

Use of Painted Hardwood Seedlings in Reforestation

Deb Pitt

Assistant Supervisor, Minnesota State Nursery Program, Manager of General Andrews Nursery, Willow River, MN

Field foresters specializing in reforestation have long known the dilemma of determining the success or failure of a hardwood planting project when conducting the first regeneration survey in the fall following planting. Frequently, the seedlings are difficult to locate among the competing vegetation and are harder yet to distinguish from volunteer seedlings on the site (figure 1). If significant competition exists, locating planted seedlings can also be frustrating for contractors doing timber stand improvement work.

The idea of painting seedlings first took root several years ago when a forester with the Minnesota Department of Natural Resources (MNDNR) suggested painting red oak seedlings at the nursery before delivering them to a site to be underplanted. The seedlings were laid out on cardboard with the roots covered with wet burlap. The stems were then painted blue, using Aero-spot tree paint in an aerosol can, and allowed to dry. This successful attempt at a relatively small project (figure 2) enabled foresters to identify planted seedlings for about a year after planting. The blue paint stood out in sharp contrast to the surrounding vegetation, enabling the forester to see the actual distribution and conduct regeneration surveys that accurately accounted for planted seedlings.

After the first project, interest in this practice grew among MNDNR foresters who plant hardwoods, and demand for painted seedlings increased dramatically. The challenge for nursery staff proved to be the creation of a system that could

apply paint to a large quantity of seedlings in a cost-effective and logistically practical manner. During a 3-year period, personnel at General Andrews State Forest Nursery (Willow River, MN) tried several strategies. Using a panama backpack sprayer to paint oak seedlings in the nursery seedbed was labor intensive and did not easily penetrate the leaf canopy to reach the stem. Another attempt was using aerosol cans of tree paint to treat the hardwoods as they were lifted in the fall. This method was expensive, logistically cumbersome, and very dependent on weather. In another effort, a small number of seedlings were dipped into an oil-based tree-marking paint, but the thick coating hampered bud break in the spring. Using tree-marking paint in a sprayer mounted behind a tractor also proved problematic because the paint needed thinning and an oil-based thinner would have been required; it was assumed that the thinner would be toxic to the seedlings. Finally,



Figure 1. A typical hardwood planting site in southeast Minnesota (Photo source: Doug Rau, Minnesota Department of Natural Resources, 2006).



Figure 2. A painted red oak seedling (Photo source: Rick Klevorn, Minnesota Department of Natural Resources, 2009).

several test applications of outdoor latex paint were made to determine how well the paint flowed through the equipment, to assess negative effects on the seedlings, and to determine if the paint would last a full growing season on the trees. After rejecting several methods, this final attempt produced positive results for each situation.

In 2010, the nursery purchased Latex Zone Marking Paint (manufactured by Ace Hardware Corporation), traditionally used for painting handicap signage. The bright blue paint can be thinned with water. A 55-gal (208-L) sprayer tank, equipped with a Hypro PTO Roller Pump (Model 7560C) mounted on a tractor, was used for application (figure 3). Nursery staff modified the boom with drop arms, which were adjusted with the tractor's three-point hitch to the height of the seedlings. Three floodjet nozzles (figure 4) were positioned to direct spray on the lower portion of the stems. When nozzle strainers were in place, the pressure was set to 35 to

40 psi, but it was common for the nozzles to become plugged. Thereafter, strainers were removed from the nozzles and pressure was calibrated to 10 to 15 psi. After several trials, a formula of 2 gal (7.57 L) of paint mixed with 3 gal (11.36 L) of water was established. This amount of thinned paint is sufficient to treat two 600-ft (183-m) nursery beds at two passes per bed, or the equivalent of 20,000 to 30,000 seedlings. Two passes ensures that paint is on all sides of the seedlings. Applications are made in September on sunny days when foliage and stems are dry to ensure adhesion of the paint (figure 5). These applications have been successfully made to red oak (*Quercus rubra* L.), white oak (*Quercus alba* L.), swamp white oak (*Quercus bicolor* Willd.), bur oak (*Quercus macrocarpa* Michx.), black walnut (*Juglans nigra* L.), and silver maple (*Acer saccharinum* L.). Nursery staff have painted as many as 500,000 or more hardwood seedlings per year.

A benefit of using latex paint is the quick drying time. On a warm, sunny day the paint will dry to the touch within 1 hour of application and it seems to set within a day. Painted seedlings at General Andrews Nursery are usually left in the nursery bed for at least a week before lifting, but may remain there until the following spring (figure 5). The paint adheres well and does not easily rub off when the seedling is handled. The blue color stands out well against green summer foliage as well as bright fall colors. The cost of the paint was \$99.95 per 5-gal (18.9-L) pail, which is enough to treat about 65,000 seedlings. To cover the cost of paint and labor, a fee of \$20.00 per thousand seedlings is charged.

The time saved in the field and the increased data accuracy for regeneration surveys continue to make painted seedlings popular with many Minnesota DNR foresters. As long as demand continues for this service, a system for painting hardwood seedlings in a practical, efficient, and cost-effective manner will continue to evolve in the State nurseries.



Figure 3. The sprayer setup at General Andrews Nursery (Photo source: Theresa Dobosenski, Minnesota Department of Natural Resources, 2011).



Figure 4. Nozzle placement on sprayer (Photo source: Theresa Dobosenski, Minnesota Department of Natural Resources, 2011).



Figure 5. Painted red oak 6 months after application (Photo source: Deb Pitt, Minnesota Department of Natural Resources, 2011).