Facets of Pecan Production in the Southeast.

• A mix of large and small growers.
• Wide variation in cultural methods employed.
• A mix of very old and newer orchards.
• Growers tend to be very conservative.
• A rapid decline in pecan specialists in many states resulting in few cultivar trials remaining.
Cultivar makeup of Georgia Orchards
1997 Survey

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Cultivar</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>28%</td>
<td>Stuart</td>
<td>1890</td>
</tr>
<tr>
<td>28%</td>
<td>Desirable</td>
<td>1945</td>
</tr>
<tr>
<td>13%</td>
<td>Schley</td>
<td>1900</td>
</tr>
<tr>
<td>5%</td>
<td>Cape Fear</td>
<td>1940</td>
</tr>
<tr>
<td>5%</td>
<td>Sumner</td>
<td>1932</td>
</tr>
<tr>
<td>2%</td>
<td>MoneyMaker</td>
<td>1896</td>
</tr>
</tbody>
</table>
Cultivar Makeup of Newly Planted Trees
1997 Survey

- 49% Desirable 1945
- 19% Sumner 1932
- 9% Cape Fear 1940
- 9% Pawnee 1984
- 6% Stuart 1890
History of Pecan Testing at UGA

• Ongoing since 1921.
• 50 years of data for some varieties.
• Commercial level care.
• Data collected
  – Tree yield.
  – Nut quality.
    • Nut size
    • % kernel
    • % fill
    • specific gravity
    • kernel quality grades
Success and Failure

- Very conservative in making recommendations.
- Prevented the planting of many inferior cultivars.
- Have recommended a few cultivars (< 10) that are planted on a modest scale.
- Have recommended a few cultivars that were failures.
Current Program

• Breeding program started in 1999.
• Continued cultivar testing program
  – USDA cultivars and selections
  – Grower selections
  – Selections from other universities
• Also responsible for muscadine breeding program.
Changes in the testing program.

• Single test orchard located at station farm.
• Check cultivars included in all plantings.
• Reduced # years testing to 15-20.
  – If a cultivar hasn't shown anything by then it probably won't.
  – ¼ of test orchard replanted every 5 years.
• Pest susceptibility data is now taken (black aphids, sooty mold, leaf scab, nut scab).
• Alternate bearing index is reported.
Challenges to Pecan Testing and our Responses
Challenge: Four growing regions with widely differing environments.

Response: We only test and recommend for the Southeastern region. The USDA runs a more national testing program.
Challenge: Pecan scab is composed of multiple races. Pecan has differential and ephemeral resistance to these races.

Response:

- Test selections in high-pressure, no-spray situations.
- Select only cultivars that have acceptable nut quality so that the loss of resistance is not devastating.
- Remind growers that resistance is likely ephemeral.
Challenge: Large sized trees take up much orchard space. Do you test more selections or do more reps?

Response:

• Generally decided we want to test more selections since so many fail quickly and in ways that don't require many reps to see.

• Plant 5-6 trees of each test selection.
  – Can see very poor productivity but hard to rank the rest.
  – Recommend those that look good on a trial basis.
Challenge: Cultivar quality production habits can change dramatically as a tree matures.

Candy

Final Year = 2001
Response:
- Good selections are tested for a minimum of 15-20 years.
- Quality of young (years 1-10) and mature (10-20) trees is reported separately.
- Alternate bearing index of cultivars is reported.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>% kernel years 1-10</th>
<th>% kernel years 11-20</th>
<th>Alt. Bearing Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kanza</td>
<td>51.3</td>
<td>51.5</td>
<td>0.73</td>
</tr>
<tr>
<td>Kiowa</td>
<td>53.1</td>
<td>52.2</td>
<td>0.65</td>
</tr>
<tr>
<td>Melrose</td>
<td>54.1</td>
<td>49.8</td>
<td>0.79</td>
</tr>
<tr>
<td>Pawnee</td>
<td>55.0</td>
<td>53.2</td>
<td>0.58</td>
</tr>
<tr>
<td>41-19-20</td>
<td>52.5</td>
<td>40.0</td>
<td>0.85</td>
</tr>
<tr>
<td>53-9-1</td>
<td>51.8</td>
<td>45.5</td>
<td>0.81</td>
</tr>
</tbody>
</table>
Challenge: Growers vary widely in the level of care they apply to trees.

Response:

• Apply UGA guidelines of good commercial quality care to test orchards.
  – These are your most valuable growers.
• Evaluate the pest susceptibility of the cultivars.
• Rank susceptibility of cultivars and try to get growers to match cultivars with their level of care.
Challenge: Pecan "personalities" are often responsible for pushing new untested cultivars.

- Resulted in planting poorly adapted western cultivars in the Southeast.
- Nursery owners sometimes push their proprietary cultivars.
- Knowledgeable testers are often less enthusiastic about their cultivars than are amateur testers.

Response:

- Test as many of these cultivars as possible with check cultivars.
- Remind growers that many cultivars look good at first.
- Try to coordinate with extension agents for a unified front.
Challenge: How do you bring growers into the mix?

Response:

- We have regular field days in the test orchard.
- Present talks at grower meetings.
- We regularly test selections presented to us by growers.
- Small scale tests at multiple growers are too much labor.
- Larger tests at big growers are more worthwhile.
What is the best way to replicate a grower test?

• Traditionally we have used single tree replicates with a random arrangement of trees in the orchard.
  – Allows easy statistical analysis.
  – Well accepted in literature.
  – Avoids soil variation.

• Problems
  – Difficult to manage.
  – Yields are harder to obtain due to harvest timings.
  – Differences in growth can result in unrealistic competition.
  – Pest pressures are minimized by variation.
A new test set up by a colleague uses single rows of 20 trees to test selections.

Orchard land "looks" uniform.

Growers find it easier to look at the varieties.

Rows can be harvested as a group and a composite yield obtained.

How comfortable would you be with this arrangement?