

UGA variety test update: 'McMillan' shows promise for low-input plantings

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The University of Georgia has conducted a pecan variety test on its Ponder Farm in western Tift County for many years. This test was initiated in 1979 by Dr. Ray Worley, and has been continued and updated by myself over the years. The goal of this study is to test a wide variety of new cultivars and selections which may have potential for Georgia growers. Sources of new selections have been new USDA selections and cultivars, Auburn University selections, grower selections, and most recently selections from the UGA breeding program. Results from this test have been used to help us recommend the cultivars 'Caddo', 'Oconee', 'Pawnee', 'Forkert', 'Kanza', and 'Sumner' for Georgia orchards. Many others were trialed and found to be unsuitable, eliminating these saved growers from having to find this out themselves at great expense.

The Ponder Variety Grove was set up to be managed as a commercial orchard. Trees are planted at a 40 foot spacing, which results in significant shading in about 15

years. At this time trees may be replanted or thinned. Trees are irrigated through the use of microjet sprayers, and fertilized and sprayed using UGA guidelines for commercial orchards. One difference from commercial orchards is that we like to see some damage from pests each year so that we can better differentiate cultivars based on resistance to these pests. Because of this, we tend to apply pesticides a little later and lighter than a commercial grower might. Since Tift County is not as prone to scab infection as many areas of the state, we will sometimes skip some of the early and later fungicide sprays.



Dr. Patrick Conner

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Ideally we like to see at least moderate levels of scab infection on 'Desirable' at the end of the year.

Generally we plant about one quarter of the orchard every 4-5 years with new selections. At this rate trees can be tested for 16-20 years before replanting. This spaces the work of planting and grafting and yield measurements so that everything can get accomplished in a timely manner. Usually 4-6 replicate trees are planted of each cultivar. Of course it would be nice to test a larger number of trees than this, but a balance must be struck between the number of trees tested per cultivar and the number of cultivars that you test. We have found that this number of trees gives a good indication for how the cultivar will perform, but still allows us to test a sufficient number of selections. The trees are randomly located within the section of the orchard that is being planted. Two to three standard cultivars are planted at the same time so that we can compare new cultivars with existing cultivars. We always plant 'Desirable' as one standard cultivar and then rotate in some combination of 'Stuart', 'Pawnee', or 'Sumner' depending upon the type of selections we are testing in that section. For instance we included 'Pawnee' when testing early cultivars and 'Sumner' when testing scab resistant cultivars.

We evaluate cultivars in three broad areas: productiv-

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ity, quality and adaptability. The productivity of any cultivar is, of course, of prime importance. We measure productivity by determining actual tree yield for each tree in the test. Quality of the nut crop produced is highly important in determining the value of a pecan cultivar. We evaluate the quality of the crop of each tree in the test from a 50-nut subsample, and then pool the results of each cultivar to obtain an average. From the nut sample we determine nut size, percent kernel, shelling ability, kernel color, packing material adherence (fuzz), kernel shape, and overall attractiveness of the kernel. Adaptability is the final category that we rate. This takes into account several diverse characteristics including disease and insect resistance, harvest date, and pollen release and stigma receptivity dates.

'McMillan' is a cultivar that was brought to our attention by Dr. Bill Goff of Auburn. This cultivar came

Table 1. Average yield of test cultivars each year from planting in 2002.

| Cultivar | # Trees | Yield | | | | | | | | | | | Avg. |
|-----------|---------|-------|---|---|---|---|----|----|----|----|----|----|------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| McMillan | 5 | 0 | 0 | 0 | 1 | 3 | 18 | 24 | 63 | 35 | 90 | 32 | 24 |
| Desirable | 6 | 0 | 0 | 0 | 1 | 3 | 11 | 20 | 20 | 45 | 53 | 45 | 19 |
| Stuart | 5 | 0 | 0 | 0 | 0 | 1 | 7 | 20 | 30 | 54 | 48 | 58 | 20 |

Table 2. Average nut quality of test cultivars 2002-2012.

| Cultivar | Yield | | | | Harvest date (50% shuck split) |
|-----------|----------------|--------------|----------|--------------|-----------------------------------|
| | lbs./tree/year | # Nuts / lb. | % Kernel | Cluster Size | |
| McMillan | 24.1 | 51 | 50% | 3.4 | Oct. 12 |
| Desirable | 18.5 | 45 | 52% | 2.5 | Oct. 14 |
| Stuart | 19.8 | 47 | 45% | 2.6 | Oct. 23 |

with a reputation of high sustained levels of production and excellent pest resistance. 'McMillan' was planted in our orchards in 2002 and bore its first crop in 2005 (Table 1). 'McMillan' has been a high yielding and precocious cultivar, and early yields were approximately double those of 'Desirable'. Year 8 (2009) was the first heavy yielding year, with many limbs

bending down from the crop. In the following year yield was lighter, only about half of 2009, but not bad considering the crop size of 2009. Year 10 was another very heavy crop year, nearly double that of 'Desirable', and the following year production was again light. 'McMillan' has now entered into an alternate bearing mode, **Continued on Page 43, See UGA**



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but light years still have a decent crop. Limb breakage has occurred, but has been acceptable considering crop load. We have not crop thinned 'McMillan' and it would probably benefit from some thinning in the 'ON' years. Trees grow vigorously and have a fairly wide canopy.

Nut quality of 'McMillan' is only average, with a thick shell reducing percent kernel to about 50% (Table 2), and kernel color being dark some years. I usually describe 'McMillan' as looking like a high quality 'Stuart' nut (Fig. 1). 'McMillan' will fill better than 'Stuart' and seldom has the packing material (fuzz) sticking to its kernel like 'Stuart'. It is, however, slightly smaller

than 'Stuart' and the kernel color is not as bright. Nut shucks are distinctive with a rough appearance. While the nut quality is not too exciting, the productiveness and scab resistance of this cultivar suggest it would be a good choice for low input plantings. I have not seen any leaf or nut scab on 'McMillan' in our sprayed planting

(Table 3). Aphid damage has also not been a problem. Dr. Goff rates 'McMillan' as having "good" resistance, meaning it will scab in wet years without sprays, but scab is easily controlled with a minimal spray program. Harvest time of 'McMillan' is midseason, a couple days before 'Desirable'

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Table 3. Average pest resistance of test trees 2002-2012.

| Cultivar | Leaf Scab ^Z Avg. (worst) ^V | Nut Scab ^Y Avg. (worst) | Black Aphid Damage ^X Avg. (worst) | Sooty Mold Buildup ^W Avg. (worst) |
|-----------|---|---------------------------------------|---|---|
| McMillan | 1.0 (1.0) | 1.0 (1.0) | 1.5 (2.2) | 1.0 (1.0) |
| Desirable | 2.0 (4.0) | 2.6 (4.8) | 1.7 (2.7) | 1.1 (2.0) |
| Stuart | 1.4 (2.8) | 1.2 (3.5) | 2.2 (3.8) | 1.1 (2.0) |

^Z 1=No scab, 2= Few stray spots, 3=Several spots with expanding lesions, 4=Stem scab or defoliation.

^Y 1=No scab, 2=Few stray spots, 3=Obvious scab but no quality loss (0-10%), 4=10-50% shuck coverage, 5=50-100% covered, nut drop.

^X 1=No damage, 2=Light spotting, less than 25% leaves affected, 3=Moderate spotting, 25-75% leaves, 4=Heavy spotting, >75% leaves affected, some leaves completely yellow.

^W 1=None, 2=Light, some black on few leaves, 3=moderate, black on most leaves, 4=Heavy, black flakes on leaves and stems.

^V Average score over all years and (average of worst year for each trait).

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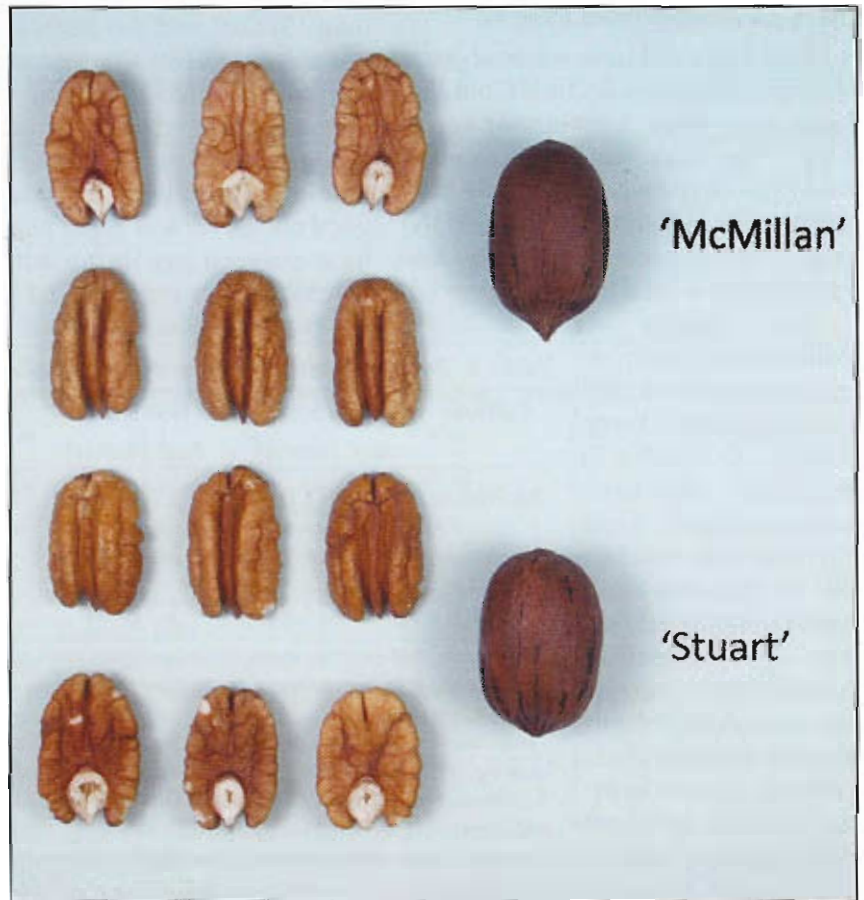
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on average (Table 2).

Right now, I recommend 'McMillan' for high scab pressure or low-spray situations. I like the productivity of this cultivar and the fact that aphid damage has been minimal so far. In general I think 'McMillan' is a good choice for organic or low-input orchards. It would also be a good tree to plant in low spots or other high scab pressure locations. Nut quality is not good enough that I would not recommend it as a main cultivar in a well-managed orchard. In these situations a grower will want to higher quality pecan that will bring a better price.

'McMillan' is a protogynous cultivar with early receptivity and mid to late pollen shed. It would be pollinated by 'Desirable', 'Caddo', 'Cape Fear', 'Creek', 'Oconee', 'Pawnee', 'Mandan', 'Byrd', and 'Amling'. 'Amling' or 'Creek' would probably be the best choice as pollinators as these cultivars also have good scab resistance.

Fig. 1. 'McMillan' nut and kernel in comparison to 'Stuart' in 2012. 'McMillan' was 48 nuts/lb and 49% kernel. 'Stuart' was 44 nuts/lb and 43% kernel.



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