

from hatching eggs on the ground or on objects near the trees the bands should be applied before the eggs hatch, and at the latest they should be in place before the migration time of the caterpillars. The date of hatching varies so widely with the weather conditions of the season that no definite date can be recommended, but the bands should usually be in place by the middle of June, and in some seasons before that time.

Tree Tanglefoot.—Several devices for preventing the caterpillars climbing the trees, such as bands of cotton, burlap, metal, and various sticky substances, have gradually given place to the sticky mixture known as "Tree Tanglefoot," which may be obtained in bulk from any dealer in insecticides. A fair substitute may be made by boiling together equal parts of castor oil and resin.

The tanglefoot is applied with a wooden paddle so as to form a complete ring about the trunk, 4 inches wide, from 5 to 8 feet from the ground. Before the mixture is applied the surface of the trunk on which the application is to be made should be scraped unless the bark is already sufficiently smooth. The tanglefoot gradually hardens on the surface, and it is therefore advisable to break its surface by scraping it over with a coarse comb at intervals of ten days or two weeks. Instead of applying the tanglefoot to the bark it may be spread upon a strip of canvas or burlap fastened around the trunk.

When the material known as *raupenleim* is available, it makes the most effective band; it is more easily applied, and remains sticky for a much longer time.

While the trees are being banded, any connections with infested locations should be broken. Telegraph wires or branches interlocking with infested trees may reinfest the clean trees after all ordinary precautions have been taken; and it is therefore necessary to band telegraph and telephone poles whose wires have any connection with the shade trees to be protected, or to cut out with trimmers the branches which connect with the sources of infestation.

Spraying Outfit.—For spraying city shade trees effectively it is absolutely necessary to have an efficient spraying outfit. A power sprayer is required, capable of giving from 400 to 600 pounds pressure, and with a pump capacity great enough so that a solid stream may be held constantly from 65 to 85 feet up from the nozzle. These requirements should be insisted upon when purchasing spraying outfits for shade-tree work.

THE WHITE-MARKED TUSSOCK MOTH AS AN ORCHARD PEST.

By G. E. SANDERS.

At intervals of from ten to seven years, most orchards in Canada are visited by the Tussock Moth. From one week to ten days after the blossoms fall the young larvæ emerge from the egg and begin to feed on the leaves. After feeding for two weeks on the leaves the jaws become strong enough so that they can attack the fruit. From that time until they pupate, or from early July until mid-August, the larvæ feed on the fruit rather than on the leaves of the apple. In 1907, 1911, and 1916-17 the Tussock Moth was the most serious pest in many of the orchards of the Maritime Provinces, damaging, in some cases, as high as 50 per cent of the fruit. The injury to the fruit is somewhat similar to that inflicted by the Fruit Worms, but instead of a round deep bite into the fruit, the injury by Tussock caterpillars usually takes the form of long, narrow, shallow, irregular channels, which do not heal over as smoothly as Fruit Worm injury, but rather with a thick, brown, corky scab.

The larvæ of the White-marked Tussock emerge just before the time of the fourth, or last, summer spray, and in the past the last summer spray has been recommended as the proper spray to control it. In the spraying work of 1917 it was found that from forty-four trees receiving the first spray only, 9.1