# Effect of Spray Nozzle Type, Spray Pressure, and a Drift Agent on Weed Control With Glyphosate

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## Objective

Previous Ohio State University research in the laboratory suggests that Turbo Teejet® and air induction (AI) nozzles reduce drift by decreasing the percentage of spray volume that is smaller than 100 microns compared to standard flat-fan nozzles. The effect of the larger spray droplets on weed control with glyphosate applied in the field is poorly documented. Field observations indicate that the addition of a drift control agent to glyphosate when using an AI nozzle can decrease the level of weed control. The objective of this study was to compare three nozzle types, two spray pressures for the AI nozzle, and the addition of a drift control agent on the effect of weed control with glyphosate applied in the field.

## Background

| | | | |
|---|---|---|---|
| Cooperator: | Tom Weiler | Soil Test: | pH = 6.9 |
| County: | Morrow | | P = 31 ppm |
| Nearest town: | Chesterville | | K = 207 ppm |
| Drainage: | Systematic | Fertilizer: | None |
| Soil Type: | Sloan silty clay loam | Herbicides: | 32 oz./A of Credit Plus |
| Tillage: | Conventional | Planting Date: | May 14, 2004 |
| Previous Crop: | Corn | Planting Rate: | 197,200 seeds/A |
| Variety: | Pioneer 93B26 | Row Width: | 10-inch |

## Method

The field chosen had light to moderate common lambsquarters and giant ragweed pressure and light to heavy (variable) dandelion pressure. The study was designed as a randomized complete block with two factors and four replications and a plot size of 10 feet wide by 40 feet in length. One factor was nozzle type that included four treatments, a standard flat fan (XR nozzle) at 40 pounds per square inch (PSI), a Turbo Teejet nozzle at 40 PSI, an AI nozzle at 40 PSI, and an AI nozzle at 60 PSI. The angle and size of the nozzles were: AI – 11002, Turbo Teejet – 02, and the XR Teejet – 8002. The second factor was the addition or subtraction of a drift control agent, Corral® AMS Liquid applied at a rate of 2.5 gallons/100 gallons of spray mixture. Credit Plus was applied at 32 ounces/acre to all treatments and ammonium sulfate (AMS) was added at a rate of 8.5 pounds/100 gallons of spray mixture to those treatments that did not contain the drift control agent since it included AMS.

The Credit Plus was applied on June 17, 2004 when the giant ragweed were 10-14 inches in height, common lambsquarters were 6-12 inches in height, and dandelions were seedlings. The soybeans were in the 2nd to 3rd

trifoliate leaf stage. Treatments were applied using a carbon dioxide pressurized hand-held plot sprayer and a spray volume output of 15 gallons per acre. Weed control was evaluated on June 30, 2004 based upon a scale of 0 to 100 percent with zero indicating no weed control and 100 percent indicating perfect weed control. All treatments were compared to an untreated check.

## Results

**Table 1. The Effect of Spray Nozzle Type and the Addition of a Drift Control Agent on Weed Control with Credit Plus Applied at 32 oz/A.[a]**

| Treatment[b] | Pressure (PSI) | Rate | Weed Control[cd] Giant Ragweed | Common Lambsquarters | Dandelion (Seedlings) |
|---|---|---|---|---|---|
| XR Nozzle Corral AMS | 40 | 2.5 gal./100 gal. | 99 ab | 99 ab | 90a |
| XR Nozzle AMS | 40 | 8.5 lb./100 gal. | 98 b | 97 ab | 90a |
| Turbo T Nozzle Corral AMS | 40 | 2.5 gal./100 gal. | 99 ab | 100 a | 88a |
| Turbo T Nozzle AMS | 40 | 8.5 lb./100 gal. | 99 ab | 100 a | 93a |
| AI Nozzle Corral AMS | 40 | 2.5 gal./100 gal. | 99 ab | 96 b | 87 a |
| AI Nozzle AMS | 40 | 8.5 lb./100 gal. | 100 a | 100 ab | 88 a |
| AI Nozzle Corral AMS | 60 | 2.5 gal./100 gal. | 100 a | 100 a | 90 a |
| AI Nozzle AMS | 60 | 8.5 lb./100 gal. | 100 a | 100 a | 88 a |
| LSD (P = 0.05) = | | | 1.91 | 3.07 | 6.70 |
| CV% = | | | 1.47 | 2.38 | 5.72 |

[a] Credit Plus is glyphosate formulated at 3 lb. acid equivalent/gal.
[b] Treatment includes nozzle type (XR = extended range flat fan, Turbo T = Turbo Teejet, AI = air induction) and +/- drift agent (Corral AMS has drift agent, AMS does not).
[c] Plots were visually evaluated on June 30, 2004.
[d] Treatment means followed by the same letter are not significantly different.

## Summary

All treatments provided excellent control of giant ragweed and common lambsquarters. The XR nozzle at 40 psi and no drift control agent provided significantly lower control, but still excellent control. Common lambsquarters control was the lowest when using the AI nozzle at 40 psi and a drift control agent. There was no difference between nozzles and drift control agent for control of dandelion and control was fair.

This single, small-plot study, based on the weed species present, indicate there is very little difference in weed control between a XR, Turbo Teejet, or AI nozzle.

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