

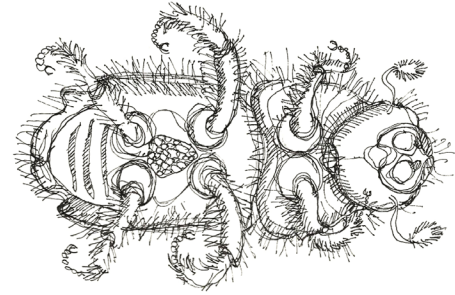
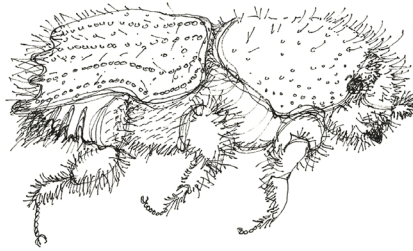
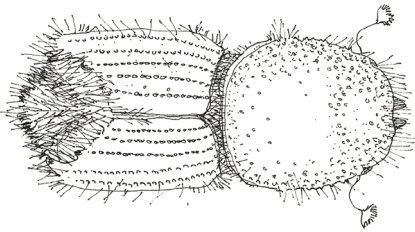
TANO ROAD ASSOCIATION
PIÑONS
THE BATTLE OF THE BARK BEETLE



PREVENT PROTECT PREVAIL

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SIX-SPINED ENGRAVER BEETLE IPS CALLIGRAPHUS



actual size: 5mm, 3/16"

PREVENTION AND TREATMENT OF BARK BEETLES

Bark Beetles are nearly always fatal according to the New Mexico State University Extension Office because even if the beetle invasion itself does not kill the tree, the beetle carries the blue stain fungus which always kills the tree.

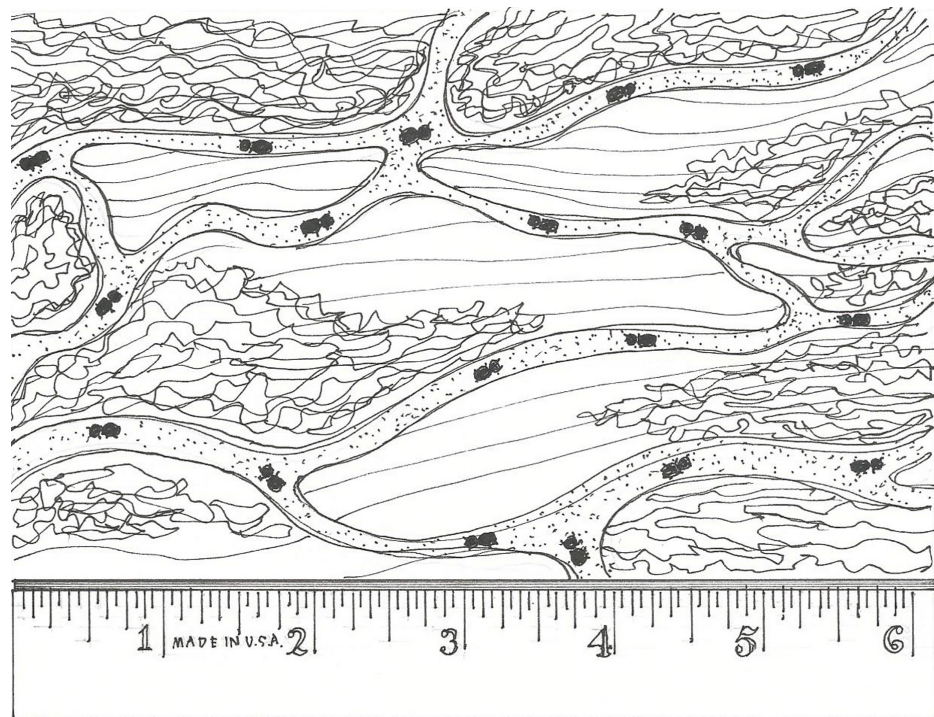
In the view of the Extension Office, there is no cure once a tree is infested and an infested tree should be cut down and **hauled away immediately**. The Extension Office notes that infested trees must not be chipped and used as mulch since some beetles will survive the chipping process and simply breed in the mulch, often at an accelerated rate of reproduction. During the chipping process, the beetles will swarm out of their nests in the infested tree and go immediately to neighboring piñons. This is also the collective wisdom of most entomologists and arborists.

But why Bark Beetles one year and not another? Simply, the reason is stress as a result of drought. Strong piñons with large well developed root systems seek out what little water is available while weaker piñons cannot. The weaker piñons struggle to just survive, producing little new needle growth and few new candles, conserving energy to the root system. The effect in this "survival mode" is a piñon with severely reduced pitch sap flow in the tree. It is this reduced sap flow which permits successful Bark Beetle infestation. In a Darwinian sense, this is nature's way of eliminating weak trees and reducing demand on an already scarce water supply.



A bore hole on a piñon tree trunk is about 1/8 of an inch in diameter

The Bark Beetle has, like most insects, a definite life-cycle. They are part of a larger category of insects known as “tree borers”. Adult males bore into the bark of the piñon, generally on the main trunk initially. The holes are about 1/8 of an inch and easily seen by the naked eye. Once past the bark of the piñon, the males enter the outer cambium of the tree and begin chewing tunnels up and down the cambium. These tunnels are the mating chambers for the female Bark Beetle.



Bark Beetles are pictured here in a mating chamber. They are about the size of a grain of rice



Generally, the stronger trees do not attract heavy infestations of Bark Beetle since if a male Bark Beetle does bore an entry hole into a healthy piñon, it is almost immediately closed over by a rich flow of piñon sap, expelling the Bark Beetle and sealing off the entry hole. In subsequent years, these sealed off entry holes will appear as dark amber-colored sap nodules, hard to the touch. Because the male Bark Beetle has not successfully prepared the mating tunnels in a healthy piñon, no further infestation occurs. It is for this reason that adequate water supply, essential for pitch sap flow in piñons, is a key factor in preventing Bark Beetle infestation.

In the crevices of the tree and bark, you will often see the orange colored “saw dust” tailings of the beetles which are generally from the tunneling activity of the newly hatched larvae. When this is evident the piñon is already heavily infested. Prior to this, however, you may only see the entry holes which would indicate eggs may have been laid by the female but have not matured to larva yet and the evidence of the saw dust from the tunneling has not occurred.



Lichen and bore holes showing orange sawdust tailings



Once the eggs are hatched, the larvae will begin feeding on the pitch sap of the piñon and extend massive networks of horizontal tunnels around the entire circumference of the piñon (termed girdling) to tap off all vertical sap flow as a food source for the larvae colony. It is because of this activity that evidence of heavy infestation of Bark Beetle is easily noted by yellow or brown needles on the piñon from the top down resulting from the starved sap supply of the tree.

Other factors can also put a tree under stress. Needle tip fungus is common among piñons and while it rarely kills the tree by itself, it will place the piñon under stress and therefore make it susceptible to Bark Beetle. Pitch Moth, another common pest to the piñon, will generally only kill the piñon over a period of years but will also put the piñon under stress as well.

Twig beetles, over time, kill the new twigs at the tips of the limbs. Remove limbs and twigs that are infested, and dispose of them before the larvae hatch.

Of greater nuisance is mistletoe, the yellow-green growth sometimes called “witch’s broom” that invades both piñon and juniper trees. Piñon dwarf mistletoe (*Arceuthobium divaricatum*) is a small, parasitic plant.

The external shoots are yellow-green to brown, have small scale-like leaves at the nodes of shoots, and are perennial. Mistletoe extracts nutrients and water from the branches of the host tree eventually killing the branch. If left unattended it will not only kill the tree but spread to other nearby trees.

The only sure way to rid the tree of mistletoe is to remove the infested branch. Removing only the visible mistletoe does prevent further spore dispersion in the autumn months but the actual infection remains.

Add any of the stress factors together and you multiply the susceptibility to Bark Beetle and the piñon’s ability to fight off an infestation.



PREVENTION AGAINST BARK BEETLE

Water

As we have discussed, watering your piñons well, especially during the winter months, is an effective defense against Bark Beetle.

Understanding the life cycle of the Bark Beetle, rich sap flows in the piñon resulting from adequate watering seal off initial entry holes made by the male and prevent infestation.

Be sure to build holding wells around the trunk of the piñon (ideally out to the drip-line of the tree) to allow for maximum soaking of the tree. Generally, two fills of the well should be considered an adequate watering at a time.

Topical Pesticide (Spraying)

In addition, local nurserymen will suggest spraying with the insecticide Sevin or the environmentally friendly permethrin. Spraying can be another effective tool against Bark Beetle depending on when the spraying is done. Spraying must be done prior to infestation. Since spraying is topical, that is, dried into the bark of the piñon, spraying after infestation will not kill any beetles already into the cambium of the piñon.

Spraying coats the bark of the tree. When the male Bark Beetle begins making an entry hole in the outer bark of the piñon, the insecticide is ingested by the beetle which dies from paralysis. But if the spraying is too old (anywhere from 2-6 months efficacy) then the tree must be re-sprayed to extend the protection. Spraying once in the spring and again in mid-summer can serve as an effective preventative.

Throughout Colorado, permethrin has been used for years instead of Sevin since it has been shown to be well tolerated by wildlife. Permethrin is made from a concentration of the chrysanthemum flower, and when highly distilled, it is extremely effective as an insecticide. Synthetic forms have now been formulated with equal effectiveness. Once it dries it is safe for pets and wildlife to be around. Permethrin, like all insecticides, is a topical spray to the bark. It is only a preventative, prior to an infestation of the Bark Beetle.

Systemic Pesticide

Once the Bark Beetle is inside the tree the only logical way to attempt to save the tree would be with some type of chemical which enters the sap system of the tree and kills the pest feeding on the sap inside the tree. This type of treatment is termed systemic.

Here is the problem with systemic treatments. Bark Beetles feed on the sap and make extensive tunnels where newly hatched larvae feed; sap flow can no longer reach the extreme upper portions of the piñon. In order for a systemic treatment to be effective, there must still be sap flow in the tree to carry the insecticide to the infested areas. If the infestation is too far advanced, feeding the insecticide to the roots will soak into the root system but not go up the trunk where the Bark Beetle is nesting.

Even though our Extension Office does not recognize the use of systemic treatment, several products are currently available.

SUMMARY



The stages of demise can be sudden, within days if a piñon is heavily infested.

While there have been varying levels of success with systemic pesticides, both injection and root based applications, topical pesticide application has been quite effective. You should consider that each of the methods suggested should be part of an overall program to protect and treat piñon trees.

The best protocol is to **prevent infestation** in the first place. This is best accomplished by:

1. periodic water soaking the root base
2. application of topical pesticide [spraying] in early Spring and mid-Summer.

DISPOSAL OF INFESTED TREES

1. Once piñons are infested, the “best practices” protocol is to cut them out right away to prevent further infestation to nearby trees, including your neighbor’s.
2. Immediately remove to the landfill all debris and cuttings from your property.
3. Do not chip the dead trees up, no matter who advises you otherwise as this will cause swarming by the remaining beetles which are not killed by the chipper, most of those fleeing as the wood is being fed into the chipper.

It is not recommended to “solarize” your infested cuttings and debris by covering them with a 6 mil black (or clear) plastic blanket and letting the heat build-up by the sun kill the beetle.

Note: Our Northern New Mexico daytime temperatures are not consistently high enough for long enough to kill beetles deep inside the wood cuttings. The rapid cool off of our nighttime temperatures throughout the year makes it unlikely the required high sustained temperatures can be reached for the recommended 30 days of a “solar oven effect”. Some beetles may be killed in the smaller branches, however, those nesting in the larger main trunks are more likely to survive and pose a threat of further infestation. Furthermore, it is very difficult to keep the wrapping air-tight and escape-proof.

It is essential to remove the dead tree from the property altogether.

Burning infested wood in your stove or fireplace can result in other risks. Of course the beetle will not survive the fire. However, even if the temperature outside has been consistently below freezing for several weeks, Bark Beetles can still be alive and feeding on the recently felled piñon in your wood pile and, as a result, they may infest healthy trees nearby. Using this firewood of infested piñons may be a false economy.

Provided as a public service by the Tano Road Association
Art work by John A. Forrest

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