Pecan Cultivars: Current Use and Recommendations

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Pecan remains the most valuable native North American nut crop. This premium quality nut has traditionally been grown commercially in the southeastern U. S. from Texas to Florida. Recent trends show the production to be expanding in some of the southwestern states. A century ago, native trees produced almost all the production. The proportion of production (by weight) from improved cultivars has been increasing steadily since, and currently accounts for 61 percent of the total (1, 3). Native groves continue to be flooded, bulldozed, and otherwise annihilated.

Natives generally produce smaller yields of smaller nuts which are of lower percent kernel, but have kernels which are higher in oil and flavor than the average of improved cultivars. This results from improved cultivars failing to fill out completely more often than natives. Native orchards are generally not cared for, and thus their production is very low. Some of the native stands are unworthy of management, being composed of trees that produce small quantities of small or otherwise inferior pecans. Other groves are very valuable and their potential approaches those of improved cultivars.

Currently, only Texas, Oklahoma, and Louisiana have sizable acreages of natives (Table 1). Small acreages are also reported for five other states. The total of over 0.8 million acres includes all solid stands of natives, and accounts for 59 percent of the total U. S.

Table 1. Total U. S. pecan acreages by type.

State	Native		Improved	
	Acres	% of Total	Acres	% of Total
AL			55,000	9.5
AZ			21,000	3.6
AR	4,500	0.5	4,500	0.8
CA			2,500	0.4
FL			15,000	2.6
GA			200,000	34.4
KS	7,750	0.9	250	0.0
KY	250	0.0	50	0.0
LA	45,000	5.4	12,000	2.1
MS			25,000	4.3
MO	12,500	1.5	500	0.1
NM			20,000	3.4
NC			4,000	0.7
OK	169,000	20.1	12,000	2.1
SC			10,000	1.7
TN	100	0.0	75	0.0
TX	600,000	71.5	200,000	34.4
Totals	839,100	100.0	581,875	100.0

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Table 2. Estimated acres of each cultivar by state, and percent of U.S. improved pecans by acreage.

Cultivar	AL	AZ	AR	CA	FL	GA	KS	KY	LA
Barton		210							
Burkett									
Caddo									
Cape Fear						6,000			
Cheyenne				325					
Choctaw									
Delmas	1,650								
Desirable	3,850				3,000	20,000			
Frotscher	1,100					6,000			1,200
Giles							100		
Hirschi[1]							50		
Ideal[2]		210							
Kiowa									
Mahan									
Maramec									
Mobile									
Mohawk		210							
Moneymaker	1,650				750	16,000			
Moore					1,200	10,000			
Pabst						6,000			
Peruque									
San Saba Imp.									
Schley	5,500					15,000			240
Shoshoni							50		
Sioux									
Squirrel[3]									
Stuart	27,500				4,500	80,000			7,800
Success	2,200								1,200
Sumner						6,000			
Tejas									
Van Deman						6,000			
Western		10,500		300					
Wichita		9,450		1,875					
Unknown	11,500	420	4,500		5,550	29,000	50	50	960
Totals	55,000	21,000	4,500	2,500	15,000	200,000	250	50	12.000

[1]Sometimes called Steuck.
[2]Sometimes called Bradley in the West.
[3]Squirrel's Delight.

Table 2. Estimated acres of each cultivar by state (Continued).

Cultivar	MS	MO	NM	NC	OK	SC	TN	TX	Totals	% of U.S.
Barton								2,000	2,210	0.4
Burkett					500				500	0.1
Caddo								2,000	2,000	0.3
Cape Fear				1,000					7,000	1.2
Cheyenne								12,000	12,325	2.1
Choctaw								4,000	4,000	0.7
Delmas									1,650	0.3
Desirable	3,000			200				24,000	55,250	9.5
Frotscher						300			7,400	1.3
Giles		150							250	0.0
Hirschi[1]		100							150	0.0
Ideal[2]			1,000						1,210	0.2
Kiowa								2,000	2,000	0.3
Mahan	1,250				500	300	8	2,000	4,058	0.7
Maramec					1,000				1,000	0.2
Mobile						300			300	0.1
Mohawk					1,400			4,000	5,610	1.0
Moneymaker									19,000	3.3
Moore								6,000	17,200	3.0
Pabst						300			6,300	1.1
Peruque		250							250	0.0
San Saba Imp.					200			16,000	16,200	2.8
Schley	500				300	2,500		2,000	26,040	4.5
Shoshoni									50	0.0
Sioux								6,000	6,000	1.0
Squirrel[3]					300				300	0.1
Stuart	12,500			2,400	3,600	5,000	22	12,000	155,322	26.7
Success	500				300			6,000	10,200	1.8
Sumner									6,000	1.0
Tejas								2,000	2,000	0.3
Van Deman									6,000	1.0
Western			16,000		400			48,000	75,200	12.9
Wichita			2,000		500			30,000	43,825	7.5
Unknown	7,250		1,000	400	3,000	1,300	45	20,000	85,075	14.6
Totals	25,000	500	20,000	4,000	12,000	10,000	75	200,000	581,875	

[1]Sometimes called Steuck.
[2]Sometimes called Bradley in the West.
[3]Squirrel's Delight.

pecan acreage, but only 39 percent of total production (1, 3).

Since improved cultivars currently account for most of the production, knowledge of their specific potentials, weaknesses, etc. becomes of prime importance. To determine more precisely how many acres of each cultivar currently exists, key pecan experts (see list below) in each of 17 states were contacted and they submitted data on the cultivar situation in their respective states. A national summary is shown in Table 2. There are currently more acres of Stuart being grown than any other cultivar. This old cultivar continues to serve the pecan industry well, being especially adapted from Louisiana to Florida. It does not perform well in Texas, and most Stuart trees were topworked years ago to better cultivars. Stuart is protogynous and is either self-pollinated, or is planted in strips with Desirable or other protandrous pollinators.

Western is the second most common cultivar, especially adapted from Central Texas westward. Its scab susceptibility makes it unprofitable from Central Texas east in the more humid regions. Western produces a medium sized, thin shelled nut with a high percent kernel and good kernel quality. It is normally self-pollinated, and various studies show that this does not affect nut size and quality.

Desirable is the third most common cultivar, just behind Western. This old cultivar is generally known for its annual production capacity (being somewhat free of alternate bearing) and its scab [*Cladosporium caryigenum* (Ell. et Lang) Gottwald] resistance in most areas. However, races of scab pathogenic to Desirable are building up in many areas. Uniform annual production probably results from self thinning of clusters so that the tree is seldom overloaded. A high state of tree health and nutritional reserves are thereby retained, and pistillate flowers are produced most seasons. This medium large nut is a good in-shell retail product. It is somewhat mediocre in percent kernel, but has high nut quality.

Wichita accounts for almost eight percent of the U.S. acreage, by far the most popular USDA cultivar as far as number of trees being propagated (2). This Halbert X Mahan cross is one of the most precocious and prolific of all cultivars. The medium sized nut has a very high percent kernel (58-63) and high kernel quality. This protogynous cultivar and its common pollinator, Cheyenne are the standard cultivars for the Central Texas area. The scab susceptibility of Wichita keeps it from being grown further east. It also has the weakest limb connections of any variety, and thus is super susceptible to wind and ice damage. Its higher zinc requirement contributes to its reputation as an expensive clone to grow.

Schley (not to be confused with Western, which is sometimes called Western Schley) is an old cultivar that still exists in the South. It is very susceptible to scab, phylloxera, tumor disease, and bunch disease. It does produce a high quality nut when properly managed. It doesn't yield well enough to be grown in the western scab-free environments.

San Saba Improved, Moneymaker, and Moore are grown at about equal frequencies. All are old, but that's about all they have in common. San Saba Improved is a small nut cultivar with fine foliage and scab susceptibility. It is commonly found in West Texas and Oklahoma. Moneymaker is a highly productive cultivar with mediocre nut quality and percent kernel. It is common in Alabama and Georgia. Moore is an old Florida variety that often overbears.

The percent of each cultivar by state is shown in Table 3. Stuart makes up at least 50 percent of the

Table 3. Estimated percent of the acreage in each state planted to each improved cultivar.

Cultivar	AL	AZ	AR	CA	FL	GA	KS	KY	LA	MS	MO	NM	NC	OK	SC	TN	TX
Barton		1															1
Burkett														4			
Caddo																	1
Cape Fear						3							25				
Cheyenne				13													6
Choctaw																	2
Delmas	3																
Desirable	7				20	10			10	12			5				12
Frotscher	2					3									3		
Giles							40				30						
Hirschi[1]							20				20						
Ideal[2]		1										5					
Kiowa																	1
Mahan										5				4	3	10	1
Maramec														8			
Mobile															3		
Mohawk		1												12			2
Money-maker	3				5	8			5								
Moore					8	5											3
Pabst						3									3		
Peruque											50						
San Saba Imp.														2			8
Schley	10					7			2	2				3	25		1
Shoshoni							20										
Sioux																	3
Squirrel[3]														3			
Stuart	50				30	40			65	50			60	30	50	30	6
Success	4								10	2				3			3
Sumner						3											
Tejas																	1
Van Deman						3											
Western		50		12								80		3			24
Wichita		45		75								10		4			15
Unknown	21	2	100		37	15	20	100	8	29		5	10	25	13	60	10

[1]Sometimes called Steuck.
[2]Sometimes called Bradley in the West.
[3]Squirrel's Delight.

Table 4. Pecan cultivars recommended for various states in 1983.

Cultivar	AL	AZ	AR[1]	CA	FL	GA	KS	KY	LA	MS	MO	NM	NC	OK[1]	SC	TN	East TX	West TX	No. States
Apache														CH					1
Barton										H									1
Brooks			CH																1
Caddo									C					CH					2
Candy			CH						CH	H									3
Cape Fear	C[2]H[3]		CH		C	C			CH	CH			CH		CH				8
Cherokee			CH																1
Cheyenne	CH	C	CH	C	C				C	CH		CH		CH	CH		CH	CH	12
Chicksaw			CH											CH[4]	CH[4]				3
Choctaw	CH		CH							CH				CH	CH[4]		CH		6
Colby			CH				CH	CH						CH		CH			5
Cowley			CH																1
Curtis					H	CH			H										3
Davis										H									1
Desirable	CH		CH		CH	C			C	CH			CH	CH	CH		CH		10
Elliott	CH				CH	CH			H	H					CH				6
Farley						H													1
Forket	CH								C	CH					CH				4
Giles			CH				CH				C			CH		CH			5
Gloria Grande			CH		C				CH						CH				4
Gormley														CH					1
GraKing														CH					1
Green River			CH					CH								CH			3
Hayes														CH					1
Hirschi[5]							CH				C			CH					3
Hodge								CH											1

Ideal[6]		C										CH							2
Jack Ballard			CH																1
Jackson	CH								C	H									3
Kiowa	CH		CH		C					C				CH[4]	CH		CH[4]	CH[4]	8
Mahan			CH																1
Major			CH				CH	CH			CH					CH			5
Maramec			CH											CH					2
Melrose	CH								CH	H									3
Mohawk		H	CH							C				CH	CH[4]	CH			6
Moneymaker			CH																1
Moreland			CH		CH														2
Mount														CH					1
Oakla														CH					1
Owens			CH							CH									2
Peruque			CH				CH	CH			C			CH		CH			6
Posey							CH	CH			C					CH			4
San Saba Imp.														CH					1
Shawnee														CH					1
Shoshoni			CH				CH							CH	CH	CH			5
Sioux														CH					1
Squirrel[7]														CH					1
Stuart	CH		CH		CH	CH				CH			CH	CH	CH	CH			9
Sumner	CH				C	C			CH						CH				5
Tejas			CH											CH[4]					2
Western		CH		C								CH		CH				CH	5
Wichita		C	CH	C								CH		CH				CH	6
Total	11	5	27	3	10	7	7	6	12	15	5	4	3	27	13	9	4	4	

[1]See text for further information.
[2]Commercial plantings.
[3]Home plantings
[4]Trial plantings only for both commercial and home use.
[5]Sometimes called Steuck.
[6]Sometimes called Bradley in the West.
[7]Squirrel's Delight.

acreage in five states. Other cultivars are dominant in other states, such as Western in New Mexico and Wichita in California.

Recommended cultivars differ greatly from those currently being grown (Table 4). Most state extension personnel have definite ideas about what should be planted, while climatic conditions of other states cause clonal reactions to vary so much that many cultivars are recommended. Arkansas and Oklahoma, for instance, each recommend 27 varieties. These two states have drastic differences in climate and altitude.

Some states distinguish between cultivars for commercial and for home use, knowing that commercial plantings will be cared for better. Most trees planted around homes and farmsteads are not properly pruned, watered, fertilized, or sprayed for insects and diseases. A "tougher" tree is needed under most of these conditions. For instance, Gloria Grande makes a good home tree in the Southeast. It is very scab resistant, and grows fairly well without a lot of corrective pruning. Wester makes a good tree for western areas, since it self-pollinates and is wind resistant. There are a tremendous number of unthrifty trees throughout the pecan belt around homes. Most were planted to serve the dual purpoes of producing shade and nuts. However, neither purpose is fulfilled by some trees because of lack of care.

Rootstocks

Open-pollinated seed is used to grow pecan rootstocks. Nurseries are usually located on sandy soils which allow easy digging of trees for sale. Since pecan is very heterozygous, and pollen sources are variable, there is great variability in pecan nursery rows as to plant size, diameter, etc. This is overcome to some extent by various techniques to remove inferior or small trees during the first year of growth. This rootstock selection in sandy soils may be unfortunate since most trees are transplanted into heavier soils. Trees are normally propagated to improved cultivars the second or third year.

A desirable cultivar or seed source (Table 5) as far as a nurseryman is concerned, produces a large tree (stem diameter is more important than height) as early as possible. This is an obvious need since a minimum of about 15 mm is required to patch bud. Smaller trees can be whip grafted (this technique is only successful in the more humid East), and much larger trees are needed to bark graft. Another requirement is cold resistance in the northern pecan area. Gerardi, Giles or natives are mainly used in these areas.

Genetic variability among pecan and hickory rootstocks is very common. Research to develop and/or identify superior rootstocks for pecan has great potential. Little is known as to how different rootstock sources influence scion growth, health, and nut production. Even a slightly superior rootstock would prove invaluable to growers since it would be an inexpensive, one time investment.

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Table 5. Rootstocks used in different states.

State	Cultivars
AL	Elliott and some Curtis
AZ	Riverside and many others
AR	Mainly natives
CA	Riverside, Apache, plus others
FL	Elliott, Curtis, plus others
GA	Elliott, Curtis, plus others
KS	Giles, plus natives
KY	Natives
LA	Stuart, Moore, plus others
MS	Owens, Big Dan, Moore, water hickory
MO	Mainly natives
NM	Riverside, Burkett
NC	Cape Fear, plus others
OK	Riverside, Giles, Moore, Western, plus others
SC	Curtis, Stuart, Elliott
TN	Gerardi, plus natives
TX	Riverside, Apache, plus many others

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Walnuts

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Walnut (genus *Juglans*) is known for the nuts and timber it produces. There are many species but it is the Persian walnut *(Juglans regia)* which is best known and grown most extensively in the world as a food crop. It is also commonly known as the "English" walnut but the name "Persian" is preferred because it indicates the area extending from Eastern Europe to the Himalayas where the species is native. It is widely cultivated with commercial production in France, Italy, Turkey, China, India, and the United States, the leading producer. Practically all of the U.S. production is in California (mostly in the interior valleys) which now has about 178,000 bearing acres with an average yield of around one and one-third short tons (in-shell basis) per acre. Many orchards produce over two tons per acre and yields of three tons are common in some of the recent plantings.

Walnuts have two major outlets, the in-shell and shelled markets. In recent years, the amount of the crop sold as shelled product has been increasing and now represents about 68% of the crop. Most of this is sold domestically since the export market which is around 25 to 30% of the total supply consists almost entirely of in-shell sales. Sun Diamond Growers, a coop-

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