

Panel Discussion: Weed Control Practices in Seedbeds of Deciduous Trees and Shrubs in the Indiana Department of Natural Resources Nursery Program

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Abstract: A summary of weed control practices used in seedbeds of deciduous species at Indiana Department of Natural Resources nurseries is presented.

Keywords: bareroot seedlings, fumigation, herbicides, hand weeding

Seedling Production Statistics

During the 2003 and 2004 growing season, seedling production at Indiana Department of Natural Resources (IDNR) nurseries included the following: 6 species of conifers, totaling 942,317 seedlings; 18 species of shrubs, totaling 612,821 seedlings; 29 species of deciduous trees, totaling 4,297,620 seedlings.

Weed Control Practices

Sanitation

Fumigation and herbicides kill a large percentage of weeds or weed seeds, but not 100%. Reducing weed seed levels is critical, as 1% of 10,000 are manageable, but 1% of 1,000,000 may not be manageable.

Weeds from maturing seeds in the seedbeds can be prevented by applying appropriate herbicides and hand weeding. Weeds from maturing seeds in the cover crop rotation can be prevented by the following: (1) sowing corn and sorghum green manure crops at high density; (2) applying herbicides in cover crops; (3) planting Roundup Ready® corn or Concept-treated sorghum; (4) applying Harmony® Extra in small grains; (5) preventing weeds from maturing seeds in areas adjacent to the seedbeds by applying appropriate herbicides to control species that have wind-blown seeds or seeds easily tracked into seedbeds; (6) maintaining dense stands of fescue or other cover crops in waterways and bedends.

Fumigation

Methyl bromide is applied at 300 lb/ac (336 kg/ha) at IDNR nurseries for both disease and weed control.

Use of Herbicides in Seedbeds

Glyphosate and Paraquat—Roundup™ or Gramoxone® is applied as a preemergence herbicide to seedlings in all seedbeds to kill established weeds and the cover crop planted with tree seeds.

Simazine—Princep® Caliper 90® (Special Local Needs Registration) is applied both as a pre- and postemergence herbicide to seedlings with residual activity on many grass and broadleaf weeds. It is applied to all large-seeded 1+0 and 2+0 deciduous species. The herbicide has some postemergence activity on small-emerged weeds of susceptible species.

Prodiamine—Endurance® or Barricade® is applied as a postemergence herbicide to seedlings, with residual activity for many grass and broadleaf weeds. This treatment is applied to all 1+0 and 2+0 deciduous species. They are the only soil active herbicides used on small-seeded deciduous species. These herbicides can suppress the corn cover crop in the following season.

Oxyfluorfen—Goal™ is applied as a postemergence herbicide to 1+0 for 2+0 seedlings. It is applied to 2+0 oaks and hickories before seedlings break dormancy. Goal™ has both pre- and postemergence activity on many, but not all, weeds.

Fluazifop-butyl—Fusilade® is applied as a post-emergence herbicide to all species and age-classes to control grass species.

Fire

Fire can be used prior to seedling emergence. It can be used to remove straw from all straw mulched seedbeds and to kill most established weeds and weed seeds in the straw. It does not completely kill wheat or rye cover crops.

Hand Weeding

Hand weeding is expensive, but is necessary to some degree every year. The Indiana Department of Corrections (IDOC) offenders earn U.S. \$0.90/day. IDNR intermittent laborers earn U.S. \$8.99/hour. Expenditures for hand-weeding in 2003 were approximately U.S. \$0.005/seedling or U.S. \$750/ac (U.S \$1,875/ha).