Red Pine Scale

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The red pine scale (*Matsucoccus resinosae* Bean and Godwin) was discovered in 1946 near the Hemlock Reservoir at Easton, Conn. where it was seriously damaging 30-year-old red pine plantations.

In 1950, scale infestations were found in New York in the vicinity of East Norwich and South Huntington (on Long Island) and at scattered locations along the Hutchinson River Parkway in southeastern Westchester County. The scale was found for the first time in New Jersey in 1960. Approximately 160 acres of watershed plantings around the Wanaque Reservoir in the north central part of the State were discovered to be infested. In 1969, scale infested pines were found in Westchester, Nassau, and Suffolk Counties in New York and Fairfield and New Haven Counties in Connecticut (fig. 1). The 1960 New Jersey infestation was eradicated in 1966. No additional infestations were detected until 1970 when two small infestations were again found in the same area.

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The area of known infestation is south of the natural range of red pine. The insect is found in plantations, nurseries, and on ornamental trees.

This insect apparently is spread by the wind. Studies have shown that first-stage larvae are airborne for at least a quarter of a mile.

Host Trees

The red pine scale attacks not only red pine (*Pinus resinosa* Ait.), but Japanese red pine (*P. densiflora* Sieb. and Zucc.), Japanese black pine (*P. thunbergii* Parl), and Chinese pine (*P. tabulaeformis* Carr.), as well. Attempts to establish the scale on other species of pines (jack, pitch, Scotch, white, Austrian, and mugho) have been unsuccessful. Even when intermixed with severely infested red pine, the scale may establish itself on these pine species, but fails to complete its development.

Evidence of Infestation

The first visible indication of feeding by the scale is the light olive green color of the current year's foliage. Also, new growth is shorter than normal. The olive color changes slowly to a light yellow and finally to a brick red,

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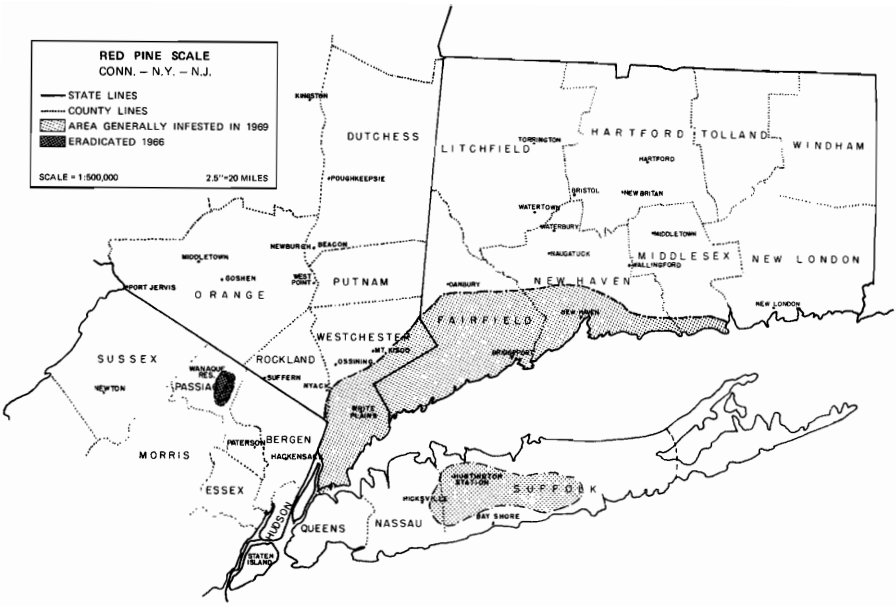

Figure 1.—Map of infested area.

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Figure 2.—Masses of male cocoons of red pine scale on lower side of branch axil.

first on individual branches, then gradually over the entire crown. A close examination of the undersides of these branches will reveal masses of male cocoons resembling small fluffs of cotton (fig. 2). The tree dies soon after the foliage starts to change to red. The bark on branches and trunks of heavily infested trees has a swollen and cracked appearance. Dead tissue can be found beneath each feeding scale.

Economic Importance

The red pine scale has become one of the most important insect pests of red pine in the Northeast. Thousands of trees, ranging from nursery stock to mature trees, have been killed. Many more are so severely injured that they will not survive attacks by secondary bark borers. Although presently restricted to a relatively small area outside of the natural range of red pine, the scale poses a serious threat to natural red pine.

Description

The adult females are brownish red and wingless, ranging from 1/16 to 3/16 inch long. The body is roughly pear-shaped and coarsely wrinkled (fig. 3, *A*). The preadult males resemble the females but are smaller—1/32 to 1/16 inch long (fig. 3, *B*). The true adult males are two-winged, midgelike in appearance, and have a prominent brush of long white waxy filaments at the end of the abdomen. Females lay the minute, amber-yellow, oval-shaped eggs in a white, loosely woven, waxy sac attached to their abdomens. The first-stage larvae resemble the adult females but are much smaller—0.4 by 0.2 millimeters. Projecting from the posterior of each larva are two long sensory hairs. The first-stage larvae transform into an intermediate stage which is elliptical in shape, legless, and without antennae (fig. 4).

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Figure 3.—Red pine scales: *A*. Adult female (⅛ inch), dorsal view; *B*. preadult males (1/16 inch), dorsal view.

Seasonal History

The red pine scale has two well-defined generations during the year (fig. 5). The eggs of the summer generation are laid in May. By early June, first-stage larvae appear. After a short period of moving around, these larvae settle down under a bark scale and start to feed. They will remain stationary in this position during the rest of their feeding period. The larvae transform into the intermediate stage by mid-July. The preadult males emerge in August. They then enclose themselves in a loosely woven, white, spindle-shaped, waxy cocoon, and transform into true adults (fig. 2). The female intermediate forms do not transform into the preadult stage but develop directly into the adult. These females lay eggs for the fall generation in late August or early September. The fall generation overwinters as partly grown first-stage larvae. In the spring, these larvae resume feeding. Transformation into the intermediate stage begins in April. This stage develops rapidly and the adults emerge in early May to repeat the cycle.

Control

Several species of native predators, especially an anthocorid bug, *Elatophihus inimica* (D. & H.), a coccinellid beetle, *Mulsantina picta* (Rand.), a hemerobiid, *Hemerobius stigmatus* Fitch, and a chrysopid, *Chrysopa* sp., attack the red pine scale, but these have not prevented the buildup and spread of scale populations.

No effective chemical sprays have been found for controlling this scale in plantations. Infested

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Figure 4.—Intermediate stage larvae of red pine scale on twig of infested red pine. The bark scale has been removed to expose the insects.

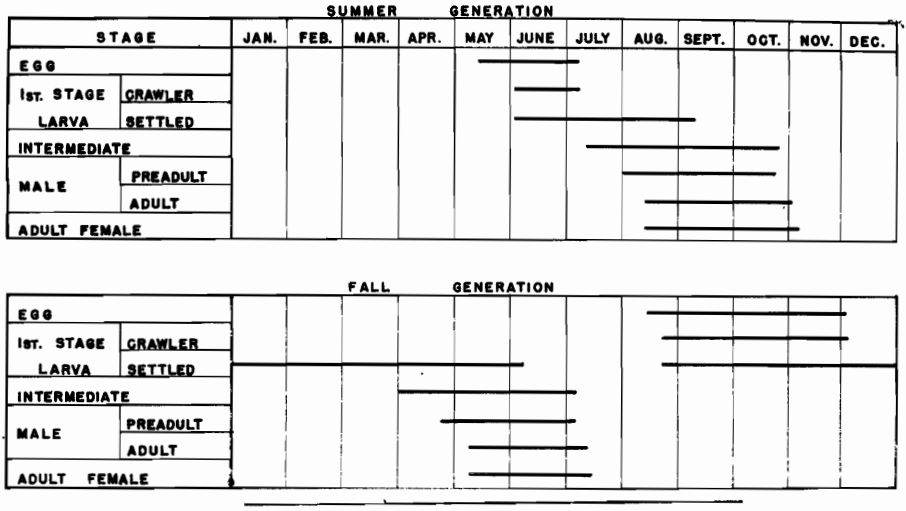

Figure 5.—The seasonal life cycle for summer and fall generations of red pine scale.

trees should be cut during the winter months to prevent spread of the scale. The logs should then be pealed and the branches and bark burned.

On ornamentals, some protection can be achieved by two applications of a 2-percent oil emulsion —the first applied in early June and the second in early September.

CAUTION: Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticidies are under constant review by the U.S. Department of Agriculture, consult your county agricultural

agent or State Extension specialist to be sure the intended use is still registered.

References

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