



Spring 2009

Volume 2 Issue 1

Inside this issue:

<i>Announcing the 9th CTRE Conference</i>	2
<i>Recent publications</i>	4
<i>Upcoming meetings</i>	5
<i>Announcements</i>	5
<i>Herbicides for Post Emergence Weed Control</i>	6
<i>Christmas tree research and extension in Germany: An overview</i>	7
<i>Real vs. Artificial Trees?</i>	8
<i>Phytohormones imbalance : A cause for bud drying in Forest and Christmas Trees</i>	9
<i>International Co-operation on Current Season Needle Necrosis (CSNN)</i>	10

**2.02.09 – Christmas trees**

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### *Letter from the Coordinator*

Greetings! I hope that you are well and surviving this sudden and deep economic downturn. We're all learning how to get along by tightening our belts. One silver lining to this dark cloud, at least in the U.S., is the increased number of requests for funding proposals. Hopefully, some of us in the world of Christmas tree research and extension can successfully take advantage of these opportunities. Otherwise, we'll continue doing as much as we can under the circumstances until the recovery commences.



Since the previous newsletter, the Proceedings of the 7<sup>th</sup> International Christmas Tree Research & Extension Conference held in Tustin, Michigan, during 2007, has been posted on our IUFRO website along with previously posted proceedings from our 6<sup>th</sup> and 8<sup>th</sup> conferences. To find these proceeding go to [www.iufro.org](http://www.iufro.org) and navigate as follows: Natural Science Divisions => Division 2 – Physiology and Genetics => 2.02.09 – Christmas trees => Publications and References.

Our **9<sup>th</sup> International Christmas Tree Research and Extension Conference** will be held 13-18 September of this year in the Pacific Northwest region of the United States. We'll spend three days in Corvallis, OR, and two in Puyallup, WA, including field tours in each area. Initial information about the conference is in this newsletter and a web site (<http://oregonstate.edu/dept/NWREC/christmastrees/iufro>) will soon be available where further details and updates will be posted. I'm certain that our hosts, Chal Landgren, Gary Chastagner, et al. will do a superb job designing and implementing the program. This will be a conference that you won't want to miss. Start your budgeting and plans to attend now. I'm looking forward to seeing you there.

### *About the Christmas tree IUFRO Workgroup*

The scope of this unit includes all aspects of Christmas tree and greenery production including nutrition, genetics, propagation, diseases, arthropod pests, weeds, production techniques, post-harvest quality, and marketing. While the indoor display of forest trees to celebrate Christmas is a centuries-old tradition, establishment and culture of plantations specifically for Christmas tree use is a relatively new development. During the last 20 to 30 years, as the worldwide consumption of real Christmas trees has risen to exceed 80 million annually, the science and technology behind plantation Christmas tree production has developed rapidly, particularly in Europe and North America. This unit provides a forum for the exchange of scientific research results among researchers, students, extension agents and extension specialist who work professionally with the Christmas tree

# *Announcing !!!!!!!!*

## *Ninth International Christmas Tree Research and Extension IUFRO Unit 2.02.09 - Christmas Trees*

The Pacific Northwest is pleased to host the 9<sup>th</sup> International Christmas tree Research and Extension conference.

**When and Where:** September 14-16, Oregon State University, Corvallis, Oregon, USA and September 17-18, Washington State University, Puyallup, Washington, USA.

**Flights:** Arrivals should be scheduled to Portland, Oregon (PDX). Shuttle service to the Hilton Garden in Corvallis can be arranged via HUT airport service. <http://www.portlandairportshuttle.com>

Departing flights can be arranged from either Seattle (SEA) or Portland. Conference vans will be arranged for both airports.

**Costs:** The conference is expected to cost approximately \$990 USD which includes conference transportation, meals and lodging. Final costs will vary somewhat depending on the number of participants.

**Program:** The conference program will comprise contributed talks from participants, posters, discussions, and field trips to Christmas tree research locations and outstanding production sites in Oregon and Washington.

A rough outline of the week is:

- Sunday September 13. Arrive in Oregon and evening social. Hilton Garden Hotel, Corvallis, Oregon.

- Monday-Wednesday, September 14-16. Conference meetings in morning on Oregon State University campus, with field tours in the afternoons. Conference Banquet on Sept. 15 will feature local cuisine, wine and micro brews.

- Thursday September 17. Tour bough production areas near Mt. St. Helens, view old growth noble fir, outstanding tree farms and a volcano. Enjoy a fresh seafood BBQ.

- Friday September 18- Tour facilities and meeting at Washington State University, Puyallup Research and Extension Center, Puyallup Washington.

**Topics:** These include, but are not limited to: Planting stock propagation & production, plantation establishment and cultivation, fertilization and nutrition, genetics, pest management (disease, insects, and weeds), economics and management issues, post-harvest quality, certification



**View pot-in-pot production facilities**

# *Announcing !!!!!!!!*

## *Ninth International Christmas Tree Research and Extension IUFRO Unit 2.02.09 - Christmas Trees*

### **Additional Opportunities (Pre/Post Conference)**

For those participants wishing to arrive early, the Pacific Northwest Christmas Tree Growers Association will be having their Fall meeting called Tree Fair. This two day meeting will be held at the Vancouver Washington Hilton Hotel on September 11 and 12. Information about the association and this meeting is available at:

<http://www.nwtrees.com/aboutframe.htm>

In addition, a number of post-conference tours are being planned for those wishing to visit National Parks in Washington, other tree farms and Seattle.

### **More information**

Watch the conference website (in late March): <http://oregonstate.edu/dept/NWREC/christmastrees/iufro>

Oregon Program: Chal Landgren-  
[chal.landgren@oregonstate.edu](mailto:chal.landgren@oregonstate.edu)

- Oregon facilities: Rick Fletcher-  
[rick.fletcher@oregonstate.edu](mailto:rick.fletcher@oregonstate.edu)

Washington Program: Gary Chastagner- [chastag@wsu.edu](mailto:chastag@wsu.edu)

### **Organizing Committee**

Chal Landgren, Rick Fletcher, Gary Chastagner, John Hart, Mike Bondi, Kathy Riley



**Current Season Needle Damage at WSU Puyallup**

### *Welcome to the Pacific Northwest*



**Weed and genetic trials near Corvallis**

## *Recent Christmas tree publications*

Andersen US, Córdova JPP, Nielsen UB, Nielsen C1, Sørensen M, Kollmann J 2008: Conservation Through Utilisation of the Endangered *Abies Guatemalensis* Rehder \* a Case Study from Guatemala. *Oryx*, 42 (2): 206-213.

Andersen US, Córdova JPP, Nielsen UB, Kollmann J 2008: Provenance variation in germination and seedling growth of *Abies guatemalensis* Rehder. *Forest Ecology and Management* 255 : 1831-1840.

Cregg, Bert M., Nzokou, Pascal, Goldy, Ron. 2008. "Growth and physiology of Fraser fir and Colorado blue spruce in response to mulch." *HortScience* 43. July (3rd Quarter/Summer).

Emerson, J., J. Frampton and S. McKeand. 2008. Genetic variation in early growth and bud production among natural populations of Fraser fir. *HortScience* 43(3):661-666.

Furiness, Cari and J. Frampton. 2008. Preliminary findings: analysis of carbon storage in Fraser fir plantations. *Limbs & Needles* 35(1):22.

Frampton, J. and J. Owen. 2008. Christmas tree and greenery production in Denmark. *Limbs & Needles* 35(3):18-21.

Hansen, O.K. & Nielsen. UB 2008: Crossing success in *Abies nordmanniana* following artificial pollination with a pollen mixture of *A. nordmanniana* and *A. alba*. *Silvae Genetica*, 57(2): 70-76

Hart, J., Landgren, C., O'Donnell, J and Bates, R. 2009. *Cutting Fertilizer Cost for Christmas Tree Production*. *American Christmas Tree Journal* 53(1) pgs. 12-15.

Klooster, Wendy, Cregg, Bert M., Fernandez, Rodney T., Nzokou, Pascal. 2008. "Effect of nutrition on growth and physiology of landscape shade trees in pot-in-pot production." *HortScience* 43. July (3rd Quarter/Summer).

Klooster, Wendy, Cregg, Bert M., Fernandez, Rodney T., Nzokou, Pascal. 2008. "Fertilizer and media effects on growth and physiology of conifers in pot-in-pot production." *HortScience* 43. July (3rd Quarter/Summer).

Nielsen, CCN & Rasmussen, HN 2009. Frost hardening and dehardening in *Abies procera* and other conifers under differing temperature regimes and warm spell treatments. *Forestry* 82: 43-59.

Nielsen, U.B. 2007: Genetic variation in characters important for noble fir greenery production. *Scan. J. For. Res.* 22: 9-109.

Nikiema, Paligwende, Nzokou, Pascal, Rothstein, David E., Cregg, Bert M. 2008. "Effect of different groundcover management in Fraser fir plantation on soil pH, moisture, and microbial biomass C and N." *HortScience* 43. July (3rd Quarter/Summer).

Nzokou, Pascal, Cregg, Bert M. 2008. Using soil tensiometers and local weather information for improved irrigation scheduling in Fraser fir production. *Great Lakes Christmas Tree Journal* 3 (3): 12-17.

Nzokou, Pascal, Nikiema, Paligwende. 2008. The influence of three plant growth regulators on susceptibility to cold injury following warm winter spells in Fraser fir [*Abies fraseri* (Pursh) Poir] and Colorado blue spruce (*Picea pungens*). *HortScience* 43 (3): 742-746.

Nzokou, Pascal, Cregg, Bert M., O'Donnell, Jill. 2008. Alternative leader growth control for Fraser fir and Korean fir Christmas trees. *Northern Journal of Applied Forestry* 25 (1): 52-54.

Nzokou, Pascal, Gooch, Nicholas J., Cregg, Bert M. 2008. "Plant stress as indicator for irrigation scheduling in Fraser fir production." 43. July (3rd Quarter/Summer).

Nzokou, Pascal. 2008. Climate change and global warming: What does it mean for Christmas tree production in the Great Lakes. *Great Lakes Christmas Tree Journal* 3 (1): 11-12.

Potter, K.M., J. Frampton, S.A. Josserand, and C.D. Nelson. 2008. Genetic structure and variation in isolated Fraser fir (*Abies fraseri* [Pursh] Poir.) populations. *Can. J. For. Res.* 38:2128-2137.

Rasmussen, HN, Veierskov, B, Hansen-Møller, J, Nørbæk, R, Bräuner Nielsen, U. 2009 Cytokinin profiles in the conifer tree *Abies nordmanniana*: Root-shoot relations in a year-round perspective. Online in March, *Journal of Plant Growth Regulation*.

Reinhardt K, Johnson D.M., and Smith W.K. 2009. Age-class differences in shoot photosynthesis and water relations of Fraser fir (*Abies fraseri*), southern Appalachian Mountains, USA. *Canadian Journal of Forest Research* 39:193-197.

Reinhardt K. and Smith W.K. 2008. Impacts of cloud immersion on microclimate, photosynthesis, and water relations of *Abies fraseri* (Pursh.) Poiret in a temperate mountain cloud forest. *Oecologia* 158:229-238.

Reinhardt K. and Smith W.K. 2008. Leaf gas exchange of understory spruce-fir saplings in relict cloud forests, southern Appalachian Mountains, USA. 2008. *Tree Physiology* 28:113-122.

Rutledge, M.E., J. Frampton, L. Eric Hinesley and G. Blank. 2008. Using a bud volume index with the Top-Stop Nipper to control leader growth of Fraser fir Christmas trees. *HortTechnology* 18 (4):583-587.

Veierskov, B, Rasmussen, HN & Eriksen, B. 2008. Ontogeny in terminal buds of *Abies nordmanniana* (Pinaceae) characterized by ubiquitin. *Am. J. Bot.* 95: 766-771.

## *Recent Christmas tree publications*

### *Now Available Online*

*Proceedings of the last three CTRE conferences are available for download on our IUFRO work unit website.*

*<http://www.iufro.org/science/divisions/division-2/20000/20200/20209/publications/>*

*These proceedings provide an overview of international research and extension activities related to Christmas trees during the last 8-10 years.*



**Seventh International  
Christmas Tree  
Research & Extension  
Conference**

**October 2 - 7, 2005  
Kettunen Center  
Tustin, MI, USA**

**Sixth International Christmas Tree  
Research & Extension Conference**



**September 14 - 19, 2003  
Kanuga Conference Center  
Hendersonville, NC**

**Proceedings**

Hosted by  
North Carolina State University

## *Herbicides for Post Emergence Weed Control in 10 Field Grown Conifer Species*

**J. F. Ahrens and T. L. Mervosh, Connecticut Agricultural Experiment Station, Windsor.**

Mesotrione and a combination of glyphosate, oxyfluorfen and clopyralid were applied over ten conifer species to evaluate plant injury and weed control. The conifers, of typical transplant size, were planted in tilled sandy loam soil in Windsor, CT between April 17 and May 5, 2008. Species consisted of eastern white pine (*Pinus strobus*), Fraser fir (*Abies fraseri*), Douglas-fir (*Pseudotsuga menziesii*), Norway spruce (*Picea abies*), white spruce (*Picea glauca*), Colorado spruce (*Picea pungens*), eastern hemlock (*Tsuga canadensis*), American arborvitae (*Thuja occidentalis* 'Emerald Green'), yew (*Taxus x media* 'Hicksii') and juniper (*Juniperus horizontalis* 'Blue Star'). Five plants of each species were planted per plot, in two 34-ft-long rows spaced 3 ft apart. An RCB design with four replicates was utilized. Herbicides were sprayed in a volume of 25 gal/A using a hand-held four-nozzle boom with 8003VS tips. Treatments included mesotrione (Callisto 4SC) at 0.125 or 0.25 lb ai/A applied with simazine at 1.35 lb ai/A on May 7; the mesotrione treatments were reapplied on June 19. Also, simazine was applied alone on May 7, followed by mesotrione at 0.125 or 0.25 lb ai/A on June 19. On May 7, the three spruce (*Picea*) species and eastern hemlock



had broken bud; the other conifers were still dormant. All plants were actively growing on June 19. A combination of glyphosate (Roundup Original) plus oxyfluorfen (GoalTender) plus clopyralid (Lontrel) was applied at doses of 0.125 lb ai/A + 0.25 lb ai/A + 0.094 lb ae/A, respectively, and in the same combination at double each of these doses. Following simazine on May 7, the three-way combinations were applied on June 19 and again on July 17. Evaluations of plant injury (0 = none; 10 = plant dead) and weed control (0 = none; 10 = complete control) were recorded periodically. Rainfall in summer 2008 was about twice normal.

On June 9, some Norway spruces treated on May 7 with mesotrione (0.25 lb ai/A) plus simazine were chlorotic, with an average injury rating of 2.0. All other injury ratings were less than 1.0 on June 9. Plots were evaluated again on July 9 (3 weeks after the June 19 treatments during active growth). Douglas-fir was the most sensitive of the conifers to mesotrione, which whitened the new flush of needle growth (injury ratings of 1.5 to 3.3). Norway spruce and white spruce had lesser extent of whitening, mostly in plots treated twice with 0.25 lb ai/A of mesotrione. Injury symptoms dissipated by September. In mesotrione-treated plots, needles of some Douglas-firs were still chlorotic, but the second flush of growth was normal in color. All conifers were tolerant of the glyphosate plus oxyfluorfen plus clopyralid treatments; only very slight injury on Douglas-fir was observed late in the season after two applications at the double dose.

The primary weeds in the field were large crabgrass (*Digitaria sanguinalis*), common ragweed (*Ambrosia artemisiifolia*), carpetweed (*Mollugo verticillata*), purslane (*Portulaca oleracea*) and yellow woodsorrel (*Oxalis stricta*). The simazine + mesotrione treatments controlled these weeds through early August (control ratings 8.7 to 10). By September 8, late emerging weeds had become prevalent in these plots. The three-way combination treatments gave excellent season-long control of all weeds present.

## *Christmas Trees Research and Extension in Germany and Overview*

**Jürgen MATSCHKE:** Center of Horticulture, Agriculture Chamber Nordrhein-Westfalen, 48167 Münster; Kindermannstrasse 38, 15377 Waldsieversdorf, Germany. Contact: [juergenmatschke@t-online.de](mailto:juergenmatschke@t-online.de)

The Christmas tree program at the Center of Horticulture & Agriculture Chamber, Nordrhein-Westfalen, operated 1991 to 2004 with the charge to improve Christmas tree species important to the region of NRW and the state (especially *Abies nordmanniana*/ and *Picea pungens*/ var./*glauca*/).

The Christmas tree production research in the Horticulture Center in Münster was organized based on a market analysis. The suitability of spruce and fir species, their cultivation, evaluation of their needle holding capacity, genetic characterization of seeds and seedling sources have been under investigation. The conditions for the installation of Christmas tree cultivation with consideration of site factors, soil preparation, planting, the importance of soil fertility and weed control, impact of cultivation cycles, and containerized Christmas production have been examined. The Christmas tree genetics program is progressing toward producing genetically improved planting stock for Christmas tree growers throughout the state. Initial emphasis has been on the establishment of genetic tests for Nordmanns fir and blue spruce. The work goes into breeding of conifers grown as Christmas trees, including breeding methods, the application of breeding results, sexual and vegetative propagation, methods of in-vitro cultivation, and disease resistance. These efforts will help further enhance Christmas tree production in Germany. Substantial space has been granted to the effect and determination of the inner quality of the trees. Besides the influential importance of shape of the dominant shoot and corrective pruning that have been proven necessary, the enhancement of vitality and the natural defense ability of conifers is covered. In addition to addressing the effects of damaging substances on plant metabolism and the formation of the meristem, the cellular influence of electromagnetic discharges and the inner quality of trees have been considered. In order to investigate this problem, some trees were selected after variable growth to compare the parameters of biophotonics with the results of conventional needle holding capacity. In order to show evidence of damage of needles long before their visual identification, the usefulness of bioluminescence analysis has been investigated.

It turned out that the natural and artificially induced ageing process can be assessed quantitatively in terms of measured parameters of biophotonic analysis in a non-invasive way. Some of the parameters correlate with measured values of chlorophyll fluorescence (CF), including connections to the preservation. CF-analysis of needles provides basic information on the function of the photosynthetic apparatus. In this connection, the influence of herbicides on the imbalance of some conifer phytohormones was examined. A brief summary of the results appear in this newsletter.



**Professor Dr. Jürgen Matsche**, now retired, long served as leader of research at the Westfalen-Lippe Horticulture Center, Germany. He has authored several books on Christmas tree and conifer nursery production.

## *Real vs. Artificial Trees*

*A summary of a recent lifecycle assessment study*

*Prepared by John Frampton  
North Carolina State University*

In the United States, one of the greatest threats to the Christmas tree industry is the use of artificial trees. More U.S. households display artificial trees than real trees and surveys indicate that most of the public thinks that using artificial trees is better for the environment than using real trees. In recent years, the National Christmas Tree Association along with state and local associations has aggressively delivered information to the public about the environmental benefits of real trees. Public discussions about this issue on the internet and other media have steadily grown during the last few Christmas holiday seasons.

In 2008, a new “American Christmas Tree Association” web site appeared ([www.christmastreeassociation.org](http://www.christmastreeassociation.org)). The information on this site touts the benefits of artificial Christmas trees. Among other claims, it states that an in-depth analysis of both real and artificial Christmas tree from “cradle to grave” over a 10-year period demonstrated that an artificial tree had a smaller carbon footprint than a real tree. Requests for more details about this study were turned down.

In February 2009, Ellipsos, a Canadian consulting firm, released a copy of “Comparative Life Cycle Assessment (LCA) of Artificial vs. Natural Christmas Tree”. This detailed analysis compares buying an artificial tree manufactured in China and purchased in Montreal with buying a real tree in Montreal that had been grown on a farm 150 km south of Montreal.

Four damage categories are compared: human health, ecosystem quality, climate change, and resource depletion. The report concludes that the real tree option is better than the artificial tree especially related to impacts on climate change and resource depletion and suggested that the artificial tree must be used longer than 20 years to have less environmental impact than the real tree. However, with respect to CO<sub>2</sub> emissions over the entire life cycle, both the real tree (3.1kg CO<sub>2</sub>/yr) and the artificial tree (8.1 kg CO<sub>2</sub>/yr) options were negligible compared to driving an average car (150 CO<sub>2</sub>g/km). Carpooling or biking to work for 1-3 weeks per year would offset carbon emissions from either type of Christmas tree.

Varying the assumptions in the model could result in better or worse results for the real tree option. The impact of these assumptions should be investigated for different Christmas tree production regions. The report suggests that real tree growers need to work toward further reducing their human health and ecosystem quality impacts and particularly their impacts from transportation.

While there’s little doubt that the choice of real versus artificial Christmas trees will continue to be vehemently debated, hopefully, this scientific assessment will steer environmentally conscious consumers toward the real tree choice.

The complete 91-page assessment can be found at:

[www.ellipsos.ca/site\\_files/File/Christmas%20Tree%20LCA%20-%20ellipsos.pdf](http://www.ellipsos.ca/site_files/File/Christmas%20Tree%20LCA%20-%20ellipsos.pdf)

--- John Frampton ---

## *Phytohormones imbalance - A cause for bud drying in Forest and Christmas Trees*

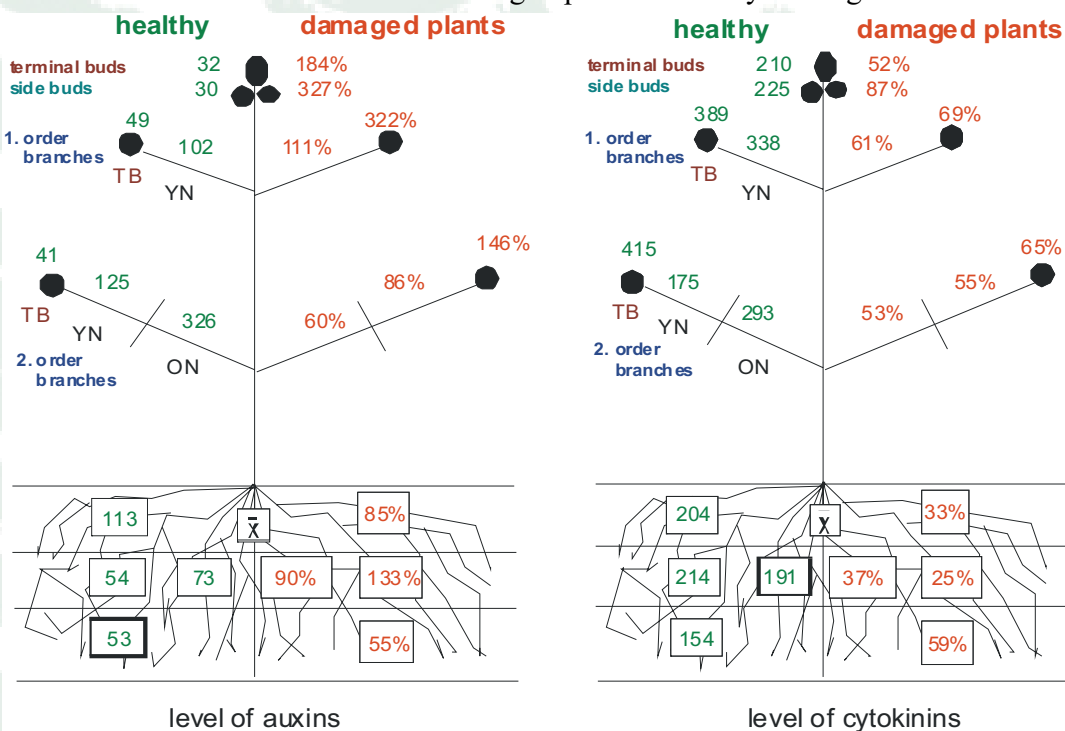
Jürgen MATSCHKE: Center of Horticulture, Agricultur Chamber Nordrhein-Westfalen, 48167 Münster; Kindermannstrasse 38, 15377 Waldsieversdorf, Germany. Contact: juergenmatschke@t-online.de

The main processes occurring during forest decline are loss of vitality, deformation of buds and increased dying off of the apical buds, both in many coniferous and in broadleaved trees. The primary cause of forest decline is usually seen in the deterioration of the photosynthetic apparatus, i.e. primarily in degradation of chlorophyll and consequently hampered photosynthetic performance also in root damage. Another cause of the loss of vitality, bud deformation and increased dying of the tips of many trees could be the imbalance between the levels of auxin (indole-3-acetic acid, IAA) and cytokinins which was recently described in *Picea pungens* var. *glauca*. The balance between auxin and cytokinins is considered to be very important for most morphogenetic events. In the apical parts of 10-year-old trees treated with herbicides an increased level of IAA and decreased contents of cytokinins were observed. Cytokinins accumulated in the middle part of the trees, being probably responsible for the outgrowth of the lateral branches in this region. This hormonal imbalance can lead to strong damages of the meristematic bud tissue in affected trees.

To study further changes in hormone levels after herbicide application, we proceeded in our experiments, this time with young trees in a model experiment including in addition to healthy and treated plants so called "recovered plants", i. e., plants which were treated at the same time not only with herbicides but also with substances relieving the damage evoked by herbicides.

The study showed that herbicides treatments delay the outgrowth of buds and concomitantly dying of the buds, going from apex to base. The total level of IAA in damaged plants was only 7% higher than that of healthy plants, but large differences were observed in the IAA levels in individual plant organs. Total cytokinin level was significantly reduced in damaged trees - to a different extent in various parts of the plants. In healthy plants, the ratio CK/IAA was very high in apical buds, medium in roots and low in needles.

For more info information on this study, contact Pr. Matschke



## *International Co-operation on Current Season Needle Necrosis (CSNN)*

**Venche Talgø<sup>1</sup>, Iben M. Thomser<sup>2</sup>, Gary Chastagner<sup>3</sup>, Thomas Cech<sup>4</sup>, Kurt Lange<sup>5</sup>, Bernhard Perny<sup>4</sup>,  
Kathy Riley<sup>3</sup>, Benjamin Louis<sup>1</sup>, Andrew Dobsen<sup>1</sup>, Sonja S. Klemsdal<sup>1</sup>, and Arne Stensvand<sup>1</sup>**

<sup>1</sup> Norwegian Institute for Agricultural and Environmental Research, Plant Health and Plant Protection Division, Høgskoleveien 7, 1432 Ås, Norway

<sup>2</sup> University of Copenhagen, Forest and Landscape Denmark, Hørsholm Kongevej 11, DK-2970 Hørsholm, Denmark

<sup>3</sup> Washington State University, Puyallup Research and Extension Center, 7612 Pioneer Way E., Puyallup, WA 98371-4998, USA

<sup>4</sup> Federal Research and Training Centre for Forests, Natural Hazards and Landscape, Department of Forest Protection, Seckendorff-Gudent-Weg 8, 1131 Vienna, Austria

<sup>5</sup> Landwirtschaftskammer Schleswig-Holstein, Abt. Pflanzenbau, Pflanzenschutz und Landtechnik, Thiensen 22, 25373 Ellerhoop, Germany



FOREST & LANDSCAPE



Landwirtschafts-  
kammer  
Schleswig-Holstein

At the 8<sup>th</sup> International Christmas Tree Research & Extension Conference (CTRE) and at the Langesø Christmas tree fair in Denmark in 2007, current season needle necrosis (CSNN) was the subject of three posters. A poster from USA (Chastagner *et al.* 2008) and a poster from Denmark (Thomsen 2008) focused on the problem as a disorder related to weather and genetic disposition, whereas a poster from Norway (Talgø *et al.* 2008a) promoted the needle fungus *Kabatina abietis* as the causal agent.

As an attempt to settle the matter of the uncertain etiology of CSNN, an international research group with representatives from Austria, Denmark, Germany, Norway and USA was established after the CTRE conference in 2007. Financial support was given by the Production Fee Foundation for Christmas Trees and Greenery (PAF) in Denmark and by all the institutes involved.

Results obtained:

- A fungus resembling *K. abietis* as described by Butin & Pehl (1993) was isolated from fir needles (*Abies* spp.) from all the five countries involved.
- DNA sequencing confirmed that it was the same fungal species that was isolated from all five countries, but the sequences indicated that it was a *Hormonema* sp.
- We are currently investigating if the *Hormonema* sp. and *K. abietis* are identical species. Funk *et al.* (1985) described CSNN-symptoms on Douglas-fir (*Pseudotsuga menziesii*) and grand fir (*A. grandis*) caused by *Hormonema merioides*.
- Pathogenicity of *K. abietis* was proved on both Nordmann fir (*Abies nordmanniana*) seedlings and transplants.
- In 2008, copper fungicide field trials against CSNN were carried out in all the five countries, but no significant effect of the treatments was found.
- Laboratory fungicide trials in the winter 2008/2009 indicated that copper fungicides are not very effective against mycelium growth and spore germination of *K. abietis*.

*K. abietis* was isolated from Nordmann fir seeds in February 2009.

In the 2009 growing season, we will perform field trials with fungicides that suppressed spore germination and mycelium growth of *K. abietis* in laboratory tests.

Preliminary results were presented in a poster at the International Congress of Plant Pathology (ICPP) in Italy in August 2008 (Talgø *et al.* 2008b), and in a journal for Danish and Norwegian growers (Talgø *et al.* 2008c, Talgø *et al.* 2009a, Talgø *et al.* 2009b). We will present some results at the 9<sup>th</sup> CTRE conference in Oregon later this year.

For more information on this study, contact Venche Talgo at: [venche.talgo@bioforsk.no](mailto:venche.talgo@bioforsk.no).

## Upcoming Meetings

**January 24, 2009.** Eastern North Carolina Christmas Tree Growers Association Winter Meeting – Sanford, NC

**February 11-12, 2009.** Christmas Tree Management Short Course, Ramada Conference Center, State College, PA

**February 24-25, 2009.** CT Plus Meeting, National Christmas Tree Association, Las Vegas, NV

**March 5-6, 2009.** Southern Appalachian Forest Entomologist/Pathologist Seminar – Crossnore, NC

**March 6-7, 2009.** MCTA Winter Meeting, Comfort Inn, Mt. Pleasant,

**March 6-7, 2009.** North Carolina Christmas Tree Association Winter Meeting – Boone, NC

**May 14-15, 2009.** Ecology and Management of High-elevation Forests in the Central and Southern Appalachians – Slatyfork, WV

**August 7-8, 2009** Michigan Christmas Tree Association Summer Meeting, Peacock Rd. Tree Farm, Laingsburg, MI

**August 12-15, 2009.** NCTA Convention & Trade Show, Chattanooga, TN

**September 14-19, 2009.** IUFRO International Christmas Tree Research & Extension Conference – Corvallis, OR & Pullyallup, WA

**September 21-22, 2009.** Growing True Fir in the Great Lakes Region II, Grand Rapids, MI

**September 25-26 2009.** Celebration of North Carolina Christmas Tree Association's 50<sup>th</sup> Anniversary – Boone, NC

## Announcements

### New Colleague in Nova Scotia

**By Ross H. Pentz,  
Christmas Tree Specialist, Nova Scotia**

We have a new team member to add to the International Christmas Tree Research Group. Dr. Raj Lada of the Nova Scotia Agricultural College is the newly established leader for Christmas tree research in Atlantic Canada. Dr. Lada is conducting needle retention research on balsam fir and assisting with our Tree Improvement Program as well.

Please welcome him to the team and wish him well in his new responsibilities.

His contact info is as follows:

**Dr. Raj Lada**

**Dept. of Plant and Animal Sciences**

**Nova Scotia Agricultural College**

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## On the Web

Please visit our Christmas Tree Working Unit's web site under the main IUFRO web site, [www.iufro.org](http://www.iufro.org). To find it, browse to Divisions => Division 2 => Unit 2.02.09 – Christmas Trees. We would like your input into how to best utilize this site. Also, we are seeking more items to include in the 'Links to other information resources' section. Please send any input or links to our unit coordinator, John Frampton ([john\\_frampton@ncsu.edu](mailto:john_frampton@ncsu.edu)).