

shot-holes are evident). Insecticides may be most effective when applied in the early morning or evening.

For the most recent information on chemicals available for control of these pests, call Agriculture Canada's Pesticides Directorate in Ottawa (toll-free) at 1-800-267-6315.

Chemical pesticides are toxic to humans, animals, birds, fish and beneficial insects. Follow all instructions and precautions listed by the manufacturer.

Forest Leaflet 12: Fall and spring cankerworm
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© Minister of Supply and Services Canada 1991
Cat. No. Fo29-31/12E
ISBN 0-662-19019-X
ISSN 1183-8655

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When referring to this publication, please cite:
Cerezke, H.F. 1991. Fall and spring cankerworm. For.
Can., Northwest Reg., North. For. Cent., Edmonton,
Alberta. For. Leaflet 12.

Cette publication est également disponible
en français sous le titre
Arpenteuse d'automne et arpenteuse du printemps.



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Fall and spring cankerworm



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Distribution and Hosts

The fall cankerworm (*Alsophila pometaria* [Harris]) and the spring cankerworm (*Paleacrita vernata* [Peck]) are closely related defoliators of many deciduous trees and shrubs. Both are native North American species, widely distributed throughout the southern half of the three prairie provinces in various types of rural and urban tree stands and plantings. Infestations, particularly of the fall cankerworm, occur often and affect both large and local areas. During frequently simultaneous infestations, larvae of the two species may feed together.

The preferred hosts of the fall cankerworm are Manitoba maple and American elm, but it also attacks ash, basswood, bur oak, Siberian elm (improperly called Chinese elm), aspen, white birch, and various fruit trees.

The spring cankerworm attacks many of the same trees as the fall cankerworm, but prefers Siberian elm.

Symptoms and Damage

Damage by both species of cankerworm usually begins in late May when young larvae chew small holes (shot-holes) in the developing leaves. As feeding continues, these holes gradually enlarge until only the larger leaf veins and midribs remain. During outbreaks lasting from 1 to 4 years, trees may be completely defoliated; however, most trees usually re-foliate in July, 3–5 weeks after the first attack. Three or more consecutive years of severe defoliation may cause many of the upper branches to die and affect tree appearance. Severe defoliation may also contribute to tree mortality. When cankerworm populations are large, starving larvae in search of food may drop on silken threads and

become a nuisance around homes or in well-used areas.

Causal Agents

Both cankerworm species have 1-year life cycles. Their larvae are slender and move with a looping motion (they are often called loopers, inchworms, or measuring worms.)

Fall cankerworm eggs overwinter on host trees and hatch into larvae in late May, when they begin feeding as the new leaves unfold. When fully mature at the end of June, they are 25 mm long and vary in color from light green to dark brownish green, with longitudinal stripes. The mature larvae drop to the ground, spin cocoons in the soil, and pupate. They emerge as adults in October. Adult females are wingless, grayish brown, and about 12 mm long, while the grayish brown, adult male moths have wings with a span of about 30 mm. The adult females climb host trees and shrubs, and mate; each female then lays about 100 eggs on the upper twigs and branches.

The mature larvae of the spring cankerworm overwinter in the soil and pupate in the very early spring. Adult wingless females and winged males soon emerge to mate, and the females climb host trees and shrubs, where they lay eggs in clusters on the stems and lower branches. The larval feeding habits and seasonal appearance of the spring cankerworm are similar to those of the fall cankerworm. Mature spring cankerworm larvae are about 20–30 mm long, and they vary in color from yellowish green to almost black, with a mottled appearance.

Prevention and Control

A number of natural agents may control cankerworm populations by affecting as

abundance of the two species. Parasitic insects attack the egg, larval, and pupal stages of cankerworm life cycles, while other predators (insects, spiders, birds, and small rodents) may attack all the stages. Cold winter temperatures, late spring frosts, starvation, or disease may also cause the collapse of larval populations.

Tree banding (an applied control) is often necessary in well-used areas when cankerworm populations are large. The bands prevent the adult females from climbing host trees to lay their eggs. Each band is applied about 2 m above the ground: the bark of the tree stem is first scraped smooth before being wrapped with a band (10–15 cm deep) of glass wool covered with stiff paper, to which a thin layer of sticky material is then applied. This sticky substance, which traps the climbing females, may require periodic cleaning or reapplication. Some adult females may still crawl over bands to lay their eggs. The banding method is most effective with isolated or well-spaced trees, because young larvae may reinfest foliage when they disperse on silken threads from adjacent trees.

To control the fall cankerworm, tree bands should be in place by mid-September, before the adult females emerge.

The spring cankerworm cycle requires that tree bands be in place by early April.

Both cankerworm species may be controlled with insecticides. The registered biological insecticide *Bacillus thuringiensis* is effective in controlling cankerworm larvae: it is sprayed onto foliage when larvae are small and still feeding. Other registered chemical insecticides may be used as contact poisons on host stems to prevent adult females from climbing them, or as foliar sprays to kill small larvae when they are feeding (as soon as