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## A DESTRUCTIVE BEETLE AND A REMEDY.

F. H. HALL AND V. H. LOWE.

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A DESTRUCTIVE BEETLE AND A REMEDY.

F. H. HALL.

**Basket-  
willow  
industry.**

One of the small but hitherto profitable industries of Central New York is the growing of basket-willows. The "whips" are grown from cuttings and, to be marketable, each must be a single, straight, pliant stem about one-eighth of an inch in diameter at the base, and from five to eight feet long. The cuttings begin to produce these "whips" the second year, and may continue to yield crops of from two to five tons per acre annually for ten or fifteen years if not injured.

Within the past five years, however, after a practical disappearance for nearly twenty years, an insect pest has appeared in the willow fields of Oneida, Madison, Onondaga and Cayuga counties, which has destroyed the profits and threatens the very existence of this industry. This enemy is the Cottonwood Leaf Beetle, *Lina scripta*. These beetles, shown at Plate I, fig. 5, are closely related to the common Colorado potato beetles, are about half as large and are dull gold and black above, dark metallic-green beneath.

These little beetles and their larvæ (shown at Plate I, fig. 2) attack the leaves and the young succulent tips of the rapid growing willow "whips," not only checking their growth but causing the stems to branch,

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\* This is a brief review of Bulletin No. 143 of this Station on The Cottonwood Leaf Beetle; Green Arsenite, by V. H. Lowe. Any one specially interested in the detailed account of the investigations will be furnished, on application, with a copy of the complete bulletin.

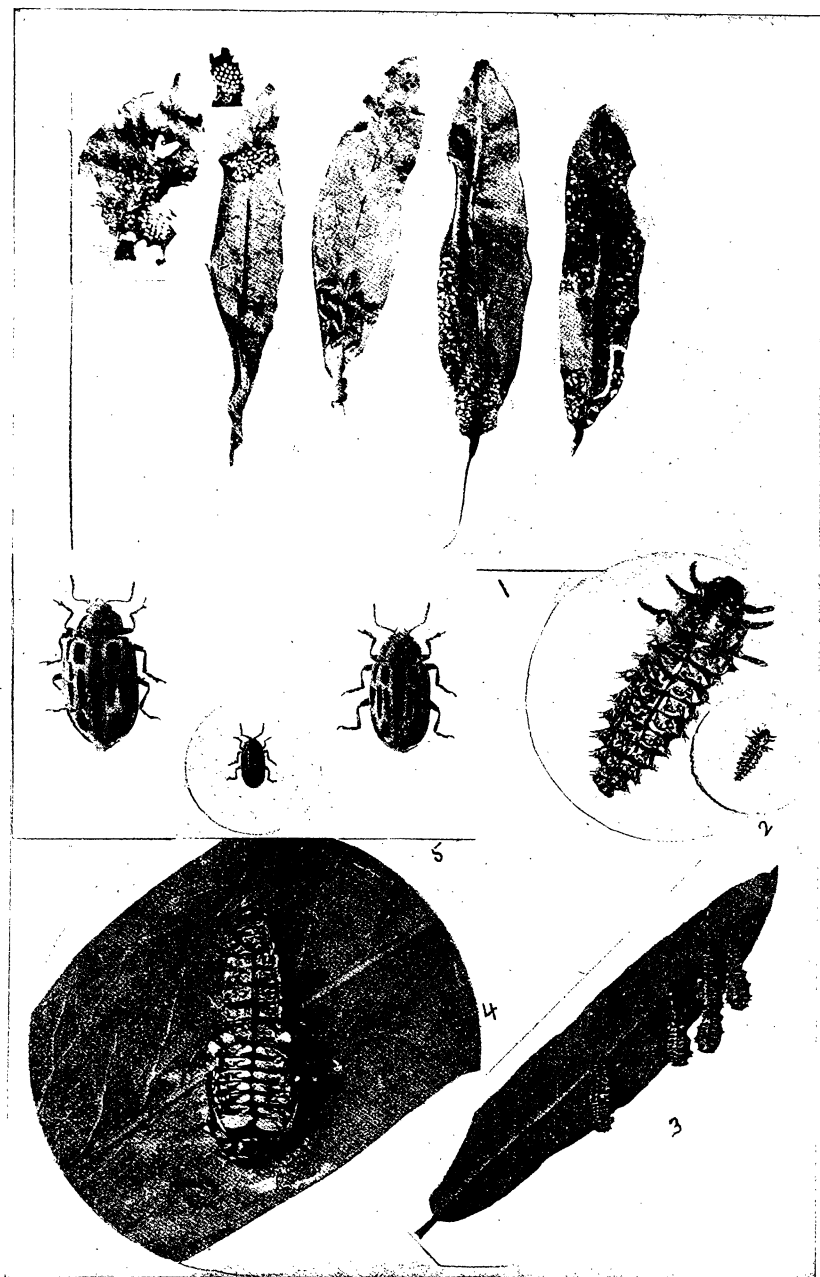


PLATE I.—EGGS, LARVA, PUPÆ AND MATURE FORM OF COTTONWOOD LEAF-BETLE.

thus rendering them useless ; for the branched " whips " cannot be woven into baskets and the branches do not attain marketable size. The injured twigs are shown in the figure upon the cover and at the right of Plate II, while a perfect " whip " is shown at the left of this plate.

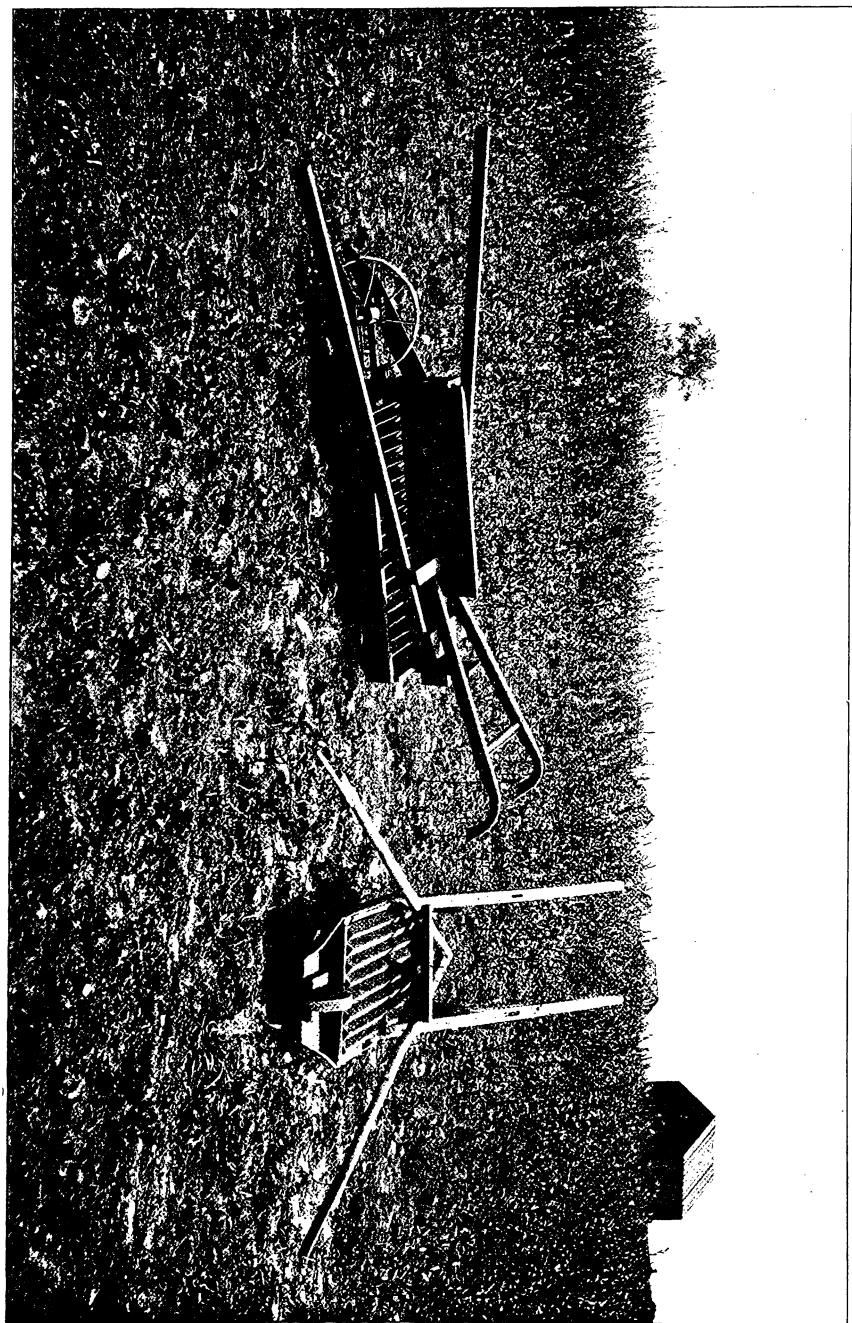
**Damage.** During 1894 and 1895 from half to three-fourths of the willow crop of Onondaga County was rendered worthless by this pest. Near Liverpool, alone, the crop of 1895 was 1,200 tons less than that of 1894, the beetle being responsible for the shortage. One grower harvested but \$200 worth of " whips " from twenty acres of willows, which ordinarily produced from \$80 to \$200 worth per acre. The insects feed also upon cottonwood, poplar and box-elder and have done slight damage upon nursery stock of these trees.

Many of the beetles survive the winter and appear **Life history.** early in May, feeding voraciously upon the bark of the new growth and upon the leaves of the willows. Eggs are soon laid, in groups upon the leaves as shown at Plate I, fig. 1, or upon blades of grass or leaves of weeds in the willow rows, and in late May or early June the larvæ appear and begin a similar destructive career. In ten or fifteen days more, about the middle of June, the larvæ are full grown, and attach themselves to the leaves by means of sticky discs at the tips of their abdomens (Plate I, figs. 3 and 4). They now become pupæ, popularly called " hangers," and remain in this condition about two weeks, finally emerging as perfect insects during late June and early July. The beetles feed upon the willows until early in August and then seek winter quarters.

The most common means of combating these **Remedial** insects is by use of the machine shown in **measures.** Plate III. This consists essentially of a long, flat, shallow trough, lined with metal and mounted on low runners. The tank is partly filled with kerosene or kerosene and water and drawn by hand or horse power between the rows of willows. The projecting arms draw the slender " whips " over the tank and the beetles and larvæ drop in and are destroyed by the kerosene. The strips over the top of the tank prevent the willows from touching the liquid. These machines are quite



PLATE II.—PERFECT AND INJURED WILLOW WHIPS.



effective, but require use every day, sometimes twice a day, for three weeks or more, which is a considerable item of expense. The beetles also begin work upon the young willow sprouts before these are high enough to be caught by the arms of the machine, and thus the insects do great damage before the machines can be used. From experiments conducted by this Station it has been found that spraying can be substituted for the machines or used to supplement them with advantage. Three treatments, about ten days apart, with green arsenite and whale oil soap solution, 1 lb. arsenite and 5 lbs. of soap to 100 gals. of water, proved a very efficient and inexpensive method of meeting the enemy. The willows become too large to spray with advantage before the third treatment, however, so it seems best to spray twice and follow with the machine.

**Green arsenite.** Green arsenite, which has been found so effective in these experiments and in treatment of other insects of similar character, is a substitute for Paris green and possesses some qualities which make it more desirable than the latter. It is fully as poisonous as the Paris green, is cheaper, and is a fine impalpable powder instead of being crystalline, which causes it to remain in suspension much better than does the Paris green. For this reason a much more even and satisfactory distribution of the poison can be attained. It costs about fifteen cents a pound, and can be obtained of the Adler Color & Chemical Works, New York, and probably from other dealers. It should be used with lime, as is Paris green, to prevent burning the foliage.