

1977

EC77-1532 Insects of Woody Ornamentals

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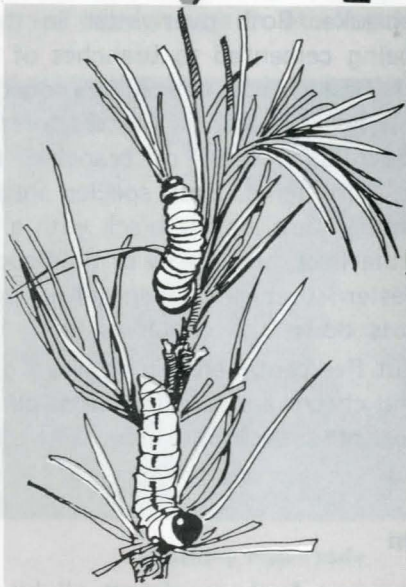
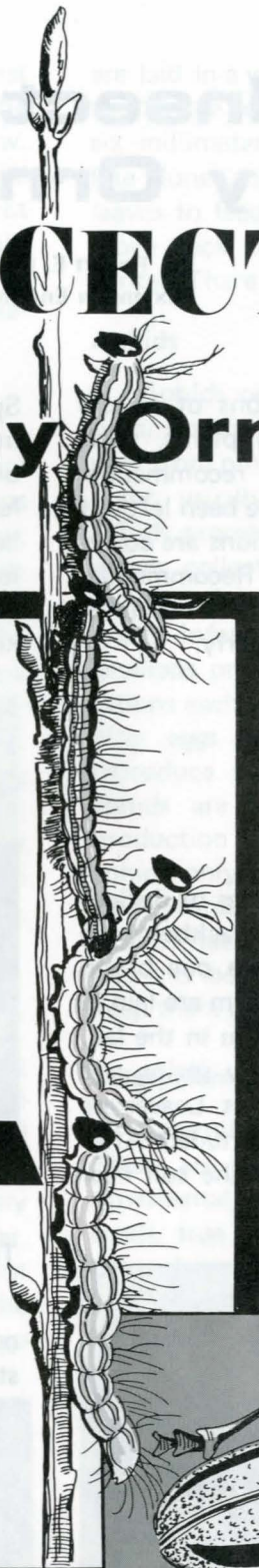
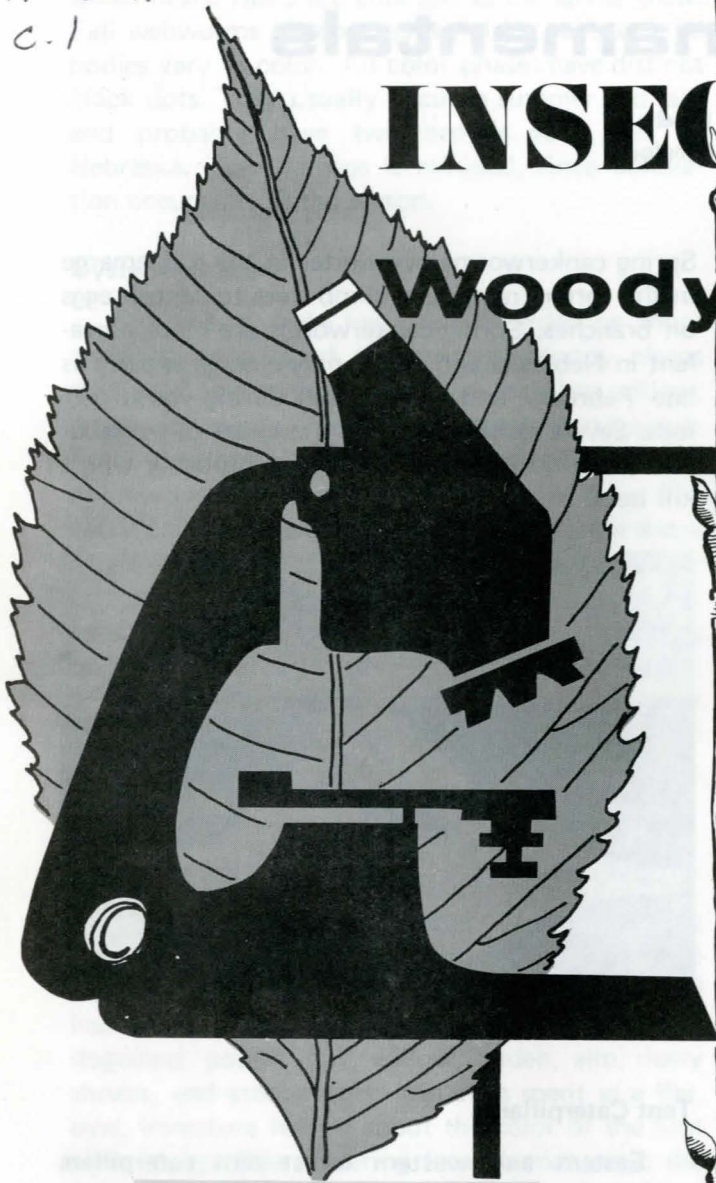
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INSECTS OF Woody Ornamentals



Extension work in "Agriculture, Home Economics and Subjects relating thereto,"
The Cooperative Extension Service, Institute of Agriculture and Natural
Resources, University of Nebraska-Lincoln, Cooperating with the
Counties and the U.S. Department of Agriculture
Leo E. Lucas, Director

Insects of Woody Ornamentals

Robert E. Roselle
Extension Entomologist

This circular contains descriptions of insects which feed on woody ornamental plants, both deciduous and coniferous. Control recommendations change so rapidly that they have been left out of this circular. These recommendations are covered in EC 77-1502 "Insect Control Recommendations for Ornamental Plants and Turf in Nebraska"—a publication which is revised yearly.

DECIDUOUS PLANTS

General Feeders

Spring and Fall Cankerworms

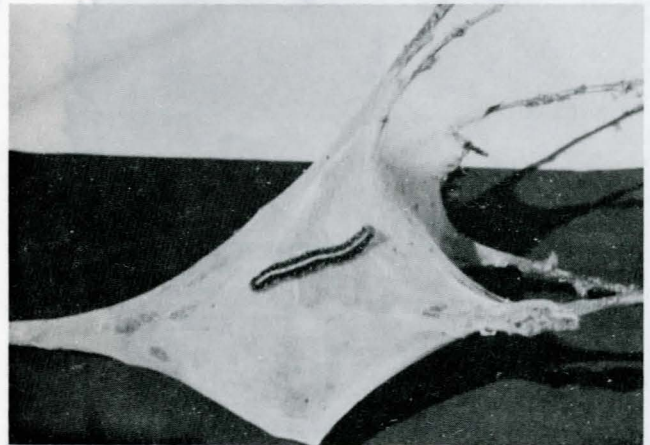
Cankerworms feed on most species of deciduous trees and some shrubs. Elm and hackberry are the favored trees. Cankerworms have one brood per year. Eggs of the spring cankerworm are laid in the spring; eggs of the fall cankerworm in the fall. The caterpillars begin feeding in early spring and are very similar—both measuring worms. Leaves are eaten and trees may be completely denuded. After completion of feeding, larvae enter the soil near infested trees.



Cankerworm

The fall species emerge as wingless females and winged males in the fall, mate, and lay eggs on branches after the wingless female climbs the tree.

Spring cankerworms overwinter in the soil, emerge in the spring, mate, and climb trees to deposit eggs on branches. Spring cankerworms are more prevalent in Nebraska and adults may emerge as early as late February and early March during warm periods. Severe defoliation over a number of consecutive years may weaken trees, but probably won't kill trees.



Eastern tent caterpillar

Tent Caterpillars

Eastern and western forest tent caterpillars occur in Nebraska. Both overwinter in the egg stage, eggs being cemented to branches of many kinds of trees. Eastern tent caterpillars construct a "tent" in crotches of branches. Western forest tent caterpillars construct a "tent" on branches. Caterpillars forage from tents. Both species are hairy. Eastern caterpillars are almost black with a white stripe down the back and a row of blue spots on each side. Western tent caterpillars have a row of yellowish spots down the center of their backs. Both are about five centimeters long when grown. Wild plum and cherry are favorite hosts, but they will infest most other deciduous trees. There is one brood per year.

Fall Webworm

Fall webworms feed on almost all kinds of

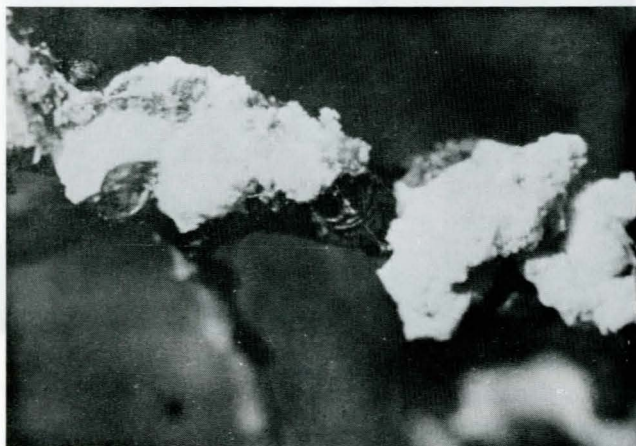
deciduous trees. Caterpillars construct a silk nest around branches, feeding on leaves and living in the silken nests. Nests are enlarged as the larvae grow. Fall webworms are covered with long hairs and the bodies vary in color. All color phases have distinct black dots. They usually occur in summer and fall, and probably have two broods each year in Nebraska. Tree damage is minimal, since defoliation occurs late in the season.

Oystershell Scale

Oystershell scale has been recorded on more than 100 species of ornamentals. Woody plants that are more severely infested are lilac, willow, dogwood, maple, poplar, cotoneaster, and apple. Fully developed females are about two to three millimeters long and may be brown or grey. The waxy covering is elongated and similar to the shape of an oyster shell, thus the common name. Winter is spent in the egg stage under mother scales. Hatching begins in mid-to-late May, depending upon the site, and lasts for two to three weeks. Small crawlers move to a feeding location, insert threadlike sucking mouthparts, shed their legs with their crawler skin, then form the waxy covering. There is one brood per year.

Cottony Maple Scale

This scale is one of the largest and most conspicuous scales on ornamental plants. The two most important host plants are silver maple and hackberry. This insect will infest apple, boxelder, dogwood, poplar, oak, willow, linden, elm, many shrubs, and stone fruits. Winter is spent as a flat, oval, immature female about the color of the host plant twigs. Overwintering females mature in the spring and deposit eggs in late May and June. Eggs



Cottony maple scale

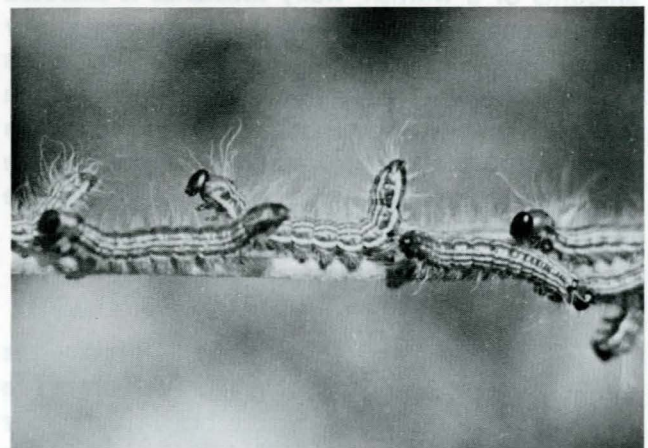
are laid in a white, cottony mass that extends from the female scale. At this stage scales may be five to six millimeters long. Crawlers begin to emerge in late June and July and move to undersides of leaves to feed during the summer. In the fall they move back to twigs and small branches to overwinter. There is one brood per year.

Aphids

Aphids occur on almost all species of woody ornamentals. Most of them are green, but color will vary from pink to black. All suck sap from the host plant, usually from the undersides of leaves. All aphids excrete a sticky substance called honeydew, which collects on lower leaves, branches, automobiles, furniture, and other items that are beneath infested trees. A black mold frequently develops on the honeydew. There are many generations each year. Most species produce young alive after eggs hatch within the female's body, and reproduce without male aphids. In the fall male aphids are produced that fertilize females for production of overwintering eggs. Most species of aphids only slightly decrease tree vigor, but many cause some yellowing and distortion of foliage. Aphids have many predators, especially lady beetles and lace wings, and several parasites that help keep them under natural control.

Caterpillars

Caterpillars are larvae of butterflies or moths. There are scores of kinds that infest shade and ornamental trees. All have chewing mouthparts, six small, true legs behind the head, and several false or prolegs on the abdomen. Most are not serious, but a few species can damage the vigor of trees by continued defoliation over a period of years,



Walnut caterpillars

especially cankerworms and green-striped mapleworms. Other foliage feeders such as green fruitworms, spanworms, leaf folders, red-humped caterpillars, unicorn caterpillars, tussock moths, and many other kinds are present every season, but seldom in sufficient numbers to cause damage. Damage is done by either feeding on leaves or feeding on leaf surfaces causing skeletonization. Life cycles vary with each species.

Leafhoppers

Leafhoppers are small, wedge-shaped, active insects that suck juices from undersides of leaves. Colors are most often grey, green, or brown. They jump and fly readily when foliage is disturbed. Feeding by inserting a slender mouth-siphon causes the upper surface of leaves to appear yellow-flecked and necrotic. Eggs are laid in plant tissues and there are several broods each year. Some species transmit plant disease-causing organisms such as phloem necrosis of elms and aster yellows of flowers and vegetables.

Treehoppers are closely related to leafhoppers. Most treehoppers have grotesque shapes extending from the head area. The buffalo treehopper that resembles a buffalo head and the twospotted treehopper that has a projection forward from the head are two common kinds. Some species scar twigs with slits into which eggs are deposited.

Ash

Leaf Curl Aphid

This aphid causes terminal leaves on twigs to form rosettes, similar to herbicide injury. The aphids develop inside the rosettes of leaves. Large amounts of a whitish, waxy substance is excreted by the aphids and generally rosettes are sticky from honeydew. Other aphids feed on ash leaves without causing distortion, but may excrete enough honeydew to cause lower leaves to have a shiny appearance. They are not serious to the health of trees, but the distorted leaves are unsightly.

Borers

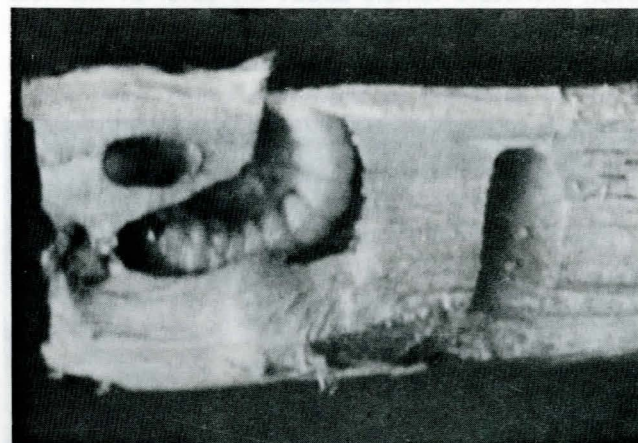
Two borers are common in Nebraska—the red-headed ash borer and the lilac-ash borer. The red-headed ash borer adults are brown with four narrow, yellow lines across the wing covers. The head area is reddish. The legs are long and spindly.

Red-headed ash borers are attracted to newly planted or weakened trees. They also readily lay eggs on dead trees and firewood that still has bark attached. They overwinter in the trunk. Adult beetles emerge in early spring, often from firewood inside homes. Females are active all summer depositing eggs. The larvae are round-headed borers that feed in the inner bark and into the inner wood. Young trees are subject to breaking during high winds.



Red-headed ash borer

The lilac-ash borer adult is a clear-winged moth resembling a wasp. Eggs are laid on ash and lilac; larvae burrow into the sapwood and heartwood. Frass, a sawdust-like material, is usually expelled from burrows. The larva is white with a light brown head and about 2.5 centimeters long. One generation occurs each year. This borer also attacks privet.

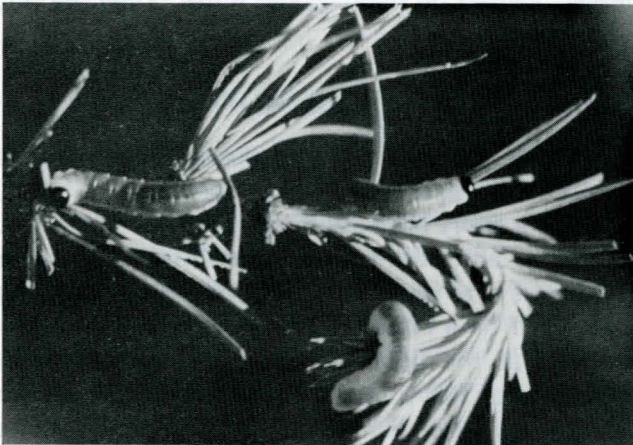


Lilac borer

Sawflies

Sawflies are light green, almost translucent

larvae with brown or black heads. Larvae feed on leaves. The larvae tend to cling to leaf edges with a prehensile-like tail and most have false eye spots on the head. Sawflies are larvae of a wasp-like insect. Usually not a serious pest.



Sawfly

Flower Galls

Flower-like galls form on the flowers of male ash trees. Galls dry and remain on branches. Galls are caused by microscopic, eriophyid mites. There is no injury to trees.

Birch

Bronze Birch Borer

Adults are small, 12 millimeters long, bronze colored, metallic beetles that are attracted to weakened birch trees. They emerge from infested and dead trees in late May. Adults feed on birch leaves and may be active for several weeks. Eggs are deposited on trees that are in decline due to environmental stresses. The combination of weather stress and borer injury will usually kill trees, especially paper birches. The larvae feed under the bark, severing the water and nutrient conducting vessels. Infested trees have raised, serpentine burrows that are visible on the bark. Larvae are small, white, and have a broadened area just behind the mouthparts. They are called flat-headed borers.



Bronze birch borer larvae

Aphids

Several species of small, light green aphids suck sap from undersides of leaves. Usually a sticky-shiny honeydew can be observed on lower leaves. They are not serious pests.

Elm

Elm Leaf Beetles

Adults are yellow and black with a black stripe near the outside of each wing cover. They hibernate in buildings and protected places outdoors. In spring, usually May, surviving adults fly to elms and deposit masses of about 25 yellow eggs on undersides of leaves. Larvae are yellow and black striped, feed by stripping the leaf surfaces on undersides of leaves. Heavy infestations may cause leaves to be completely skeletonized, turn brown, and fall prematurely. When larvae have finished



Elm leaf beetle and damage

feeding they crawl down the trunks and pupate in bark cracks and on the ground. A second brood occurs over an extended period during the summer.

Woolly Elm Aphids

Winter is spent in the egg stage on elm trees. In the spring, eggs hatch into females that move to undersides of leaves to feed. Each female gives birth to many young—all females. As the colony grows the leaves become distorted and a covering is formed for the developing aphids. White, waxy material is excreted by the aphids along with the cast skins.

Elm Leaf Aphids

Refer to general feeders.

European Elm Scales

Winter is spent as small, oval shaped, flat insects on twigs. In spring they resume feeding and when mature are round, grey, with a ring of white. Eggs are produced under the mother scale in the spring and hatch in mid-June. Small, oval crawlers move to leaves and tender twigs to feed until fall, then move back onto twigs to spend the winter. There is one brood each year. Continued infestations will cause small branches to die.

Coxcomb Galls

Aphids cause red or green coxcomb-shaped galls between leaf veins. They are not important.

Pocket Galls

Small, elongated pocket galls on leaves, caused

by microscopic mites (eriophyid). They are not important.

Globe Galls

Small, globe-shaped galls on upper surface of leaves, caused by microscopic mites. They are not important.

European Elm Bark Beetle

Adults carry Dutch elm disease. The adult is about three millimeters long, mahogany in color, and has a short projection from the rear abdomen. European elm bark beetles overwinter as larvae in dead elms with bark intact. Adults emerge in spring about the time lilacs are blooming and fly to elms to feed at the base of leaves and axils of small branches—at this time they can transmit the fungus that causes Dutch elm disease. After feeding, adults are attracted to dying or recently expired elms, lay eggs in a gallery they chew in the cambium. Larvae feed outward from the egg gallery, leaving a distinctive pattern. There is a summer brood that deposits eggs that develop into the overwintering larvae.

Euonymus

Euonymus Scale

This is the only serious insect pest of euonymus in Nebraska. Male scales are small, elongate, and chalky-white. Females are brown or grey and much wider than the males. Males are much more numerous than females. Presence of the white males is the first evidence of damaging infestations.



Euonymus scale

Mature females overwinter, deposit eggs in the spring to produce the first brood of crawlers, usually in May. There are several broods that overlap from May until September.

Hackberry

Cankerworms

Refer to general feeders.

Nipple Gall

Adults are about three millimeters long and resemble tiny cicadas. They winter in rough bark, cracks and crevices in trees, and probably in protected locations near hackberry trees. In the spring, about the time leaves begin to unfold, the adults emerge, mate, and begin depositing eggs on the undersides of hackberry leaves. Egg laying will progress for several weeks. Nymphs begin to feed shortly after emerging from eggs. Feeding causes the leaves to produce pouch-like galls on undersides of leaves in which the nymphs develop during the summer. Adults emerge in the fall, usually late September and early October. There is one brood each year. They do not appear to seriously impair tree vigor.



Hackberry nipple gall

Cottony Maple Scale

Refer to general feeders.

Witches Broom

Tips of branches send out a mass of short spindly twigs about 6 to 8 inches (15-20 cm) long. These growths usually die but remain attached to branches for long periods of time, resulting in

unsightly trees and impairing normal development. Witches broom is caused by microscopic eriophyid mites.

Lilac

Oystershell Scale

Refer to general feeders.

Borers

The lilac borer is a caterpillar of a clear-winged moth. The insect overwinters as the borer stage in lilac canes. It is white with a brown head and is about 25 millimeters long. Adults, which resemble wasps, emerge in May, mate, and deposit eggs on the bark of lilac canes, mostly from the soil level to one meter high. Newly hatched caterpillars feed in the sapwood, later in the heartwood. Sawdust-like frass is expelled from burrows. There is one brood per year.

Linden

Lacebugs

Adults have thin, intricate, lacy wings—thus the common name. Adults overwinter on host trees, hiding in cracks and crevices in bark or crotches. They emerge in spring at the time leaves are unfolding and deposit eggs on the undersides of leaves. Nymphs and adults feed by inserting mouthparts and sucking sap. Feeding damage is visible from above as small, round, yellow spots. Undersides of leaves are covered with fecal spots when infestations are severe. Injury is rarely serious, although some leaves may lose much of their ability to function.

Leafhoppers

Refer to general feeders.

Honey Locust

Mimosa Webworm

These insects are prevalent in eastern Nebraska wherever honey locusts grow. Movement in the U.S. indicates that this insect will occur anywhere that honey locusts or horticultural varieties of the tree are planted. Mimosa webworms overwinter as pupae in cracks or crevices of infested trees or in protected areas nearby. Adults emerge in June to deposit eggs. The larvae are grey to brown with five

white longitudinal stripes. Larvae web leaflets together, feeding inside the webs and skeletonizing leaflets. The webs are unsightly and may cover entire trees. The first brood larvae are usually visible about July 1. A second brood develops in August.

Locust Plant Bugs and Leafhoppers

These insects occur at the same time and damage to foliage is similar. They are active from May until July. Damage is caused by the insects sucking sap from leaves, causing leaves to become distorted, turn yellow, and fail to develop. Continued feeding can kill twigs and reduce vigor of trees. They are small, about four millimeters long, green or grey. Shaking branches will disclose infestations as they are very active and will fly when molested. Eggs are laid in bark to spend the winter. Hatching begins in late April and May the next year. There is one brood per year.

Pod Gall Midge

This insect causes leaflets to form into a globe-shaped pod. Adults are small flies about three millimeters long. Eggs are laid in leaflets in the spring. After hatching, one or more tiny whitish maggots develop within the leaflet gall. Infested leaflets may dry up and fall. Although infestations are not serious to tree vigor, disfiguration of trees reduces their ornamental value.

Maple

Cottony Maple Scale

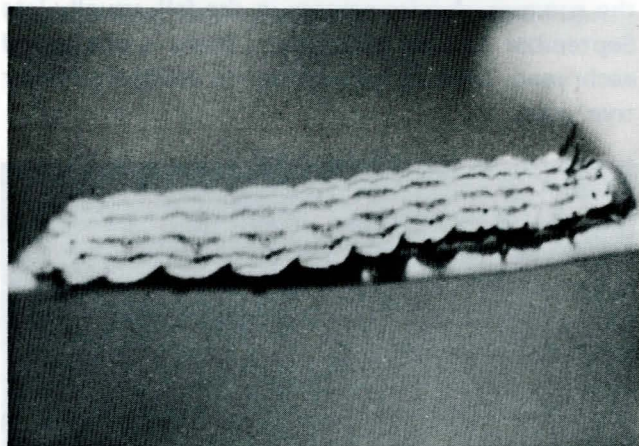
Refer to general feeders.

Leaf Galls

Microscopic eriophyid mites cause several kinds of galls on silver maple leaves. The most common is bladder gall. Small, globular galls develop on the upper leaf surfaces. Color of galls are green or red, becoming very dark as they age. The red galls are spectacular and may cause homeowners to become concerned. They do not injure trees. The small mites overwinter under bark scales, moving to leaves in the spring. In the fall they move back to bark scales. Another kind of eriophyid mite causes flat galls on the lower surface of silver maple leaves. This gall is red and looks like felt patches. These are not harmful to tree health.

Greenstriped Mapleworm

Occurring primarily in the eastern tier of counties, south of Omaha, this insect probably will spread into other areas where silver maples are numerous. Winter is spent as pupae in the soil or under debris near infested trees. In the spring the adult, which is an attractive moth, emerges. The topside of the body is yellow and the underside and legs are pink. Each forewing is pink on the inner and outer border with a yellow band between. Eggs are laid in clusters on the undersides of leaves in June. Small caterpillars are yellow tinged with green and covered with small black spines. The fully grown caterpillars are 37 millimeters to 5 centimeters long, pale green with seven black or green (dark) stripes. Two horns are just behind the head and there are two rows of short spines on each side of the body. A second brood is produced in August. Infestations can strip trees of nearly all foliage. Usually, trees are not severely damaged unless defoliation occurs for three or more years.



Green-striped mapleworm

Aphids

Refer to general feeders.

Leafhoppers

Refer to general feeders.

Oak

Galls

Oaks are subject to scores of different gall causing insects. The most common of galls result from the feeding of small flies called midges, small wasp-like insects called cynipids, and eriophyid

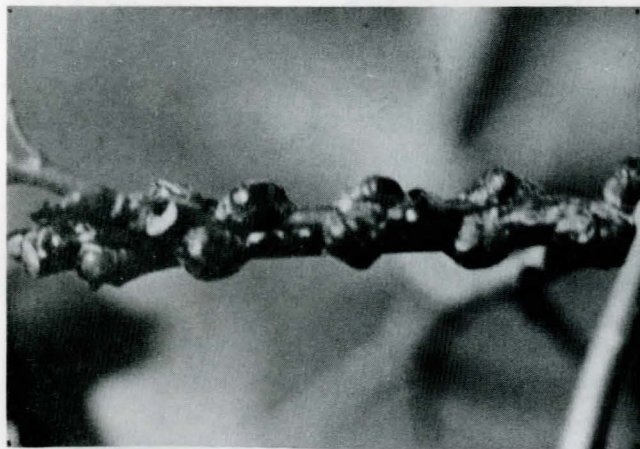
mites. Most oak galls are not serious, but some do weaken young trees. The **gouty oak gall**, caused by a cynipid wasp, is round, woody, and occurs in masses along stems. They do kill infested stems and may be serious on small trees. **Woolly catkin galls** occur on the stems of male flowers. They are showy, oval masses as much as two inches (5 cm) in diameter and covered with rose colored wool-like hairs. They are caused by a gall wasp and are not harmful to trees. Wasp caused leaf galls arise from the leaf surfaces, may be round, translucent, green as the **translucent oak gall**, or small and attached to leaf veins as the **oak flake gall**, or so small they are not readily observed unless present in large numbers such as the **oak blister gall**. Few of the leaf galls are of importance. Little is known about the life cycles of the oak gall insects. Eggs are probably laid in the spring after leaves have unfolded and insects likely have several broods per year.

Kermes Scale

Buckshot size scales on terminal twigs of bur oak may kill terminal growth. The gall-like female scale deposits eggs in the spring under her shell. Eggs hatch in June and July, and crawlers move to the bark to feed and overwinter. The next spring they move to the terminals, frequently near the base of leaves, and develop into large scales. There is one generation each year.

Lecanium Scale

This scale has been damaging to pin oak and red oak in eastern Nebraska. Insects probably will occur in most residential areas of the state where these species of oaks have been planted. The oak lecaniums are soft scales, but female coverings



Lecanium scale—oak

become hard and brittle after eggs are deposited. Attacks concentrated on terminal branches will sometimes kill the new growth. The mature female is dark brown and about the size of a BB cut in half. Eggs are deposited in late May and June. Crawlers occur in June and July and move to leaves or tender growth to feed. In the fall they return to the branches to overwinter. The next spring growth is completed and injury is visible by summer.

Twig Borers

A very small beetle larva has caused twig damage to pin oaks in Douglas and Lancaster Counties. They probably occur in other residential areas of the state. The only one identified is *Agrius*, a flat-headed borer. Larvae tunnel in the terminal twigs, causing them to die. Little is known about the life cycle. In California, a similar insect deposits eggs on new growth soon after the adult emerges. Larvae tunnel beneath the bark, eventually girdling the twigs. The larva is white, legless, and has deep constrictions of the body. The maximum length is about seven millimeters. It may be in the larval stage more than one season.

Giant Bark Aphids

Aphids about five millimeters long with long, spindly legs and occur on oak bark. They are grey with black spots and are usually found in colonies. Heavy infestations can damage terminal growth. Winter is spent in the egg stage on bark. They increase during the summer and are most numerous in the fall.

Caterpillars

Refer to general feeders.

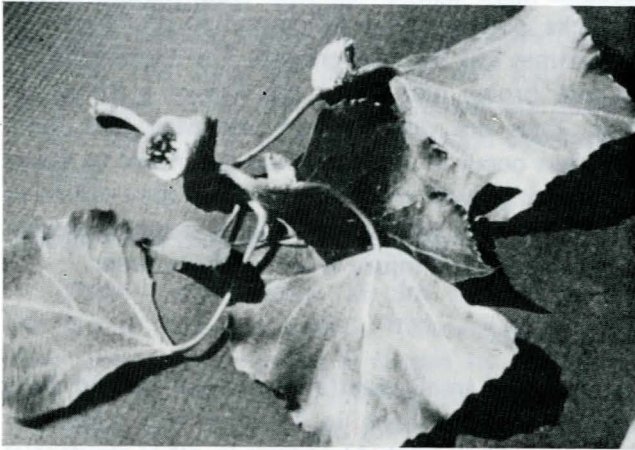
Poplar and Cottonwood

Petiole Gall

Pemphigus aphids cause enlargements of the leaf petiole. The insects develop within the galls during the summer. The life cycle is not well known. Injury is usually not serious.

Poplar Borer

Infested trees have swollen scars and holes in the trunk and larger limbs. Infestations are more frequent in the middle third of trees. Adults deposit eggs in slits cut in the bark during the summer. Larvae, called round-headed borers, bore



Poplar petiole gall

into the inner bark and sapwood and, as they grow, into the heartwood. Usually there are openings in bark where frass is expelled. Damage weakens larger trees, making them susceptible to wind breakage, and may kill small trees.

Cottonwood Borer

Adults are large, 25 to 30 millimeters, black with patches and cross stripes of white. Eggs are laid in slits in the bark at ground line. Larvae feed in the base of trees and may tunnel into larger roots. Heavily infested trees may have sawdust frass extruding from holes at their bases. The larvae, round-headed borers, are white and up to 50 millimeters long. They require two years to mature.

Leaf Beetles

Adults, about six millimeters long, are yellow with black stripes. The head area is black. Larvae are 10-12 mm long, dark with two white spots on each side. These spots are scent glands that give off a disagreeable odor when larvae are molested. Larvae feed in groups, skeletonizing leaves. As they grow they feed individually and consume entire leaves. They winter under bark or debris on the ground, as adults. There are several broods each year. They also feed on willow.

Privet

Thrips

Adult thrips are small, about 1 mm long, dark colored. Nymphs are smaller and a lemon-yellow color. They feed by rasping on the undersurfaces of leaves. Damage appears as yellow flecks and a dusty appearance. Tiny, dark fecal spots are

present on undersides of infested leaves.

Borers

The lilac-ash borer is common in privet, causing plants to die above infested stems. The first symptom of borer damage is yellowing and drying of plants. The damage is usually from soil level upward about 30 centimeters. For a more complete description refer to ash.

Sycamore

Lacebugs

Adults have thin, intricate, lacy wings. Nymphs are dark and somewhat spiny. They feed by inserting sucking mouthparts into leaf tissues. Yellow flecks are visible on the upper surface of leaves. Large numbers can cause leaves to become chlorotic and interfere with photosynthesis. Undersides of leaves frequently are stained by the varnish-like feces. Lacebugs overwinter as adults on or near sycamore trees. There are several broods each year and all stages are present at one time in the summer.

CONIFEROUS PLANTS

General Feeders

Bagworms

Bagworms feed on all coniferous plants and most deciduous plants. They are especially damaging to conifers because destroyed foliage is not regenerated. Continued severe feeding will kill evergreens, but would have little effect on most deciduous plants. Bagworms winter in the egg stage inside bags attached to plants. Eggs hatch in early to mid-June. Small larvae begin feeding immedi-



Bagworms

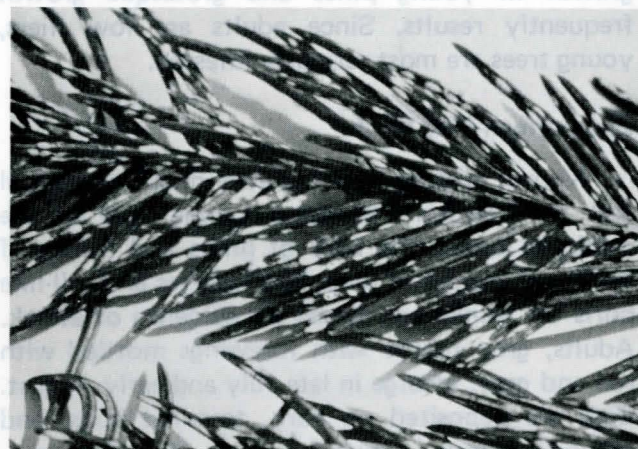
ately and soon begin the construction of the protective bag by mixing bits of the host plant with silk. Growth continues until larvae are about 25 to 30 millimeters long and the bag may be 50 millimeters long. Growth is completed in August and early September. Male moths emerge, usually leaving the pupal case extended from the bag. Females pupate and develop into a wingless, worm-like adult inside the bag. Mating takes place through the open end of the bag. Females deposit eggs, then die, never leaving the bag. Each female may produce 500 to 1000 eggs. Distribution is principally in the eastern 1/3 of Nebraska, with local records in a few central counties.

Spider Mites

Mites feed by inserting needle-like "teeth" into the plant cells, then drawing up sap from the ruptured cells. Damage is identified by yellowish to rust color of evergreen foliage. Presence of mites can be detected by tapping branches over a white piece of paper. All mites are small, half to one millimeter long, may vary from pale green to almost black. Heavily infested foliage may be covered by a very fine web. Hundreds of small, globe-shaped eggs are deposited on the host plant and in webbing. Mites go through similar development stages. The first stage "larva" has six legs, successive stages and adults have eight legs. Most overwinter as eggs, beginning development with warm conditions in the spring. Injury may occur as early as May on evergreens near buildings or in warmer locations. Dry, warm weather hastens development. There are several broods each year. They will occur on all conifers and most deciduous woody ornamentals, as well as most perennials and vegetables.

Pine Needle Scale

Pine needle scale infests most species of pines and spruce grown in Nebraska. Mature scales are chalky white, two to three millimeters long, and usually slender. Eggs overwinter under the old scale of the females. Hatching begins about June 1 or when new needles begin to appear. Young crawlers move to green needles to feed. Some mature in July and a second brood is produced in August. The later brood matures in the fall and deposits red eggs which overwinter under the old scale.



Pine scale

Pine

Pine Tip Moth

Terminal and lateral tips are destroyed by small larvae boring into the new growth. Infested tips crumble readily. The insect overwinters in the larval stage either in duff under infested trees or in infested tips. Adults, small moths, emerge in May. Eggs are deposited at base of needles near the tips of branches. Larvae bore into needles, as they grow they bore into the bud and shoot. The first brood pupates in shoots in late June and early July. The second brood moths emerge in early July. Larvae of the second brood continue to feed in buds and shoots until fall. In northern counties, larvae may overwinter in duff under trees, in southern counties larvae overwinter in infested tips. All species of two and three needle pines are hosts. The most severely injured are Ponderosa, Scotch, and Mugho pines, with important injury to plantations of Austrian pines. Continued infestations prevent



Pine tip moth injury

growth in young pines and grotesque growth frequently results. Since adults are low fliers, young trees are most seriously infested.

Zimmerman Pine Moth

Known distribution includes much of central and northcentral Nebraska. Larvae feed in the cambium under the bark of limbs and trunks of nearly all species of pine. Pitch masses and gall-like burls on trunks and limbs are evidence of attack. Adults, grey moths with forewings mottled with red and grey, emerge in late July and early August. Eggs are deposited on bark, terminal buds, and around wounds. Larvae hatch in 10 to 14 days, overwinter in cracks of bark. Feeding begins the following spring in May and June and insects tunnel into cambium of new growth. Later they move to whorl areas of trunks and branches to burrow under the bark. Damaged branches and tops may die or be broken by winds.

Sawflies

Sawfly larvae resemble caterpillars. They can be identified by slick, hairless bodies, the presence of more than five pairs of fleshy prolegs on the abdomen, prehensile tail, and usually two false eyespots on the head capsule. Adults are non-stinging wasps. Adults lay eggs in slits in needles. Larvae feed on needles, consuming the previous year's growth by chewing needles to the stem. Defoliation of young pines may reduce vigor, even though new growth may not be completely destroyed. Life cycle of Nebraska pine sawflies is not completely known. They probably winter in paper-like cocoons in forest duff or on trees. Adults emerge in the spring to deposit eggs from April to June. There apparently is one brood each year.

Bagworms

Refer to general feeders.

Spider Mites

Refer to general feeders.

Spruce

Spruce Needle Miner

Small caterpillars mine spruce needles. The dead needles and frass are held together by fine webbing on old needles. The first evidence is a mass of dead needles held to the stems. Small holes

are at the base of dead needles where larvae have entered. They move from needle to needle and continue to enlarge the nest along stems. New growth is not infested until the next season. The insect overwinters as larvae in old nests. Overwintering larvae begin to feed in May, changing to adults in late May and June. Eggs are laid in small groups on needles. Larvae begin to feed after hatching, enlarging the nests during the summer and remain in the nests through the winter.

Spider Mites

Spider mites are serious pests of spruce. Refer to general feeders of coniferous plants.

Bagworms

Refer to general feeders of coniferous plants.

Juniper

Bagworms

Bagworms are severe on junipers. Large populations will kill plants. Refer to general feeders.

Spider Mites

Refer to general feeders.

Webworm

Larvae feed on foliage in the thicker, inner portions of juniper. Extended feeding will involve outer portions and can kill portions of junipers. Masses of webbing and dead needles are the first indications of webworm infestations. Larvae are about 13 millimeters long when fully grown. The adult is a small moth. Eggs are laid in the spring, probably late May and June. Larvae feed during the summer, overwinter in the web and dead needles, again feed in the spring and pupate. There is one brood per year.

Juniper Scale

This insect is so small that infestations likely are not noticed unless numerous enough to cause discoloration of foliage. Injury, rare in Nebraska, is similar to spider mite damage. Branches will yellow and may die. The female scale is about 1.5 millimeters wide, light brown with a darker center. There is one brood per year.

The Cooperative Extension Service provides information and educational programs to all people without regard to race, color or national origin.