The Evaluation of Boomless Nozzles for Weed Control in Pastures, Rangelands, and on Roadsides

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### Table: Nozzle Spray Characteristics

<table>
<thead>
<tr>
<th>PSI</th>
<th>DROP SIZE</th>
<th>CAPACITY ONE NOZZLE IN GPM</th>
<th>NOZZLE SPACING &quot;X&quot; = 0°-2°</th>
<th>NOZZLE SPACING &quot;X&quot; = 0°-3°</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>24° HEIGHT</td>
<td>36° HEIGHT</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>4 MPH</td>
<td>6 MPH</td>
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<td></td>
<td>8 MPH</td>
<td>10 MPH</td>
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<td></td>
<td>15 MPH</td>
<td>20 MPH</td>
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<td></td>
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<td></td>
<td>2 MPH</td>
<td>3 MPH</td>
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<td>4 MPH</td>
<td>5 MPH</td>
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<td>20 MPH</td>
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</table>

### Broadcast and Turf Application

<table>
<thead>
<tr>
<th>Model</th>
<th>Application Rate (GPA)</th>
<th>Swath Width (ft) @ 40 PSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC-XT020</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1.7</td>
<td>12.4</td>
</tr>
<tr>
<td>40</td>
<td>2.0</td>
<td>14.6</td>
</tr>
<tr>
<td>50</td>
<td>2.2</td>
<td>16.0</td>
</tr>
<tr>
<td>60</td>
<td>2.4</td>
<td>17.7</td>
</tr>
</tbody>
</table>

### Additional Notes

- Application rates are based on overall swath widths listed at 48" height. Refer to operating instructions if using a different swath.

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**Diagram:**

- "R", "L"
- "W"
- "Y"

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**Legend:**

- Stainless steel
- Polyacetal
- Flow rates = 0.9 - 26.3 gpm at 30 - 60 psi
- Medium-Coarse Drops
- Distances = 15-16 ft
- Distances = 16-20 ft

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**Units:**

- PSI: pounds per square inch
- GPM: gallons per minute
- GPA: gallons per acre
- MPH: miles per hour
Field trials were conducted to evaluate pattern quality, herbicide efficacy, droplet spectra and swath width comparing boomless nozzles.
Materials and Methods:

Experiment: Field Plots located near Manhattan, KS
Design: 4 x 2 randomized complete block with split plot and 3 reps.
Main plot: Herbicide (glyphosate and paraquat)
Subplots: Spray nozzle
Plot Size: 20 ft. x 25 ft.
Species: wheat (head and seedling stages)
Visual Ratings: 28 days after treatment (DAT)
Herbicides (2): Paraquat, 0.5 and .375 lb ae/a, NIS at .25% v/v
   Glyphosate, 0.387 and .28 lb ae/a, N PAK AMS @ 5.0% v/v
Spray Volume: 18 GPA
Estimated swath width: 15 feet
Spring plots: 30-inch wheat
Fall plots: 6-inch wheat

Application Conditions:
   Date: May 2 and Nov 14, 2006
   Temp: 78 and 55 degrees
   R. H.: 40 and 55%
   Wind: Direction – 155 and 90 degrees (90 would be perpendicular to plot).
   Wind Speed: 2-5mph, 3-6
Materials and Methods cont.:

Spray Tips: 
- TeeJet BoomJet XP
- Hypro Boom Extender XT
- Evergreen Boombuster BB
- Wilger ComboJet WC-J

Orifice Size: 
- XP – 20R
- XT - 024
- BB – Mod 140
- WC-J - DR 8003, 04, 06, 08

Pressure: 35-40 PSI

Boom height: 36 inches

Speed: 3.5 MPH

Gator/4-wheeler designed sprayer
Materials and Methods cont.:

Boombuster (BB) Mod 140
XP 20R
XT 024
Wilger 8003, 8004, 8006, 8008
Results

Discussion
% Control Large Wheat

Spray Uniformity Large Wheat

LSD=5

LSD=1
Summary Statements:

• Expected differences in chemical were shown with glyphosate at 100% control and paraquat control ranging from 77 (XT) down to 60% (XP). The BB was 73% and the WC-J was 67%

• Uniformity of control across the spray swath showed little differences with glyphosate but ranged from 8 (XT & BB), WC-J at 7, and down to 5 XP with paraquat.

• Mode of action, coverage, and droplet size will effect the results.
Summary Statements:

• In the tall wheat trials the swath width based on width of control was best for WC-J (131-inches with glyphosate) and lowest with the XP (94-inches with paraquat).

• In the small wheat trials the XT had the widest width at 192-inches and the XP controlled over the least width at 134-inches.

• Wind direction and height of spray stream may effect results.

• Droplet analysis and pattern quality evaluations are not complete at this time.