CULTIVAR OPTIONS FOR GEORGIA ORCHARDS

Dr. Patrick Conner
University of Georgia – Tifton Campus
THERE IS NO PERFECT VARIETY

Look at strengths vs. weaknesses. Trade offs will need to be made.

- Scab resistance vs. nut quality
- Early production vs. stable production
- Proven performance vs. new varieties
- Scab resistance vs. aphid susceptibility
Scab Resistance

• A primary factor in cultivar choice.
• The resistance of a pecan cultivar will be influenced by the races present where it is grown.
• There tends to more scab pressure as you go south and east.
• Do not plant a susceptible cultivar if you cannot spray.
Alternate Bearing

- Mature trees tend to bear alternately.
- Generally, precocious cultivars bear alternately more as mature trees.
- Will you summer shake to reduce your crop?
Harvest Date

• Early nuts often have a price advantage.
• Will you be able to harvest the nuts before the crows?
• Will the trees be in a large solid block?
• Will the equipment be ready on time?
• What is the harvest date of your other cultivars?
Nut Size and Quality

- Large nuts sell for a premium if quality is good.
- Large nuts often have more trouble filling.
- Small nuts often have to be sold in larger batches and marketed well to bring high prices. This can be difficult for a new grower.
What not to base your selection on.

“That’s all the nursery had left.”

• Talk to the nursery at least a year in advance, trees are in short supply.
• Some cultivars will not be widely available.
<table>
<thead>
<tr>
<th>Recommended</th>
<th>Recommend Conditionally</th>
<th>Recommended for Trial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caddo</td>
<td>Cape Fear</td>
<td>Amling</td>
</tr>
<tr>
<td>Desirable</td>
<td>Creek</td>
<td>Byrd</td>
</tr>
<tr>
<td>Elliott</td>
<td>Kiowa</td>
<td>Excel</td>
</tr>
<tr>
<td>Forkert</td>
<td></td>
<td>Lakota</td>
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<td>Kanza</td>
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<td>Oconee</td>
<td></td>
<td>McMillan</td>
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<tr>
<td>Pawnee</td>
<td></td>
<td>Morrill</td>
</tr>
<tr>
<td>Sumner</td>
<td></td>
<td>Zinner</td>
</tr>
</tbody>
</table>
Amling

Excellent overall pest resistance.
Medium sized nut.
Pretty, oily kernel.
Protandrous (Type I) flowering.
Amling

Need to know the productivity of this cultivar. Otherwise it looks very good.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Nuts / pound</th>
<th>% Kernel</th>
<th>Harvest</th>
<th>Nut scab</th>
<th>Black aphid damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amling</td>
<td>57</td>
<td>55</td>
<td>Oct. 17</td>
<td>1.0 (1.0)</td>
<td>1.0 (1.0)</td>
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<tr>
<td>Desirable</td>
<td>44</td>
<td>53</td>
<td>Oct. 14</td>
<td>2.5 (4.4)</td>
<td>1.7 (2.7)</td>
</tr>
</tbody>
</table>
Excel

Excellent overall pest resistance.
Large sized nut.
Thick shell reduces % kernel.
Thin canopy.
Earliness is variable, not early in Tifton.
One of the few scab “immune” cultivars with large nut size.

<table>
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<tr>
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<th>Harvest</th>
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<th>Black aphid damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excel</td>
<td>44</td>
<td>49</td>
<td>Oct. 13</td>
<td>1.0 (1.0)</td>
<td>1.3 (2.2)</td>
</tr>
<tr>
<td>Desirable</td>
<td>44</td>
<td>53</td>
<td>Oct. 14</td>
<td>2.5 (4.4)</td>
<td>1.7 (2.7)</td>
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</tbody>
</table>
McMillan

Excellent overall pest resistance.
Medium sized nut.
Medium quality kernel.
Excellent productivity.
McMillan

Yield (pounds / tree) of Excel each year from planting.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Avg.</th>
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<tbody>
<tr>
<td>McMillan</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.8</td>
<td>3</td>
<td>18</td>
<td>24</td>
<td>63</td>
<td>35</td>
<td>90</td>
<td>23</td>
</tr>
<tr>
<td>Desirable</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.5</td>
<td>3</td>
<td>12</td>
<td>20</td>
<td>20</td>
<td>45</td>
<td>53</td>
<td>12</td>
</tr>
<tr>
<td>Stuart</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
<td>20</td>
<td>30</td>
<td>54</td>
<td>48</td>
<td>12</td>
</tr>
</tbody>
</table>

A very good low-input tree. High yield in 2011 with 48-46% kernel. Similar quality to Stuart

<table>
<thead>
<tr>
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<th>Harvest</th>
<th>Nut scab</th>
<th>Black aphid damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>McMillan</td>
<td>51</td>
<td>50</td>
<td>Oct. 12</td>
<td>1.0 (1.0)</td>
<td>1.5 (2.2)</td>
</tr>
<tr>
<td>Desirable</td>
<td>44</td>
<td>53</td>
<td>Oct. 14</td>
<td>2.5 (4.4)</td>
<td>1.7 (2.7)</td>
</tr>
</tbody>
</table>
McMillan – 53 nuts/lb  49% kernel
Stuart – 45 nuts/lb  45% kernel
Elliott

77 nuts/lb.
51% kernel

- Excellent resistance.
- Good quality kernel.
- Well-known to buyers.
- Alternates.
- Small nut size.
- Freeze damage in north.
- Yellow aphids a common pest.
Kanza

68 nuts/lb.
51% kernel

- Similar nut to ‘Elliott’.
- Cold hardy.
- Early harvest data, end of September.
- Small nut size.
- Tends to alternate.
Lakota

59 nuts/lb.
62% kernel

- 2007 USDA release.
- Good scab resistance so far.
- Harvest end of Sept.
- Medium sized nut?
- Bred for northern regions.
- Little testing in this region.
# Cultivars with Good Resistance

<table>
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<tr>
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<td>Cape Fear</td>
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<td>Kiowa</td>
<td>Excel</td>
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<td>Mandan</td>
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<tr>
<td>Oconeé</td>
<td></td>
<td>McMillan</td>
</tr>
<tr>
<td>Pawnee</td>
<td></td>
<td>Morrill</td>
</tr>
<tr>
<td><strong>Sumner</strong></td>
<td></td>
<td>Zinner</td>
</tr>
</tbody>
</table>

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Sumner

Nut similar to ‘Schley’.

Good scab resistance.

Late harvest date.

Preferred by black aphids.

Can over bear as a mature tree.

Very popular in Georgia as a scab resistant cultivar.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Nuts / pound</th>
<th>% Kernel</th>
<th>Harvest</th>
<th>Nut scab</th>
<th>Black aphid damage</th>
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</thead>
<tbody>
<tr>
<td>Sumner</td>
<td>56</td>
<td>54</td>
<td>Oct. 29</td>
<td>1.0 (1.0)</td>
<td>1.3 (2.2)</td>
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<tr>
<td>Desirable</td>
<td>44</td>
<td>53</td>
<td>Oct. 14</td>
<td>2.5 (4.4)</td>
<td>1.7 (2.7)</td>
</tr>
</tbody>
</table>
Creek

55 nuts/lb.
48% kernel

USDA release in 1996.

Overloads badly, needs crop thinning.

Upright strong tree.

Reported to bear well in competition.

Only plant it if you will crop thin!

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## Cultivars with Mediocre Resistance

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<td><strong>Cape Fear</strong></td>
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<td>Morrill</td>
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<td>Zinner</td>
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The University of Georgia College of Agricultural & Environmental Sciences
Oconee

48 nuts/lb.  53% kernel

Large nut size and good quality.
Variable scab resistance.
Vigorous tree is precocious.
Preferred cultivar for black aphids.

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Cape Fear

55 nuts/lb.  51% kernel

USDA release in 1996.

Precocious and needs crop thinning.

Scabs badly in some locations.

Susceptible to bacterial leaf scorch.
Cape Fear showing defoliation from bacterial leaf scorch.
# Cultivars with Low Scab Resistance

<table>
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<td><strong>Caddo</strong></td>
<td><strong>Cape Fear</strong></td>
<td><strong>Amling</strong></td>
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<tr>
<td><strong>Desirable</strong></td>
<td><strong>Creek</strong></td>
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</tr>
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<td><strong>Elliott</strong></td>
<td><strong>Kiowa</strong></td>
<td><strong>Excel</strong></td>
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<td><strong>Forkert</strong></td>
<td></td>
<td><strong>Lakota</strong></td>
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<td><strong>Kanza</strong></td>
<td></td>
<td><strong>Mandan</strong></td>
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<td></td>
<td><strong>McMillan</strong></td>
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<tr>
<td><strong>Pawnee</strong></td>
<td></td>
<td><strong>Morrill</strong></td>
</tr>
<tr>
<td><strong>Sumner</strong></td>
<td></td>
<td><strong>Zinner</strong></td>
</tr>
</tbody>
</table>
Desirable

44 nuts/lb.

53% kernel

#1 Cultivar in Georgia

Extremely susceptible to scab, must be sprayed often.

Consistent bearing from year to year.

Easier to grow in middle Georgia.
Pawnee

56 nuts/lb.  54% kernel

Ready to shake in Mid-September.

Will need to shake twice.

Susceptible to scab.

Easier to grow in middle Georgia.

Veining and spotting is common in some years.
UGA Releases

Byrd, Morrill, Cunard

All are new, have only been released a few years.

Very precocious cultivars, will need top quality management.

Not clear what the level of scab resistance will be.

Not recommended for new growers.
Stuart

48 nuts/lb.  45% kernel

Well known, but no compelling reason to plant this cultivar any more.

Marginal nut quality at best.

Old trees can be profitable.
My picks for small low-input plantings.

McMillan
Excel
Lakota - trial
Kanza - in northern areas
Amling (pollinator)
My picks for sprayed plantings.

McMillan
Excel
Kanza - in northern areas
Lakota - trial
Amling (pollinator)

- All will need aphid control.

Sumner
Elliott
Oconee (pollinator) - Less scab resistance than Sumner and Elliott.

Cape Fear – luck of the draw with scorch, needs to be crop thinned.
Where to get more information.

Pecan Grower’s Handbook.

Pecan Breeding Website : Google for ‘UGA Pecan Breeding’
UGA Pecan Breeding Program

The University of Georgia established a pecan breeding program in 1998. The ultimate goal of this breeding program is to develop pecan cultivars adapted for use in the humid southeastern U.S. Potential new cultivars are selected on the basis of large nut size, good cracking and shelling characteristics, early nut maturity, light colored kernels, and a cluster size small enough to ensure adequate filling. Resistance or tolerance to major pecan pests and diseases is also an essential criterion in the selection of new cultivars.

Program Coordinator

Patrick J. Conner

Phone: (229) 386-3903
Email: pconner@uga.edu
Pollen shed and pistil receptivity chart.

Pecan Nursery List

Recommended Cultivars for Georgia.

- Caddo
- Elliot
- Kanza
- Pawnee
- Desirable
- Forkert
- Oconee
- Sumner

Cultivars Not Recommended that Have Merit in Some Situations

- Cape Fear
- Creek
- Klowa

Cultivars Recommended for Trial.

- Byrd
- Excel
- Lakota
- Mandan
- McMillan
- Zinner

Cultivars Recommended for low-input or high scab pressure locations.

- Amling
- Elliot
- Excel
- Kanza
- McMillan
- Sumner

New cultivars planted in 2004 through 2006 still being evaluated.
**Pecan Breeding: Cultivar Information**

**McMillan**

- Average nut quality of test trees 2002-2010.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Yield</th>
<th># Nuts/Lb</th>
<th>% Kernel</th>
<th>Cluster Size</th>
<th>Harvest Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>McMillan</td>
<td>15.9</td>
<td>51</td>
<td>50%</td>
<td>3.3</td>
<td>Oct. 12</td>
</tr>
<tr>
<td>Desirable</td>
<td>11.5</td>
<td>44</td>
<td>53%</td>
<td>2.5</td>
<td>Oct. 14</td>
</tr>
<tr>
<td>Stuart</td>
<td>12.3</td>
<td>48</td>
<td>45%</td>
<td>2.6</td>
<td>Oct. 23</td>
</tr>
</tbody>
</table>

- Average pest resistance of test trees 2002-2010.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Leaf Scab $^Z$</th>
<th>Nut Scab $^Y$</th>
<th>Black Aphid Damage $^X$</th>
<th>Sooty Mold Buildup $^W$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.0 (1.0)</td>
<td>1.0 (1.0)</td>
<td>1.3 (2.2)</td>
<td>1.0 (1.0)</td>
</tr>
<tr>
<td>Desirable</td>
<td>2.5 (4.0)</td>
<td>1.0 (4.4)</td>
<td>1.4 (2.7)</td>
<td>1.0 (1.0)</td>
</tr>
<tr>
<td>Stuart</td>
<td>1.5 (2.0)</td>
<td>1.2 (3.5)</td>
<td>2.2 (3.8)</td>
<td>1.0 (1.0)</td>
</tr>
</tbody>
</table>

- Comments

This nut comes to us with a reputation of being a consistent bearer of mid-size nuts with excellent scale resistance. 'McMillan' was planted in our orchards in 2002 and bore its first crop in 2005. So far, we have not observed scale on our trees in a spraying orchard. This nut has been a high-yielding pearsy cultivar with yields approximately double those of 'Desirable'. 2009 was a heavy yielding year, with many limbs breaking down. In the following year yield was lighter, only about half of 2009, but not bad considering the crop size of 2009.

Nut quality is only average, with a thick shell reducing percent kernel to about 50%, and kernel color being a little dark. Nut shells are distinctive with a rough appearance. While the nut quality is not too exciting, the productivity and scale resistance of this cultivar suggest it might be a good choice for low input plantings. Right now, I recommend it for trial in high scale pressure or low-spray situations. 'McMillan' is a type II (progenitor) cultivar. In general, I think this is a good choice for organic plantings, and low input plantings. Standard commercial growers will probably want a higher quality nut that might demand a higher price.

'McMillan' is a progenitor cultivar with early receptivity and nut to late pollinizer shed. It would be pollinated by 'Desirable', 'Beech', 'Halfar', 'Birl', 'Anding', and to a lesser extent by 'Cape Fear' and 'Netsun'. 'Anding' would probably be the best choice of a pollinator as this cultivar is also a good choice for low input plantings.

This cultivar was introduced by Auburn University and more information can be found on this selection at the Alabama Pecan Growers Association website.

**History**

Seedling from Baldwin County, Alabama.
Pollination Types

Protandrous (Type I) – Pollen produced first.

Protogynous (Type II) – Stigmas receptive first, then pollen is produced.
There are equal numbers of Type I and Type II trees in native groves, ensuring good pollination.
Pollinator Placement

Pecans need cross pollination to set the best crop.

- Pollinators planted no more than 4 rows apart
  or
- Every 5th tree in every 5th row.