

# THE PITCH & NEEDLE

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## About this Newsletter

The *Pitch & Needle* is a semi-annual publication of the Oregon Department of Agriculture and is intended as an aid to anyone involved in the growing and shipping of Christmas trees. Through this bulletin, we hope to provide you with the most current shipping information as well as other topical information related to the Christmas tree industry. If you have any suggestions for topics or articles for the next issue, contact Gary McAninch at (503)986-4644 or e-mail <gmcainc@oda.state.or.us>.



## **2002 Christmas Tree Certification Requirements for Shipments to States and Territories of the United States**

Below is a summary of requirements to ship cut Christmas trees to states and territories of the United States and to selected foreign countries. Inspections and certifications are provided by Oregon Department of Agriculture personnel. Review the information in the summary and contact the department to arrange field inspections prior to harvest and certification. Please provide at least five (5) days notice before the actual shipping date when requesting certificates. Requests need to be scheduled as far in advance as possible. Destination shipping requirements are subject to change.

Christmas Tree Brokers must submit to the Oregon Department of Agriculture, Plant Division, a list of all growers and growing locations from which Christmas tree harvest and shipping will occur.



**All States:** All bills of lading, invoices and bills of sale should bear county of origin as well as the name and address of the shipper. All shipments of Christmas trees grown in Oregon are required by Oregon law to be accompanied by a shipping permit.

**Arizona:** Oregon Christmas tree shipping permit required. The Arizona Department of Agriculture will inspect all trucks as they enter the state (including transit shipments). If pests are found, the

shipment will be held at the border station pending identification. The Arizona Department of Agriculture estimates a 4-hour turnaround on pest identification during business hours. Trucks arriving after business hours may be held until the next business day. Trucks arriving Friday afternoon or over the weekend may be held until identification can be made the following week. Any pest found that is on Arizona's quarantine list is cause for rejection.

Arizona law requires all trucking companies participating in the "Pre-pass" program and carrying agricultural products to stop at Arizona weigh stations.

### **Shipping Pines to California**

California's European pine shoot moth (EPSM) and cereal leaf beetle (CLB) quarantines remain in effect. All cut pine Christmas trees shipped into California must be accompanied by a certificate verifying that the trees came from an area that was trapped and California EPSM quarantine requirements have been met. In addition, a CLB certificate must also accompany all Scotch, red and Austrian pines. Scotch, red or Austrian pines originating in CLB infested counties must be fumigated in order to qualify for certification. Pines from uninfested counties may be shipped provided a CLB origin certificate accompanies them. Cut pine Christmas trees may transit through California without EPSM certification provided they are shipped in an enclosed container. Scotch, red and Austrian pines transiting through California must be accompanied by a "CLB STATEMENT OF TRANSIT COMPLIANCE AGREEMENT" See California shipping requirements for details.

**California:**

1. County of Origin and species of Christmas tree (Douglas-fir, Scotch Pine, etc.) must appear on shipping documents. Mail order Christmas trees shipped via US Mail, UPS, Federal Express, etc. to customers in California must have the county of origin and species of Christmas tree clearly marked on the outside of each shipping carton. The best location for the county of origin is on the shipping label or adjacent to the label.

2. All shipments that include pine species destined for California must be accompanied by a European Pine Shoot Moth (EPSM) certificate. These certificates are only available for growing grounds that have been trapped during the 2002 trapping season. Contact your area Horticulturist for additional information. Only certificates dated 6/1/02 to 5/31/03 are valid and may be obtained for eligible growing locations by calling the Department Horticulturist for your area at 503/986-4644.

3. Shipments of EPSM uncertified pine Christmas trees may be shipped through California to other states provided the name and complete address of the consignee are present on the invoice, bill of sale or bill of lading and the Christmas trees are shipped in a closed van (open trucks or trailers will not be allowed to pass through California if the shipment includes uncertified pine). Note: Pine Christmas trees must also be accompanied by a Cereal Leaf Beetle certificate.

4. Cereal Leaf Beetle certification is required for Scotch pine (*Pinus sylvestris*), red pine (*Pinus resinosa*), and Austrian pine (*Pinus nigra*). Any of these trees originating in infested Oregon counties (Baker, Benton, Clackamas, Columbia, Crook, Lane, Linn, Malheur, Marion, Multnomah, Polk, Tillamook, Umatilla, Union, Wallowa, Washington and Yamhill) are prohibited from shipment into California unless they are treated and certified before shipment. Regulated articles coming from uninfested counties must be certified by the Oregon Department of Agriculture as to origin before the shipment is made. Regulated pine species

originating from infested counties may be shipped through California to other states when accompanied by a "Cereal Leaf Beetle STATEMENT OF TRANSIT COMPLIANCE AGREEMENT." Requests for certification should be directed to the ODA's Plant Division @503/986-4644.

**Delaware:** Oregon Christmas tree shipping permit is required.

**Florida:** Signed compliance agreement with the Oregon Department of Agriculture. See attached memo entitled "European Brown Garden Snail Certification of Oregon Grown Christmas Trees Destined for the States of Florida, North Carolina and Virginia." The deadline for signing and returning the compliance agreement to the Department of Agriculture is October 15, 2002. In addition, a European Brown Garden Snail Certificate is required.

**Hawaii:**

1. Container Inspection. Containers must be free from soil and debris and care must be taken to prevent contamination of Christmas trees and containers with soil during storage and loading procedures.

2. The requirements for Christmas tree shipments to Hawaii will be the same as 2001. Trees shipped to Hawaii must be shaken to qualify for certification. Shaking options are:

a. 10 percent of Christmas trees in each consignment may be manually shaken by striking the butt of the tree on a hard surface. The debris shaken from each tree must be examined for the presence of live insect pests by an inspector. If live yellow jacket queens are found in any sampled trees in the consignment, all trees must be manually shaken.

b. 100% of the trees in the consignment may receive mechanical shaking (motor or PTO driven shaking unit).

3. An Oregon State Phytosanitary Certificate must accompany the inspected shipment. Shaking procedure used will be noted on the certificate. Certificates should be placed in a waterproof plastic envelope and securely attached to the inside of the container door.

4. Shipments of certified Christmas trees will undergo cursory destination inspection for yellow jacket queens on arrival in Honolulu.

5. Shipments of uncertified Christmas trees will receive thorough destination inspection for insect pests by the Hawaii Department of Agriculture.

**Guam and other Pacific Trust Islands:** Oregon State Phytosanitary Certificate is required.

**New Mexico:** Shipping document showing origin of trees required.

**North Carolina:** Same as Florida.

**Oregon:** The Oregon Christmas Tree Law requires that a shipping permit accompany each shipment of Oregon grown Christmas trees. Living "balled and burlapped," potted or containerized trees are regulated as nursery stock and require a nursery license.

**Puerto Rico:** Oregon State Phytosanitary Certificate is required. Additional Declaration: "The cut pine Christmas trees in this consignment are free from Pine Shoot Beetle, *Tomicus piniperda*." All shipments are inspected on arrival.

**Virginia:** Same as Florida.



## **2002 Christmas Tree Certification to Foreign Countries**

**Canada:** Canadian customs invoice required. Shipments of cut pine Christmas trees, wreaths, and boughs to all provinces must be accompanied by a phytosanitary certificate. The phytosanitary certificate must have the following additional declaration: "The pine Christmas trees in this consignment were grown in an area known not to be infested with pine shoot beetle, *Tomicus piniperda*." Phytosanitary certificates are not required for other species of cut Christmas trees shipped to Canada.

**Costa Rica:** Federal Phytosanitary Certificate and import permit are required. Trees and containers must be free of soil.

**El Salvador:** Federal Phytosanitary Certificate and import permit required. Trees and containers must be free of soil.

**Hong Kong:** Federal Phytosanitary Certificate and import permit are required. Trees and containers must be free of soil.

**Japan:** Federal Phytosanitary Certificate is required. Trees and containers must be free of soil. To avoid the possibility of Japan rejecting a shipment because of live insects or dead or diseased needles, it would be advisable to process the trees with a mechanical shaker.

**Korea:** Federal Phytosanitary Certificate is required. Pine prohibited. Trees and containers must be free of soil.



**Mexico:** Phytosanitary Certificate (PC) required for *Abies* spp., *Pinus sylvestris*, and *Pseudotsuga menziesii*. An Import Permit (IP) is not required for these species, but is preferred. PC and IP required for all other Christmas trees and conifer branches. All requirements on the IP must be met for trees to be certified. The IP is obtained from the customer in Mexico. In order to obtain a Federal PC the following requirements must be met:

- If required, obtain Import Permit first;
- The trees must be inspected prior to harvest;
- Shipped trees must be mechanically shaken prior to shipping and must be clean and free from dead branches and twigs or yellow and red needles caused by pests or diseases;
- Trees must not be dyed or flocked unless prior arrangements have been made with the Mexican Forestry Dept.;
- Trees must be free of Pine Shoot Beetle, European Pine Shoot Moth, White Pine Blister Rust and Gypsy Moth;
- Numerous class 2 organisms are also prohibited or have established tolerance levels. Some of these organisms include Pine Needle Scale, Douglas Fir Twig Weevil, Engleman Spruce Weevil, Black Pineleaf Scale, etc. A complete list is available from the ODA or the USDA/APHIS.
- Points of entry into Mexico are: Ensenada, Mexicali, Tecate, Tijuana, C. Hidalgo, Ojinagra, Cd. Juarez, Piedras Negras, Cd. Acuna, Manzanillo, Mexico City, Acapulco, Lazaro Cardenas, Columbia, Salina Cruz, Subtenente Lopez, Mazatlan, Topolobampo, Agua Prieta, Nogales, San Luis Rio Colorado, Matamoros, Reynosa, Nv. Progreso, Cd. M. Aleman, Nv. Laredo, Altamira, Tampico, Veracruz, Coatzacoalcos, Merida, Progreso.

**Singapore:** Neither IP nor PC is required. PC's can be provided as a courtesy.

**Taiwan:** PC is required. Trees and containers must be free of soil.

**The Philippines:** PC and IP are required. Trees and containers must be free of soil.

**All Other Foreign Countries:**

1. Phytosanitary certificate required.
2. The foreign importer (buyer) should obtain a plant import permit from the Ministry or Department of Agriculture of the importing country.
3. Christmas tree growers may wish to contact the importing country's nearest consulate office in the United States for agricultural inspection and customs requirements.

For a specific country's shipping requirements, contact the Oregon Department of Agriculture, Salem, 503/986-4644, or USDA-APHIS, Portland, 503/326-2814.

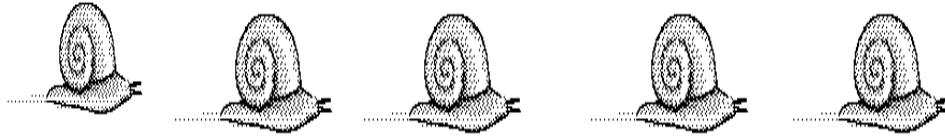


**Phytosanitary Certificates**

Phytosanitary certification is provided by Oregon Department of Agriculture personnel. To schedule certification, call at least five (5) days before the shipping date. Phytosanitary certificates are generally valid for 14 days. Inspections are scheduled on a first call basis. There is a \$10 fee for each phytosanitary certificate issued.

Questions regarding Christmas tree shipping should be directed to your Department Horticulturist at 503/986-4644.





## **European Brown Garden Snail Certification of Oregon Grown Christmas Trees Destined for the States of Florida, North Carolina and Virginia**

The Oregon Department of Agriculture has entered into a Master Permit Program with the Florida Department of Agriculture and Consumer Services, the North Carolina Department of Agriculture, and the Virginia Department of Agriculture and Consumer Services, for the purpose of certifying Christmas trees grown in Oregon and offered for sale in Florida, North Carolina or Virginia. The Master Permit Program establishes a list of Oregon Christmas tree growers whose plantations are certified to be free from European Brown Garden Snail. The Master Permit Program will allow Christmas trees produced by participating growers to clear agriculture inspection with minimum delay.

To meet the Master Permit Program requirements for shipping Christmas trees to Florida, North Carolina, and Virginia, Oregon Christmas tree growers must comply with the following:

### **Compliance Procedures**

1. The grower shall notify the Oregon Department of Agriculture of intent to ship Christmas trees to Florida, North Carolina, or Virginia by completing the enclosed compliance agreement. Return the completed form to the Oregon Department of Agriculture, Plant Division, 635 Capitol Street NE, Salem, Oregon 97301-2532. Only the names of growers who have completed and returned compliance agreements by September 27, 2002, will be included on the list sent to Florida, North Carolina and Virginia.
2. The Oregon Department of Agriculture will conduct a visual inspection for the presence of European brown garden snail.
3. Christmas tree plantations found to be free from European brown garden snail infestation shall qualify for master permit certification.
4. The department will prepare a list of all qualified growers and forward the list to Florida, North Carolina and Virginia agriculture officials.

**Reminder: European Brown Garden Snail Certificate must still accompany each shipment.**

**EUROPEAN BROWN GARDEN SNAIL  
COMPLIANCE AGREEMENT**

As authorized in ORS 570.305 through ORS 570.310, and because a quarantine (OAR 603-52-129) has been established against the introduction and spread of European Brown Garden Snail, *Helix aspersa*, an agreement is hereby established between the Oregon Department of Agriculture and the Christmas tree grower identified below for the purpose of maintaining Oregon cut Christmas trees free from European brown garden snails.

Business Name: \_\_\_\_\_ License # \_\_\_\_\_  
(please print)

Owner's Name: \_\_\_\_\_  
(please print)

Street Address: \_\_\_\_\_

\_\_\_\_\_  
City State Zip

Telephone: ( ) - \_\_\_\_\_

Please indicate the state(s) listed below to which you will ship Christmas trees.

- Florida - Number of truck loads \_\_\_\_\_
- North Carolina - Number of truck loads \_\_\_\_\_
- Virginia - Number of truck loads \_\_\_\_\_

The above named Christmas tree grower agrees to comply with the terms as specified in the compliance procedures.

\_\_\_\_\_  
Owner's Signature Date

Return Completed form to:  
  
Gary McAninch  
Oregon Department of Agriculture  
635 Capitol Street NE  
Salem, Oregon 97301-2532

**In order that we may supply you in a timely manner with the various certificates that you need for the coming Christmas tree season, please take a few minutes to complete and return this form. Your cooperation will eliminate delays and save time for everyone. Thank you.**

Business Name: \_\_\_\_\_

**(1) Shipping Permits/Certificates**

Please indicate the number and type of certificates you need:

Quantity	Type of Certificate
_____	Christmas Tree Shipping Permits
_____	European Brown Garden Snail Certificates (Required for Christmas trees shipments to AL, AR, FL, MS, NC, TN, VA)
_____	European Pine Shoot Moth Certificates (Required for shipping pine Christmas trees to California. Only pines from fields that have a negative trapping history for pine shoot moth are eligible.)

**(2) Exporting Christmas Trees**

Christmas trees shipped out of the continental United States usually require an inspection and phytosanitary certification prior to shipping, and may also require a preharvest field inspection. If you plan to export Christmas trees to Mexico, Hawaii, Japan, Puerto Rico, or other foreign area, please complete the section below:

Country or Area of Destination	Approximate Number of Loads
_____	_____
_____	_____
_____	_____

Please list the field location(s) where the trees for export are being grown (use a separate sheet of necessary). Indicate the approximate acreage of the field, the types of trees (nobles, grands, dougs, pines, etc), and include, maps, addresses, and other references as needed.

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**Return completed form to: Gary McAninch, Oregon Department of Agriculture, 635 Capitol Street NE, Salem, OR 97301-2532**



## Sudden Oak Death in Oregon

By Eric Reusche

About one year ago *Phytophthora ramorum* was discovered outside of Brookings, Oregon. This disease, also known as Sudden Oak Death, was first detected in California 7 years ago, and has been spreading rapidly since. Currently there are 12 counties in California under federal quarantine for this disease, along with 9 square miles in Curry County.

*P. ramorum* has a fairly large host list, besides three species of Oak (*Quercus agrifolia*, *Q. kelloggii* and *Q. parvula*), Madrone (*Arbutus menziesii*) and Tan Oak (*Lithocarpus densiflorus*) are also hosts. Also, Big Leaf Maple (*Acer macrophyllum*), Rhododendron (*Rhododendron spp*), California Buckeye (*Aesculus californica*), California Bay Laurel (*Umbellularia californica*) or Oregon Myrtlewood) and Evergreen Huckleberry (*Vaccinium ovatum*) are known hosts and commonly found here in Oregon.

There are several things we do know about this disease. Although it is a *Phytophthora* species, it is an aerial form, and has yet to be found moving down below the soil line. Researchers also believe that it takes a fairly large amount of inoculum to spread the disease. *P. ramorum* also does not spread much below the cambium. *P. ramorum* expresses itself like dozens of other diseases and environmental reactions on the leaves of its hosts, so only laboratory analysis can confirm its existence in a host plant.

There are more unanswered questions about this disease than answered. Mode of spread, chemical control measures, and range of *P. ramorum* are all yet to be determined. A major question is also just exactly what will the final host list look like. Although now it appears to attack mostly native evergreen shrubs and broadleaf trees, the report of spores being found on *Sequoia sempervirens* make it appear that it could jump over to conifer species. It is yet to be proven that a mature Redwood tree is susceptible to this disease but research-

ers are working hard to answer that question. There are also 3 other species that researchers are currently studying very closely, but have yet to name them. In laboratory studies, *P. ramorum* seems to infect just about all the leaf samples it is subjected to, but how this translates to actual field conditions is yet to be determined.

What does this disease mean to the Christmas tree industry? Well, besides losing the native vegetation along the edges of your fields, and increased wild fire risks, we are currently under quarantine from several countries. Along with our own federal quarantine, both Canada and United Kingdom have placed severe restrictions on exporting plant material to their countries. South Korea has also quarantined host material. If, or when the host list grows longer we can assume that other countries will follow suit.

*P. ramorum* has already had a major impact on the nursery industry in both California and Oregon, and it is only just beginning. What happens next is anyone's guess, but for the State of Oregon, we have from the beginning developed a concerted effort to control and eradicate this disease. We were the first to try and protect ourselves by imposing the first quarantine on California. We actively scouted for signs of spread of this disease into our state, and when the first infections showed up, we moved quickly, along with the private and public landowners in the area, to eradicate by cutting and burning host material in the infected area. We are currently monitoring, cutting and burning any remaining isolated hot spots. Only time (and money) will determine the outcome of our efforts to contain and eradicate this serious disease.

## Christmas Tree Research – Final Reports Available

In 2001, two Christmas tree research projects were recommended for funding by the Oregon Department of Agriculture's Christmas Tree Advisory Committee. Funds for these projects were made available through annual license fees paid by Oregon Christmas tree growers. Final reports for both of these projects have been received and abstracts for both projects are printed below. Anyone wishing to receive copies of the full final reports should either contact the researchers directly at the addresses listed below or by contacting Gary McAninch, Oregon Department of Agriculture, 635 Capitol Street NE, Salem, Oregon 97301-2532

### Changes in Soil Conditions Over Multiple Christmas Tree Cropping Cycles

By: Linda Brewer, Rick Fletcher, John Hart and Chal Landgren, Oregon State University and Steve Webster, Washington State University,

**Abstract.** This study was conducted to determine whether hypothesized changes in soil conditions are occurring over multiple rotations of Christmas trees. Soil nutrients generally do not appear to be limiting growth or different between first and late rotational fields based on paired samples in this study. However, calcium (Ca) values at three sampling depths, were lower in late rotation fields than in first rotation fields. At depth two (3 to 12 inches) this difference was significant ( $p=10\%$ ). Soil pH was not statistically different between early and late rotations at any depth. Atrazine residual levels increased in late rotations, but were well below concentrations that effect tree performance. Soil density can increase with rotation age if tillage is not implemented between rotations. *Mycorrhizae* were present in plentiful numbers and species in both first and late rotations on sampled noble fir fields. No factors have been clearly identified to cause decline in productivity with multiple

cropping cycles. A literature review lists findings of other researchers in the areas of conifer nutrient levels, soil compaction, tillage practices, mycorrhizal associations, and effects of atrazine and hexazinone on cropping systems.

### Effectiveness of cultural practices in reducing Annosus root rot inoculum levels in noble fir Christmas tree plantations

Project Leader: Gary A Chastagner, Washington State University, 7612 Pioneer Way East, Puyallup, WA 98390, Phone: 253-445-4528, Fax: 253-445-4621, E-mail: [chastag@wsu.edu](mailto:chastag@wsu.edu)

**Project background:** The Pacific Northwest (PNW) is the major Christmas tree production area in the United States. About one third of the 34-36 million Christmas trees harvested in the U. S. are grown in western Oregon and Washington. Nationally, Oregon ranks first, producing about 9 million trees per year. Noble fir is generally considered to have the highest postharvest quality of any Christmas tree available today and is rapidly becoming the most important Christmas tree species in the PNW. The amount of noble fir grown increased from about 5% in 1969 to 45% of the trees harvested today. Noble fir can only be grown successfully within the western portions of the PNW, giving growers in this region an advantage in today's highly competitive market.

Although demand for noble fir Christmas trees is increasing, growers are facing a number of disease and insect problems that limit their ability to meet the demand for this species. During the past 15 years, Annosus root rot (*Heterobasidion annosum*) has become a major problem for growers. In the early 1980's, Annosus root rot was present in only 2 percent of the plantations. With the increased production of noble fir in the early 1980's and subsequent increased number of second and third rotation plantations, there has been a tremendous increase in this disease. A recently

completed survey indicates that it is now present in plantations throughout Oregon and Washington. Once this disease becomes established in plantations, it is very difficult to produce subsequent crops of noble fir. This severely limits the ability of growers to sustain current production levels, not to mention meet the increasing demand for this species.

Annosus root rot is spread via two methods. Fruiting bodies on diseased trees and stumps produce airborne spores that are able to spread long distances and colonize freshly cut stumps or wounds on trees. Spore dispersal occurs throughout the growing season, but is greatest in the fall. Freshly cut stumps are susceptible for a limited period of time. The fungus colonizes the stumps, moves into its roots, and then by means of root-to-root contact infects adjacent healthy trees. Once the disease becomes established in an area it can also spread to adjacent trees or newly transplanted seedlings from diseased roots and stumps from the previous crop.

In forest situations, one of the most effective cultural methods of controlling Annosus root rot is the removal of stumps and roots prior to planting the next crop. The effectiveness of this method is dependent on the size of the residual pieces of stumps and roots that are left behind. The goal of this project is to determine the effectiveness of various methods of stump/root extraction or the use of grinding equipment in reducing the development of Annosus root rot in PNW Christmas tree plantations.

The major objective of this project was to determine the effectiveness of stump removal prior to planting in reducing Annosus root rot development in noble fir Christmas tree plantations. Project results:

During 2001, 19 field plots were established to obtain a better understanding of the extent of mortality that can result from Annosus root rot. About 31,000 trees that had been planted between 1997 and 2000 were examined for above-ground

symptoms such as branch flagging, wilting, and death. The percentage of symptomatic trees in these plots ranged from 0.3 to 13.6%. If missing and replanted trees were included, the maximum percentage reached 29.9%. Annosus root rot was associated with 87.8% of the dead and dying trees in these plantations and was detected on noble, Fraser, Nordmann, and grand fir, as well as Douglas-fir. Noble and Fraser fir appear to be very susceptible to this disease.

The plots were selected because they contained areas where seedlings had been planted next to stumps and areas where the stumps had been removed prior to planting. Based on the levels of mortality that have developed to date, stump removal appears to be a very effective cultural treatment to limit the development of Annosus root rot in Christmas tree plantations. Areas within these plantations where the stumps had been removed prior to replanting had limited or no Annosus root rot.

In addition to these plots, a trial was established involving twenty pairs of colonized stumps and root systems. One stump and roots in each pair was removed by hand prior to planting a noble fir seedling in its place. A noble fir seedling was also planted next to the other stump. This trial was established to confirm the data obtained from the 19 field plots. Given that it can take several years for Annosus root rot to develop when trees are planted next to stumps, it has not been possible to obtain data from this trial during the course of this project.

As part of our ongoing Annosus root rot management project, the effectiveness of the stump removal treatment in limiting the development of Annosus root rot in the above trial will be assessed during the next year. The 19 field plots will also be monitored during the next several years to determine the continued effectiveness of the stump removal treatments employed in these fields in controlling the development of Annosus root rot on the replanted trees through the end of the rota-

*cont'd page 12*

tion. Given the effectiveness of stump removal without any additional fallow/cover crop treatments in limiting the development of Annosus root rot, none of the proposed fallow/cover crop studies were conducted during this project.

Publications resulting from project:

Chastagner, G. A., I. M. Thomsen, J. Hudak, and K. L. Riley. 2002. *Heterobasidion annosum* associated with mortality of Christmas trees in the Pacific Northwest. *Phytopathology* 92: S14 (Abstract).

Chastagner, G. A., and J. Hudak. 2002. Root diseases associated with dead and dying noble fir Christmas trees in the Pacific Northwest. *Phytopathology* 92: S14 (Abstract)

### **Christmas Tree Research - Current Research**

During its February 2002 meeting the Oregon Department of Agriculture's Christmas Tree Advisory Committee approved funding for two research projects. Funding for these projects was made available through annual license fees paid by Oregon Christmas tree growers. Both projects are currently underway and are scheduled for completion in 2003. The following is an overview of both projects.

#### **Genetic Testing for Improved Christmas Tree Sources**

Project Leader: Chal Landgren, Extension Agent, OSU Extension Service, 505 N. Columbia River Highway, St. Helens OR. 97051.  
Phone 503. 397.3462, FAX 503. 397.3467, e-mail [chal.landgren@orst.edu](mailto:chal.landgren@orst.edu)

#### **Team Members**

Rick Fletcher, OSU Extension Forester, Mike Bondi, OSU Extension Forester,  
Brad Withrow-Robinson, OSU Extension Forester

**Background and Objectives:** Christmas tree growers have long recognized the importance of using top rated genetic sources when growing trees. Likewise, locating, testing and deployment of additional sources has been a top grower research priority for years.

This project is composed of a number of genetic trials each with separate activities and in various stages of development. With each, the primary objective is the development of superior seed sources for Christmas tree production. To accomplish this objective, each trial needs support for costs associated with establishment, measurement, evaluation and maintenance. Last, cone stimulation procedures for noble fir need investigation.

#### **Effectiveness of Cultural Practices in Controlling Annosus Root Rot in Noble fir Christmas Tree plantations**

Project Leader: Gary A Chastagner, Washington State University, 7612 Pioneer Way East, Puyallup, WA 98390, Phone: 253-445-4528,  
Fax: 253-445-4632, E-mail: [chastag@wsu.edu](mailto:chastag@wsu.edu) in cooperation with Gregory Filip, Forest Science Department, Oregon State University, Corvallis, OR 97331-7501, Phone: 541-737-6567,  
Fax: 541-737-1393

**Project Overview:** This proposal represents a continuation of an ODA funded project that was initiated during 2001. (Refer to column 2, page 12) Annosus root rot spreads via two methods. Fruiting bodies on diseased trees and stumps produce airborne spores that are able to spread long distances and colonize freshly cut stumps or wounds on trees. Spore dispersal occurs throughout the growing season, but is greatest in the fall. Freshly cut stumps are susceptible for a short period of time. The fungus colonizes the stumps and roots and spreads to the roots of healthy trees in contact with the colonized roots. Once the disease becomes established in an area it can also spread to adjacent trees or newly transplanted seedlings from diseased roots and stumps from the previous crop.

*cont'd page 13*

Limited information is available regarding the effectiveness of the various control practices that are used in forest situations to control this disease in noble fir Christmas tree plantations. One of the most effective cultural methods of controlling Annosus root rot in forest settings is the removal of stumps and roots prior to planting the next crop. The effectiveness of this method is dependent on the size of the residual pieces of stumps and roots that are left in the field. No information is available regarding the effectiveness of the various types of stump/root extraction or grinding equipment that is available for use in Christmas tree plantations in controlling this disease in Christmas tree plantations. Studies are also needed to determine if it is feasible to accelerate the rate of inoculum breakdown following stump removal with the use of a fallow period and/or various cover crops.

This project has two objectives: 1) determine the effectiveness of stump removal in reducing Annosus root rot in subsequent crops of trees; and 2) determine the effects of various fallow/cover crop treatments in reducing the inoculum viability on residual pieces of stumps and roots that are left in the field after stump removal or grinding.

**Overview of methods and time line:** During this past spring and summer, a series of 19 plots involving over 23,000 trees were established in recently planted plantations in Oregon and Washington to examine the effectiveness of stump removal in controlling the development of Annosus root rot. In some sites, growers had removed stumps prior to planting, while in other sites seedlings were planted next to stumps. During the summer, all of the dead trees in each of these sites were dug up and examined to determine if Annosus root rot was responsible for their death. *Heterbasidion annosum* was recovered from about 77% of these trees. The percentage of dead trees and trees that the growers had already replanted ranged from 0.9 to 28% in these sites. In addition to the above studies, a replicated plot was also established to compare the effectiveness of stump removal in controlling the development of Annosus root rot on

noble and Fraser fir by planting seedlings next to root rot infected stumps or in sites where infected stumps had been removed.

During early 2002, additional trials will be established to further evaluate various stump removal methods in conjunction with cover crops for control of Annosus root rot. Data will be collected during the summer from the plots that were established during 2001 to obtain additional information relating to the effect of various cultural practices on the spread of Annosus root rot in these plantations. These data will also help us determine the rate of spread of this disease from one season to the next, which will provide us with a better understanding of the potential losses that growers might expect to occur in plantations where this disease is present.

#### References:

Omdal, D. W., C. G. Shaw III, and W. R. Jacobi. 2001. Evaluation of three machines to remove Armillaria- and Annosum-infected stumps. *Western Journal of Applied Forestry* 16(1): 22-25.

Woodward, S., J. Stenlid, R. Karjalainen and A. Huttermann. 1998. *Heterbasidion annosum* – Biology, Ecology, Impact and Control. 589 pages. CAB International

## **OREGON CHRISTMAS TREE ADVISORY COMMITTEE**

The purpose and function of this committee is to provide advice and counsel to the Oregon Dept of Agriculture in the administration of ORS 571.505 through 571.580 (Oregon Christmas Tree Grower Statutes). The committee provides general recommendations to the department in matters relating to department inspection services, licensure and permitting procedures, regulatory strategies, information dissemination and general implementation of program functions which are of service or necessary to the Christmas tree industry.

The committee consists of six members who are appointed by the Director of Agriculture. Members serve three-year terms and are eligible to serve two consecutive terms.

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