

Center for Applied Nursery Research Projects Funded for 2009

Comparison of Above-ground Pot in Pot System and Traditional Pad System in Conifer Production

The number of conifer genera/species that can be grown by southeastern growers has been limited in the past due to many factors including:

- The paradigm that many conifers cannot be produced or used in landscapes of the southeast due to heat.
- The high rate of blow over discourages many growers from producing conifers.
- A lack of trial data indicating what species/genera perform well in the southeast.

This study aims to take advantage of previous trial data conducted by Dr. John Ruter (UGA-Tifton Campus) and Tom Cox (Cox Gardens, Canton, GA) and breeding efforts by Dr. Ruter that strongly suggest many conifer genera/species can be grown in southeastern landscapes. Because heat tolerance is the most apparent hindrance to conifer production in the southeast, this study aims to utilize a low cost method to reduce pot soil temperatures in summer months and moderate soil temperatures in winter months; the above ground pot-in-pot system. It will also investigate the effect on plant health, plant growth and reduction in blow-over incidence when using this production system. Additionally, this study will look at differences in the aforementioned variables when utilizing the above-ground production system in full sun versus shade-house environments.

*Mathew Chappell
University of Georgia*

Investigating the Disinfestation Properties of Irrigation Water in Commercial Nurseries

Several methods for disinfecting water containing plant pathogens have been investigated, including filtration, heat, ozone, ultra-violet irradiation, nonionic surfactants, and fungicides. Some methods, such as ozone and UV, may be prohibitively expensive for smaller nursery operations. Chlorinating water by adding sodium hypochlorite, calcium hypochlorite, chlorine gas or chlorine dioxide is an economical method for managing water-dispersed plant pathogens, including *Phytophthora* and *pythium*. A number of chlorine test kits on the market are used to measure free (available chlorine (ppm)), but none can differentiate between 'hypochlorous acid' and 'hypochlorite ions', both considered in the available form, in water. However, only hypochlorous acid is actively sanitizing the water. The oxidation reduction potential (ORP) is an alternative measure for expressing the sanitizing ability of a chlorine solution, and has recently been adopted by postharvest vegetable processing operations due to food contamination issues.

Measurement of ORP, rather than total chlorine content, is a simpler and more accurate measure of the disinfestation potential of a solution. I would like to demonstrate the utility of this relatively new and inexpensive technology used to optimize the sanitizing properties of chlorinated water systems. I plan to attain this goal by:

- Conducting a survey to collect irrigation samples from commercial nurseries in western, central and eastern districts of North Carolina
- Measuring pH, ORP, turbidity and total chlorine content of water samples, as well as assaying samples for water-dispersed plant pathogens

Correlating pH, ORP and turbidity readings with the presence of water-dispersed plant pathogens and compare those findings with the current industry standard assay used for chlorine (ppm chlorine).

Kelly Ivors
North Carolina State University

Identifying Non-invasive Cultivars for the Green Industry

The annual cost of invasive plants to the U.S. has been estimated at more than \$34 billion (Pimentel et al., 2005). An estimated 85% of woody plants now considered invasive were originally introduced for landscape purposes (Bell et al., 2003). The establishment of the National Invasive Species Council (1999) and its release of the National Invasive Species Management Plan (NISC, 2001) have major implication on the ability of the green industry to produce some current plants and introduce new plants. However, cultivars of species may have characteristics making them less invasive (Wood, 2007). One strategy of the nursery industry is to identify and promote non-invasive cultivars of plants otherwise considered invasive. Previous research has found and identified non-invasive cultivars of otherwise invasive species (i.e. *Nandina domestica* 'Firepower' and *Ruellia tweediana* 'Purple Showers').

The overall objective of the current proposal is to characterize the potential invasive impact (growth rate, flowering period, seed production, germination requirements) of cultivars of *Ligustrum japonicum*, *L. lucidum*, *L. sinense*, *Nandina domestica* and *Strachytarpheta* species as compared to the "wild type" of each species.

Gary Knox
University of Florida

New Perennial Peanut Selections for Southern Landscapes

Perennial peanut (*archais glabrata*) is becoming widely known and appreciated by the Green Industry as a low maintenance groundcover. Perennial peanut seems perfectly suited for today's low input, sustainable, environmentally friendly landscapes. It is drought tolerant, grows well on low-fertility soils, and is relatively free from disease or insect pest problems. Moreover, as a nitrogen-fixing legume, it has low fertilizer needs. However, the market for perennial peanut would increase dramatically if better ornamental selections were available. Most current selections of perennial peanut have not been selected for ornamental attributes or cold tolerance.

Objectives are to:

- Develop nursery production protocols
- Evaluate perennial peanut for landscape characteristics such as tolerance to drought, shade and cold; resistance to foot traffic, aesthetics; and management needs (planting/installation, fertilizer, weed control, mowing (for use as a lawn))

Gary Knox
University of Florida

Evaluation of Elite Selections from UGA Blueberry Breeding Program as Edible Landscape Plants

Most of the current blueberry varieties developed are aimed at commercial blueberry producers, and are not necessarily suited to the home gardener. The commercial cultivars are often bred for large acreage plantations, long distance shipping and rapid ripening, all traits that have limited value for the home consumer. Many blueberry selections generated by the UGA Blueberry Breeding have considerable ornamental appeal such as attractive spring flowers, multi-colored fruit and considerable fall coloring of leaves. These traits are of no value for large commercial blueberry growers, but would be very appealing

to homeowners for edible landscape plants. Therefore, the objective of this project is to evaluate elite selections of blueberries from the UGA Blueberry Breeding Program for their unique ornamental value, specifically with the home gardener and landscape industry in mind.

Scott NeSmith
University of Georgia

Evaluation of Actino Iron Incorporation in Container Production

John Ruter
University of Georgia

Developing Sterile Plants for the Nursery Industry

John Ruter
University of Georgia

Investigation of the Possible Causes of Distorted Growth Seen in *Itea virginica*

John Ruter
University of Georgia

Vegetative Propagation of Southern Ecotypes of *Kalmia latifolia* (Mountain Laurel) and *K. hirsute* (Sandhill Laurel)

Current work by this PI is attempting to determine if southern selections (ecotypes) of our native *Kalmia latifolia* (mountain laurel) may be more suitable for use in southern landscapes than northern ecotypes of *K. latifolia*. In addition to southern mountain laurel selections, *Kalmia hirsute* (sandhill laurel) also shows potential for use in southern landscapes based on its native range (Mississippi, Alabama and Georgia). The challenge in this research has been to find sufficient numbers of these plants from growers for evaluation, a limitation based on difficulty or lack of recommendations for their vegetative propagation. While vegetative propagation (primarily tissue culture) protocols are well-developed for many northern selections and popular cultivars of *K. latifolia*, propagation southern *K. latifolia* selections and *K. hirsuta* remains challenging. Tissue cultured liners of southern selections are not readily available from some of the larger tissue culture operations. Several northern cultivars have been used to evaluate stem cutting propagation procedures (6,7), however growers of southern selections and cultivars report a need for more successful vegetative propagation recommendations for southern taxa. At the most recent CANR open house, several participants expressed an interest in and a need for propagation protocols for southern taxa, and additional personal communications with growers of these selections confirm this. Therefore, the objective of the proposed research is to determine requirements for hormone application, rooting substrate type, and time of stem cutting collection for the vegetative propagation of southern *Kalmia* selections.

Amy Wright
Auburn University

Projects Continuing from 2008:

Evaluating *Miscanthus* Cultivars in Georgia for Invasiveness

Matthew Chappell and Gary Wade, University of Georgia

Evaluation of Cold Hardiness of Selected Tropical Plants

Bodie Pennisi, University of Georgia

Evaluating Selections of *Kalmia latifolia* (Mountain laurel) for Use in Sustainable Southern Landscapes

Amy Wright, Auburn University