No. 82. Issued January 2, 1907.

ited States Department of Agriculture,
BUREAU OF ENTOMOLOGY,
L. O. HOWARD, Entomologist and Chief of Bureau.

PINHOLE INJURY TO GIRDLED CYPRESS IN THE SOUTH ATLANTIC AND GULF STATES.

By A. D. Hopkins,
In Charge of Forest Insect Investigations.

Pursuant to certain complaints of serious injury by wood-boring insects to girdled cypress timber in the South Atlantic and Gulf States, the Bureau of Entomology began a series of experiments and investigations with special trees girdled on definite dates in every month of the year, as well as with those girdled in regular operations at known dates or periods, to determine whether or not there was any important relation between the month or time of year the trees were girdled and subsequent injuries.

This work was personally conducted by specialists of the Bureau in cooperation with cypress manufacturers in southeastern North Carolina, southern South Carolina, southeastern Georgia, western Florida, and southern Louisiana. It was begun in the spring of 1903 and continued until December, 1904. Over 300 trees were examined, and observations were made on practically all of the different species of insects which are in any manner associated with injury to the wood and bark of living, dying, and felled, as well as girdled, cypress.

RESULTS OF INVESTIGATIONS.

The principal injury to the wood of standing girdled cypress was found to consist of pinholes in the sapwood and heartwood caused by two classes of small wood-boring beetles, called timber beetles, ambrosia beetles, pin borers, "pin worms," etc. They bore the so-called pinholes in the wood as places to deposit eggs and rear their broods, and the latter, when fully developed, leave the wood and fly to other trees to repeat the process.

One of these classes of wood-boring beetles is represented by small, short, cylindrical, reddish beetles one-eighth to one-tenth of an inch in length, which are exclusively sapwood borers. As a rule they are not common in girdled trees, but are abundant in logs from living trees.

The other class is represented by elongate, slender, reddish, cylindrical beetles three-eighths of an inch in length, which often extend their borings deep into the heartwood and are often common and quite

injurious to both girdled and felled trees. One species of this latter class causes more damage, perhaps, than all of the many other insects which have been found boring in the wood of girdled trees. It is known technically as *Platypus compositus* Say, and may be distinguished from other cypress pin-borers by the English name "girdled-cypress pin-borer," or Pan American Platypus. (See fig. 1.)

The facts and evidence of immediate practical importance may be briefly stated as follows: Trees girdled in March, April, October, and November were not at all or but slightly damaged by the girdled-cypress pin-borer, while those girdled in May, June, July, and September were more or less seriously damaged. There were indications that trees girdled in August were not damaged as badly as those girdled in July

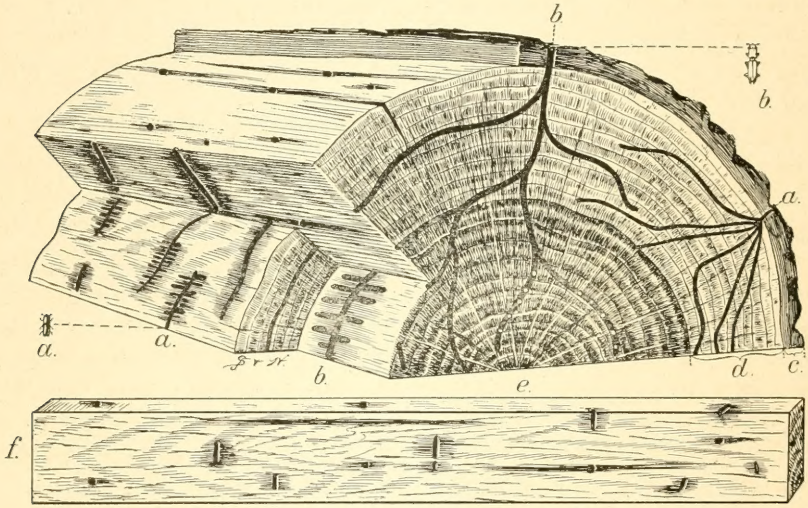

FIG. 1.—Work of ambrosia beetles in oak: *a*, *Monarthrum mali* and work; *b*, *Platypus compositus* and work; *c*, bark; *d*, sapwood; *e*, heartwood; *f*, character of work in lumber from injured log. (Author's illustration.)

and September; also, that trees girdled from December to February were not seriously affected. It was found that local factors and conditions had an important bearing on whether or not injury resulted from girdling at given dates. In some localities there was practically no injury to trees girdled on any of the dates. In other localities some of the trees girdled on a given date would be badly damaged while others would show no trace of injuries. The absence of injuries in the former localities may have been due to the presence of a limited number of the insects, or to their being attracted to felled trees in preference to the standing girdled ones, or to some other unknown causes. The attack on individual trees is evidently due to individual differences in the trees themselves, for our general observations indicate quite clearly that certain types and varieties of trees of the same species are more resistant

or immune to their insect enemies while others are more attractive to them. It is well known that there is a marked difference in the individual characteristics of cypress trees in any given locality, and especially so in different localities, and that there is also marked difference among a large number of trees girdled on the same day or time of year in the results obtained. Some will die quickly and dry out rapidly; some will remain alive a much longer time, the wood remaining moist and becoming discolored; some will yield beautifully grained lumber of the highest grade; while others, equally as sound, will yield tough, cross-grained, dull lumber of a low grade. These conditions are not due entirely to the character of the work of girdling, nor to accident, local influences of soil, etc., but largely to variations which produce more or less distinct, good and poor natural varieties. Therefore certain trees or varieties which prove to be especially attractive to the pin-borer, no matter when they are girdled, may be attacked and more or less injured.

The girdled-cypress pin-borer *must have* moist wood in which to excavate its burrows and develop its broods of young and *will not* attack the trees after they have been dead long enough for the wood to become dry. It evidently prefers to attack the wood of felled gum and cypress. Our observations indicate that living trees felled in April and August offer specially attractive conditions for infestation by this species, and that it will often begin to enter the wood within a few days after the trees are felled. This suggests the utilization of felled trees as traps to attract it away from the girdled ones and at the same time facilitate the destruction of the broods by placing the logs of the trap trees in water after they have become thoroughly infested and before the broods of adults begin to emerge and fly.

To accomplish this the trap trees felled in April must be burned or placed in water during the following June and those felled in August treated in the same manner in October.

RECOMMENDATIONS.

General recommendations for the prevention of insect injury to girdled cypress may be briefly stated as follows:

First.—Conduct the principal girdling operations in March, April, October, and November, or either in the former or latter months as may seem best from the local conditions and relative value of the product in each locality. October-girdled trees should be felled and floated or worked up within one year to avoid injury by another class of wood borers which attack trees after they have been dead one or more years.

Second.—In localities where it is known that the insect is abundant and injurious, felled trap trees may be provided in March and April, and July and August, say, one otherwise worthless gum or cypress trap tree for each fifty to seventy trees to be girdled in the same locality.

Third.—If it is desirable to girdle trees at other times during the summer and to utilize trap trees, these latter should be provided a week or more ahead of the girdling, and located on the banks of streams, ponds, or pools, where, at the proper time, they can be readily rolled into the water.

Fourth.—Trap trees should never be provided unless it is quite certain that they will be placed in the water or otherwise destroyed within two or three months after they are felled and infested by the insects, otherwise they may contribute to a greater multiplication of the insects and increased danger of serious injury to the girdled trees.

The adoption and carrying out of these recommendations should be governed in each locality by the personal observations and experience of the operators, based on a study of the conditions resulting from trees girdled at different positively known dates or times of year, and also on a study of the evidences of infestation by the pin-borer in the girdled trees and in the logs, stumps, slash, etc., of cypress, gum, and other trees. These evidences of infestation consist of the greater or less quantities of fine, whitish boring-dust on the bark and around the base of the trees and stumps, under the logs, etc., the work of the girdled-cypress pin-borer and its class being distinguished from that of the sapwood borers by the prevalence of short cylindrical sections of adhering dust expelled from the holes.

For more detailed information on the habits of wood-boring insects and the character of injuries caused by them in standing and felled trees, lumber, etc., the reader is referred to the Yearbook of the United States Department of Agriculture for 1904, pages 381 to 398.

Approved:

JAMES WILSON,
Secretary of Agriculture.

WASHINGTON, D. C., *December 19, 1906.*

O