Tractor Speed and Boom Height Effects on Spray Coverage

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On-Farm vs. UGA Research?

**Concerns**
- Tractor Speed
- Boom Height
- Coverage
- Quality vs. Quantity?
2016 Peanut Weed Control Research
A Growers Peanut Field in 2016
Who Spent $138/A on Herbicides

August 24, 2016

+ 0.3 oz/A Strongarm +
24 oz/A 2,4-DB

$55/A for hand-weeding (2X)
5250 lb/A
Is this a bad combination???
Herbicide Efficacy

Coverage
- Nozzle Type
- GPA
- Pressure
- Boom Height
- Tractor Speed
- Time of Day

25% Rate
25% Timing
25% Environment
25% Coverage
Figure 1. Tractor Speed Effects on Spray Coverage (%) – 30” Boom Height – 15 GPA (2015)

\[ y = -1.1802x + 17.49 \]
\[ R^2 = 0.7231 \]

N = 30
Objective

• Evaluate the effects of tractor speed and boom height on spray quality
  – commercial sprayer
  – Coverage
  – \text{VMD}_{50}
Materials and Methods

- March 16, 2016
- Crisp County
  - *Steve and Stewart Whelchel*
- JD 4630
  - 80’ boom
  - 20” nozzle spacing
- Tractor Speeds
  - 8.5 and 13.0 MPH
- Boom Heights
  - 40 and 60 in
- 15 GPA (water + dye)
- AI11004VS + AI11006VS spray tips
  - 45 PSI
- 30 Kromekote cards (2” X 3”)
  - 7” X 10’ apart
- Dropletscan (*WRK of Arkansas, LLC*)
2016 Nozzle Test

JD 4630
80’ Spray Boom
20” nozzle spacing
2016 Speed/Boom Height/Nozzle Test
2016 Nozzle Test
Figure 2. The Influence of Tractor Speed and Boom Height on Spray Coverage (%)

*(15 GPA, 45 PSI, AI11004 and AI11006 nozzles)*

*averaged over 2 boom heights (40” and 60”)*

**averaged over 2 tractor speeds (8.5 and 13.0 MPH)**
Figure 3. The Influence of Tractor Speed and Boom Height on Droplet Size (VMD$_{50}$)

(15 GPA, 45 PSI, AI11004 and AI11006 nozzles)

*averaged over 2 boom heights (40” and 60”)

** averaged over 2 tractor speeds (8.5 and 13.0 MPH)
TurboDrop® Asymmetrical Dual Fan (Greenleaf Technologies)
Table 1. The Influence of *Nozzle System* on Spray Coverage and VMD\textsubscript{50} – 2016.

<table>
<thead>
<tr>
<th>Nozzle Type</th>
<th>Pressure (PSI)</th>
<th>Speed (MPH)</th>
<th>Boom Height (in)</th>
<th>GPA</th>
<th>Coverage (%)</th>
<th>VMD\textsubscript{50} (microns)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI11004VS</td>
<td>45</td>
<td>8.5</td>
<td>40</td>
<td>15</td>
<td>9.85</td>
<td>418</td>
</tr>
<tr>
<td>AI11006VS</td>
<td>45</td>
<td>13.0</td>
<td>40</td>
<td>15</td>
<td>10.20</td>
<td>446</td>
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<tr>
<td>TADF05-D</td>
<td>38</td>
<td>10.0</td>
<td>40</td>
<td>15</td>
<td>9.76</td>
<td>450</td>
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<tr>
<td><strong>LSD (0.10)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>NS</strong> (P = 0.4142)</td>
<td>6</td>
</tr>
<tr>
<td>CV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.84</td>
<td>0.79</td>
</tr>
</tbody>
</table>
Summary - 2016

• No interaction between speed and boom height

• No effect of speed or boom height on coverage ($P > 0.45$)

• $VMD_{50}$ increased with speed but was not affected by boom height

• 2015 results different than 2016 results
  – sprayer, nozzles, methodology
Questions?
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