The larvae pass through five stages. With the mean temperature at 59.7 degrees F. the average larval period of females was 22 days. The pupal period of females averaged 24.3 days when the mean temperature was 56.5 degrees F. These temperatures were exceptionally low for the summer season, and the larval and pupal periods are generally much shorter. The period from oviposition to adult emergence averaged about 31 days and ranged from 26 to 50 days.

The longevity of adults varied from 6 to 47 days, while the average longevity of fed adults in cages was 31 days under Parke Reserve conditions. Reduced longevity was pronounced when on one occasion the temperature went to 92 degrees F. in 1935.

Microplectron hibernates in the last larval, prepupal, and pupal stages. Experiments have demonstrated that the egg and younger larval stages will not hibernate. The larvae hatching from eggs that were laid later than September 22nd in 1934, and September 15th in 1935, did not develop sufficiently to survive the winter, and eggs laid during the latter part of September succumbed to frost.

It is definitely known that *Microplectron* can withstand the rigorous winters of Quebec. Forty-three colonies of *Microplectron* adults were recovered from *Diprion* cocoons collected at Parke Reserve in the fall of 1935, and similar collections made in September, 1936, are, at the time of writing, beginning to produce adults of the parasites at Belleville, where the cocoons are being incubated. In spite of the hardy nature of this parasite, it should be remembered that *Microplectron* adults are not strong fliers, and crawling seems to be the chief means of locomotion, so, when liberations are made, some consideration should be given to optimum conditions for establishment. Experiments indicate that the parasite does best in an open stand, where the sun's rays can penetrate. This preference is coincidental with that of the host itself. Sawfly cocoons lying closest to the surface of the ground cover are more readily attacked by *Microplectron* than are cocoons covered with dense layers of moss or debris.

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NEWS AND VIEWS

AUTOGIROS AND CHEMICALS USED IN CAMPAIGN TO SAVE ELMS

"Silvicide"—a way to make unwanted trees kill themselves—and aerial scouting are new features of the campaign by the U. S. Department of Agriculture) to save American elms from extinction by Dutch elm disease, which has practically wiped out European elms.

Most elms condemned as possible sources of infection—more than three million all told—have been felled and burned. About 625,000 of these, however, were killed by the new treatment—"silvicide." This is done by peeling a band of bark from the tree at about breast height and placing over the exposed wood granulated copper sulphate, kept in place by a strip of oil cloth. Moisture from

the wood dissolves the copper sulphate, which, taken up by the sap, soon poisons the tree. This treatment has proved about 95 percent effective in killing banded trees. Hot, dry weather in July and August might even bring the kill up to 100 percent. Any trees hardy enough to survive the girdling and chemical injection will be felled and burned. Trees killed by silvicide are left standing for the owner to use when and as he sees fit.

Four autogiros scout inaccessible areas and railroad rights of way for diseased trees. Flying slowly just above the tree tops, trained observers readily spot wilted or discolored foliage—indications of the presence of the disease. They mark the location of every suspected tree on a map, later used to guide a ground crew to the spot.

Dutch elm disease came into the United States between 1925 and 1933 on burl elm logs shipped from Europe to cabinet makers in the Middle West. The fungus that causes the disease does not grow on the outside of elm trees. Its spores are not carried by the wind. It is spread by insects, particularly the small European bark beetle and the American elm beetle, which lay their eggs in shallow tunnels beneath the bark. The young beetle grubs feed on the wood around them, mature, and emerge to fly off to other elms, carrying with them disease spores, if the wood on which they fed was infected.

Objectives of the Federal eradication campaign, now in its fifth year, are (1) discovery and removal of every diseased tree as soon as possible after the first symptoms of infection—yellowing and wilting leaves and dying branches, which show up well in June and July; (2) removal of dead and dying elms, which are particularly attractive to bark beetles; (3) destruction in swamps and woods of wild elms that have no value and may harbor Dutch elm disease spores.

The disease is concentrated in a comparatively small area extending radially from New York City about 50 miles into Connecticut, New York State, and New Jersey. There have been a few isolated cases also in Maryland, Virginia, Indiana, and Ohio, and, beyond the major disease area, in Connecticut. No cure for the disease has been developed. The only hope for the American elm is to find every diseased tree and destroy it before the infection can be spread to healthy trees.

The results of the campaign thus far support the belief on which it was started—that Dutch elm disease can be eradicated from the United States, if the necessary man power and equipment are on hand at the right time. There must be enough trained scouts to find every diseased tree at the onset of the infection and enough well-equipped follow-up crews to destroy infected trees before the disease can spread from them to healthy elms.

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