

# BALSAM WOOLLY ADELGID: HISTORY OF A PEST



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I've been fortunate to have been able to spend a lot of time lately delving into the history of the Christmas tree industry in western North Carolina. In the process I've run across some interesting facts about one of the industry's most troublesome pests, the balsam woolly adelgid (BWA).

Charles Speers, US Forest Service Entomologist, was the first person to identify BWA in the natural stands of Fraser fir. He'd been called to look at some trees that were dying on Mount Mitchell. Speers, who had worked in balsam fir forests up north, was the first one to recognize the pest. It was 1957, and it was the first record of BWA in the Southern Appalachians.

Spread and impacts on Mount Mitchell were quick. Speers and George Amman, another US Forest Service Entomologist, examined trees more closely in 1958 and found that the adelgid was present on 1,400 acres. The year before, Speers had reported 12 dead trees – now at least 11,000 trees had died in an area 260 acres in size. Incredibly by the end of 1962, more than 10% of the Frasers on Mount Mitchell were dead.

How the BWA spread across the region is also well documented, as US and NC Forest Service personnel monitored other Fraser fir stands and Christmas tree farms. In 1961 the adelgid was detected in Pineola; in 1962 on Roan Mountain, in Burnsville, on Jonas Ridge, in Linville, and near Boone; in 1963 in the Great Smoky Mountains National Park (detected at Mt. Sterling) and Grandfather Mountain; in 1964 in Moses Cone Park; in 1970 in the Balsam Mountains; and in 1972 on Clingmans Dome. The other natural stand of Fraser fir, Mount Rogers, seemed to avoid any infestation for many years. But in 1979, it was discovered and when one infested tree was cut down, it was determined from its growth rings that the pest had been on the tree for fourteen years.

The rapid spread and mortality got everyone's attention. Not only were people concerned that Fraser fir might die out like the American chestnut had, but the fledgling Fraser fir Christmas tree industry now had to worry about its source of seed. Fraser fir seed was only available from the natural stands in the early 1960s and Roan Mountain was the primary source.

Meetings were held in early 1960 to discuss the appearance of this new pest in the southeast and the ramifications on the developing Christmas tree industry. At a January 12 meeting in Asheville, mostly forest service personnel were present including Speers and Ammons. A second meeting was held in Durham on February 15 to include more extension specialists and growers. A. T. "Sandy" Davison and Bill Aldridge were the representatives of the North Carolina Christmas Tree Growers' Cooperative as the State Association was called then. It was agreed at these meetings that a permanent seed source(s) for Fraser fir should be identified and steps taken to preserve it from infestations of the adelgid.

The following is from a letter dated September 15, 1962 from Sandy Davison to Mr. J. J. Green, Pest Control Forester, Department of Conservation and Development, Raleigh:

*Dear Joe: I have been working on the Roan off and on during the past weeks and have talked with Jack Kelly, the Assistant Ranger of the district about the balsam woolly aphid infestation that he and his crew found. It appears to have been there for several years but has not spread very far. Naturally we in the North Carolina Christmas Tree Growers' Cooperative are very concerned about our seed source on the Roan, and we wish to take immediate steps to enhance its protection. As you know, we started work two years ago toward setting up a protected area with the cooperation of Mr. Rettig and your National Association Trustee who spent some time looking over possible areas and decided on the southeast arm of the Roan as having the best trees and accessibility for such a purpose. Because of Rettig's retirement much of the early enthusiasm of the USFS appears to have died. We are undertaking to renew our activity with them... We must act soon, before we have nothing on which to act.*

Growers were able to bend perhaps the most important ear in the state. A meeting was held in Asheville on January 8, 1963, by a request from NC Governor Sanford, to discuss the woolly adelgid infestation. All the players were present including the Blue Ridge Parkway, Great Smoky Mountains National Park, North Carolina Christmas Tree Growers' Cooperative, NC Forest Service, NC National Forests, NCSU extension forestry, NC State Parks, USDA, and US Forest Service. Russell Beutell was the grower representative. Plans were made at this meeting to establish a seed orchard at the Holmes State Forestry Tree nursery in Henderson County. It was also suggested that an area be protected on Roan Mountain for seed production.

The NC Forest Service would end up starting a seed orchard not in Henderson County but in Avery at the new Linville River Nursery in Crossnore in 1968 and 1969, with trees selected from growers' fields by Fred Whitfield, Forestry Extension Specialist, and Marty Shaw, District NC Forest Service Ranger.

A seed production area was established on Roan Mountain somewhat faster. Dwight Brenneman, Nursery Superintendent of the Edwards State Forest Nursery in Morganton marked 300 Fraser fir trees on the Roan on August 20, 1963. Working with him were Robert Kellison who had been hired that year as a forestry faculty member at NC State College, and John Gilliam and Leonard Hampton, both Forestry Extension Specialists. Trees were thinned in the fall of 1963 to increase cone set, but the shallow rooted habit of the Frasers made them prone to blowing over. Trees were originally sprayed November of 1963 with BHC (similar to lindane) and more trees were sprayed along the 2 1/4 mile Balsam Road in the summer of 1964. However, spraying was discontinued in the seed production area in 1974 after many trees had been lost to windthrow.

In 1963 the summer meeting of the North Carolina Christmas Tree Growers' Association (they had changed the name that year) was held in Burnsville on August 23. Fred Whitfield introduced speaker Dr. M. H. Farrier, entomologist with State College. Growers on the field tour visited Mount Mitchell to observe damage caused by the balsam woolly adelgid. Interestingly, Dr. Charles Hodges, pathologist with the US Forest Service, also spoke at this meeting. Dr. Hodges, though now retired, is still helping diagnosis diseases of Fraser fir and other conifers at the Plant Disease and Insect Clinic in Raleigh.

Concerns about BWA and the industry's seed source persisted into the 1970's. Growers were especially concerned because EPA was scrutinizing the use of the one material that was proving effective for its control -Lindane.

A portion of the February 18, 1977, "notice of rebuttable presumption against registration and continued registration of pesticide products of pesticide products containing lindane" reads as follows:



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Growers fought to change this perception. Waightstill Avery, who was Avery County Extension Director at the time, wrote a letter to Dr. Charles Apperson, entomologist with NCSU on March 3, 1977 about the need for lindane as well as additional research on woolly adelgid control. Effects of BWA were voiced in a letter from Daylon Rogers, editor of *Limbs & Needles* and representative to the National Association to Don McNeil with the National Christmas Tree Association in a July 22, 1980, letter.

*At the present time Lindane is the only thing registered for Balsam Woolly Aphid. We are doing some experiments with other materials but so far nothing has proved effective*

*The Balsam Woolly is not only destroying our natural stands of Fraser Fir but is now found in young plantations in practically every county where Fraser is grown.*

*This leaves us with the prospect in the near future of NO SEED, no plants, no trees, no business, unless we can protect the Frasers.*

According to records maintained by Dr. Jim McGraw, who had replaced Fred Whitfield in 1975, grower concerns ended up going all the way to Washington. McGraw was sent a copy of a November 5, 1979, letter from Senator Jesse Helms to W. W. Cagle, Jackson County Christmas tree grower, reassuring him that there were no immediate plans by EPA to ban Lindane. Nothing more was said beyond making Lindane a restricted use pesticide. Christmas tree growers were able to use Lindane for BWA control until its manufacture was stopped almost twenty years later.

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On February 13, 1980, UNC Educational Television presented a documentary called: "Fraser Fir, a Southern Appalachian Phoenix." The documentary was to help raise awareness of the issues with balsam woolly adelgid in the natural stands to raise money for research. Jim McGraw and Bill Huxster were interviewed by Mike Gray with Cooperative Extension. Johnny Hensley, County Extension Agent in Yancey County, was also on the program. Jack Wiseman was the Christmas tree grower representative. Hugh Morton from Grandfather Mountain was also featured. However, in the years to come, more public attention would be shifted to the potential role of acid rain in the decline of the spruce-fir forests. Little research was done on natural predators or even resistance in fir to BWA until recent years when another similar pest, the hemlock woolly adelgid, brought such considerations to the forefront again.

Worries about a source for Fraser fir seed carried into the early 1980s. On May 25, 1979, a late season snow killed the cones on Roan Mountain and elsewhere. The following year was also a poor one for seed production. Without seed, there could be no growth of the industry.

On September 16, 1980, a cooperative agreement was reached between TVA and Ponderosa Tree Farm in Buncombe County for a Fraser fir seed orchard. According to the enclosed summary, the Ponderosa Tree Farm had 10 acres of Fraser fir planted in 1952 and 1953. The land was sold, and the current owner, Ben Nesbitt, had intended to sell the trees for Christmas trees and never had. The trees were "let go" and the fall of 1979 when the County Extension Agent in Buncombe County, Bobby Peek, was invited to the farm to help determine what to do with the trees, he suggested they be managed for seed. The following spring, Peek and Huxster observed both male flowers and cones produced, hence the agreement with TVA to help fund upkeep in exchange for seed. Part of the agreement was for the TVA to purchase a high pressure sprayer to treat trees.

More growers were starting their own seed orchards. For instance, on the front cover of the June 1982 LIMBS & NEEDLES is a picture of a new seed orchard that Bruner and Linda Sides were establishing. A seed orchard would also eventually be established at Mount Rogers.

In 1981 a good seed crop finally came through. The news even made it in *The Raleigh Times* half a state away. The article quoted Gerald Tysinger, supervisor of the Crossnore nursery, as saying, "I never saw such a crop of cones as was on Roan mountain and Mount Mitchell. The firs were loaded down."

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- Summer Meeting 50th Anniversary: Larry Elliott, Chair
- Nominating Committee: Harry Yates, Chair
- 2010 National Convention

These volunteers attend meetings to represent you as a member of NCCTA. They deserve your gratitude and assistance.

## Calendar Of Events

March 5, 2009	BOD / FFPC Meeting
March 6-7, 2009	Winter Meeting / Trade Show Boone United Methodist Church
June 11, 2009	BOD / FFPC La Quinta Inn, Boone
September 24, 2009	BOD / FFPC and Opening Reception of NCCTA's 50th Anniversary Celebration La Quinta Inn, Boone
September 25, 2009	Summer Meeting and Trade Show; NCCTA 50th Anniversary Celebration La Quinta Inn, Boone
September 26, 2009	Farm Tour

BWA continues to plague the industry, but Fraser fir, as always, has proven to be a survivor. Regeneration in the natural stands has been encouraging and it doesn't appear that Fraser will go the way of the American chestnut as many had feared. Now another introduced pest, the elongate hemlock scale, is moving through the area. Its control may also be made more difficult because of the loss of Lindane. But Christmas tree growers have learned a lot since the early 1960s when BWA first showed up. Growers know how to scout and apply pesticides effectively.

Sources of information for this article include, Kristine Johnson's "Fraser Fir and Balsam Woolly Aphid: Summary of Information" written in 1980, 1965 Cooperative Extension notes, Jim McGraw's compilation of meeting notes, letters and other information on BWA, and "A History: School of Forest Resources, 1929-1979" by William D. Miller and Walter M. Keller. 

## NCCTA 50th Anniversary Celebration

September 24-26, 2009

Summer Meeting / Trade Show / Farm Tour  
with the Eastern NC Christmas Tree  
Growers Association

### Events:

Thursday, September 24, 2009  
50th Anniversary Reception at La Quinta

Friday, September 25, 2009  
at Boone United Methodist Church  
NCCTA Business Meeting  
ENCCTGA Business Meeting  
Educational Meeting

Saturday, September 26, 2009  
Farm Tours in Watauga County

### Hotels for meeting:

(these Hotels are side by side in Boone  
on NC 105 Extension  
Cut off Date for these Rates:  
Feb. 26 and Sept. 17

Non-smokers: La Quinta Inn Boone  
\$63.75 per night plus Tax  
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Smokers: Sleep Inn Boone  
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