MCH Pheromone Packets

FAQ's About Protecting Trees from Douglas-fir Beetle & Spruce Beetle

Spruce beetle (D. rufipennis), actual size 4.4mm-7mm. Photo: Zach Smith, CSFS.

What is MCH?

In nature, bark beetles communicate with pheromone scents called semiochemicals. MCH (methylcyclohexane) is the pheromone produced by both Douglas-fir beetles (*Dendroctonus pseudotsugae*) and Spruce beetles (*Dendroctonus rufipennis*) to indicate when a tree has reached maximum capacity, and there are no resources available for additional beetles. MCH has been synthesized into small pouches that can be attached to trees as a sort of "No Vacancy" sign. MCH is **NOT** an insecticide and works by affecting beetle behavior, making it a safe alternative to prevent bark beetle infestations in both Douglas-fir & Spruce trees.

MCH is packaged in a semipermeable plastic bubble that releases the product into the environment over time to create a "pheromone plume" around your property. Each bubble contains 1000 mg of MCH, and can be applied to protect individual trees or in a grid pattern in stands containing a significant number of trees.

MCH bubble, packaging color varies between production years. Photo: Abbey Bowser, CSFS.

How do I know if my trees are infested with beetles?

Pitch Tubes & Boring Dust

Infested trees usually have several masses of resin exuding from a hole that's been chewed into the bark by a beetle. However, in years with below average precipitation, pitch tubes may not form. The tunneling of the beetles also creates boring dust that falls around the base of the tree, in bark crevices, and around the pitch tubes (if present).

In Spruce, pitch tubes (left) and boring dust (right) are a distinctive red color. Photos: Zach Smith & Abbey Bowser, CSFS

Fading Needles & Woodpecker Damage

Following a successful attack, Spruce needles will turn a pale yellowish-green color, and Douglas-fir needles will fade to reddish-brown. Trees may retain their needles for several years following an attack or drop their needles as they begin to fade. Woodpeckers will often search for beetle larvae in infested trees, stripping the bark off the tree and leaving behind large holes.

Douglas-fir needles will fade from green to red following a successful beetle attack. Photo: Dan West, CSFS

For assistance identifying potential beetle infestations, contact your local CSFS field office.

Is MCH the right treatment for my trees?

Beetles can fly over ¼ mile from their source tree. If you notice infested trees near your property, MCH treatment is recommended, especially in years with below average precipitation. The map found on the Colorado State Forest Service's Insect and Disease page can help determine if Douglas-fir beetle and/or Spruce beetle activity has previously been detected in your area.

> ***MCH is only effective for use on Douglas-fir and Spruce trees,*** not for other conifers. Identifying the tree species on your property is important for MCH application. Treatments differ for protecting other tree species from bark beetles.

Quick Tips for Identifying Douglas-fir & Spruce

Both Douglas-fir and Spruce have needles that are attached to the branch individually. Douglas-fir needles are flat, and have a scaly cone that grows characteristic bracts.

Douglas-Fir

Photos: Zach Smith, CSFS

Spruce needles have 4 distinct sides and come to a sharp point. The cones are composed of thin, overlapping scales. There are two native species of spruce in Colorado: Engelmann spruce & Blue spruce.

Spruce

Photos: Abbey Bowser, CSFS

How do I apply MCH?

- Although MCH is not toxic, the manufacturer recommends wearing gloves when handling this product.
- MCH packets should be stapled to trees using a heavy duty staple gun, taking care not to puncture the bubble and stapling only the top plastic layer.
- Staple packets about six feet above the ground on the north facing side of the tree, as high as you can safely reach. MCH should be applied with the bubble side facing down.

Bubbles should be stapled to the north facing side of the tree, bubble side facing down. Photos: Dan West, CSFS

- ***To maximize the efficacy of the product, MCH packets should be placed in a grid pattern***, no more than 50 feet apart. The pheromone plume emanating from the bubbles will provide protection to any trees that fall inside this 50 foot radius. Trees that are more susceptible to attack, near the home, or in major viewsheds should be prioritized. The recommended application rate is 20 bubbles per acre. For the added protection of large, valuable trees, apply two bubbles per tree. We recommend purchasing an additional 10% of product to apply to every tree growing next to the home.

Alternatively, the Colorado State Forest Service can apply MCH to your property at an hourly rate of $92.00.

Grid Placement: The diagram below shows how to apply MCH in a 50'x50' grid pattern to maximize the efficacy of the product. Bubbles were first placed around the home, and then dispersed every 50 feet across the property. Any trees that fall inside the area between the bubbles will also be protected by the pheromone plume. Additional bubbles should be applied to any large, valuable trees for added protection.

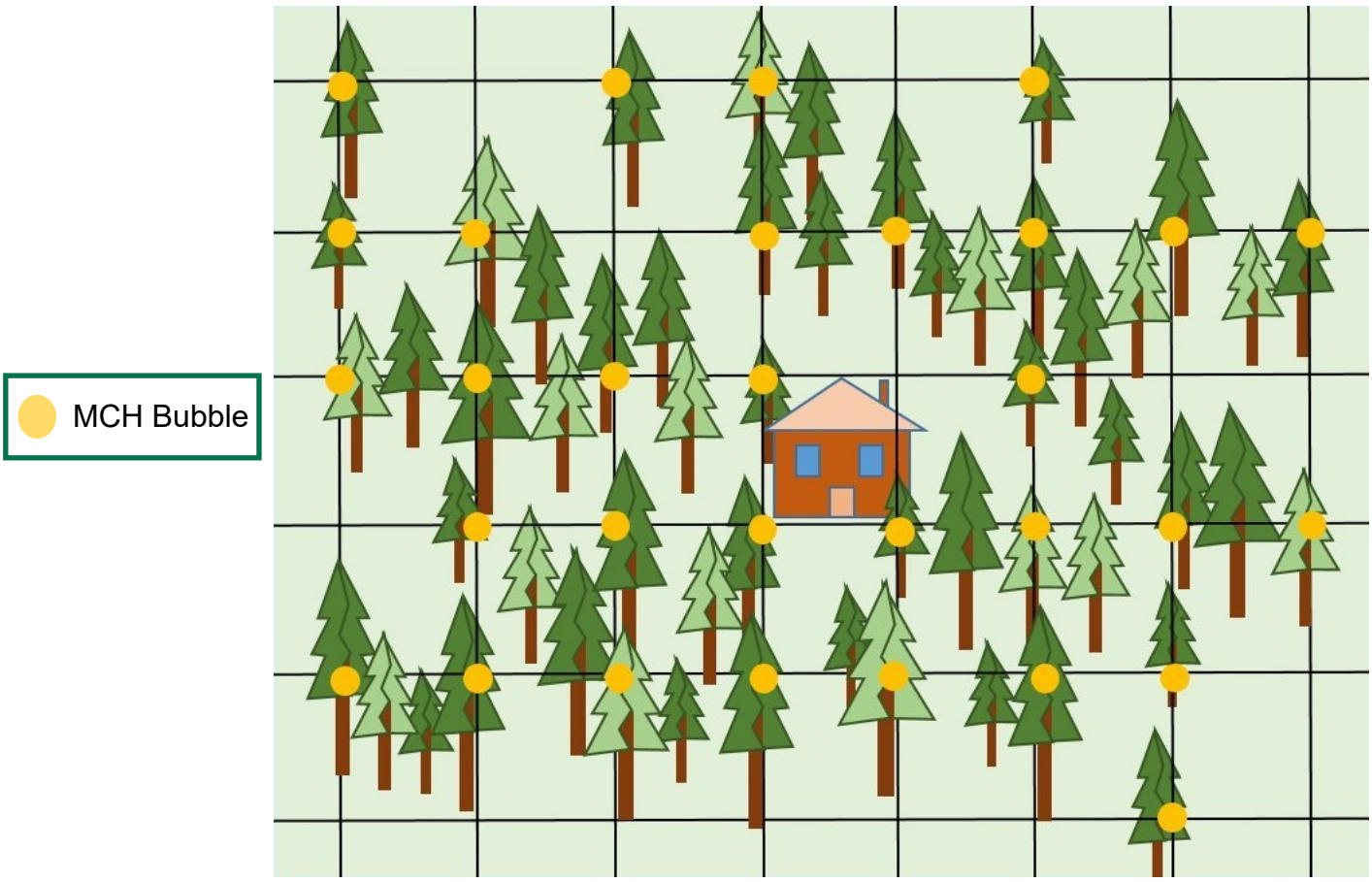

Diagram of 50'x50' grid placement used for deploying MCH bubbles, not drawn to scale.

When should MCH be applied?

MCH should be deployed two weeks before the projected beetle flight begins, **in early spring.** In Colorado, Douglas-fir beetle begins to emerge early May. Spruce beetle flight begins the end of May and continues into July. Annual precipitation & temperature variations may slightly affect the timing of beetle emergence. MCH will protect your trees for approximately 120 days, which will provide protection while adult beetles are flying to new trees. Only one application is needed each year.

Can I save my tree after if has been attacked?

Unfortunately, MCH is only effective when used preventatively. Once a tree has been mass-attacked, there is little that can be done to save the tree. MCH should be placed on surrounding trees, and ***removing any infested trees or slash should be prioritized.***

How much MCH do I need?

The amount of MCH needed is dependent on the size of the property, number of trees, and specific landowner goals. Some landowners choose to protect stands containing a significant number of trees. Others opt for a more cost effective treatment, prioritizing their largest, most valuable trees. Whatever your treatment goals, the Colorado State Forest Service can use the purchasing power of the Colorado State University to obtain MCH at a reduced cost for landowners. The 2025 MCH price is $3.20/bubble, plus an additional shipping and handling fee.

How do I order MCH through CSFS?

To order MCH packets or for assistance developing an individualized treatment plan, contact CSFS Forest Health Program at CSFS_foresthealth@mail.colostate.edu ***Orders must be received by 7 March 2025***.

Useful Tips

- Remember, MCH is only effective at protecting Douglas-fir and Spruce trees!
- MCH should be applied in early spring, before beetle flight begins.
- Place MCH in a grid pattern, no more than 50 feet apart.
- MCH bubbles should be stapled to the north facing side of the tree, as high as you can safely reach.
- Unused packets can be stored in an airtight container in the freezer for use next year.

COLORADO STATE FOREST SERVICE
COLORADO STATE UNIVERSITY

Colorado State University
5060 Campus Delivery
Fort Collins, CO 80523-5060
(970) 491-6303

Learn more on the CSFS website at csfs.colostate.edu or by contacting your nearest field office

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