

UNDERSTANDING PERFORMANCE OF YOUR ATV-MOUNTED BOOMLESS SPRAY NOZZLES

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This TechNote summarizes research by Robert Woolf and others at Kansas State University. The complete reference can be viewed at www.techlinenews.com/boomlessnozzlesks.pdf

All-terrain vehicles (ATVs) with small-capacity spray tanks and boomless nozzle systems are popular for controlling weeds in pastures, wildlands, rangelands, and roadsides. These systems are well adapted to uneven terrain and are thought to have potential to spray 25 to 30-foot swaths using a centrally located single or dual nozzle arrangement.

Field studies were conducted in Kansas to evaluate the effectiveness of spray nozzles on ATVs. Studies were conducted in cropland on short (4 to 5-inch) and tall (24 to 30-inch) wheat to more easily measure differences between spray nozzles. Each nozzle was tested using a 12-volt, 45 pounds-per-square-inch (psi), 3.6-gallons-per-minute (gpm) pump, a type commonly used with ATV mounted sprayers. The nozzles compared were TeeJet BoomJet (XP), Hypro Boom Extender (XT), Evergreen Boom Buster (BB) and the Wilger Combo-Jet (WC-J). To measure pattern uniformity of the nozzles, a contact herbicide, paraquat (only kills tissue it contacts) was compared to a systemic herbicide, glyphosate (translocates through the plant). Most weed districts apply systemic herbicides, which include products such as 2,4-D, Milestone®, Transline® and others.



ATV-mounted boomless nozzles.

Results of the study showed the following

- Coverage and droplet size varied between the different nozzles.
- All four nozzles provided the same uniformity of control with the systemic herbicide; control with the contact herbicide varied, with XT and BB having the best uniformity of coverage followed by WC-J and XP the lowest.
- Actual swath width was less than rated by the nozzle manufacturers. Swath width was greater with short vegetation compared to tall vegetation. In tall vegetation the nozzle providing the widest control with the systemic herbicide was WC-J (131 inches) and lowest with the XT (120 inches). In short vegetation, the XT had the widest width at 187 inches compared to XP at 134 inches.
- Boomless nozzle droplets are large ranging from 693 to 782 microns for the systemic herbicide. Compared to the desirable droplet size standards for good coverage and optimum weed control (300 to 500 microns), there is less opportunity for good coverage on the target weed with boomless nozzles. Larger droplets also have less potential to drift in the wind.
- Droplet size varied between herbicides but was lowest for XT (693 microns), followed by BB, XP and WC-J (782 microns).

Practical Considerations When Using Boomless Nozzles

- Pick the nozzle that best fits the mode of action of the herbicide you are using. All the nozzles tested provided good control with a systemic herbicide but control varied when applying a contact herbicide.
- Optimize your weed control by knowing the effective pattern width and coverage over that pattern. Tall vegetation can disrupt the pattern limiting the effective width of the treatment zone. Applicators may have to adjust their swath width based on vegetation height, nozzle, and pump type.
- To achieve manufacturer-rated swath width, spray nozzles on ATVs would have to be mounted much higher than practical, which would lead to increased drift. It is better to adjust your swath width based on equipment and vegetation characteristics rather than mount spray nozzles too high.
- Boomless nozzles have large orifices making them harder to pressurize with the pumps typically found on ATV-mounted sprayers. A different, more powerful pump such as a tractor-type roller pump may provide better coverage width.

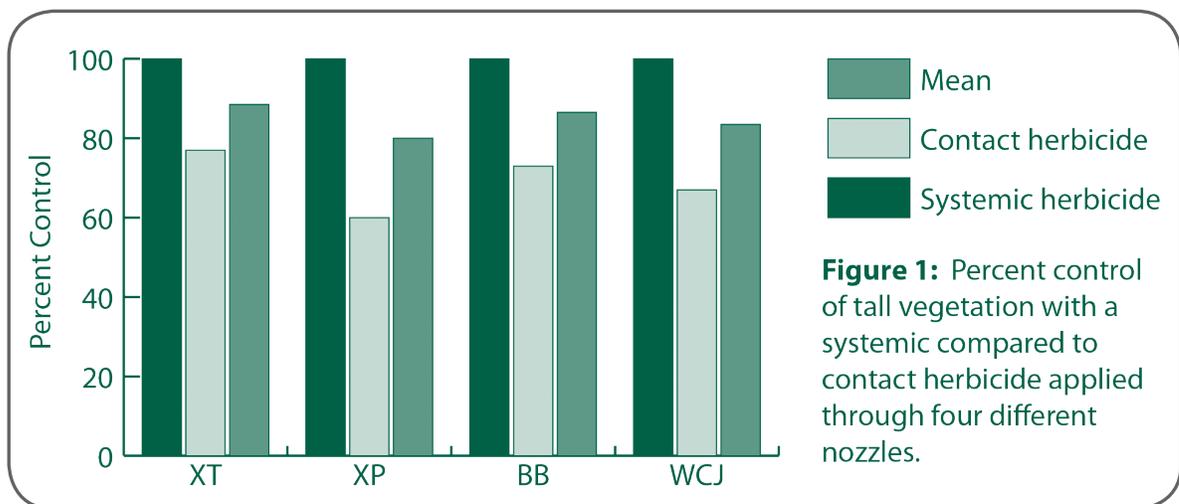


Figure 1: Percent control of tall vegetation with a systemic compared to contact herbicide applied through four different nozzles.

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