Saving Money with Peanut Fertility

Glen Harris
UGA-Tifton
Peanut Fertilization (and Liming) Strategy

- Soil Test
- Build Soil P & K
- Lime to pH 6.0
- Inoculate If Out For More Than 4 Years
- Provide Calcium to The Pegging Zone
- Apply 0.5 lb Boron/a
- Troubleshoot
2000 lb x 0.34 = 680 lb N/ton
$475/680 = $0.70/lb N
2000 x 0.46 = 920 lb N/ton
$550/920 = $0.60/lb N
\[
(32-0-0) \\
2000 \times 0.32 = 640 \text{ lb N/ton} \\
\frac{375}{640} = \$0.58/\text{lb N}
\]
2000 x 0.46 = 920 lb P2O5/ton
$1000/920 = $1.08/lb P2O5

2000 x 0.18 = 360 lb N/ton
360 x 0.70 = $252
1000 – 252 = 748
748/920 = $0.81/lb P2O5
2000 x 0.6 = 1200 lb K2O/ton
$550/1200 = $0.45/ lb K2O
## Fertilizer Prices (cents/lb)

<table>
<thead>
<tr>
<th></th>
<th>Pre-2005</th>
<th>2008 (Peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>28</td>
<td>85</td>
</tr>
<tr>
<td>P2O5</td>
<td>22</td>
<td>85</td>
</tr>
<tr>
<td>K2O</td>
<td>12</td>
<td>80</td>
</tr>
</tbody>
</table>

2009 ?
Which Crop Needs the Most Fertilizer?

If "Medium" Soil Test P and K

Which Crop Needs the Most Fertilizer?
Soil Testing is the Key!

http:\aesl.caes.uga.edu

The University of Georgia
College of Agricultural and Environmental Sciences
Cooperative Extension Service

UGFertex-Based Nutrient Application Guidelines

<table>
<thead>
<tr>
<th>Client:</th>
<th>Joe 3060 Farmer</th>
</tr>
</thead>
<tbody>
<tr>
<td>County:</td>
<td>Tift</td>
</tr>
<tr>
<td>Soil Group:</td>
<td>Coastal Plain</td>
</tr>
<tr>
<td>Crop:</td>
<td>Cotton</td>
</tr>
<tr>
<td>Yield Goal:</td>
<td>1250 lbs</td>
</tr>
<tr>
<td>Field ID:</td>
<td></td>
</tr>
<tr>
<td>Home Place:</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>11/02/2003</td>
</tr>
<tr>
<td>Flow Depth:</td>
<td>8 inches</td>
</tr>
<tr>
<td>Previous Crop:</td>
<td>Peanuts - Spanish &amp; Runner Type</td>
</tr>
<tr>
<td>Irrigated:</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Results

**Very High**

**High**

**Medium**

**Low**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Very High</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphorus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Soil Test Index**

- Phosphorus: 40 lbs/Acre
- Potassium: 100 lbs/Acre
- Calcium: 750 lbs/Acre
- Magnesium: 25 lbs/Acre

**Buildup**

- Soil P: 0
- Soil K: 0
- P₂O₅ Required: 0 lbs/a/year
- K₂O Required: 0 lbs/a/year
- Years Required: 2
- For Buildup: 2
- Soil pH: 5.8
- Lime Index: 7.6

**Lime and Nutrient Guidelines**

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Limestone (0.5 tons/Acre)</th>
<th>Phosphate (0.5 P₂O₅)</th>
<th>Potash (0.5 K₂O)</th>
<th>Calcium (0.5 Ca)</th>
<th>Magnesium (0.5 Mg)</th>
<th>Sulfur (0.5 S)</th>
<th>Boron (0.5 B)</th>
<th>Manganese (0.5 Mn)</th>
<th>Zinc (0.5 Zn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>60 lbs/Acre</td>
<td>80 lbs/Acre</td>
<td>80 lbs/Acre</td>
<td>0 lbs/Acre</td>
<td>25 lbs/Acre</td>
<td>10 lbs/Acre</td>
<td>0.5 lbs/Acre</td>
<td>0 lbs/Acre</td>
<td>0 lbs/Acre</td>
</tr>
<tr>
<td>Phosphate</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potash</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Magnesium</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Sulfur</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Boron</td>
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<tr>
<td>Manganese</td>
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</tr>
<tr>
<td>Zinc</td>
<td></td>
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</tbody>
</table>
### Soil Test Index #

#### All Agronomic Crops
(Except Peanuts)

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Med</th>
<th>High</th>
<th>Very</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>0-30</td>
<td>31-60</td>
<td>61-100</td>
<td>101+</td>
</tr>
<tr>
<td>K</td>
<td>0-60</td>
<td>61-150</td>
<td>151-250</td>
<td>251+</td>
</tr>
</tbody>
</table>

#### Peanuts

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>Med</th>
<th>High</th>
<th>Very</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0-15</td>
<td>16-30</td>
<td>31-60</td>
<td>61+</td>
</tr>
<tr>
<td>K</td>
<td>0-30</td>
<td>31-60</td>
<td>61-150</td>
<td>151+</td>
</tr>
</tbody>
</table>
# Soil Test Interpretation

For P and K

All Agronomic Crops – Including Peanuts!

<table>
<thead>
<tr>
<th>Soil Test Rating</th>
<th>Chance of Yield Response to Applied Fertilizer (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>80</td>
</tr>
<tr>
<td>Medium</td>
<td>50</td>
</tr>
<tr>
<td>High</td>
<td>10</td>
</tr>
<tr>
<td>Very High</td>
<td>Near Zero</td>
</tr>
</tbody>
</table>
Provide Calcium to the Pegging Zone!
Peanut Fertilization (and Liming) Strategy

Gypsum/Landplaster at Bloomtime
Automatic for “Seed” and “Large Seeded”
Pegging Zone Soil Test at Cracking

Liming Method AT PLANTING!
After Turning + When Need pH Adjustment
Calcium Sources

Gypsum/Landplaster/CaSO4
Wet Bulk – (Phospho and FDG)  16-20 % Ca
Semi-Granular
Granular (mined)

Lime
Dolomitic vs. Calcitic
Fine vs. Regular Ground

“Liquid Lime”?
Calcium Application Rates

Runner: 160 - 200 lb Ca/a
Large-Seeded: 320 - 400 lb Ca/a
Peanut Gypsum Rate Study - 2008
RDC Pivot

Yields (lb/a)
Peanut Ca Trial w/JH - 2008
ABAC

Yields (lb/a)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield (lb/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GG0</td>
<td>5022</td>
</tr>
<tr>
<td>GG500</td>
<td>5369</td>
</tr>
<tr>
<td>GG1G</td>
<td>4982</td>
</tr>
<tr>
<td>O6G0</td>
<td>5138</td>
</tr>
<tr>
<td>O6G500</td>
<td>5496</td>
</tr>
<tr>
<td>O6G1G</td>
<td>5938</td>
</tr>
</tbody>
</table>
pH=4.5
pH=5.7

pH=4.9
Inoculate!
Peanut Inoculation Trial - 2006
Sunbelt Expo

Yields (lb/a)

DynaStart
Vault
Optimized
UTC

UTC

5000 4500 4000 3500 3000 2500 2000 1500 1000 500 0

4880 4695 4757 4528

Peanut Inoculation Trial - 2006
Sunbelt Expo
UGA Boron Recommendation

0.5 lb B/a
“Pound for Pound, Boron is Boron”
- Glen Harris
How Much Fertilizer Value is Removed in Vines?

50-10-60 (lbs N-P2O5-K2O/a)
70-80-50 (cents/lb N-P2O5-K2O)
35-8-30 = $73/a

Depends on: Variety
Yield
Baling Efficiency
Nutrient Content
Fertilizer Prices
Soil Organic Matter
The Value of Litter

- **Old Prices**
  - 60# N \( \times .28 \times .6 = 10.08 \)
  - 60 # P2O5 \( \times .22 \times .8 = 10.56 \)
  - 40 # K2O \( \times .12 \times .8 = 3.84 \)
  - Total = $24.48

- **New Prices**
  - 60#N \( \times .82 \times .6 = 29.52 \)
  - 60#P2O5 \( \times .74 \times .8 = 35.52 \)
  - 40#K2O \( \times .80 \times .8 = 25.60 \)
  - Total = $90.64

Other Nutrients?
Organic Matter?
Liming?
Nematode Suppression?
Straw ? (in 60 bu/a Wheat)

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>34</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2O5</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>K2O</td>
<td>108</td>
<td></td>
</tr>
</tbody>
</table>

28–6–86 = $120/a
Burning Wheat Straw

Lose N and P
Keep the K

Concentrate K in Pegging Zone?
Troubleshoot
Turner County - 2008
Manganese Toxicity (?)
Recommended Soil Test Mn with Different pH

Soil pH

Soil Test Mn (lb/a)
Recommended pH with Different Zn Levels

Soil pH (lb/a) vs. Soil Test Zn (lb/a)
Dealing with High Cost Fertilizers

1. Soil Test
2. Compare University Labs vs. Private Labs
3. Lime to Recommended pH
4. Rate, Timing, Placement and Source
5. Credit Legumes and Animal Manures
6. Increase Soil Organic Matter
7. Consider Enhanced Efficiency Fertilizers?
Organic Weed Control?