A Conifer Root Aphid, *Prociphilus americanus* (Walker), in True Fir

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A few years ago some Christmas tree growers in Washington state found an aphid feeding on the roots of young true fir (*Abies sp*.) trees that were stunted, yellowed and in obvious decline. The aphid was subsequently identified as *Prociphilus americanus* (Walker), a conifer root aphid (no common name). While reported earlier feeding on the roots of true fir, often attended by ants (*Lazius sp.*), the aphid has never been reported to injure its host tree. In the last 2 years some Oregon growers of true fir have reported this aphid as well, again associated with young trees showing signs of stress (stunted and yellow tops, reduced root development). In fields where the infested trees are found one can also find apparently healthy trees (normal growth and color) also with aphids feeding on their roots, although usually at lower density.

APHID FEEDING. Aphids feed by piercing host tissue (leaf, stem or root) and sucking plant sap through tube-like mouthparts. While removing plant sap, aphids may also inject toxins, plant growth regulators or pathogens along with saliva to aid feeding. Feeding may therefore cause abnormal growth, disease and even terminal dieback. Aphids excrete large amounts of honeydew which is essentially unprocessed plant sap. Many insects use honeydew and therefore are attracted to these colonies.

LIFE HISTORY. Like some other aphids, *P. americanus* has a life history that alternates between two different host plants. The primary host harbors the sexually reproducing form while the secondary host harbors an asexually (parthenogenetic) reproducing form. For *P. americanus* the primary host is ash (*Fraxinus sp.*). Here it forms dark brown to black colonies in curled terminal new growth in early spring. These colonies may form on suckers or at the base of the tree as well. During late April through early June a winged form leaves the primary host and searches out its secondary host, true fir. Here the aphid feeds on the roots and reproduces asexually during the summer months. These wax-covered colonies may be visited by ants collecting honeydew. Honeydew-collecting ants sometimes defend their honeydew providers and may even move aphids around. During late August through October a winged form returns to ash to continue the sexual cycle. The asexual form may continue to develop on fir throughout the year. Therefore, eliminating the ash, the primary host, or even controlling the winged aphid is not likely to be an effective control for *P.americanus*.

OTHER *PROCIPHILUS* SPECIES. There are about 50 species in this conifer root aphid genus. The primary hosts are plants in the Rosaceae, Caprifoliaceae and Oleaceae. The secondary hosts are all conifers.

PEST STATUS. *P. americanus* has been reported on the roots on Fraser fir in North Carolina Christmas trees although it is not considered a pest and the North Carolina Extension Forestry bulletin does not recommend chemical control. Here in the northwest large aphid colonies are found on severely stunted and yellowed young trees but smaller colonies are also found on apparently healthy trees in the same field. Some have taken this observation to mean that the apparently healthy trees have not yet succumbed to the aphid while others use this as evidence that the aphid is not the cause of the injury.

CHEMICAL CONTROL*. A number of broad spectrum insecticides have been tested against this root aphid in true fir between 1995 &1998. For a list of registered products see the Pacific Northwest Insect Management Handbook which is available on line at: http://pnwpest.org/pnw/insects.

RESEARCH NEEDS*. Much research is needed as we know very little about this aphid on true firs. From a practical standpoint the most important questions concern pest status and chemical control. At this time it has not been determined if treated trees recover. If they do not other possible causes of young tree decline and mortality might be disease, transplant shock, incorrect planting depth which results in "J" rooting, poor nutrition or off-site planting.

* section updated 6/2009 by James Young