

## Pecan Cultivars for Alabama

Major advances in pecan cultivar development and selection have occurred in the past few years, requiring extensive evaluations and frequent updating of recommendations. Because the Alabama pecan industry has smaller growers, often without the equipment or economic incentive to spray intensively with large airblast sprayers, we have focused on pest-resistance to reduce spray requirements. We have evaluated many selections under heavy incidence of pests, especially scab, but also aphids and mites, with no sprays applied at all in replicated tests. This has enabled us to identify susceptibility to scab that escapes other researchers with standard methods for years. On the other hand, our methods lead us to ruling out some good cultivars that perhaps could be grown with a very intensive spray program.

Another major focus has been early harvest date. The much higher prices in September and October, especially for giftpack quality nuts, has made and will make it essential for growers to have early maturing cultivars to remain competitive. As early cultivars take more and more of the limited giftpack market, cultivars like Desirable and Schley will likely become less valuable because much of the demand for giftpack nuts will already be filled by the time they mature.

We list cultivars we recommend by current observations of scab resistance category (Table 1). Additional characteristics of recommended cultivars are listed in Table 2.

Regarding scab resistance level, I need to stress the word current, as strains of the scab fungus may develop on a selection which makes it worse than currently observed. I further need to stress that the development of strains down the road that attack currently scab resistant cultivars does not mean that planting scab resistant cultivars has no usefulness. With some cultivars, like Elliott, scab incidence has been minor for decades. With Stuart, scab was very light for decades, then became moderate for more decades. Today, over 100 years since Stuart was introduced, it remains only middle of the pack or better in scab incidence. Similar cultivars to Elliott and Stuart certainly exist, we just need to subject the test selections to heavy enough scab pressure initially from multiple strains in many locations to identify which ones they are. Do not let pathologists or others convince you that scab resistance is not useful simply because scab resistant varieties ultimately become susceptible as new strains develop. The resistance, if the proper screening is done in the beginning, will last for decades and often for your lifetime.

### **Scab Resistance Categories.**

I will group the cultivars into four categories of scab resistance, based on observations in our experiments as well as observations from other researchers. For established cultivars, the most useful and extensive observations are from growers orchards, mainly in Georgia, Alabama, and Louisiana, and these observations are included in the rankings as well.

The categories are excellent, good, mediocre, and poor. A cultivar with *excellent* resistance has exhibited no scab or minor occurrence even in the total absence of sprays in wet

seasons. *Good* resistance means that we have observed damaging scab in the total absence of sprays in wet seasons, but the disease is usually minor in dry years, or in wet years with a modest spray program of 2-4 sprays. *Mediocre* resistance means that we will see serious losses in wet seasons in the absence of sprays, but the disease causes little risk with a normal 8-10 spray fungicide program. *Poor* resistance implies total crop loss almost every season under Southeastern conditions if no sprays are applied, and considerable risk of loss in wet years even when a normal spray program is followed.

Bear in mind that these categories apply to conditions in humid areas with 50-60 inches of annual rainfall, and scab would be expected to be less in drier areas.

## Recommendations

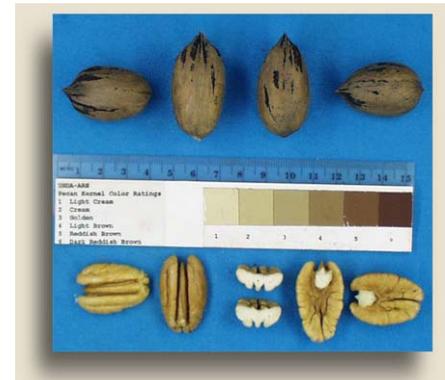
Cultivars are grouped into three categories according to how we recommend them. *Recommended* cultivars are those we feel represent the best overall within their scab resistance category. Cultivars *recommended conditionally or for trial* are good choices also, but either have less supporting data or have problems identified with them that need to be considered before they are planted.

## Excellent Resistance

We recommend four cultivars, Lakota, Excel, Gafford, and Headquarters, all of which have shown excellent scab resistance in our observations so far.

### Lakota

(Mahan x Major) Type II. 67 nuts/lb. 57% kernel. Produces an excellent quality nut with bright kernels. Nuts are medium-sized to small. Harvest is early, but about 2 weeks after Pawnee. It has excellent resistance to scab and exceptional tree vigor. Yields are high, with a need for crop thinning to control excessive crop to maintain quality and reduce alternate bearing. The cultivar has not been evaluated on older trees in the Southeast, so the recommendation is tentative and risky.



### Excel

GA seedling, suspected to be (Pierce x Success) Type II. 45 nuts/lb. 49% kernel. Excel has a unique combination of large nut size, excellent scab resistance, and early harvest date, about October 7. Kernels are bright, but kernel percentage is only moderate as shells are thick. Yields are high, but alternate bearing and overbearing may be a problem on older trees.

### *Gafford*

(AL seedling) Type I. 56 nuts/lb. 50% kernel. Produces a moderate quality nut with bright kernels. Nuts are medium-sized, and harvest is midseason. It has excellent resistance to scab and foliage pests. It is one of the most pest-free selections we have ever evaluated. Yields have been good to excessive. To maintain quality and reduce alternate bearing, crop thinning will be required.



### *Headquarters*

(AL seedling, Elliott x ?) Type II. 60 nuts/lb. 54% kernel. This tree is likely an Elliott seedling, but nuts are larger than Elliott and have similar quality. Headquarters, tested as HQ2-4, has produced good yields of nuts of good quality with minimal care and no sprays. Scab resistance is excellent, and harvest date is midseason, about October 17.

Cultivars with excellent scab resistance that we recommend conditionally or for trial include Kanza, Amling and Adams 5.

### *Kanza*

(Major x Shoshoni) Type II. 65 nuts/lb. 52% kernel. A cultivar with excellent scab resistance that we recommend for trial in North Alabama is Kanza. Kanza is a Major x Shoshoni cross released by USDA in 1996. It has excellent scab resistance and unlike Elliott excellent cold hardiness. Similar to Elliott, it alternately bears but maintains good quality in on years. In our tests at the EV Smith Research Center, kernel brightness has been worse than Elliott, and percent kernel, at only about 49% for Kanza, is also less than Elliott. Perhaps shuckworm damage, which occurs earlier on Kanza than most cultivars, contributed to the lower kernel grades for Kanza in this test. Kanza is suggested for trial plantings in North Alabama, where Elliott is too freeze susceptible.



### *Amling*

(TX seedling). Type II. 60 nuts/lb. 53% kernel. This selection is recommended for yard tree use only, for which it is an excellent choice. This selection has inconsistent and low yields and would not be profitable enough in commercial orchards. The absence of overbearing ensures quality and reduces stress on yard trees, which cannot be mechanically crop thinned. Scab resistance is excellent, and foliage has been rated good in late season with no sprays. Nut quality is very good



### ***Adams 5 (GA seedling).***

Like Amling, we recommend this selection for yard tree use, and it is outstanding for that purpose. It has the distinction of being the only cultivar that we have evaluated for many years that has never had a single scab lesion. In other words, we feel like it is the most scab resistant pecan variety that has ever been tested. Nut quality is good, but nut size is probably too small for commercial use. Foliage condition is excellent in late season even with no sprays.

Cultivars with excellent scab resistance that we don't recommend include Gloria Grande and Jenkins.

Gloria Grande is a cultivar producing a large nut of mediocre kernel percentage, about 47%. Yields are good and consistent. A serious drawback of Gloria Grande is extreme susceptibility to black aphids. Jenkins can produce excellent quality nuts of medium size, with 53% bright kernels. However, as trees get older and with irrigation resulting in larger nut size, kernels have frequently been off- grade and fuzzy. Yellow aphids and sooty mold accumulation, and susceptibility to zonate leafspot are additional problems with Jenkins.

### **Good Resistance.**

Next, we'll discuss cultivars with good scab resistance, which can be grown with a minimal fungicide spray program. The cultivars we recommend in this group are McMillan and Baby B.

#### ***McMillan***

(AL seedling). Type II. 56 nuts/lb. 51% kernel. This cultivar has been highly productive and consistent. Scab resistance has been good on this cultivar, similar to Sumner. In wet years with no sprays scab losses can occur, but scab is easily controlled with a modest fungicide program of 3-4 sprays. Kernels are somewhat dark and occasionally, like Pawnee, have ugly dark kernel markings. Harvest date is about October 20.



#### ***Baby B***

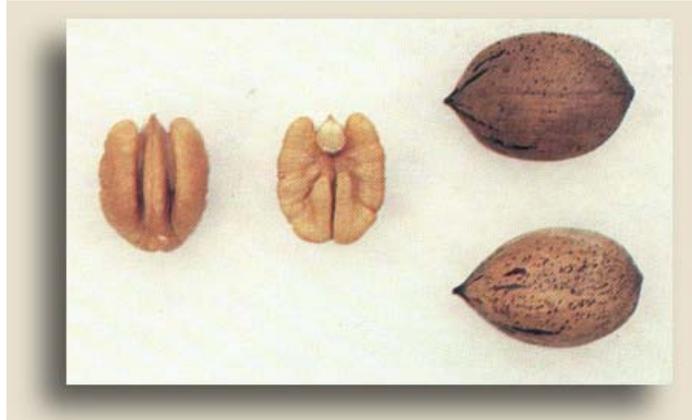


(GA seedling) Type II. 67 nuts/lb. 50% kernel. This tree, tested as Pippin 99-4 is exceptional with respect to foliage appearance and condition. The large leaves remain on the tree in full canopy even in years with heavy pressure from diseases and insects. Likely related, yields are heavy and consistent. Nuts resemble Elliott, but harvest date is very early, similar to Pawnee and Kanza. Scab resistance is good, but some spraying will be required.

Cultivars with good scab resistance that we recommend conditionally or for trial include Elliott and Sumner.

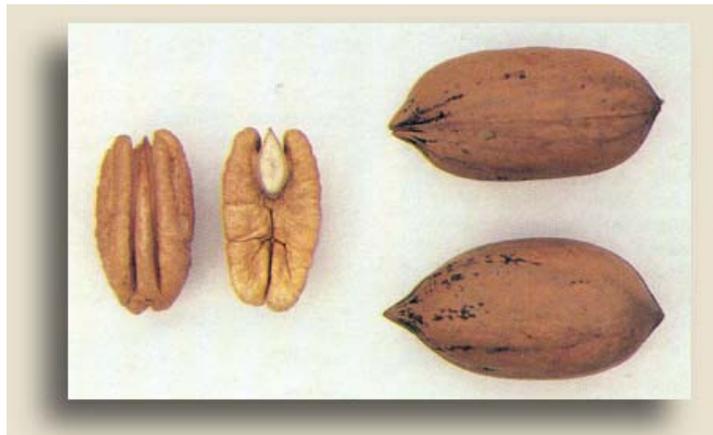
### *Elliott*

(FL seedling) Type II. 72 nuts/lb. 51% kernel. Elliott is an older cultivar widely planted in the Southeast. It has been the standard for scab resistance and retains good resistance in most locations over 80 years since its release about 1925. The reason for its conditional status is because Elliott has known flaws that need to be considered. The widespread planting has allowed strains of the fungus to develop at certain locations such that the usual excellent scab resistance has weakened, resulting in our current scab resistance rating of good. In the face of these strains of the fungus, scab resistance is no longer strong enough to grow Elliott without sprays in many locations. Foliage condition on Elliott on unsprayed trees is often weak, as Elliott is susceptible now to foliage diseases and is quite susceptible to yellow aphids and sooty mold accumulation. Alternate bearing is severe, though Elliott usually maintains high quality with excellent bright kernels even in heavy on-years. Elliott's early budbreak makes it quite susceptible to spring freezes. Elliott has low yields on young trees when compared to similar selections like Baby B and Headquarters.



### *Sumner*

(GA seedling) Type II. 50 nuts/lb. 50% kernel. Sumner is a productive cultivar with good kernel quality, high and consistent yields, large nuts, and good scab resistance. A major disadvantage for Sumner, like Gloria Grande, is that it is highly susceptible to black aphids, and damage from these pests can be serious unless systemic insecticides or aggressive scouting and spraying are used. Sumner also has the disadvantage of late harvest, about 11 days after Stuart. We have frequently seen total crop loss to scab when no fungicides are used on this selection, although the disease is easily controlled with a modest spray program of 3 or 4 fungicides. Sumner may have a niche in the Chinese market, as demand exists there for large, long nuts.



## *Syrup Mill*

(AL seedling) Type I. 65 nuts/lb. 47% kernel. This cultivar has produced good yields, is extremely vigorous, and retains foliage well. Kernels are bright and well-developed, but kernel percentage is low because shells are moderately thick and the shell has a sharp and extended tip. Scab resistance is good in most places, but at certain sites, including the E. V. Smith Research Center in central Alabama, scab has been severe on unsprayed trees in rainy seasons, similar to Sumner. The disease is easily controlled with a few fungicide sprays.



## *Mandan*

(BW-1 x Osage) Type 1. 50 nuts/lb. 57% kernel. This cultivar is conditionally recommended for trial by those seeking to begin harvesting very early, several days ahead of Pawnee. Kernel quality and appearance are suspect, as Pat Conner cut down the trees in the test at Tifton because a portion of the kernels were dark and unattractive with veining. Kernel color is described in the USDA release as "excellent". Scab resistance so far has been good, but we have had insufficient time to test in multiple locations with many strains.



## **Mediocre Resistance.**

Among the many cultivars in this category, we recommend three Caddo, Giftpack and Apalachee.

## *Caddo*

(Brooks x Alley). Type I. 70 nuts/lb. 54% kernel. The small, football shaped nut of this cultivar is consistently well filled with bright kernels. The nut has good cracking qualities, and is suited to shelling markets. It is a very prolific and consistent bearer. Scab is easily controlled with sprays, but it can be susceptible to fungal leaf scorch and black pecan aphids. Harvest is early, about October 11.



## *Giftpack*

(GA seedling Schley? x ?. Type II. 56% kernel, 61 nuts per pound. This cultivar, likely a Schley seedling, has kernel quality similar to Sioux and Schley, and should sell well in the giftpack market. Kernels are bright and the nut is thin-shelled. It is earlier than Schley, with harvest about October 12. Yields are very good and consistent. Scab resistance is mediocre, but scab is less than on similar cultivars Schley or Sioux. Black aphid damage has been less than Schley. Like with Schley, bird predation of the thin-shelled nuts will be a problem.

## *Apalachee*

(Moore x Schley) Type I. 80 nuts/lb. 57% kernel. One of the most thoroughly-evaluated cultivars before release, tested as USDA 48-13-311, Apalachee is planted in grower trials and research orchards in Georgia, Alabama, Texas, and Louisiana. Consistently for many years, it has exhibited remarkable yields of high quality nuts with early harvest date. The high quality, beautiful kernel appearance, and early maturity of the nuts have resulted in good prices for the limited quantities available despite the very small nut size. Kernel percentage is about 57-58%, with 80 nuts/lb. In addition to small nut size, problems include alternate bearing and black aphid susceptibility. Kernels can be dark, especially if left to lay on wet ground. Bird predation is a serious problem, so nuts must be promptly harvested.



Cultivars with mediocre scab resistance which we recommend conditionally or for trial include Creek, Forkert, and Surprise.

## *Creek*

(Mohawk x Western?) Type I. 54 nuts/lb. 50% kernel. Variety trial results understate the yield potential of Creek, as the small compact trees tolerate crowding and should be spaced closely, resulting in high per acre yields. It is only conditionally recommended, as trees must be crop thinned, have good irrigation, aphid control and late fertilizer applications or quality and alternate bearing are intolerable. Scab is easily controlled with sprays, and this cultivar has relatively low levels of aphids and sooty mold. When managed aggressively, Creek is a very dependable producer of high yields of good quality nuts which can be sold on the early market.



## Forkert

(Success x Schley). Type II. 53 nuts/lb. 58% kernel. Produces a nut with high kernel percentage. A disadvantage is that kernel grooves are tight and retain packing material, and the kernel color can be dark. The nut is large and thin-shelled, and may be cracked during mechanical harvest. The tree is strong and easy to train. Forkert requires a good scab control program, but is an excellent cultivar for retail/inshell marketing. Harvest is midseason to a few days earlier. Be aware that Forkert sheds pollen so late that it is not a good pollenizer for most cultivars. To pollinize Forkert, you need a very late pollen shedding cultivar, like Moreland, and since Forkert is no help in pollination of Moreland, a third cultivar must be in the planting to pollinize Moreland, like Cape Fear. Forkert is susceptible to yellow aphids and sooty mold accumulation, and highly susceptible to pecan phylloxera.



Forkert is somewhat susceptible to longitudinal suture splitting. Scab susceptibility varies by location, and in places scab is as bad on for Kurt as it is on Desirable. Forkert, in container-load quantities, would likely sell well in the Chinese market, where large, long, thin-shelled nuts are in demand.

## Surprize

(Alabama seedling, Success? x ?). Type I. 49 nuts/lb. 49% kernel. This cultivar originated in Baldwin Co., AL, and is a vigorous tree with strong branches. Nut size is large, making it a good choice for inshell/retail marketing. Kernels may not fill out well in some years if not irrigated properly. Production from year to year is very consistent. Surprize is susceptible to yellow aphids and sooty mold accumulation. Harvest is late. Surprize is recommended in south Alabama because the strong tree structure resists hurricane damage, and because it produces consistent yields there. Outside of South Alabama, quality has been inconsistent.



## Poor Resistance.

Since scab is such a major limiting factor in pecan production in the Southeast, we do not fully recommend any cultivars with poor scab resistance. However, some cultivars are so exceptional regarding other characteristics, that they are worthwhile to plant despite enormous scab risk.

## Desirable

(Success x Jewett) Type I. 46 nuts/lb. 53% kernel. This old standard cultivar we conditionally recommend. The conditions involve scab control. Desirable should not be planted in low wet areas with poor air flow. Desirable orchards need to be open, with no more than 50% canopy coverage. Growers need to be prepared to spray fungicides at 7-day intervals during wet periods. Advantages of Desirable are well-known, a large nut that shells well with bright kernels, and the most consistent yields of any widely-planted cultivar. A major and often overlooked advantage

for Desirable is that it is not as susceptible to aphids or sooty mold as most cultivars. In addition to scab susceptibility, disadvantages include weak limb structure and susceptibility to pecan leaf scorch mites. Be aware that there is great risk in wet seasons of substantial crop loss on a cultivar this susceptible because of inability to get sprayers in the orchard when the orchard floor is too wet.



### *Byrd.*

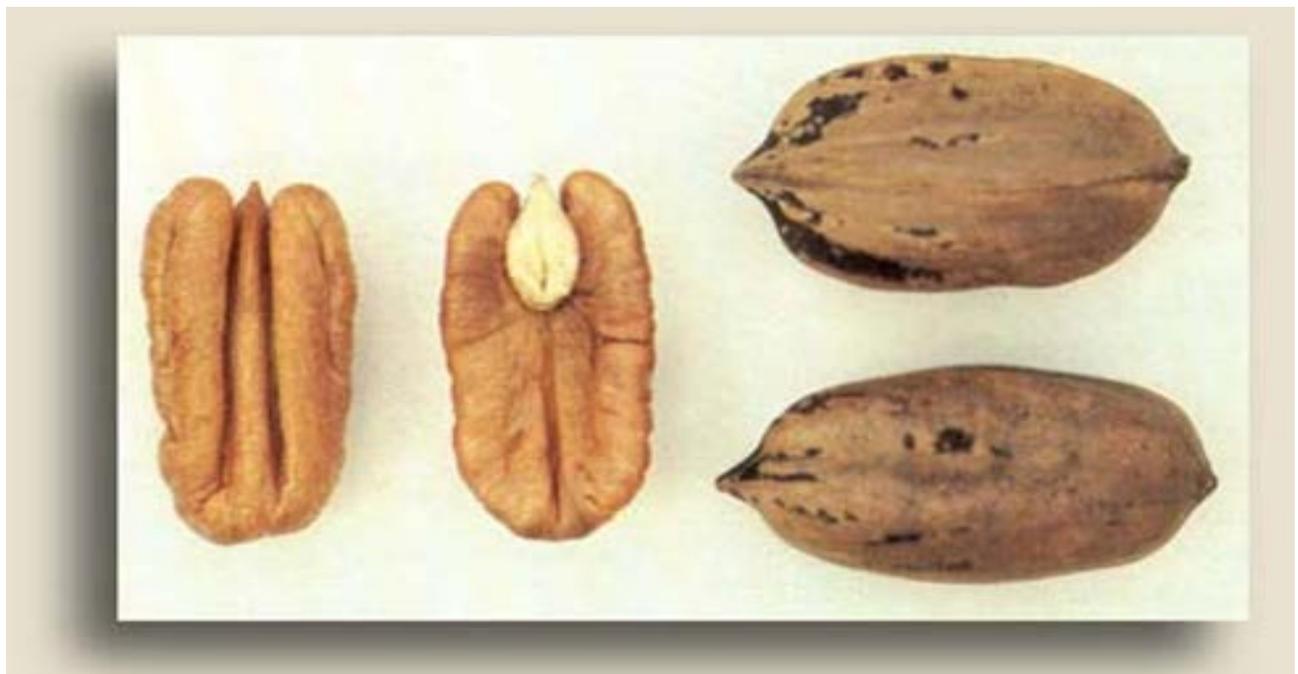


(Pawnee x Desirable) 46 nuts/lb. 62% kernel. Another cultivar we conditionally recommend, at least for trial, is Byrd. This cultivar is a Pawnee x Desirable cross so both parents are highly scab susceptible. I have observed over 200 scab lesions on a stick of graftwood of Byrd. With large nut size, 45 nuts per pound, and high kernel percentage exceeding 60% kernel, this variety should bring a very high price. Harvest date is reported as about the same as Pawnee to a few days later. There is little information about long-term yields.

There are many other cultivars with good or outstanding characteristics but with poor scab resistance. Because of the devastation of this disease and the high risk, we do not recommend planting them. These include Pawnee, USDA 70-6-15, Sioux, Nacono, Western, and Wichita.

**Table 1. Pecan cultivar recommendations for Southeastern Orchards, grouped by scab resistance.**

| Scab Resistance | Recommended                                | Recommended conditionally or for trial | Not recommended   |
|-----------------|--|--|---|
| Excellent       | Lakota<br>Excel<br>Gafford<br>Headquarters | Kanza<br>Amling<br>Adams 5<br>Elliott  | Jenkins<br>Gloria Grande<br>Barton<br>Curtis                    |
| Good            | McMillan<br>Baby B                         | Syrup Mill<br>Sumner<br>Mandan         | Candy   |
| Mediocre        | Caddo<br>Apalachee<br>Giftpack             | Creek<br>Surprize<br>Forkert           | Cape Fear<br>Moreland<br>Stuart<br>Melrose<br>Oconee            |
| Poor            | None                                       | Desirable<br>Byrd                      | Pawnee<br>USDA 70-6-15<br>Sioux<br>Nacono<br>Western<br>Wichita |



**Table 2. Characteristics of recommended cultivars for the Southeast.**

| <b>Cultivar</b> | <b>Poll. Type</b> | <b>Origin</b>                               | <b>Nuts / lb.</b> | <b>% kernel</b> | <b>Harvest Date (50% shuck split)</b> | <b>Scab Resistance</b> |
|-----------------|-------------------|---|-------------------|-----------------|---------------------------------------|------------------------|
| Adams 5         | ?                 | GA seedling (Mitchell)                      | 81                | 53              | Oct 7                                 | Excellent              |
| Amling          | I                 | TX seedling (Schley? x ?                    | 60                | 53              | Oct 11                                | Excellent              |
| Apalachee       | I                 | Moore x Schley                              | 80                | 57              | Oct 7                                 | Mediocre               |
| Baby B          | II                | GA seedling (Dougherty)                     | 67                | 50              | Sept 28                               | Good                   |
| Byrd            | I                 | Desirable x Pawnee                          | 46                | 62              | Oct 1                                 | Poor                   |
| Caddo           | I                 | Brooks x Alley                              | 70                | 54              | Oct 7                                 | Mediocre               |
| Creek           | I                 | Mohawk x Starking<br>Hardy Giant            | 54                | 50              | Oct 8                                 | Mediocre               |
| Desirable       | I                 | Success? x Jewett?                          | 47                | 52              | Oct 16                                | Poor                   |
| Elliott         | II                | FL seedling (Santa Rosa)                    | 76                | 51              | Oct 12                                | Good                   |
| Excel           | II                | GA seedling, Pierce? x<br>Success? (Pierce) | 45                | 49              | Oct 7                                 | Excellent              |
| Forkert         | II                | Success? x Schley?                          | 53                | 57              | Oct 19                                | Mediocre               |
| Gafford         | I                 | AL seedling (Butler)                        | 56                | 50              | Oct 18                                | Excellent              |
| Giftpack        | II                | GA seedling (Dougherty)                     | 61                | 56              | Oct 10                                | Mediocre               |
| Headquarters    | II                | AL seedling (Macon)                         | 53                | 57              | Oct 17                                | Excellent              |
| Kanza           | II                | Major X Shoshoni                            | 65                | 52              | Sept 28                               | Excellent              |
| Lakota          | II                | Mahan x Major                               | 74                | 57              | Oct 3                                 | Excellent              |
| Mandan          | I                 | BW-1 x Osage                                | 50                | 57              | Sept 25                               | Mediocre               |
| McMillan        | II                | AL seedling (Baldwin)                       | 56                | 51              | Oct 22                                | Good                   |
| Sumner          | II                | GA seedling Schley? x ?<br>(Tift)           | 50                | 52              | Oct 29                                | Good                   |
| Surprize        | I                 | AL seedling Success? x ?<br>(Baldwin)       | 49                | 49              | Nov 1                                 | Mediocre               |
| Syrup Mill      | I                 | AL seedling Van<br>Deman? x ? (Mobile)      | 65                | 47              | Oct 20                                | Good                   |

### Photo Credits

Photos of Excel, Surprize, and Byrd from University of GA Pecan Breeding program

Photos of Lakota, Kanza, Elliott, Sumner, Mandan, Apalachee, Creek, Forkert, and Desirable from USDA Pecan Breeding program

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