

For Immediate Release: Pine Bark Beetle Outbreak in Arizona

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Dry spring weather conditions have created critical conditions in Arizona's forests and woodlands. Below normal winter precipitation coupled with normally dry conditions in May and June have increased the susceptibility of Arizona's ponderosa pine and piñon forest to forest health problems. Bark beetles have emerged in the forest and woodlands of Arizona. The offspring from over-wintered adult beetles that have successfully attacked live trees and slash in late 2003 are beginning to emerge as the first generation of 2004 adults. At all elevations, populations of *Ips* bark beetles are higher than normal. What may determine whether or not we have increases in bark beetle killed trees this year is the weather.

Moisture levels in the fall/winter (November to April) of 2001-2002 were 6.9 inches below normal (average precipitation for Flagstaff, Prescott and Show Low), leading to the death of millions of trees in 2002. In contrast, precipitation levels during the fall/winter of 2002/2003 and 2003/2004 were 2.3 and 2.4 inches below normal, respectively. Thus the past two years have had very similar dry fall/winter weather patterns.

Fire managers are experiencing more intense fire behavior this year in many areas in vegetation where insect and drought killed trees exist. Because of these burning

conditions, firefighters are utilizing fire suppression and management tactics to ensure the safety of firefighters while minimizing the impacts to these fragile ecosystems.

Even with below normal levels of precipitation this year most of our forests had sufficient amounts of moisture in the soil on May 1. However, when over-wintering beetles were emerging soil moisture became depleted very quickly due to persistent dry, windy spring weather. With these past and present conditions in mind it is hard to predict the level of bark beetle damage that will occur in 2004. We can, however, assume that similar weather patterns will bring similar levels of tree mortality.

The last three years of U.S. Forest Service and University of Arizona aerial survey flights have shown a significant increase in bark beetle-caused tree mortality compared to levels prior to 2001. The 2003 survey showed the greatest number of acres affected. In reality, the 2003 survey, due to timing of the 2002 flights, recorded 100,000's of impacted acres that were actually damaged in late summer and fall of 2002. With this in mind we could expect to see significant levels of beetle related pine mortality in the 2004 survey results. Damage levels will depend to some degree on weather patterns throughout the remainder of the summer.

As more and more trees are killed by bark beetles there will be fewer trees to be attacked in subsequent years. The surviving trees will have increased vigor due to less competition and be less susceptible to attack. If we see fewer acres affected in 2004 it may be due to the fact that many of the weak stands of trees that were growing on highly susceptible sites (south slopes, lower elevation, or poorer soils) have already been severely damaged. This may be true in areas such as Crown King, Pine, or Prescott that have experienced over 50% mortality in many ponderosa stands during the last two years.

As Mike Wagner, Regents Professor at Northern Arizona University was heard to say about the lower levels of mortality in some of the stands that had high outbreak conditions in 2002, "...you can't kill a tree twice!"

Although the last significant bark beetle outbreak in Arizona occurred in the 1950's, unfortunately we have not been able to make conclusions on how the 50's outbreak relates to the current one. Recent outbreaks in other parts of the country are not comparable because of the different species of beetles, and climatic conditions. Based on historical records, *Ips* outbreaks are relatively short lived and rarely sustained for long periods of time. However, because of the ongoing record drought and unprecedented tree densities in our forests and woodlands, we are entering uncharted territory. For these reasons it is very difficult to predict how successful the beetles will be this year or the next few years.

The best way to avoid having trees attacked by bark beetles is to take preventive measures. First and foremost, lower tree density through thinning. However, at this time of year thinning may cause increases in bark beetle populations due to the beetle's ability to utilize thinning residue or slash. Beetle attacks may occur in standing trees nearby thinning treatments if the newly cut trees are left on the ground for more than 30 days. If the material is hauled off the property to a landfill where the material will be buried or if it is chipped within 30 days it will not cause a problem. When chipping on site, don't pile the chips next to live trees as the chips may attract bark beetles. Keep chip piles in the open sun and as far from live trees as possible. If slash removal or chipping is not an option, then it may be best to wait until October to begin thinning.

Many people are unsure as to which trees should be removed. In these cases it may be best to consult with a certified forester or arborist. For a listing of certified professionals consult the yellow pages, call your local University of Arizona County Extension office, or log on to [www.isa-arbor.com](http://www.isa-arbor.com) to find a certified arborist or [www.safnet.org/certified/directory.htm](http://www.safnet.org/certified/directory.htm) to find a certified forester.

The small slash (limbs and tops less than 3 inches in diameter) can be used by adult beetles, but they won't produce much brood from it. The small material can be chipped or piled. When piling, put the smallest diameter material in the middle with the largest on the outside.

Often property owners will have several trees that have significant value in their landscape. These trees may be prized for their size or location. These high value trees can be given additional care to prevent infestation. They can be irrigated or sprayed with preventative insecticides.

When irrigating native pine trees they should be given enough water to wet the soil at least two feet deep. The water should be applied in a donut shaped pattern at the drip-line or outer edge of the trees branches. It generally takes about 2" of rain to soak 2 feet deep. Check the soil 6 to 8 inches deep just outside the drip-line of the trees monthly. If the soil is dry, then water. Generally, the months that most often warrant watering are May, June, and October. However, depending on weather patterns watering may be needed any month of the year. If current dry conditions continue into the summer you may need to irrigate in early July. Keep in mind watering restrictions that may be in effect in your community and follow those guidelines as well. (Check with your local office of the Arizona Department of Water Resources for restrictions in your area.)

Applications of fertilizers will not help protect trees from the effects of drought, and will not protect against bark beetle attacks. Fertilizers may even hinder the ability of the trees to fight off bark beetles. Fertilizers often cause trees to put on extra growth, this growth will require higher levels of moisture to maintain healthy conditions. Fertilizers may also burn foliage if improperly applied.

Un-infested trees can be protected from beetle attacks by spraying with insecticides. When spraying, the entire trunk and the base of large branches 4” or more in diameter must be soaked. Spraying large trees is generally not a practice that homeowners can do themselves. To locate a certified pesticide applicator call the Arizona Structural Pesticide Control Commission at 800-223-0618.

The currently recommended chemicals for this purpose are carbaryl and permethrin. You must use a product that is especially formulated for bark beetles, such as Sevin SL, Dragnet, Premethrin Plus C, or Astro. This is a protective measure only, it will not kill beetles once they enter the tree. Typical home and garden products containing carbaryl or permethrin that are not formulated for bark beetles will be ineffective. Correct materials when applied properly can be effective for an entire season. Spraying should have been completed prior to April 1 to ensure a full season of protection. Spraying after April 1 can be effective but you must be sure that the trees have not already been attacked. Trees can be checked for infestations by climbing, with a hydraulic lift, or with high-powered binoculars to inspect the entire trunk of the tree for pitch tubes and boring dust. Also check the bark crevices and the base of the tree for fresh boring dust. Spraying trees already infested is ineffective.

The only known direct control method for infested trees is the removal of the infested trees. A good rule to remember is “If the tree is brown cut it down, if in doubt cut it out.” If we leave dead trees standing, we run the risk of the new generation of beetles leaving the tree and attacking more trees. Finding reddish-brown boring dust in the bark crevices of a tree indicates that the tree has been successfully attacked, and the tree should be cut down even if the tree is still green at that point. If dead trees are next to houses or other structures, they can become a hazard tree.

Insecticide injections or systemics have not proven effective against *Dendroctonus* species of bark beetles in studies conducted by U.S. Forest Service and Canadian Forestry Service researchers. We are assuming that chemical injections will be equally ineffective on *Ips* species of bark beetles. Many trees have been injected with what seemed to be success. What may have happened is that the treated tree successfully pitched out the attacking beetle with resin prior to the treatment. The tree was then injected with insecticide when in fact no beetles were actually in the tree. The tree saved itself! We repeat, studies have shown that injecting chemicals will not kill *Dendroctonus* species of bark beetles attacking conifers and injures the tree in the process.

There are several miracle cures being promoted to save trees from bark beetles. These materials may not have gone through extensive research to test their effectiveness. Buyer beware! Often, if what is being marketed sounds “too good to be true” it generally doesn’t live up to its billing. Remember, it is against the law to use unregistered pesticides and using pesticides for insects not listed on the label is unwise.

The University of Arizona, Northern Arizona University, and U.S. Forest Service are engaged in research to test materials to prevent and control *Ips* species of bark beetles

in northern Arizona. When these studies are completed and reviewed the results will be released to the public as soon as possible.

Many trees may only have the top half of the tree dead. In 2002 we saw the lower half of the tree was killed shortly thereafter. Do not cut the top out of the tree hoping that the rest of the tree will recover. It is best to remove such trees to prevent the spread of beetles to other trees and to prevent them from becoming a hazard tree. You need not wait until the entire tree turns brown, many adult beetles may have flown from the tree before turning brown. Dead trees that do not have bark beetles in them and do not pose a safety hazard can be left in the forest to be used by wildlife.

Remember, the most effective method for preventing bark beetle infestations is to thin overly dense stands of trees in the right way, at the right time of year, using the right equipment with proper training. If you need more information please contact your local University of Arizona Cooperative Extension office, State Land Department, or your local fire department. Additional information can be found at the following web sites.

<http://ag.arizona.edu/extension/fh/> or <http://ag.arizona.edu/yavapai/>

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