



# Western Pine Shoot Borer

## Forest Health Fact Sheet

September 2017



Jerald Dewey, USFS, Bugwood.org

Western pine shoot borer larva within pith of pine shoot

Western pine shoot borer (*Eucosma sonomana*) is a moth that attacks new terminal and lateral shoots of pine. This pest is more common in young pine plantations and damage is done by its larval stage. Caterpillars enter and feed on the pith within shoots and cause stunted needles and/or shoots, which results in growth loss and shoot dieback. Infested terminal shoots are usually stunted but will survive, but infested lateral shoots usually die. Each attack on the terminal shoot reduces annual height growth by 25% and can alter tree form. Tree genetics affects susceptibility to shoot borer attack and can confound growth data collected at pine progeny test sites.

### Hosts

- Major: ponderosa, Jeffrey, lodgepole and knobcone pines
- Minor: larch and western hemlock

Western shoot borer occurs within the range of ponderosa pine and in Oregon is most often found in pine plantations in the east and southwest.

### Biology

Adult moths have copper and grey patterns on the wings and a wingspan of 1.5-2.5 cm. They lay eggs on elongating shoots in the spring and larvae hatch from eggs and bore into shoots. Larvae feed on the pith within shoots and emerge in late spring and drop to the ground to pupate.

### Damage

External symptoms of shoot borer infestations include shortened needles and reduced elongation of the terminal shoot. The shortened needles result in a 'shaving brush' appearance in shoots and shoots may be thickened. Because the infested terminal does not elongate, lateral shoots are often longer than the terminal. A normal (uninfested) terminal shoot is usually 25-40% longer than lateral shoots. Another external sign of shoot borer infestation is an exit hole near the middle of the shoot

where the larva has emerged from the pith. Shoot borer infestations can also be detected by clipping the upper third of a pine terminal to expose damaged pith tissue. The pith of infested terminals are packed with frass and are dark brown (rather than white) where the larva has fed. Larvae are present in the pith between June and early August.



USFS-Ogden, Bugwood.org

Damaged pith from shoot borer

The symptoms of shoot borer attacks in lodgepole pine are similar to those in ponderosa pine, but less obvious from a distance. Larval feeding is more destructive in small diameter lodgepole terminals and emergence holes can weaken the stem, resulting in breakage. Frequently the tip of infested lodgepole pine terminals will die by late fall. Laterals often compete with infested terminals for dominance, but effects on tree form are usually minor. The annual reduction in height growth from shoot borer infestation in lodgepole pine terminals has been estimated at 25%.

Western pine shoot borer attacks start when pines are approximately 4 - 5' tall, and gradually increase over the next 25 to 30 years. In older plantations, it is common for 50% of the trees to be attacked on an annual basis. Fast growing pines are more likely to be attacked than slow growing trees with short terminals.

## Management

### *Silvicultural*

Location and site prep can exacerbate attacks from shoot borer.

Ponderosa pine grown on drier sites often suffer high levels of infestation, while pine plantations at higher elevations show low

levels of shoot borer damage. Intensive site preparation and brush control designed to increase growth in pine plantations results in a higher level of shoot borer infestation. Pine stands intermixed with true fir or Douglas-fir tend to suffer fewer attacks.

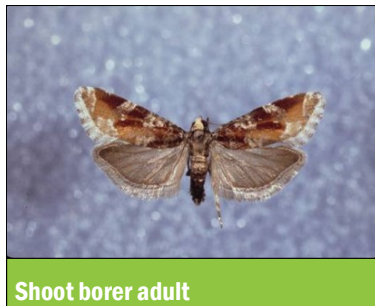
### *Insecticidal*

Insecticides, contact or systemic, have proven ineffective at controlling western pine shoot borer damage. Traps baited with a synthetic pheromone bait and pesticide (MalEx) to attract and kill males has proven effective at reducing damage in pine plantations only if applied across the entire site. Traps must be set by mid-March, before moth flight has occurred. Lures and traps may be purchased locally through [Alpha Scents, Inc.](http://www.alpha-scents.com) among others.

**When using pesticides, always read and follow the label**

## Management highlights

- Avoid planting at low-elevation, dry sites
- Interplanting true fir or Douglas-fir reduces amount of attacks
- Pheromone-baited pesticide traps can successfully reduce the amount of males and thus damage on site if applied across entire site



Stunted 'shaving brush' appearance of infested shoot

Ladd Livingston, Idaho Dept. of Lands, Bugwood.org

## More information:

Oregon Dept. of Forestry, Forest Health  
<http://tinyurl.com/odf-foresthealth>  
2600 State St. Bldg. D, Salem, OR 97310  
503-945-7200

## Other references:

USFS Forest Health Protection  
[www.fs.usda.gov/goto/fhp/fidls](http://www.fs.usda.gov/goto/fhp/fidls)

OSU Forestry Extension  
<http://extensionweb.forestry.oregonstate.edu/>