Importance of Planter Performance in Cotton, Corn, and Peanut

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Planting Conditions

Too Shallow, low downforce, dry soil, seeds are visible at the top of the ground

Too Deep, Max downforce, wet soil, gage wheels are making a trench and compacting the soil hindering seedling emergence
Peanuts planted at 1.5” seeding depth exhibited higher overall emergence irrespective of the downforce treatments.
Peanut Emergence and Growth

1.5” Deep
High Downforce

1.5” Deep
Low Downforce
Peanut Emergence and Growth

2.5” Deep
Low Downforce

3.5” Deep
High Downforce

1.5” Deep
Low Downforce

1.5” Deep
Low Downforce
<table>
<thead>
<tr>
<th>Depth</th>
<th>Downforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5” Deep</td>
<td>High Downforce</td>
</tr>
<tr>
<td>3.5” Deep</td>
<td>Low Downforce</td>
</tr>
<tr>
<td>3.5” Deep</td>
<td>Medium Downforce</td>
</tr>
<tr>
<td>3.5” Deep</td>
<td>Medium Downforce</td>
</tr>
</tbody>
</table>
Cotton Emergence

Large Seed/High Vigor Variety

Week 1 - Dark Color
Week 3 - Light Color

Emergence (%)

Seed Depth/Downforce/Moisture Content (%)

L  M  H
0.5  1.0  1.5

MC1 (6.0 %)
MC2 (7.0 %)
MC3 (8.5 %)
Cotton Emergence

Small Seed/Low Vigor Variety

- Week 1 - Dark Color
- Week 3 - Light Color

Emergence (%)

Seed Depth/Downforce/Moisture Content (%)

MC1 (6.0 %)
MC2 (7.0 %)
MC3 (8.5 %)
Cotton Yield

![Graph showing cotton yield variations with different moisture, downforce, and depth conditions for three moisture classes (MC1, MC2, and MC3) and two vigor varieties (High Vigor and Low Vigor).](image-url)
Depth x Downforce x Vigor – SEREC Midville - 2019

The graph illustrates the crop emergence percentage across different seed depth/downforce combinations for two varieties: Large-Seeded Variety and Small-Seeded Variety.

- **Seed Depth/Downforce (lbs):**
  - 0 lbs
  - 100 lbs
  - 200 lbs

- **Crop Emergence (%)**: The percentage of crop emergence for each seed depth and downforce level is shown.

- **Seed Depth**:
  - 0.5" (Stages of development)
  - 1.0" (Stages of development)
  - 1.5" (Stages of development)
Depth x Downforce x Vigor – SIRP Camilla - 2019

Dry – No Pre-Plant Irrigation

Emergence (%)

Seed Depth/Downforce (lbs)

0 100 200 0 100 200 0 100 200

0.5" 1.0" 1.5"

Large-seeded Variety
Small-seeded Variety
Depth $\times$ Downforce $\times$ Vigor – SIRP Camilla - 2019

Opt $-$ 0.5” Pre-Plant Irrigation

<table>
<thead>
<tr>
<th>Seed Depth/Downforce (lbs)</th>
<th>Large-seeded Variety</th>
<th>Small-seeded Variety</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
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</tr>
</tbody>
</table>

Options:
- Opt – 0.5” Pre-Plant Irrigation
Corn Emergence 2020

Graphs showing the emergence of corn over days after planting for different speeds:
- Monosem
- John Deere (PP)

Emergence (%) on the y-axis, Days after planting on the x-axis.
Final Corn Emergence 2020

[Graph showing the percentage emergence of corn at different speeds for John Deere (PP) and Monosem.]
Final Corn Emergence 2021

The graph shows the percentage of corn emergence (%) at different speeds (mph) for two methods: Speed Tube and Gravity Drop. The emergence rates are as follows:

- **Speed Tube**
  - 4 mph: 98% (A)
  - 6 mph: 96% (AB)
  - 8 mph: 95% (ABC)
  - 10 mph: 96% (AB)

- **Gravity Drop**
  - 4 mph: 95% (ABC)
  - 6 mph: 97% (A)
  - 8 mph: 95% (ABC)
  - 10 mph: 93% (BC)

The letters (A, AB, ABC, C, BC) indicate statistical significance among the groups.
Seed Depth 2020

Bar graphs showing seed depth for different speeds with Monosem and John Deere PP models.
Seed Spacing 2020

![Graph showing Seed Spacing (in) vs. Speed (mph) for different speeds: 2, 4, 6, 8, and 10 mph. The graph compares Monosem and Precision Planting, with CV (%) on the y-axis. The data shows an increase in CV (%) as speed increases.]
Seed Singulation 2020

The graph shows the singulation percentage at different speeds for two methods: Monosem and Precision Planting. The percentage of singulation decreases as speed increases for both methods. At a speed of 2 mph, Monosem has a singulation of about 90%, while Precision Planting has a slightly lower percentage. As speed increases to 10 mph, the singulation drops significantly, with Monosem reaching about 65% and Precision Planting about 62%.
Coefficient of Variation 2020

![Graph showing Coefficient of Variability (%)](image)

- Coefficient of Variability (%)
- Speed (mph)
- Gravity Drop
- Speed Tube

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[Image: University of Georgia Extension Logo]

[Image: Georgia Precision Ag Logo]
Yield 2020

![Graph showing yield measurements at different speeds for Monosem and John Deere (PP).]
Seed Spacing 2021

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Gravity Drop</th>
<th>Speed Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5.63</td>
<td>5.51</td>
</tr>
<tr>
<td>6</td>
<td>5.51</td>
<td>5.52</td>
</tr>
<tr>
<td>8</td>
<td>5.67</td>
<td>5.63</td>
</tr>
<tr>
<td>10</td>
<td>5.73</td>
<td>5.55</td>
</tr>
</tbody>
</table>

The chart shows the comparison between Gravity Drop and Speed Tube for different speeds. The values are labeled with letters (A, B, AB) indicating significant differences.
Yield 2021

![Bar chart showing yield comparison at different speeds (mph).](chart.png)