

**2005 Report on
Roadside Vegetation Management
Equipment & Technology**

Project 2156: Section 9

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1.0 Introduction

The objective of this report is to provide Oklahoma Department of Transportation (ODOT) personnel with recommendations concerning the utilization of new technologies that will enable more effective management of Oklahoma roadside right-of-ways. Industries responsible for technological advances in the roadside vegetation management (RVM) industry segment are increasingly aware of tight of maintenance budgets and environmental issues. Two new technologies that ODOT has access to and could benefit from are 1.) Norstar Industries, Inc. “Long Shot” Articulating Boom and 2.) U-Teck “WeedEnder” Technologies.

2.0 Norstar Industries, Inc. “Long Shot” Articulating Boom

Herbicidal brush and weed control is often needed in difficult to reach locations including riprap, guardrails, fences, overpass approaches, under bridges and on steep inclines. Treatment of these areas has typically been addressed by ODOT through the use of personnel equipped with backpack sprayers or by personnel operating handguns attached to hoses feed by various truck mounted spray tank delivery systems. Treatments by these traditional methods are slow, result in increased maintenance costs and expose ODOT personnel to injury risk.

Norstar Industries, Inc. has developed a truck-mounted, articulating “Long Shot” boom system equipped with a “nutating” spray head that has the capability to apply herbicides to the previously mentioned difficult to treat locations (Figures 1 and 2). A “nutating” head utilizes banks of solid stream nozzles that move rapidly, in a vertical plane producing a nodding motion initiating a spray pattern that prevents skips and produces larger spray droplets. Thus, off-target drift potential is reduced. The boom has a fully extended reach of 19 feet and is controlled by an electric joy stick inside the cab or outside the cab by a remote control equipped with 30 ft. of electrical cable (Figure 3). The joy stick sends function signals to a hydraulic manifold which via electro-magnetic spool valves send hydraulic fluid to three different cylinders that make the boom functional. The long shot boom has three hydraulic cylinders, one cylinder rotates (90 degrees) the boom from a stowed position along the side of the spray tank to the desired spray position. The second cylinder raises the inside boom (main boom) up and down (up about 60 degrees from level position and down about 30 degrees below level position) and the third cylinder moves the outside boom (stick boom) 120 degrees, from a stowed position under the main boom to a “straight out” position for spraying. The hydraulics for the Long Shot boom is self contained with a pump driven via the spray pony motor, tank, hoses and filter.

The “nutating” spray head can be configured with multiple solid stream spray nozzles controlled by electronic solenoids allowing adjustable spray pattern widths from 2 feet to

36 feet wide. Configurations of the spray head can include inclusion of a “BoomBuster” nozzle in place of the solid stream nozzles.

Norstar Inc. supplies a retro fit option that was quoted as costing \$22,000. Additional charges include installation and training at \$2,500 and crating for shipping at an additional \$500.

3.0 “Long Shot” Articulating Boom Summary with Recommendations

If the ODOT Maintenance Division so desires, the OSU RVM program can initiate a demonstration of this technology and explore retro fit options utilizing existing ODOT spray truck chassis. It may be possible to use the existing hydraulic systems on ODOT spray trucks that currently use an auxiliary motor to drive the spray pump (ODOT Div. 3 uses many spray trucks equipped with this auxiliary motor configuration). These units do not use the trucks hydraulic system to run the pump required to delivery herbicides to the roadside. Cost savings may be considerable if ODOT can utilize the Norstar’s Long Shot boom system without the need to purchase an additional auxiliary motor and separate hydraulic system.

We believe that ODOT spray truck units currently using the truck’s hydraulic system to power the spray pump would not have hydraulic capacity to power both the spray pump and the hydraulic system necessary to articulate the Norstar Long Shot boom. Using the truck’s existing hydraulics would result in a lack of capability to maintain constant uniform flow through the spray pump leading to inaccurate herbicide application to ODOT rights of way.

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Norstar industries Inc.
Headland, AL 36345
Phone 866-693-0055
Fax 334-693-0066
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4.0 U-Teck “WeedEnder” Technologies

ODOT rights of way are populated with many signs, traffic control barriers, signal boxes, delineators, guardrails, retaining walls and beautification projects including tree plantings. Weed control around these areas can present ODOT with management problems that can complicate standard herbicidal weed control and mechanical weed control options. One of these complications is the fact that urban traffic corridors are inherently dangerous due to the high volume of traffic encountered by maintenance crews. Crews in slow moving ODOT spray trucks and ODOT personnel working on foot treating rights of way or removing weed populations with mechanical devices are exposed workers to extremely dangerous working conditions.

Weed barrier technology has evolved to the point that new materials are available that provide long-term, aesthetically pleasing materials that effectively blocks weed invasion. While herbicidal controls are usually lower in cost expenditures, there are situations and specific locations where physical weed barriers should be considered. “WeedEnder” is a product manufactured by U-Teck, Fayetteville, North Carolina, that is designed as a tough, non-woven material which is constructed of a dense, multi-directional needling of synthetic fibers and is impregnated with a special resin that has ultraviolet inhibitors to safeguard against deterioration. The company claims the estimated life of WeedEnder is in excess of 10 years under normal conditions.

WeedEnder products are available for new I-beam (6”x 4”) guardrail construction (Figure 4) as a pre-punched product with holes arranged according to DOT specifications. The product is laid over bolt-on, lower mount sections prior to upper guardrail installation. U-Teck material cost estimates are approximately \$1651.45 per 250 linear feet of 4’ wide WeedEnder punched to facilitate 6’3” beam spacing. U-Teck also estimates an experienced four-man installation crew can install approximately 2,000 ft. per day. Materials to retro-fit existing I-beam guardrails would cost approximately \$2,178.03 per 250 linear feet of 4’ wide WeedEnder punched and slit to facilitate 6’3” beam spacing. An experienced four-man installation crew can install approximately 1,500 ft. per day. Material costs include the 250’ x 4’ mat, foot print gaskets, stainless steel staples, stainless steel stakes, adhesive caulk, joining strips and a pneumatic staple gun.

This product is also available pre-punched for use with new wooden guardrail construction projects (Figure 5). Retro-fit kits are available (figure 6) for existing guardrails with WeedEnder being punched and slit, enabling the product to be slid around exiting guardrail supports. WeedEnder also has application as a weed suppression technique in and around signs or utility boxes (Figure 7) or with ornamental plantings (Figure 8).

5.0 “WeedEnder” Technologies Summary with Recommendations

OSU RVM program personnel would recommend that ODOT consider this weed control option as an alternative to conventional herbicidal weed control in areas where erosion may be a concern on highly sloped areas and in those urban areas were spray crews may be at higher risk due to heavy traffic loads. WeedEnder could have application as a standard recommendation around all tree plantings, signs and utility boxes to enable unimpeded mower access lessening the need for costly and dangerous “weedeater” work.

U-Teck can be contacted at:

U-Teck
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Figure 1. Long Shot boom mounted on 1 ton F550 with 750 gal. tank.



Figure 2. Long Shot boom with “nutating” head used to treat brush under bridges.



Figure 3. Joystick operation of Long Shot boom and head.



Figure 4. Images of WeedEnder product used in new I-beam guardrail construction.



Figure 5. WeedEnder product around new wooden guardrail construction.

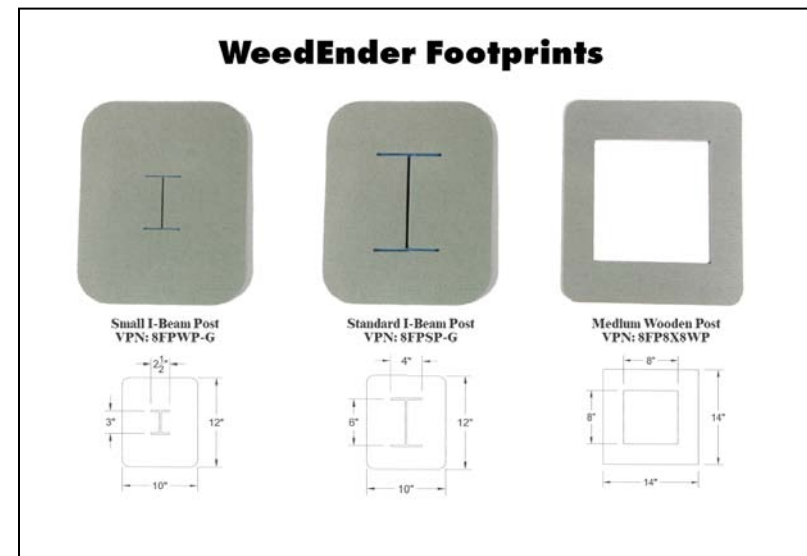


Figure 6. Use of the WeedEnder retro-fit kit for existing gaurdrail.



Figure 7. Use of the WeedEnder product around signs and utility boxes.



Figure 8. WeedEnder product used with beautification plantings.



