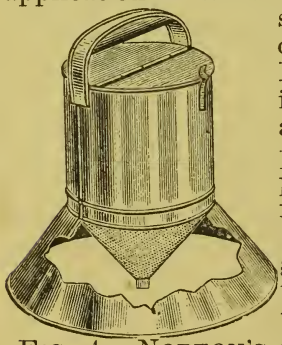

FIG. 4.—NORTON'S PLANT DUSTER. (From the manufacturers)

Treatment, however, should begin as early as the beetles make their appearance, for if the beetles that first appear in the spring are destroyed, no further damage will result.