



Forest Insect & Disease Leaflet

Ips Engraver Beetle



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Ips Engraver Beetle: a bark beetle affecting pines and spruces

Twenty-five species of bark beetles in the genus *Ips* (also called engraver beetles) are currently recognized in the west. Each species differs slightly in appearance, life cycle, and host preference. *Ips* beetles generally attack pine and spruce with different species found on various hosts. Engraver species of particular importance in Utah include *I. pini* in most pines and *I. pilifrons* in most spruce.

How does the beetle damage a tree?

Damage occurs when adult beetles attack the tree and reproduce in the conductive tissues of susceptible host trees. Conductive tissues transport water and nutrients throughout the tree. Female beetles construct a tunnel just under the bark to lay eggs. After the eggs hatch, the larvae feed creating more tunnels that further destroy the conductive tissue. The destruction of conductive tissues prevents the transport of water and nutrients throughout the tree--eventually killing the tree. The larvae then pupate and exit the tree as adult beetles. New adults will either re-attack uninfested portions of the same tree or attack another susceptible host tree.

When a beetle chews through the bark it produces reddish or orange boring dust. The boring dust is generally dry and free from pitch. Successfully attacked trees will generally have this boring dust (red-orange) in bark crevices and/or around the base of the tree. Needles on branches or trees killed by the beetle will generally turn yellow or light green, in spruce; and yellow to red in pines, within a few weeks or months following attack.



Ips boring dust in bark crevices



Needle discoloration on pine



Adult beetle on dime

Life cycle of the *Ips* engraver beetle

The life cycles of *Ips* beetles generally last from 6 - 8 weeks that often results in 3 to 4 generations produced in one season depending on climate, elevation, and species. Because multiple generations are produced, generations may overlap. Consequently, beetles may attack host trees throughout the season when adult beetles are flying. In Utah, adult beetles can begin attacking host trees as early as mid-April in central and northern Utah and even earlier in portions of southern Utah.

Can you control the *Ips* engraver beetle?

Adult beetles are attracted to trees under stress. Adults prefer to attack trunks or branches that are one to four inches in diameter. Beetles will usually initiate attacks at the tops of larger trees or on individual branches. They may attack larger diameter material depending on population densities and host stress.

Ips populations often build in fresh green material (> ¾ inch diameter) created by pruning, logging, land clearing, wind damage, or any other activity or disturbance that creates downed material. Populations may also build in small diameter stressed trees. As beetle populations increase, they can attack and kill healthy trees.

The best defense against *Ips* beetle attack is to maintain the health and vigor of susceptible trees. The principle stress factor associated with susceptible trees is usually water related. Watering requirements depend upon soil composition and root development. Soil associated with newly planted trees needs to remain moist, but not wet, for the first few years until a good root system is established. Larger, established trees, should receive a deep watering (2 - 4 inches of water) once every 3 - 6 weeks, depending upon soil composition and its ability to retain water. Most of the water should be applied at the trees drip line near the edge of the branches continuing to water a few feet past the drip line. The top 18 inches of soil should remain moist, but not soaked. Over-watering trees can be just as damaging as under-watering. If water continually accumulates around the tree or the area is always muddy, then over watering is occurring. Trees currently under stress often require 2 to 3 years to recover from stress-induced events. As tree vigor improves, their resistance to bark beetle attack increases.

Trees, branches or other debris heavily infested with beetles should be removed from the site or treated to prevent beetles from emerging and attacking nearby host trees. Infested material should be deposited at a site at least 2 miles away from susceptible hosts. Treatment of infested material may include: 1) removing and disposing of all the bark; 2) chipping and spreading the chips in the sun; 3) completely burning the outer bark to kill all life stages; or 4) burying the infested material.

If beetles are in the area, susceptible trees may be at risk, especially if they are under stress. Uninfested trees and infested trees in urban settings where the insect has not attacked more than 1/3 of the tree bole, or branch mortality does not exceed 50 percent can be protected from further attacks by spraying the trees with a registered insecticide. Insecticides containing the active ingredient Carbaryl® are quite effective as a preventative treatment with several brand names of the flowable formulations registered for bark beetle control. The insecticide must completely cover all sides of the trunk, root collar and branches (≥ ¾" diameter preferably reaching to the top of the tree. The insecticide should be applied so that it is dripping from treated surfaces. This will ensure that all bark crevices are thoroughly treated. If any portions of the trunk (including the top of larger trees) or susceptible branches are missed, then beetles can successfully attack the non-treated area. Applied properly following the recommended label rates, the treatment should provide protection from attacking *Ips* beetles for approximately 18 months. The insecticide treatment is most effective when applied using a high-pressure sprayer (325 psi or greater) using a #8 orifice nozzle. On larger trees hydraulic pump pressures must be higher (400 psi) and nozzle orifice size should be #10. Pump pressure should remain at the recommended psi during application.

Always use EXTREME CAUTION when applying pesticides/insecticides. Follow instructions and safety recommendations.

For further information please contact:



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