ROOTS & SHOOTS

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University of Idaho
Center for Forest Nursery and Seedling Research

Letter from the director

As we work our way into what seems to be a snow-filled 2008, I wanted to touch base with you again. 2007 was a busy year for me and one that has left me excited for what lies ahead. Since arriving last May, I have had the chance to establish research trials, visit many area nurseries, develop and teach a course in forest regeneration, host the 28th Intermountain Container Seedling Growers' Association Meeting and bring three new graduate students into the fold at the University of Idaho Center for Forest Nursery and Seedling Research. Within this issue of the newsletter, you will see the results of some of this activity.

To recap, this newsletter will be published twice per year, once in the summer and once in the winter. It is intended to provide you with a simple overview of the current activities at the center. It is meant to be informative, concise and fun. Since the best way to ensure that it reaches these goals is through feedback from the readers, please continue to let me know what you would like to see.

This semester, I am teaching a core course in one of my favorite subjects, forest regeneration (see Focus on Education, page 4). This course is filled to the gills with 42 students who are learning traditional and modern theories and practices through lectures and labs. Lab activities include field trips and what I

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And the winner is…

Our very own Annette Brusven!

We received 19 submissions of potential new names for this newsletter. The winning name (Roots and Shoots), selected by a secret ballot vote at our holiday pizza lunch, was provided by our very own Seedling Sales and Extension Associate, Annette Brusven. The runner-up was Pitkin Progress, submitted by Kathy Hutton of Plants of the Wild. Thank you all for your creative entries.

So, to give all of you who wanted a t-shirt another shot, we are going to have another contest. This time around, we are searching for a creative new way to share our name. We need something simple (like a bookmark or pencil) but that stands out from other handouts. The item should appeal to many different types of individuals, from grade school students to teachers to nursery growers, and be something that is kept for a long time. Nursery staff will vote on the suggestions, and the person with the winning entry will receive a Pitkin Forest Nursery t-shirt (modeled in the photo below by Anthony, Sue, Annette and Don).

To submit your entry, please contact Anthony S. Davis (asdavis@uidaho.edu; 208.885.7211).❖

Anthony, Sue, Annette and Don wearing Pitkin Forest Nursery t-shirts.

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hope will become an annual tradition, a seedling growing competition at the Pitkin Forest Nursery. As I have mentioned to some of you, courses in nursery management and seedling quality assessment are in the works.

Much of our ongoing research is conducted by graduate students (see New Faces, page 3). **Kayla Traver** is investigating artificial regeneration of sagebrush, and **Nathan Robertson** is looking at the effects of the herbicide sulfometuron methyl, commonly used for site preparation, on crop tree seedling development. **Rob Keefe** is working on seedling development/establishment models for use in forest regeneration. Look forward to learning more about their research in upcoming issues of this newsletter.

At the Intermountain Container Seedling Growers' Association meeting held in Moscow, ID last fall, we had a number of great discussions. One focused on current needs in nursery research. **Marla Schwartz** (Northwoods Nursery) brought up the subject of environmental footprints, and a long discussion developed focusing largely on appropriate disposal of seedling containers. **Gabriela Buamscha** (USDA Forest Service) has taken the lead in identifying what options exist for containers that have passed their prime. We will keep you updated on what stems from this. Discussions also revolved around alternative growing media (Bill Sayward, Itasca Greenhouse), a topic that will be addressed at the 2008 Western Forest and Conservation Nursery Association meeting in Missoula, Mont. Additionally, alternative fertilization protocols and nutrition guidelines for native plants, chemical applications, and cold hardiness/storage issues were covered and will be kept active with the hope to address as many as possible.

Discussion on current needs in nursery education identified a broad concern over the availability of well-trained individuals for future openings, resulting in some ideas to improve recruitment. A proposed minor to accompany the forest resources degree at the University of Idaho was discussed as well.. We will keep you posted on these topics and hope you will continue to share your ideas with us.

Keep growing,

Anthony S. Davis, Ph.D.

Research summary

Justin Schmal and Phil Woolery, 2007 summer interns, presented posters at the Society of American Foresters National Convention in Portland, Ore. Justin presented interim results of ongoing research being conducted by Anthony S. Davis and R. Kasten Dumroese. Don Regan recently shared the two-year results of a stocktype trial at the joint meeting of the Western Forest and Conservation Nursery and the British Columbia Nursery Associations in Sidney, BC. Summaries are follow. Although western larch has been grown in container nurseries for a long time, seedlings usually surpass target morphological specifications midway through the growing season, and the imbalance of root to shoot ratio can undermine the outplanting success of western larch. **Justin** presented how manipulation of common nursery cultural practices such as date of sowing and nutritional regimes can affect seedling growth and development. Later sowing date and reduced nutrition rate decreased seedling growth and may allow for meeting target specifications, while target height was achieved quickly with early sowing and high nutrition rate. These cultural practice manipulations had little effect on net photosynthetic assimilation and intrinsic water use efficiency. This information is meant to inform seedling growers and users of options that will help develop a growing regime for western larch that will ensure that target seedling specifications are met so that the outplanting success of western larch may be improved. **Phil** discussed the effect of dehydration on three-month old American chestnut seedlings, which was studied by measuring the chlorophyll fluorescence (F_v/F_m) of seedlings grown under four different irrigation regimes during a period of four days. Irrigation was withheld for 0, 24, 48 or 72 hours for each treatment and F_v/F_m measurements were taken after each irrigation. A multivariate analysis indicated that differences in F_v/F_m among the different treatments occurred only after the third day of the experiment when the plugs dried down to 30% of their saturated weights. After the treatments reached the 30% dry down point, F_v/F_m values dropped dramatically. The drop in F_v/F_m indicates that chlorophyll fluorescence does not have enough resolution to be a useful tool as a dehydration stress indicator but does highlight the short-term resilience of photosystem II in American chestnut seedlings. **Don** found that western white pine seedlings grown in larger containers (130 mL cavities) grew more in height and root-collar diameter than seedlings grown in smaller containers (80 mL cavities) after two growing seasons, in addition to being larger initially. Copper treatment had no lasting effect on seedling growth after two growing seasons, despite some initial differences in seedling height at outplanting.❖

Calendar of Events

Inland Empire Reforestation Council Annual Meeting

Coeur d'Alene, Idaho

26 February 2008

This year's theme is 'Tackling Difficult Reforestation Situations: New Strategies for New Challenges.' Anthony will discuss "What's New at the Center for Forest Nursery and Seedling Research."

35th Annual Meeting of the Inland Empire Tree Improvement Cooperative

Coeur d'Alene, Idaho

27 February 2008

The 2008 meeting, titled "Future Stock," is a play on the 1970 book *Future Shock*, which dealt with the idea that very rapid changes, fueled by changes in technology, would overwhelm our society. The presentations at this year's meeting will address how that concept relates to our profession. Anthony will give a talk entitled "Past, Present, Future: The University of Idaho Center for Forest Nursery and Seedling Research."

Western Forest and Conservation Nursery Association Meeting

Missoula, Mont.

24-25 June 2008

This meeting will focus on energy efficiency and alternative energy for nurseries, along with additional topics related to nursery production. Expect to see a strong representation of Center for Forest Nursery and Seedling Research graduate students!

Society of American Foresters National Convention

Reno, Nev.

5-9 November 2008

As always, the SAF convention is a great opportunity to share research results and interact with other professionals in our field. The theme this year is "Forestry in a climate of change" – a timely topic indeed.

New faces

Three graduate students joined the Center for Forest Nursery and Seedling Research in 2007. **Kayla Traver** comes to us with an undergraduate degree in natural resources from Oregon State University. She is now pursuing her Master of Science degree looking at container production of sagebrush seedlings. **Nathan Robertson**, who holds an undergraduate degree in organismal, ecological, and environmental biology from Montana State University, is also working towards his Master of Science degree, investigating the effects of sulfometuron methyl on conifer seedling development. **Rob Keefe,** who has a Bachelor's degree in forest science from University of New Hampshire and a Master of Science from the University of Idaho (forest biometrics) joins us to pursue a Ph.D. in forest regeneration. It is exciting having them as part of our team and helping to address our research needs. ❖

Rob (foreground) and Nathan conducting western larch seedling gas exchange measurements in September 2007.

Kayla cleaning media from seedling roots prior to drying.

Focus on: Education

As part of the Bachelor of Science in forest resources at the University of Idaho, a core course in forest regeneration is now a component of the curriculum. As a course about early stand silviculture, it focuses on artificial and natural regeneration and is designed to have its students achieve seven goals:

1. Learn the technical methodology of silvicultural practices pertaining to forest regeneration
2. Develop an understanding of how ecological concepts and principles relate to the manipulation of forest stands in silvicultural practice
3. Gain an overview of the procedures used to analyze and describe forest ecosystems in order to meet forest management objectives
4. Gain insight and experience in the prescription of silvicultural practices for the accomplishment of varied management objectives
5. Gain field experience in selected silvicultural practices
6. Develop an ability to effectively communicate silvicultural concepts, theories, and applications using correct technical terminology
7. Become an effective steward of our natural resources

Students are evaluated through written assignments, oral presentations, quizzes and tests on lecture materials and readings, and through a seedling growing competition. The seedling growing competition is designed to draw together knowledge of plant growth and development as well as management objectives. In our summer issue, we will update you with the outcome, so stay tuned.❖

Students in *Forest Regeneration* on the first day of the seedling growing competition.

New to the Native Plant Network…

The transfer of the Native Plant Network propagation protocol database (http://nativeplants.for.uidaho.edu/network/) to the University of Idaho Center for Forest Nursery and Seedling Research was completed January 1, 2008. We look forward to receiving your input and working with Kas Dumroese (USDA Forest Service). He has maintained the database since 2001. This valuable resource currently hosts more than 2500 protocols. The Native Plant Network is devoted to the sharing of information on how to propagate native plants of North America (Canada, Mexico, and US). For your information, the 10 most recent additions to this valuable resource are:

- *Eleocharis palustris*
- *Juncus acuminatus*
- *Lobelia siphilitica*
- *Carex grisea*
- *Aralia racemosa*
- *Liatris spicata*
- *Coreopsis pubescens*
- *Chrysopsis mariana*
- *Aster linarifolius*
- *Andropogon gerardii*

Be sure to upload your contributions, as this database is a tremendous wealth of shared knowledge. We are in the process of documenting and uploading all of the protocols currently used in production at the Franklin H. Pitkin Forest Nursery. For more information, visit the website or contact the Center for Forest Nursery and Seedling Research (http://seedlings.uidaho.com; ph: 208.885.3888).❖

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