2015 Precision Peanut Research

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2016 SC Peanut Growers’ Meeting
Santee, SC
January 28, 2016
AUTOMATED DEPTH PEANUT DIGGER
Digger Performance Across Soil Types

**Sandy Soil**

**Ground Level**

**Optimal Blade Depth**

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**Clay Soil**

**Ground Level**

**Optimal Blade Depth**
2013 True Digging Losses, lb/ac dry basis

Digger Setting

- Too Shallow
- Sand
- Medium
- Clay
- Too Deep

- Sand Zone
- Medium Zone
- Clay Zone
Automated Blade Depth Control
Further Development of Depth Gauge
Testing on 6-row Diggers
KMC 2-Row Tests

- AutoDepth
- FixedTopLink
Digger Performance - KMC 2-Row Tests

Blade Depth (%):
- AutoDepth
- FixedTopLink

Cylinder Extension (%):
- AutoDepth
- FixedTopLink

Time, sec

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Digger Performance - KMC 2-Row Tests

- **Blade Depth, %**
- **Shallow EC, dS/m**

- **AutoDepth**
- **FixedTopLink**
Determining Digging Losses
Digging Losses – KMC 2-Row Tests – Virginia Type

<table>
<thead>
<tr>
<th></th>
<th>Nix</th>
<th>EREC</th>
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<tbody>
<tr>
<td>Fixed</td>
<td>482</td>
<td>115</td>
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<tr>
<td>Auto</td>
<td>451</td>
<td>107</td>
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Yield – KMC 2-Row Tests – Virginia Type

![Bar chart showing yield comparison for Nix and EREC with treatments A and B.](chart.png)

<table>
<thead>
<tr>
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<td>Fixed</td>
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<td>Auto</td>
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Upcoming Digger-Related Work

• Automated blade depth
  – Evaluate best depth automation control method
  – Further refine depth gauge design
  – Commercial prototypes in 2016

• Effects of travel speed and chain speed
  – Digging losses and yield effects
  – Towards automation

• Irrigation prior to digging
  – Develop recommendations
  – Cost-benefit analysis
  – Dry year benefits
PEANUT YIELD MONITOR
2015 Yield Monitor Research

• Commercial prototypes
  – Deere GS3 platform
  – Deere cotton sensor
  – Amadas 2108, 2110, 9970, 9980

• Moisture sensing
2014 Peanut Yield Monitor - 2108

11% Load Weight Prediction Error

Predicted Load Weight, lb

Actual Load Weight, lb
11% Load Weight Prediction Error
Error vs. Load Number

![Graph showing the relationship between error and load number with various data points for different dates.

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Stationary Test Predictions

- Dry Tests
- Wet Test 1
- Wet Test 2
- Wet Test 3

9% Mass Flow Prediction Error
2015 Research – Moisture Correction of Mass Flow

Avg. Abs. Error = 11.9%

Without Moisture Correction

Avg. Abs. Error = 18.6%

With Moisture Correction
Preliminary Kernel Moisture Sensing Results

Avg. Abs. Error = ±0.5 %, w.b.
Preliminary Hull Moisture Sensing Results

Avg. Abs. Error = ±0.8 %, w.b.
Upcoming Yield Monitor-Related Work

• Wrap-up algorithm development
  – Yield prediction with moisture correction
  – On-the-go moisture sensing

• Commercial prototypes in 2016

• Combine load sensing
  – Header losses
  – Tailings losses

• Management applications of peanut yield data
Acknowledgments

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