

Pine bark beetles

Pine bark beetle outbreak in central Minnesota counties

By Jana Albers, DNR Forestry, Forest Health Specialist

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If you live anywhere on the Anoka Sand Plain, you've seen the red (Norway) pines change color over winter and, in some cases, get worse this spring. Normally, winter injury symptoms disappear as the new, green shoots and needles grow. Some of the red pines have followed the typical scenario and are fine, but others are struggling. A number of pines have already died. On the dead and dying pines, you'll see orange/ brown needles on most of the branches and no new shoots or needles developing in the bud tips.

2001 is the beginning of the fourth year of drought as measured by subsoil moisture. Despite the rains we had in April, May and, now this week, soils are dry and water tables are very, very low. In some Sherburne County locations, soil moisture and water table levels have met or are lower than those during the drought in 1988. Some lake levels have dropped six feet below their normal levels.

Tree root systems were left high and dry and this puts all trees under stress. For the last two years, red pines have been indicating their level of drought stress in the form of winter injury. You can see it in pine plantations, windbreaks, roadside plantings and backyard trees. Even the small understory pines in pine plantations are dying off due to lack of soil moisture.

With the deepening drought stress, red pines became vulnerable to insects which took advantage of their weakened state. Earlier this spring, pine bark beetles attacked the upper crowns of many of these pines. An aerial survey this week found nearly fifty red pine plantations with discolored, dead and dying crowns in Sherburne and Isanti Counties. Most of the affected trees are located in plantation interiors, indicating a serious drought stress and likely bark beetle buildup. Pines in backyards, along roadsides and in windbreaks were also affected. In some cases, 100% of the pines were orange colored. Back on the ground, a few discolored trees were felled and all had bark beetles developing in them.

A few pine plantations did not show any discoloration. Trees growing in these plantations apparently have plenty of rooting space and an adequate supply of water because they have been recently thinned by harvesting.

How can I tell if my pines are infested with bark beetles?

You'll notice several large branches or the top half of the tree with discolored needles. These branches are dead and do not have new growth. Pine bark beetle activity begins in the upper crown and progressively moves down the stem. It's easiest if you can cut a symptomatic tree down in order to check it for bark beetle galleries and exit holes. Galleries occur in the thin layer of inner bark between the outer bark and the wood. In the active galleries, you can find eggs, grubs, immature or mature adults. Exit holes are created as the new generation of bark beetles chews its way out of the bark and, when hundreds occur in a group, look like holes from a shotgun blast. This is positive evidence that bark beetles are active and could threaten nearby pines (within 1/4 mile).

What can you do?

For dead and dying pines in backyards and along roadsides and in windbreaks:

1. Cut down the pines as soon as possible. To keep bark beetles from spreading to adjacent trees, you then must get rid of the tree tops and branches by chipping, burning, burying or otherwise destroying them. The logs should be debarked, chipped, burned or removed from the property. **Do this within three weeks** of cutting the trees. If you don't, you've made it worse for the remaining pines because you've just raised a huge crop of hungry bark beetles.
2. Water, water, water. Where possible, use a soaker hose to irrigate the root systems of the remaining pine trees for the rest of the summer. This is especially important if rainfall dips below average.
3. Watch your trees carefully. Are more trees changing color? Are bark beetles still a problem? Repeat step 1 and, later, step 3.

For dead and dying pines in plantations:

1. Doing nothing is always an option. If there are trees with discolored crowns in your plantation, there will likely be bark beetle-caused mortality in your plantation this year. And, if the drought is truly over, mortality that occurs this summer will be the only mortality that the bark beetles will cause.
2. Use a management method called the "trap tree technique" to limit mortality, thin the stand and make a little money. In a nutshell, some trees are girdled and harvested, all products and slash are removed or destroyed within three weeks of being cut. Hint: have a contract with a logger in hand **before** you begin girdling the trees! That way you won't create a bigger bark beetle population and extensive tree mortality. More information is available in the [June 5, 2002 issue of the Forest Insect and Disease Newsletter](#).
3. If your plantation is heavily damaged, you may want to thin or clearcut harvest the stand in this fall or winter. Make sure bark beetles are the cause of the damage first, then contact a forester for further advice.
4. A long-term goal is to improve tree vigor by thinning the plantation. There's a double benefit; your trees will be better able to withstand drought stress and you'll make some money. But wait for a year or two so the lingering effects of drought are over and only cut trees during the fall and winter to avoid bark beetle buildup and tree mortality.

All the indications are that the drought is turning around: April, May and June will all be average or above average for precipitation. But water table recharge lags behind this. And, most importantly, tree vigor can't turn around overnight either. It will probably take two to three years for the trees to recover. In the mean time, pines will still be vulnerable to bark beetles, especially this summer. Take action where possible. For a brochure on bark beetle identification and management, contact your local DNR Office, Extension Service or County Forester.

Pine bark beetle management

Using the "trap tree" technique to manage bark beetles in pine **plantations**

The trap tree technique is used to reduce or prevent attacks of living trees which are growing near an active bark beetle infestation. This option utilizes recently cut, living trees in order to draw the attack of bark beetles to this breeding material rather than to the remaining stand. Trap trees are collected and destroyed once the beetles have started their brood and before they emerge, thus reducing the potential beetle population. Low value stems (crooked, forked, etc.) are excellent choices for trap trees since their removal also improves the quality of the stand.

The success of the trap tree technique relies on 3 principles:

- Overwintering adults which emerge in the spring prefer to attack nearby slash and logs on the ground.
- Bark beetles will aggregate their attack on a few cut logs or highly stressed trees in preference to healthy trees any time of year.
- Timing is critical. While bark beetle larvae are still developing inside these logs, trap trees are destroyed or debarked. This limits reproduction and directly reduces the population numbers. **IMPORTANT:** If trap trees are not removed or destroyed before the new beetles emerge, the landowner has accentuated the problem by increasing the beetle population in his stand.

The operation of the trap tree technique is labor intensive. It is cost efficient where the landowner has access to cheap labor and where the cash needed for other techniques is not available. Trap trees may not be a viable option in urban situations where the logs might pose a safety hazard or where timely log and slash removal and disposal is difficult. Unless the bark is removed, using trap logs for firewood is not a disposal method since the larvae can complete their life cycle in the wood pile.

Procedures for implementing a trap tree program:

- About April 1st, cut live pines and lay them in the pocket or on the edge of the pocket. Cut 4-5 trees per acre of bark beetle infestation with a minimum of 3 trees per pocket. It is preferable to leave the trees entire so that some drying takes place. This will make the downed trees more "stressed", thus more attractive to bark beetles. Keep the logs in the shade. Bark beetles will avoid sunny areas as temperatures in the sunny areas may become too high. Flag or otherwise mark the log locations because they become difficult to relocate once the foliage and vegetation reach their peak.
- In mid - to - late May, begin inspecting the inner bark of trap trees for the presence of advanced stages of beetle development (large bark beetle larvae and pupae). If either are found, the log should be treated as in #4 below. *The presence of exit holes in conjunction with galleries necessitates immediate action. Destroy this material at once.* If neither are found, continue to monitor the logs at 3-4 day intervals.
- Trap logs should be removed or treated to destroy habitat in late May, but this will vary with location and weather. To destroy bark beetle habitat, all the bark must be removed or the slash and logs should be chipped, burned, buried, submerged or piled and wrapped airtight with a plastic tarp. For any of the treatments, branches <2" in diameter can be left untreated. If the logs are buried, a pit should be dug and the whole bole and branches >2" in diameter should be buried under at least 6" of soil. If the trap method is used, plan on leaving it on 4-6 weeks, covering the pile completely, weighing the edges down with soil and avoiding poking holes in the tarp. **DO NOT CUT AND PILE TRAP LOGS FOR USE AS FIREWOOD** unless the bark is removed and destroyed.
- Evaluate each pocket to determine if the trap logs were effective in preventing attack on nearby trees. Check all the edge trees for signs of active infestation. If there are no new signs of infestation, the trap logs worked in one cycle. In this case, only monitoring should be continued for the remainder of the growing season. If nearby trees were still attacked, two things should be done. First, remove or destroy the newly infested, living trees. Second, continue the trap log procedure as outlined above, but contact your local forester or regional specialist before starting a second trap tree cycle.

Remember to DESTROY the trap log habitat by any of the following methods:

- Debark the log and destroy the bark (particularly if adult beetles have begun to form).
- Burn the log (Cook the bark, do not consume the log to ash).
- Chip the log (This is very hard on the beetles).
- Cut the logs into short lengths, stack, spray with water, and then wrap tightly in plastic (this encourages fungi that will kill the beetles, but leave them wrapped for 4-6 weeks).
- Bury the logs under 6" or more of soil.
- Submerge the logs under water.

Be creative and show some originality in the destruction of the beetle's habitat, but **DO NOT CUT AND STACK** the infested logs behind your house for firewood unless the beetles have been destroyed.