



**Mountain Pine Beetle**  
*Dendroctonus ponderosae*



**MOUNTAIN PINE BEETLE**




<p><b>General</b></p>	<p>Order: Coleoptera Family: Curculionidae <b>Control Required in Jefferson County</b></p>
<p><b>Impacts</b></p>	<p>Mountain Pine Beetle is a bark beetle that attacks pine trees. The beetles feed under the bark. Beetles carry the spores of the blue-stain fungus in their mouths and trees become infected as the beetles feed. The resulting damage disrupts the flow of water and nutrients and causes the trees to die.</p> <p>Beetle populations fluctuate from low level endemic populations to wide-spread epidemic levels with an estimated 8-to-20-year interval. Maintaining the health of the forest depends on proper thinning and including a mixed stand of types and ages of trees.</p>

**SYMPTOMS**

<p><b>Fading</b></p> <p>Late Spring to early Summer</p> <p>Foliage starts to fade to yellowish green/ reddish throughout the entire tree crown about 8-10 months after the trees are attacked. The trees eventually turn reddish.</p>		<p><b>Pitch Tubes</b></p> <p>Late Summer through Spring</p> <p>Trees increase sap flow as a defense to try to fight off infestation. Pitch tubes develop and can be seen on the trunks of trees.</p> <p>Sometimes the tree can expel the adult beetle early in an attack.</p>	
<p><b>Blue-stain Fungus</b></p> <p>Beginning in Fall</p> <p>The fungus forms spores in the pupal chambers. The new adults feed on the spores and carry the fungus with them as they move into new host trees. The fungus moves into the inner bark and sapwood. The vessels that move food and water within the tree become clogged and the tree dies.</p>		<p><b>Galleries</b></p> <p>Late Summer to Spring</p> <p>The female creates a vertical gallery as she feeds and moves upwards. She lays eggs in galleries and as eggs hatch the larvae begin to feed and form new galleries at right angles to the main gallery.</p>	

## LIFECYCLE

Larvae												
Pupae												
Adult												
Egg												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

<b>Egg</b>		Late July to early Fall	Females lay eggs in galleries perpendicular to her vertical gallery. Eggs hatch about 10-14 days later.
<b>Larvae</b>		Fall to early Summer	Larva hatch from the eggs in early fall. They feed under the bark throughout the winter and spring. in galleries at right angles moving away from the vertical gallery.
<b>Pupae</b>		June to July	Larvae transform into pupae in June-July. Adults emerge from the pupae and exit the tree.
<b>Adult</b>		Late June to mid-Sept	New adults fly and infest new trees. Females excrete an aggregating pheromone that attracts males and other females. Females and males pair up and mate in nuptial chambers under the bark.

## CONTROL

Timing	Notes
September 1 through April 15	<p><b>Option 1 - Solar (No Plastic) - Trees must be cut and logs stacked by April 15<sup>th</sup></b></p> <ol style="list-style-type: none"> <li>1. Cut infested trees down. The remaining stump height should not exceed six (6) inches measured from the side next to the highest ground, except when this is not practicable.</li> <li>2. Remove and scatter limbs.</li> <li>3. Cut trunk into lengths four (4) feet long or shorter.</li> <li>4. Find the sunniest location possible on your property and stack logs no more than one log high.</li> <li>5. Logs must be turned every 30 days to allow all sides to be heated.</li> </ol>

## CONTROL

September 1 through May 15	<p><b>Option 2 - Solar with Clear Plastic - Logs must be covered by May 15<sup>th</sup></b></p> <ol style="list-style-type: none"> <li>1. Cut infested trees down. The remaining stump height should not exceed six (6) inches measured from the side next to the highest ground, except when this is not practicable.</li> <li>2. Remove and scatter limbs.</li> <li>3. Cut trunk into lengths four (4) feet long or shorter.</li> <li>4. Find the sunniest location possible on your property and stack logs no more than one log high.</li> <li>5. Dig a trench around the stack of logs.</li> <li>6. Cover the logs with a tarp of clear plastic of at least six (6) mil. thickness. Do not use black plastic.</li> <li>7. Seal around the base of the stack with soil.</li> <li>8. The plastic should remain in place for at least three months</li> </ol>
September 15 through June 15	<p><b>Option 3 – Debarking - Must be completed by June 15<sup>th</sup></b></p> <ol style="list-style-type: none"> <li>1. Cut infested trees down. The remaining stump height should not exceed six (6) inches measured from the side next to the highest ground, except when this is not practicable.</li> <li>2. Remove and scatter limbs.</li> <li>3. Remove the bark using a chainsaw attachment, draw knife or ax, etc.</li> <li>4. Bark removal will be easier if the trees are felled and allowed to age for a short time.</li> </ol>
<p>Note: Infested wood may not be moved from the property until treatment is completed and all stages of the beetle have been eliminated.</p>	

## PREVENTATIVE TREATMENT

<i>Technique</i>	<i>Timing</i>	<i>Method</i>
<b>Prevention</b>	Anytime	<p>Maintain the health of the site by encouraging healthy stands of trees. Thinning the forest helps trees to be more robust and more likely to withstand infestation.</p> <p>Having a forest with varied species and varied age classes also makes it more resilient.</p>
<b>Treatment</b>	<p>Early spring – before June 1<sup>st</sup></p> <p>Carbaryl (Sevin and others)</p> <p>Permethrin (Astro, Dagnet and others)</p> <p>Bifenthrin (Onyx)</p>	<p>High value trees can be treated with insecticide. The entire trunk needs to be treated to a height where the tree's diameter is 4-6 inches. Under heavy beetle pressure, it may be necessary to treat higher into the tree.</p> <p>It is not recommended to treat large swaths of trees.</p> <p>Insecticides are applied to living green trees to kill or deter attacking beetles. This preventive spray is generally effective through one MPB flight (one year).</p> <p>There is no chemical treatment available for treating cut logs.</p>

Use all chemicals according to the manufacturer's label. The label will provide specific instructions including allowed sites, application methods, rates, storage, re-entry requirements and personal protective equipment. No specific recommendation or endorsement is made or implied by listing the above methods or products.

**RESOURCES**

CSFS - <https://csfs.colostate.edu/forest-management/common-forest-insects-diseases/mountain-pine-beetle/>

USFS - [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb5299324.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5299324.pdf)

Negron, Jose & Cain, Bob. (2018). Mountain Pine Beetle in Colorado: A Story of Changing Forests. *Journal of Forestry*. 117. 10.1093/jofore/fvy032.

[www.researchgate.net/publication/328408878\\_Mountain\\_Pine\\_Beetle\\_in\\_Colorado\\_A\\_Story\\_of\\_Changing\\_Forests](http://www.researchgate.net/publication/328408878_Mountain_Pine_Beetle_in_Colorado_A_Story_of_Changing_Forests)

**PHOTO CREDITS**

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Adult - Ron Long, Simon Fraser University, Bugwood.org

Blue-stain, Forest, and Pitch tubes - Whitney Cranshaw, Colorado State University, Bugwood.org

Galleries - William M. Ciesla, Forest Health Management International, Bugwood.org

Larvae - USDA Forest Service - Coeur d'Alene Field Office, Bugwood.org

Pupa and Trees - USDA Forest Service - Region 2 - Rocky Mountain Region, USDA Forest Service, Bugwood.org