Shielded Herbicide Sprayer for Hardwood Nursery Seedling Beds

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Missoula, MT

XE02E69—Shielded Herbicide Hardwood Sprayer

July 2006

This publication does not contain recommendations for the use of pesticides, nor does it imply that the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended.

CAUTION: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife—if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers.

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Introduction

Hardwood seedling production is an important component of nursery management in the Southern United States. Hardwood nurseries are hampered because herbicides that kill weeds also can kill hardwood seedlings. Nursery managers now rely on hand weeding and glyphosate herbicides, such as Roundup, that are sprayed on the leaves of weeds. Hand weeding is expensive and herbicides can damage hardwood seedlings if the chemical is sprayed on any green stems or leaves.

The Missoula Technology and Development Center (MTDC) was asked to develop a herbicide applicator that would apply glyphosate herbicide on the leaves of weeds between rows and along the edges of four- or five-row hardwood seedling beds.

Ken McNabb, director of the Southern Forest Nursery Management Cooperative at Auburn University (the Auburn Nursery Co-op), asked MTDC to develop a machine that would apply herbicide only on the weeds while shielding tender hardwood seedlings from the herbicide. The ideal machine would sense chlorophyll, spraying herbicide only when a weed was present and would be compatible with standard nursery tractors.

Early on, we looked at sophisticated sprayers that would reduce the labor needed, reduce the chemicals used, and protect the persons applying the chemical better than current methods. However, a project review by Auburn Nursery Co-op members told us that what the group really wanted was a simple, inexpensive sprayer with no "bells and whistles." The project proceeded with that need in mind.

MTDC reviewed several prototypes built by co-op nurseries as well as a couple of high-end commercially available sprayer attachments for mechanical weeders. We incorporated some of the design attributes of the different devices into the prototype that we developed. The MTDC prototype was field tested by the Virginia Department of Forestry's nurseries at New Kent Forestry Center (Providence Forge, VA) and the Augusta Forestry Center (Crimora, VA).

Based on the centers' feedback, the prototype's steering mechanism and herbicide shield were revamped. After receiving positive feedback from a second field test at the Augusta Forestry Center, the design was finalized and shop-quality drawings were prepared. These drawings are available at no charge. Mechanical drawings of some of the other nurseries' prototypes also are available from MTDC.

Highlights...

- Hardwood seedlings thrive when weeds are controlled. Hand weeding is expensive and herbicides that kill weeds also can kill the seedlings.
- Commercial sprayers are expensive.
- MTDC has developed a prototype for a shielded herbicide sprayer.
- Shop-quality mechanical drawings are available on the MTDC Nurseries Drawings Web site: *http://www.fs.fed.us/t-d/dwf/nurseries* (Username: t-d, Password: t-d).