IPS BEETLES OF PINYON PINES

Pinyon pines are the most abundant pine trees in West Texas. These small to medium sized trees grow in dry woodland environments prone to frequent fire and drought. Under these stressful conditions, native bark beetles known as engraver beetles (*Ips* spp.) flourish by utilizing pinyons as a source of food and habitat. Two species of *Ips* inhabit pinyon pines in Central-Western United States. *Ips hoppingi* is known to infest the most common pinyons of the Trans-Pecos and western Edwards Plateau in Texas, papershell pinyon (*Pinus remota*) and Mexican pinyon (*P. cembroides*), and is also found in SW Arizona, southern New Mexico, and Mexico. *Ips confusus*, or pinyon ips, commonly attacks Colorado pinyon (*P. edulis*), found in the Guadalupe Mountains and as a commonly cultivated tree in landscapes and windbreaks. However, this species is not distinguishable from *Ips hoppingi* based on external characteristics and has only been recorded from Arizona, New Mexico, Colorado, Utah, Nevada, and California.

IDENTIFICATION AND BIOLOGY

Specimens of *I. hoppingi* are reddish brown and cylindrical in shape, ranging from 1/8 to 1/5 inches in length. Five distinctive spines are apparent on the edge of the wings (elytra). Infestations begin when a male locates a suitable host tree, bores under the bark, and creates a nuptial chamber, emitting a pheromone to attract females (mating with 2 to 4 females). Each female then bores tunnels, known as galleries, laying eggs along the way. As the eggs hatch, the larvae will feed on the inner bark creating their own smaller galleries. Once mature, the adult beetles will fly off in search of a new host. Under the right conditions up to four life cycles can exist within a year. Consistent daytime temperatures below 50 degrees will trigger beetles to overwinter within a tree, not emerging until temperatures rise in the spring.

Karl Flocke, Demian F. Gomez. Texas A&M Forest Service.

SPREAD

Ips beetles are usually attracted to pines that are stressed or weakened. One of the most common precursors to infestation is drought, which weakens the tree, making it less capable of repelling beetles with sap. Physical damage such as pruning, construction, or fire scarring can preclude infestation as well. When the tree is wounded, chemical volatiles are released and work as attractants. Once one tree is infested, the next generation of beetles can spread to neighboring trees, creating pockets or spots of dead and dying pines. These beetles can be opportunistically aggressive, producing short-lived outbreaks.

SIGNS AND SYMPTOMS

The appearance of *Ips*-killed trees may seem to be a sudden development. However, diligent monitoring can reveal early warning signs of attack. *Ips* attacks will create a bore hole out of which sap will emerge creating a reddish pitch tube. Pitch tubes are usually small and may be limited or absent during severe drought. Peeling back the bark will reveal galleries with a distinctive “H” or “Y” shape. Once adults emerge from the tree they will leave behind small, round exit holes roughly the size of a BB pellet. As beetles feed on the phloem, pine needles will fade to a light rust color, and finally to dark brown. Eventually needles will drop off the dead tree. During severe infestations, a pattern of mortality may be observed with dead, defoliated trees surrounded by trees with brown needles, and subsequent trees with fading needles toward the outer extreme of the infestation center.

PREVENTION AND CONTROL

By the time a pine has started turning colors it is too late to save. The best option to minimize the attack and spread of *Ips* is prevention. Preventative strategies for homeowners and managers include:

- Keep trees healthy so that their natural defenses can fend off attacks. For landscape trees this may include watering once per month during periods of drought. For trees in natural settings, maintaining adequate spacing can help to increase tree vigor and health.
- Removing infested trees may help to curb the spread of beetles. Your primary target should be trees that have not yet faded, but already exhibit entry holes or pitch tubes. Infested trees should be immediately burned, buried, or chipped to kill the beetles. If wood is stored for future use, it should be de-barked and split to allow for quicker drying. Do not move unseasoned, infected firewood as this may spread beetles. Never stack firewood against healthy trees.
- Prune pines during winter months when the beetles are inactive.
- Preventative chemical sprays on the bark may be used to protect high value trees. If a tree is already infected, it will not be effective. Systemic injections with insecticides can be used as preventative treatment or during early attacks. Check manufacturer labels to identify a product that is permitted for use against *Ips* beetles in pine trees. Products with active ingredients such as carbaryl, permethrin, emamectin benzoate, or bifenthrin may be labeled for such applications.

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