



United States Department of Agriculture
National Institute of Food and Agriculture

Revitalizing Nursery Production and Small Farms in the Northeast: An Integrated Study.

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*Revitalizing Nursery Production and Small Farms in the Northeast:
An Integrated Study.*





Research Goals

- Assess the potential of alternative systems, *B&B, PiP and IGFC*, to enhance profitability of nursery production in northeast.
- Assess the potential of alternative systems to enhance long-term productivity and economic value of agricultural land used in nursery production.
- Assess relative risks associated with the alternative systems using stochastic efficiency analysis.
- Assess viability of alternative systems for small and medium sized farms considering diversification.
- Provide education about the systems and research outcomes to end users.



Methods

- Field Trials: Bigelow's Nursery, Sterling MA; Amherst Nursery, Sterling MA; and University of New Hampshire research farm.
- Three treatments: B&B, PiP and IGFC; for two species, white oak and river birch.
- Randomized block design: Blocks of 5 trees randomly assigned to the plots.
- Spacing of blocks consistent with typical nursery practice.
- Drip irrigation for all trees, consistent fertilization and weed control.



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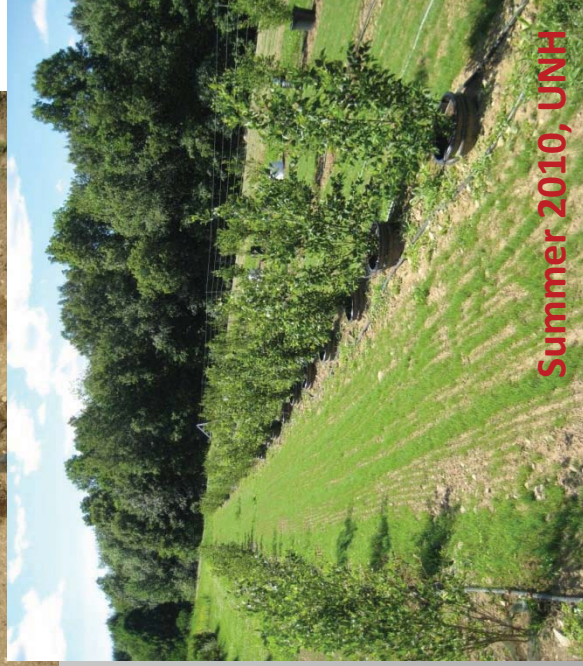
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Planting 2010, Sterling MA



Planting 2010, Amherst, MA



Summer 2010, UNH



Fall 2010, Amherst, MA



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Methods

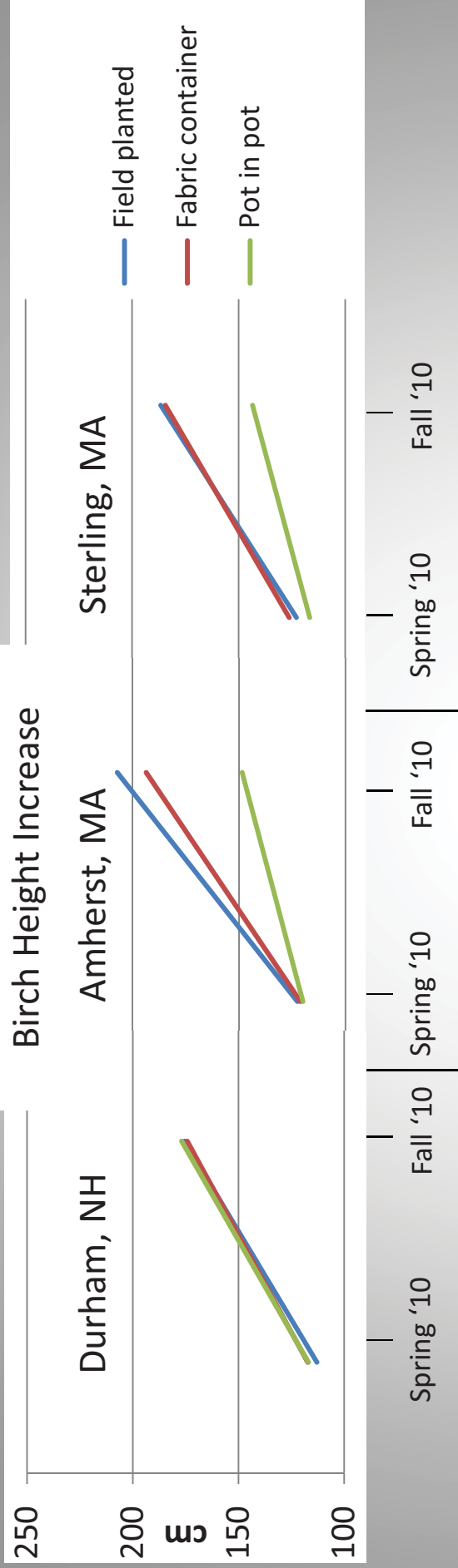
- Determine different costs for each method. (Time and expenses for planting trees, fertilizing, weed control, irrigation, staking.)
- Preliminary Analyses: year 1 costs for oaks.
 - ✓ B&B – Planting and first year costs: \$48.45 per tree.
 - ✓ IGFC – Planting and first year costs: \$53.10 per tree.
 - ✓ PiP – Planting and first year costs: \$62.07 per tree.
- No difference in planting times for oak vs birch.
- Irrigation costs – about \$7 per tree, higher for PiP.
- Oak losses up to 50% (root fungus); Birch losses about 10%.



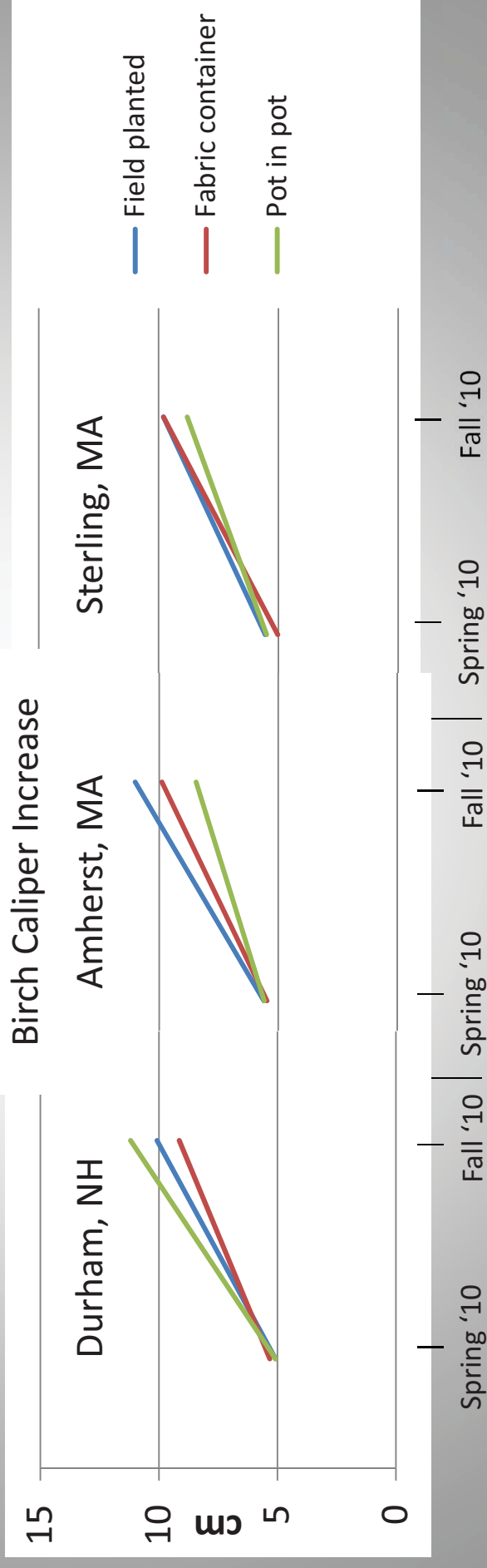
Methods

- Trees measured – caliper and height – twice each year.
- Trees graded – scale of 0 to 5 – with 0 being dead, 4 and 5 are marketable trees.
- Harvest once trees meet the required ANLA standards:
 - Weigh with soil.
 - Remove soil (how much soil?).
 - Weigh and compare roots.
 - Root analysis – circling, diameters, number of roots.
 - Root vs trunk and crown dry weights.

Birch Height Increase



Birch Caliper Increase



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Preliminary Results from Field Day

- October 22 – mid study.
 - ✓ Harvested a few “statistically equivalent” oaks and birches.
 - ✓ Presented to participants in a field day. Trees were presented as they would be for sale at a garden center: wrapped as B&B; in the plastic pot; and in the fabric container tree.
 - ✓ Asked for a choice – suppose you are going to purchase an oak tree. Which of these three trees would you buy?
 - ✓ **46% chose the B&B tree; 27% chose the plastic pot tree; 27% chose the fabric container tree.**

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Preliminary Results from Field Day

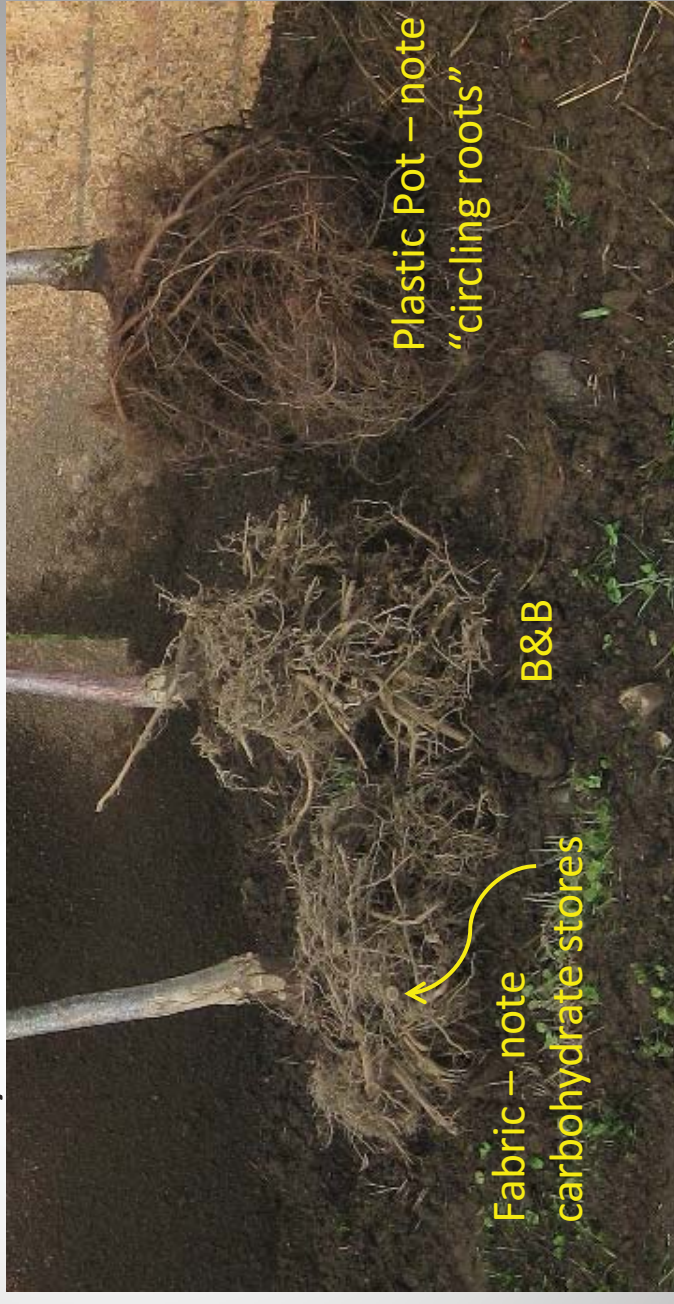
- October 22 – mid study.
 - ✓ Removed soil using an air spade.
 - ✓ Compared root structures.
 - ✓ Three oak trees shown at the right.
 - ✓ Participants asked again, which tree would you choose now (with new information on root structure.)
 - ✓ **76% chose the fabric tree; 19% chose the B&B tree; about 4% chose the plastic pot tree.**





Preliminary Results from Field Day

- October 22 – mid study.
 - ✓ Oak roots in plastic pot – a lot of circling roots.
 - ✓ Fabric container – more fibrous roots with large nodules at the juncture with the bag – carbohydrate stores..





Preliminary Results from Field Day

- October 22 – mid study.
 - ✓ Birches - compare root structures of the fabric and plastic containers.
 - ✓ Fabric – carbohydrate stores; Plastic – many circling roots.



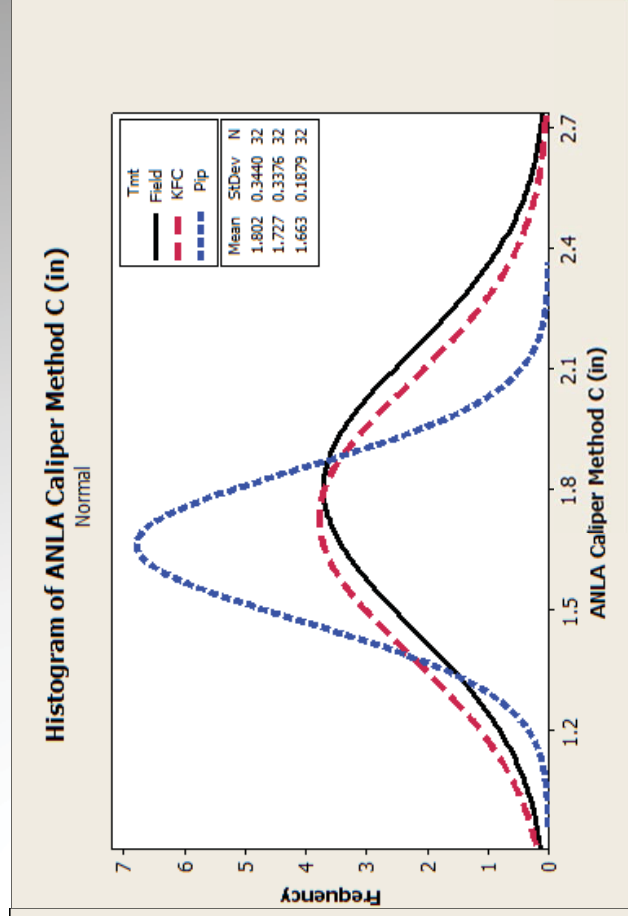
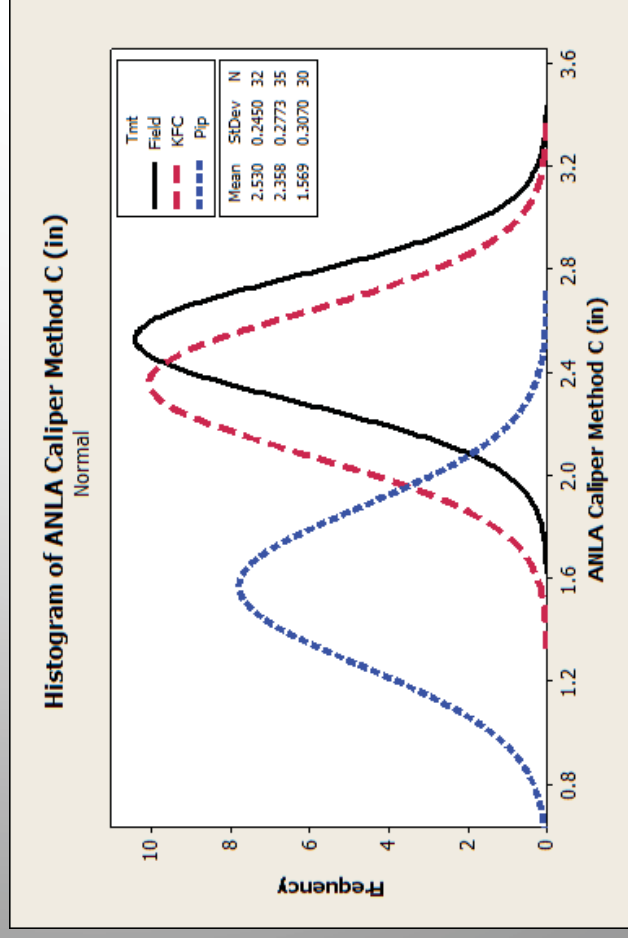


Methods: Stochastic Dominance Analysis

- New technology brings new uncertainty
- Our analysis evaluates efficiency accounting for riskiness
- Profitability counts -- but so does its variability
- Greater profit is desirable and less variable profit is desirable
- Growth data present distribution of output and “value” of trees.
- Profits random due to variation in costs and returns (tree growth and quality).

Preliminary Results

- Fitted distributions for three treatments: PiP, KFC and Field grown.
- Two sites: Amherst and UNH.
- PiP – more management intensive, but with attention to irrigation needs, can reduce variance without significant difference in mean growth.
- Field (B&B) versus Fabric (KFC) – similar in mean and variance.





Assessing Demand – Landscape and Nursery Professionals Survey

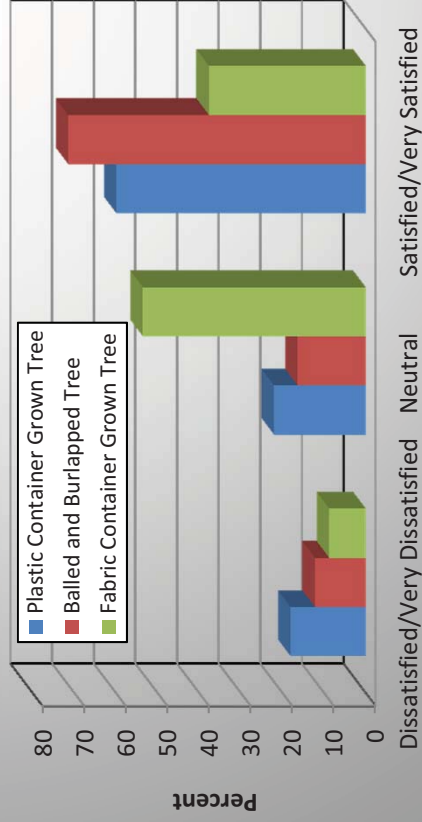
- Pre-test – summer 2010.
- Survey – Spring 2011.
 - ✓ Email survey – list provided by UMass Extension and UNH Extension.
 - ✓ Response rate – about 14 % overall – list included many non-professionals.
 - ✓ 417 respondents had purchased or planted large shrubs and trees.
 - ✓ About 6-7% were growers (supply).
 - ✓ All New England states – 62.5 % from MA, 16.5 % from NH.



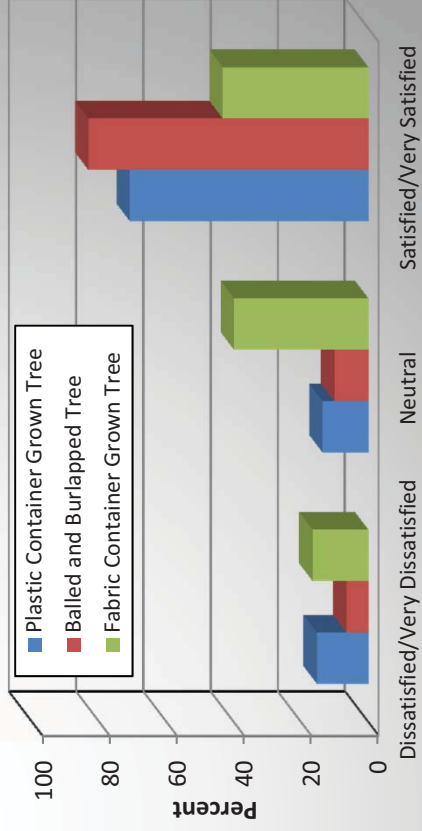
Assessing Demand – Landscape and Nursery Professionals Survey

- Survey – Spring 2011.
- ✓ Over 94% and 97% had purchased trees in plastic pots and B&B.
- ✓ Only 36 % purchased fabric container trees.
- ✓ Most satisfied with B&B and plastic pot trees.

How satisfied were you with the products you purchased/planted?



How likely are you to purchase the following trees in the future?



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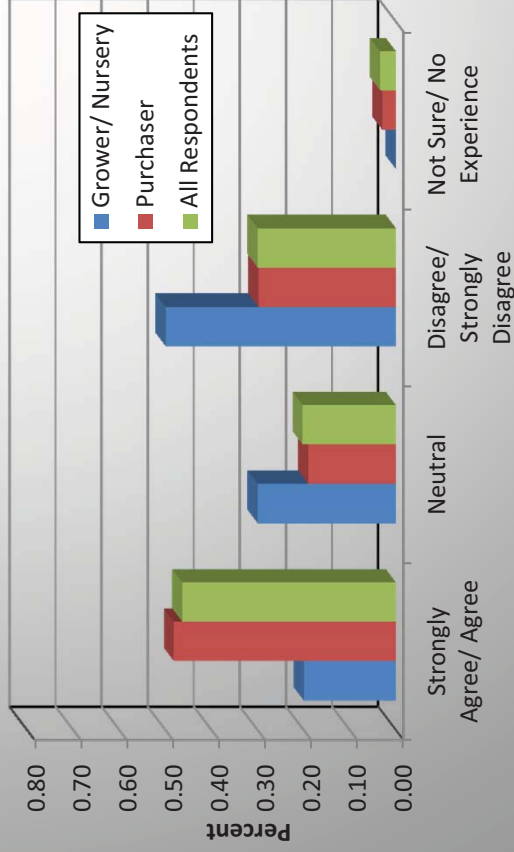




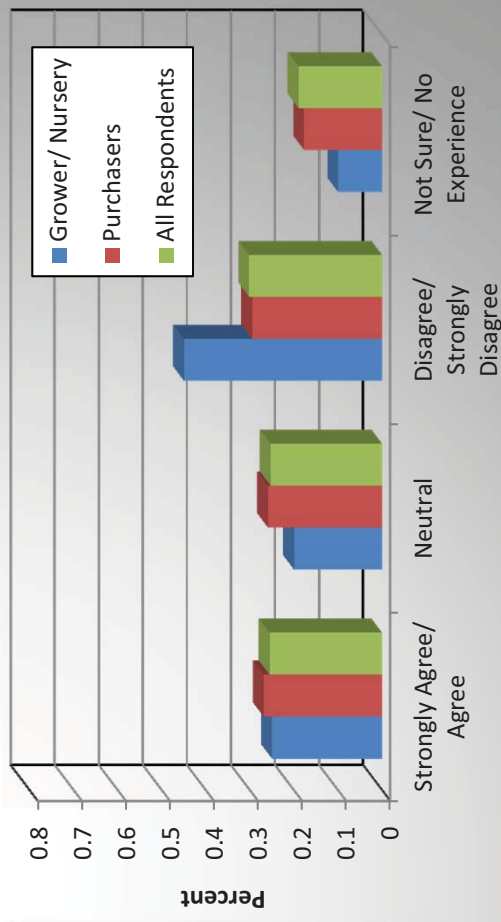
Assessing Demand – Landscape and Nursery Professionals Survey

- Survey – Spring 2011.
- ✓ Contrast attitudes about root structure for “demand” vs “supply.”
- ✓ Significant difference in percent of growers that agree soil removal is a problem vs. purchasers.

Grower & Purchaser Attitudes: B&B trees have better root structure than container grown trees.



Grower & Purchaser Attitudes: Soil removal during B&B production/processing is an environmental concern.



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Summary

- Birch Trials – end this fall/early winter. Harvest and analyze growth, distributions and roots.
 - Oak Trials – one more year of growth before they will meet ANLA standards.
 - Grower Trials – difficult to manage. Provides some insights into “real” potential of these technologies.
 - Clear preference for “locally grown.”
 - Potential benefits to the region.
 - Much yet to be done – harvest/ data collection beginning this fall.
- Grower & Purchaser Attitudes: I prefer to purchase/plant trees grown in New England nurseries.

