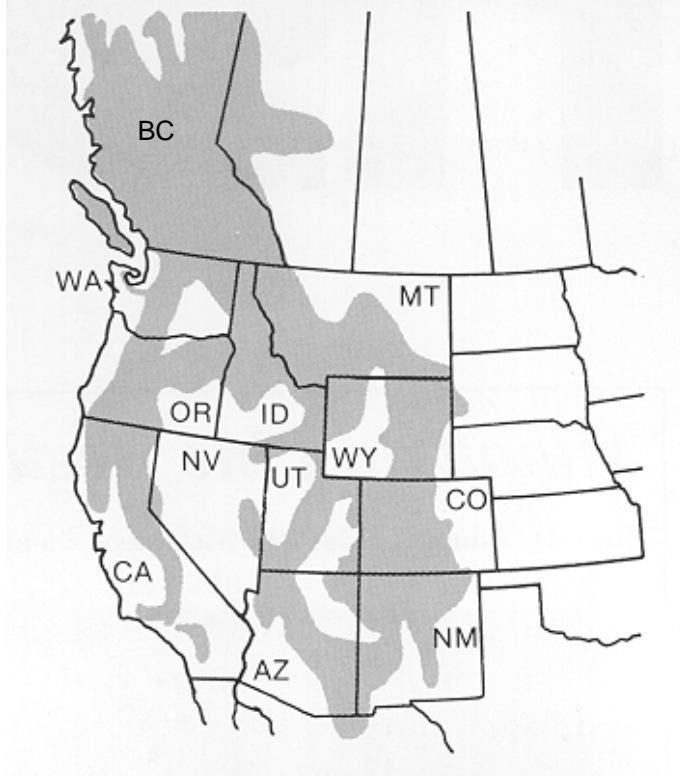


Mountain Pine Beetle Facts

Mountain Pine Beetle



- 5 + million acres infested in MT, CO, WY, OR, WA, ID, and UT
- More than 40 million acres (just more than ½ the size of MT) infested in BC
- 50 + mill closures and counting in BC
- MPB attacks all native pine species including Lodge pole, Ponderosa, Whitebark, Western White, Limber, Bristlecone

Ootsa Lake, Chilcotin Plateau, BC 2002



Conifer Bark Beetles

Mountain Pine Beetle (*Dendroctonus Ponderosa*)

- Attacks all pine species including most ornamentals and even the odd Spruce

Western Pine Beetle (*Dendroctonus Brevicomis*)

- Attacks Ponderosa pine only
- Only on west side of continental divide

Douglas Fir Beetle (*Dendroctonus Pseudotsugae*)

Spruce Beetle (*Dendroctonus Rufipennis*)

Ips, Fir Engraver and other Wood Borers



Mountain Pine Beetle

Order: Coleoptera
 Family: Scolytidae
 Genus: *Dendroctonus*
 Species: *Ponderosae*

MPB Life Cycle

July-September



Adults attack trees



July-September



Lay eggs



October-June



Larvae over-winter in tree



Following Summer



Adults emerge to attack more trees

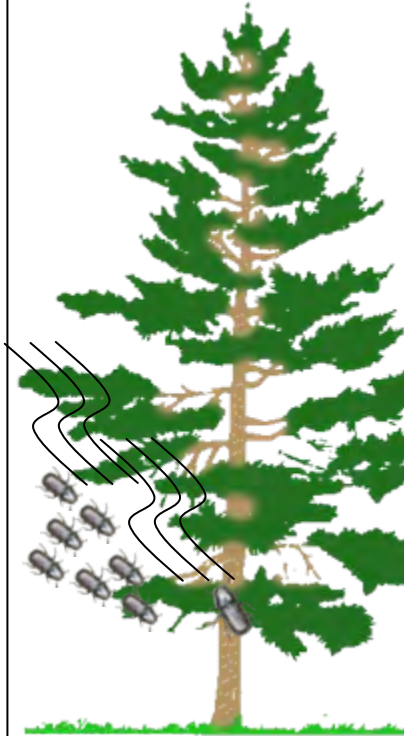
MPB Synopsis of Attack

1



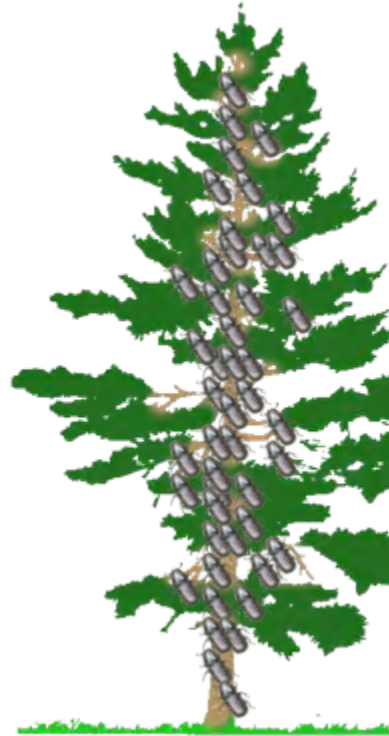
Females (often over-wintered adults) finds host pine and initiates attack, produces pheromone *trans-verbenol*

2



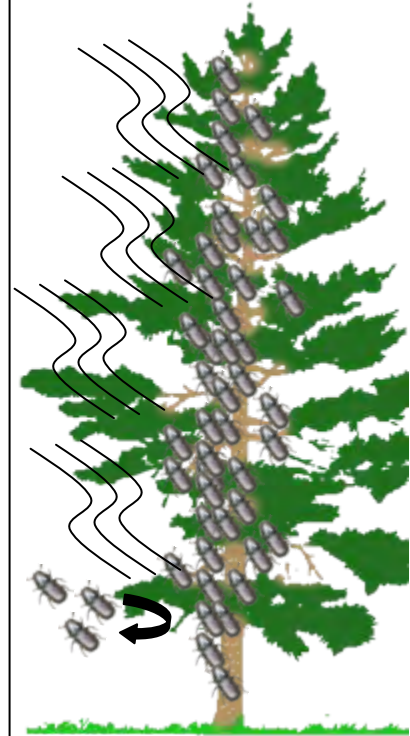
Males (+ some females) attracted. Males release pheromone *exo-brevicomín* attracting females (+ some males).

3



Many beetles respond. Tree fills up quickly.

4



Females (then males start to produce the pheromone **Verbenone** that tells other beetles that the tree is now full.

The Power of Pheromones

- Definition: message-bearing chemical secreted by an animal--especially an insect--that influences the behavior or development of others of the same species
- **Aggregation pheromones** act as attractants to bark beetles
- **Anti-aggregation** pheromones deter attack

Contech MPB Repellent - Verbenone



- Anti-aggregation pheromone
- Ideal for high value trees
- Registered by EPA
- Naturally occurring and non toxic to environment: safe for humans, pets, birds, wildlife, and even the beetles themselves
- Area treatments more effective than single tree treatments – get neighbors involved!
- Not every tree needs to be treated on acreages. Use Verbenone on grid pattern.
- Beetles receive the pheromone message that they should look elsewhere for a suitable host

Why Are Your Trees Important?

- Provision of shade
- Visual pleasure
- Noise barrier
- Erosion control, snow catchment
- Watershed & hydrology changes
- Wildlife habitat
- Air quality & CO₂ release, global warming
- Property values
- Sentimental values
- Business losses (golf courses etc.)



The Cost if you Don't Protect



- Falling, bucking and stump removal
- Disposal of trees, branches and stumps
- Chipping is a great option and kills MPB
- Replacement / replanting
- Fire hazard / Increased fuel loading
- Falling and burning in place (for small scale operations)



Keeping trees green is far better option!

Integrated Pest Management: Bringing it all Together

- Monitor trees closely – watch for signs of attack and learn about the Mountain Pine Beetle
- Keep trees healthy; water regularly
- Remove “green attack” trees
- Use Verbenone
- Consider the use of a broad spectrum insecticide
- Dispose of infested trees properly

Education + Awareness = Success

NO!



Green Attack – What to Watch For



Pitch-outs: tubes of resin created by the tree in an attempt to force the beetle out as attacks the tree.



Galleries: MPB galleries are always in phloem layer. This picture shows adults, larvae and blue stain fungi.



Frass: sawdust-like residue at the base of the tree caused by the beetles boring into the tree.

Verbenone Application

- Each retail package contains 2 pouches of verbenone
- Nail or staple each pouch on the north side of your trees—6 to 8 feet high
- Deploy pouches just prior to beetle flight. Timing can vary season to season and with elevation.
- Water your trees but don't water the pouches. Adjust sprinkler heads if necessary
- Apply at a rate of 20-25 pouches per acre on a grid pattern
- Use the prevailing winds to your advantage. It's OK to apply the pouches to other trees or objects so that the pheromone plume blows onto your trees
- Follow the package directions
- Bulk programs are available

MCH Douglas-Fir and Spruce Beetle Anti-Aggregation Pheromone

- MCH—anti-aggregation pheromone of the Douglas-fir beetle to protect trees from attack by Spruce and Douglas-fir beetles.
- For Douglas-fir and spruce beetles (*D. Pseudotsugae* and *D. Rufipennis*)
- Growing problem
- Correlation with WSB outbreaks
- Also works to prevent the build-up of populations on logs, stumps, and fallen trees
- Sends a message that tree is full and that beetles should look elsewhere for a suitable host
- Douglas-fir Beetle Repellent is environmentally-friendly and non-toxic to humans, pets, and even the beetles themselves
- High efficacy