Peanut Response to Simulated Drift Rates of 2,4-D

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Introduction - I

- In Georgia, peanuts were planted on nearly 202,000 ha in 2012
Introduction - II

- Cotton and Soybeans are grown in close proximity to peanuts in Georgia
Introduction - III

- Damage to peanut from commonly used cotton and soybean herbicides does occur

- Glyphosate and glufosinate occur most often

- Previous research has quantified the effects of these herbicides (Prostko et al.)
New technologies allow for POST topical application of 2,4-D or dicamba in cotton and soybean

Confusion of 2,4-D with 2,4-DB has consequences
2,4-D symptomology of peanut – 30 DAP
Objective

To determine peanut yield response to simulated drift and tank contamination rates of 2,4-D amine
Materials and Methods - I

- 2 Field Trials
  - UGA Ponder Research Farm (Worth Co.)
  - Attapulgus Research/Extension Center (Decatur Co.)
  - ‘GA-06G’

- Split-plot, 4 replications

- Whole Plot
  - 30, 60, 90 DAP

- Sub-plot
  - 2,4-D amine rate
  - Weedar 64 Amine (3.8 lbs/gal)
  - 105, 210, 420, 840, 1680 g ai/ha
Materials and Methods - II

- CO₂-pressurized backpack sprayer
- 140 L/ha
- Visual estimates of crop injury
  - 0 - 100%
- Yield
- 100 pod/seed weights
### Materials and Methods – III

**Peanut Growth Stages**

<table>
<thead>
<tr>
<th>Location</th>
<th>30 DAP</th>
<th>60 DAP</th>
<th>90 DAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ponder</td>
<td>10 cm tall</td>
<td>20 cm tall</td>
<td>38 cm tall</td>
</tr>
<tr>
<td></td>
<td>- R1</td>
<td>30 cm wide</td>
<td>Lapped</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R3</td>
<td>R6</td>
</tr>
<tr>
<td>Attapulgus</td>
<td>10 cm tall</td>
<td>23 cm tall</td>
<td>71 cm tall</td>
</tr>
<tr>
<td></td>
<td>- R1</td>
<td>35 cm wide</td>
<td>Lapped</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R4</td>
<td>R6</td>
</tr>
</tbody>
</table>
Reproductive Growth
Stages of Peanut

Growth stages of peanut
K. J. Boote, Peanut Science 9:35-40
Data combined over locations and subjected to ANOVA

Significant interaction between treatment and yield at 30 and 60 DAP

Regression analysis using Sigma Plot 11
Results and Discussion
Yield Response – 30 DAP

\[ y = \frac{699760}{1 + e^{-(x-169/13.8)}} \]

\[ r^2 = 0.57 \]

\[ p < 0.0001 \]
105 g ai/ha  
1680 g ai/ha  
1 week after treatment
Yield Response – 60 DAP

\[ y = 9.86 + 0.82x \]

\[ r^2 = 0.26 \]

\[ p = 0.003 \]
105 g ai/ha

1680 g ai/ha

1 week after treatment
Yield Response – 90 DAP

![Graph showing yield loss (%) against rate (oz per acre) and rate (g ai/ha). The graph indicates variability in yield loss at different rates.]
105 g ai/ha

1680 g ai/ha

1 week after treatment
Summary

[Graph showing the relationship between yield loss and rate (oz per acre) with data points for 30 DAP, 60 DAP, and 90 DAP.]
Summary

- Yield loss increased as rate increased when 2,4-D was applied 30 DAP and 60 DAP.

- There was no significant loss of yield when 2,4-D was applied 90 DAP at any rate.
Conclusions

- 2,4-D was most injurious when applied at 60 DAP
- There was no negative effect at 90 DAP
- Growers must be cautious when applying 2,4-D
Future Research

- Currently repeating tests at 2 locations in 2012

- Earlier times of application
  - 10, 20 DAP

- Continue to screen current and future herbicides for off-target/contamination damage to peanut
Questions?