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Tree Seed Handling, Processing, Testing, and Storage at Hayward State Nursery, Wisconsin Department of Natural Resources

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KEYWORDS

hardwood seeds, conifer seeds, seed collection

The Hayward State Nursery, Wisconsin grows more than 40 species from seeds. Up to 6000 bushels of raw unprocessed tree and shrub seeds are collected each year, and all seeds are collected in Wisconsin or adjacent states. All white spruce (*Picea glauca*) and some white pine seeds (*Pinus strobus*) are collected from orchards containing genetically improved material.

Most seeds are purchased through a state seed purchasing program, which allows collection from almost 1000 citizen collectors statewide. This program has been a very good vehicle for generating public interest and knowledge in forestry.

Fall Hardwoods

Oaks

Acorns are collected as soon after falling as possible, and samples are cut to test for viability. Red oak (*Quercus rubra*) acorns are collected without caps and floated to separate bad acorns from good. White oak (*Quercus alba*) acorns are stored below 4 °C (40 °F) to retard radical growth, or sown as soon as possible.

All acorns are turned every few days in the cooler.

Sugar Maple

Sugar maple (*Acer saccharum*) are dried until wings are brittle, and wings are then removed. Seedlots are run through a crippen to remove trash and hollow seeds, and allowed to dry to 6% moisture content for storage up to 3 years. Seeds per pound are calculated, and a cut test is done to determine good seeds per pound.

Other Hardwoods

Aspen (*Populus* spp.), black cherry (*Prunus serotina*), walnut (*Juglans* spp.), butternut (*Juglans cinerea*), birch (*Betula* spp.), ash (*Fraxinus* spp.), and basswood (*Tilia americana*) are processed as needed for seeding or storage.

Spring Hardwoods

Red Maple

Red maple (*A. rubrum*) seeds are collected and dried until wings are brittle; wings are then removed. Seedlots are run through a crippen to remove trash and hollow seeds. Seeds per pound are calculated, and a cut test is done to determine good seeds per pound. Seeding by machine takes place as soon as possible.

River Birch, Silver Maple

Seeds per pound are calculated for river birch (*Betula nigra*) and silver maple (*A. saccharinum*), and a cut test is done to determine good seeds per

pound. Machine or hand sowing is done as soon as possible.

Fall Conifers

Cones are stored dry, and turned every few days or spread out to prevent heating. Seed extraction begins in late November; only one species is extracted at a time. The cone kiln is run at approximately 59 °C (138 °F). The time in the kiln depends on species and results. Some species need to be re-wetted and rerun to extract most of the seeds.

Seeds and trash from the kiln are thrashed for a predetermined time to remove wings without damaging seeds. (Spent cones are offered for sale to the public following extraction.) A crippen fanning mill is used to separate seeds from trash.

Seeds are dried to 6% moisture content, with a sample taken just before storage for germination testing. Follow-up germination testing is done every other year until the seeds have all been used or seed viability declines.

Seeds are stored in plastic bags in 114-L (30-gal) foil-lined paper barrels at -7 °C (20 °F). All inventory records are updated at the end of the extraction process.