

Annual report to
FLORICULTURE NURSERY RESEARCH INITIATIVE
and
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
for the period of
OCTOBER 2010 TO SEPTEMBER 2011

PROJECT

Evaluation of locally available resources for use as alternative soil-less substrates in container-grown plant production for the Upper Midwest region of the United States.

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SYNOPSIS

Situation: Pine bark is the primary component in container substrates used by Ohio and other Upper Midwest growers. Pine bark is typically imported from southern states such as Louisiana, Georgia, and North Carolina. Availability of pine bark has decreased over the past 5 to 10 years and continues to decrease as its bioenergy value increases. Coupled with this decrease in availability is an increase in price and transportation costs from distant southern states. While Upper Midwest states lack a forestry industry to supply bark and other wood materials, they have large acreage of farmland that can generate other biomass materials. The goal of our project was to determine if biomass/bioenergy crops grown in Upper Midwest states could be harvested and processed into a suitable substrate.

Program Effort: This year's research was slowed temporarily as our unit was recovering from total loss of facilities after a tornado destroyed our building. Despite the setback, we made very good progress on understanding nitrogen (N) dynamics in switchgrass substrates, how substrate physical properties change over time, and further evaluated the potential of wheat straw as a pine

bark alternative. This year's research also started to evaluate biochar as a potential high-value amendment to traditional and alternative substrates.

Results and Impacts: Collaborators at North Branch Nursery are evaluating switchgrass, wheat straw, and pine wood substrates. Their year-long assessment of the straw based substrates are very high, however, sourcing these materials economically has been challenging. Pine wood substrates, sourced from Ohio forests, are being evaluated at Willoway Nursery, Acorn Farms, and North Branch Nursery. These crops are growing as well as plants in traditional pine bark based substrates, however, our collaborators at Buckeye Resources (a substrate and potting mix company) were not able to secure and generate the pine wood substrate at a price point lower than pine bark. Similar to the straw materials, these alternative wood substrates have been demonstrated horticulturally viable, but economically non-viable.

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PUBLICATIONS

Altland, J.E. and C.R. Krause. 2009. Use of Switchgrass as a Nursery Container Substrate. *HortScience* 44:1861-1865.

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Locke, J.C. and J.E. Altland. 2011. Use of ground wheat straw in container nursery substrates to overwinter daylily divisions. *J. Environ. Hort.* (Submitted 9/29/2011).

GRANTS AWARDED

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Owen, Jr., J.S., J.E. Altland, and H.M Stoven. 2011. Integrating selected alternative substrates for woody ornamental container production: From substrate properties to cultural management. Oregon Department of Agriculture - \$26,932.