

at a glance

- Slime flux is caused by several different bacteria and affects many different tree species.
- Symptoms include vertical streaking and liquid running down the trunk.
- Infection may occur through damaged roots and pruning wounds.
- Generally the disease does not kill the tree.
- Infection near the trunk surface may kill the tree rapidly.
- Proper watering helps mitigate the problem.
- No pesticide controls are available.
- Possibly prune out shallow infections to minimize damage.
- Do not use drain tubes.

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Slime Flux Disease of Trees

Introduction

Slime flux, also referred to as bacterial wetwood, is thought to be caused by several different genera of bacteria that are associated with the problem in many different tree species. The most commonly affected trees in Idaho are cottonwood, willow, elm, and poplar, but the disease can also be found in apple, ash, beech, birch, cherry, fir, honeylocust, linden, maple, mountain ash, mulberry, oak, sycamore, pine, and plum.

Symptoms

Affected trees have a streak of discoloration that runs vertically down the trunk just below the area of infection (figures 1 and 2). At certain times of the year, a liquid may ooze from a wounded area on the trunk. This liquid generally has a fetid odor, and it can be toxic to both the bark and the vegetation on the ground that lies in its path.

The exuding liquid is brought about by bacterial growth deep within the trunk of the tree. As the bacteria grow, they deplete oxygen within the trunk, resulting in the production of methane gas. Gas buildup can produce



Figure 1. Cottonwood trunk stained from flux. Photo by Wayne Jones.

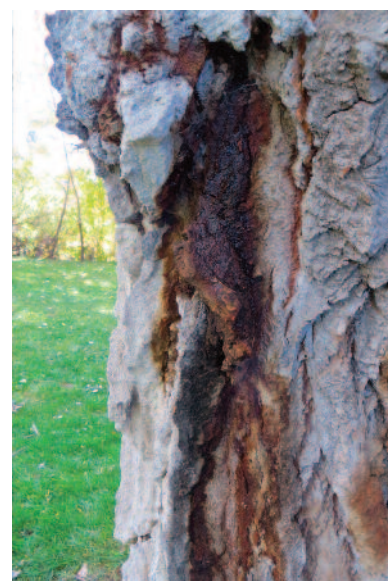


Figure 2. Wet phase of slime flux in cottonwood. Photo by Wayne Jones.

pressures of up to 60 pounds per square inch, forcing liquid out to the surface of the trunk. Sometimes bubbles form at the point of exit.

Infections deep within the trunk generally do not kill the tree, but merely create unsightly stains and disagreeable odors. On occasion, infection can occur in the bark or the cambial region (the green area just below the bark), a situation that may become more serious and rapidly kill the tree. Tree species most susceptible to bark/cambial infections include willow, mountain ash, aspen, poplar, and fruitless mulberry. Poplar species are also very susceptible to heartwood infections.

Disease Life Cycle

There is little scientific information concerning the bacteria and other microorganisms associated with slime flux. It is suspected that these bacteria enter through wounded roots or wounds in the trunks of susceptible trees. There is no evidence of insects carrying the disease and causing infections.

Control and Prevention

No chemical pesticide products are effective in controlling slime flux.

Drought stress seems to favor the development of the disease. Supplemental water (in addition to what is put on the surrounding lawn) applied to trees every 2 to 3 weeks to a depth of 2 to 3 feet during hot weather will help mitigate the problem.

Other stresses such as transplanting may also trigger slime flux, particularly shallow infections that occur just beneath the bark. To ascertain if the infection is shallow, peel back the damaged bark and probe the area for unsound and/or discolored tissue. Shallow infections should not extend much past the cambial area.

If caught early, it is possible to remedy a shallow infection. If the infection is in a small branch, prune the branch back to a lateral branch. Larger branch or trunk infections can be pruned out using an elliptical pruning technique. First, remove all discolored bark and wood with a sharp blade. Cut



Figure 3. Elliptical pruning technique for removal of slime flux infection. Photo by Wayne Jones

around the infected area until you come to healthy, yellow-green cambium. Disinfect the area with a 10% bleach solution or alcohol. Finally, make a smooth, continuous elliptical cut to promote proper wound closure (figure 3).

If the cut-away area exceeds 40 to 50% of the tree's circumference, the wound may not close completely. Watch the treated area for any possible recurrence. If fluxing starts up again at the edge of the treated area, some diseased tissue may remain. Repeat the above steps for the infected area. Elliptical pruning is more efficacious on younger trees.

Lastly, do not use drain tubes to drain away the liquid from the trunk. This practice can cause more damage than it prevents by allowing slime flux-inciting organisms as well as fungal disease organisms to enter healthy wood.