A New Utah Forest Insect Pest: Balsam Woolly Adelgid

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Introduction

The USDA Forest Service’s Forest Health Protection (FHP) group in Ogden, Utah detected and confirmed the presence of a new invasive forest pest in Utah called the balsam wooly adelgid (BWA). First noticed in the mountains above Farmington Canyon and near Powder Mountain Resort, it has now been detected in seven northern Utah counties (Boxelder, Cache, Davis, Morgan, Salt Lake, Summit, and Weber). So far, the damage is mostly north of Salt Lake City. This tiny insect primarily attacks subalpine fir, often called balsam...
trees in Utah, typically killing the tree within a few years. Subalpine fir (Abies lasiocarpa) are most easily identified by their conical crowns, usually growing at elevations above 7,500 ft in Utah. This insect also attacks white fir (Abies concolor) in Utah, but this tree species is more resistant to the insect. BWA is of particular concern because until now subalpine fir has been one of the few forest tree species that has resisted large scale insect infestations, such as bark beetles, that have killed millions of acres of trees across the West over the past 20 years. Now it looks likely that subalpine fir in the region may be facing a significant decline.

In 2015, forest health specialists first noted an increase in fir death in Utah. In 2017, the aerial detection surveyors, who fly over the entire region by plane, mapping insect and disease outbreaks, noticed an increase in fading and dead subalpine fir trees. In June, 2017, forest health professionals visited Farmington Canyon and found branch node swelling and old deposits of woolly material on mature subalpine fir trees.

Suspected to have originated in the Caucus Mountains along the boundary between Europe and Asia, BWA was first detected in North America, Maine, in 1908 and California about 20 years later. It was first found in Idaho near Coeur d’Alene in 1983 and has since spread across northern Idaho. It is believed that separate invasions of subspecies or races of BWA may differently impact tree host species. The scale of the dieback in some locations in Idaho is ‘alarming’. In the western Payette National Forest, north of Boise, an estimated 70% of subalpine fir trees are dead and falling down.

Adding to the challenge of managing this insect is the lack of market value for subalpine fir. Recovering treatment costs through the sale of saw logs is not an option. Moving subalpine fir firewood from the mountains down to town will likely result in the pest killing trees in Utah’s urban areas; limiting the movement of infested firewood is key to prevention. Widespread fir mortality has been observed and in many cases there are few other species of trees to occupy the growing site, increasing the potential for this insect to inflict ecological damage (e.g., erosion, decline in watershed health, loss of wildlife).

Identification

Tree injury from BWA is most visible in the fall. A tree’s needles appear to be drought stressed, with a key difference being that the crown starts thinning/browning from the inside out. It may take a well-tuned eye to notice that affected needles don’t turn red like they do with bark beetle attacks, but needles turn brown in color.

Closer inspection of the branches reveal a swelling and twisting deformity known as gouting. Although BWA prefers vigorously growing and mature fir trees, this insect will attack trees of all sizes and ages, whereas tree insects that are native to Utah tend to favor the larger, older trees, often bypassing the smaller, younger trees. When BWA attacks smaller trees they take on a
bonsai appearance; branch twisting and swelling has been locally observed in seedling-sized trees. BWA is covered in a white, woolly material that is apparent on the bark of infested trees. This insect will attack branches and the main stem of the tree. The tiny insect itself is difficult to see. Once a tree of any age starts to fade, it can take from 2-10 years to die, in some cases dying and falling within two years of infestation.

Only the young nymph, called a crawler, is mobile. Crawlers are present in the late spring through fall. Crawlers can be blown by wind or spread on the feet of birds, but the primary movement is by walking. In North America, BWA is exclusively parthenogenic (reproduce asexually); therefore, only females are present and they lay female eggs without the mixing of gametes. Asexual reproduction can increase the likelihood of the insect developing resistance to insecticides as parents pass on the resistance genes to offspring.

**Treatment**

Sites with high-value trees such as near cabins, campgrounds, and ski areas can be treated with insecticides to suppress BWA. If the infestation is not widespread when first detected, affected trees should be harvested and removed that season. There are many insecticides labeled for BWA control. Insecticides such as Asana, Astro, Safari, Sniper and Talstar can be applied at any time of the year. Lorsban and insecticidal soap should only be used from late fall to early spring, a time of year when no eggs are present. Horticultural oil should only be used during winter because it may burn foliage if trees are not dormant. Thorough coverage of the trunk and limbs is critical to penetrate the adelgid’s waxy covering. Good coverage is more important than the choice of insecticide. A high pressure sprayer that delivers several hundred gallons of spray per acre is essential. Heavily infested trees are unlikely to recover.
even after treatment. Cull and burn badly damaged trees to prevent spread of BWA.

Utah’s Response

A Utah partnership has been formed to survey, research, and implement education and management efforts for BWA. Led by the Utah Department of Agriculture, members represent a wide variety of concerned organizations including USDA Forest Service; USU Extension; the Utah Division of Natural Resources; USDA Animal Plant and Inspection Service; and ski resort representatives. This group is coordinating efforts to secure grant funding to study BWA’s spread and impact in Utah, and to develop public educational products.

References


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