



Researchers in California and Oregon found that if annual rainfall is at or below 15 inches, moderate to heavy tree mortality occurs in overstocked second-growth ponderosa pine.

The pine engraver beetle, also known as the bark beetle, attacks the soft fleshy cambium layer between the sapwood and the heartwood. Unfortunately, this beetle can kill a weak tree. The pine engraver kills many pine trees in the region but does not attack ponderosa pine and lodgepole pine.

The pine engraver beetle is a secondary pest, an opportunist, and will wait until some other insect has damaged and weakened the tree before attacking it as an easy meal. It looks for trees weakened by *Diplodia* blight, western pine beetle, and other insects and diseases.

A gallery is a "tunnel" made by the beetle in the cambium layer of a tree. Beetles lay their eggs in the gallery. The young hatch and feed in the gallery, then make new galleries away from the parent gallery. As shown in Figure 1, the pine engraver beetle creates a unique gallery which looks similar to a "Z" shape. These galleries can be exposed by peeling or chopping the bark away from a suspect looking tree or lying on a slash pile. These galleries are