'Lakota' Pecan

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'Lakota' is a new pecan [*Carya illinoensis* (Wangenh.) K. Koch] cultivar released by the U.S. Department of Agriculture (USDA), Agricultural Research Service and the Kansas Agricultural Experiment Station, Kansas State University. 'Lakota' is being released because of its high nut quality, high yield potential, early nut maturity, and excellent tree strength. Pecans from this cultivar can be sold in shell or shelled to produce a large proportion of halves and large pieces.

Origin

USDA conducts the only national pecan breeding program. Crosses are made at Brownwood and College Station, TX (Grauke and Thompson, 1996; Thompson and Grauke, 1991; Thompson and Young, 1985). Seedling clones are established on their own roots or budded to pollarded trees for the initial 10-year testing phase at College Station. Superior clones then enter National Pecan Advanced Clone Testing System, where they are tested across the U.S. pecan belt in cooperation with state researchers and private growers. After several years, the best clones are given Native American tribe names and released to nurseries for propagation of trees to be sold to growers. USDA cultivars are never patented, and after release, growers can propagate the new cultivar as much as desired.

The 'Lakota' are a Native American tribe and one of the seven tribes that make up the Great Sioux Nation (Hodge, 1975). They speak Lakota, one of the three major dialects of the Sioux language. They are the westernmost of the three Sioux groups that occupy land in both North and South Dakota. Today they are found mostly in the five reservations of western South Dakota.

'Lakota', tested as selection 64-6-502, is a progeny from a 1964 cross between the 'Mahan' and 'Major' cultivars made by L. D. Romberg at Brownwood, TX. 'Mahan' originated in Kosciusko, Attala County, MS, by J. M. Chestnutt (Brooks and Olmo, 1956). The parentage of 'Mahan' is unknown, but probably one parent is 'Schley' ('Eastern Schley') (Thompson and Young, 1985). 'Mahan' has proven to be a superior parent in the USDA Breeding Program, being the parent of five other USDA cultivars. It contributes nut size, scab resistance, precocity, superior leaf health, and tree vigor. All seedlings of 'Mahan' are protogynous because this cultivar is homozygous-dominant for this genetic characteristic (Thompson and Romberg, 1985). 'Major' is an old native from the Green River, Henderson County, KY (Thompson and Young, 1985). 'Major' is scab-resistant and has early nut maturity. It was long considered the best of the northern cultivars but now has been largely replaced by newer superior USDA/state cultivars. It is also the female parent of two other USDA cultivars, 'Osage' (Thompson et al., 1991) and 'Kanza' (Thompson et al., 1997). It has been a main source of early nut maturity and scab resistance for the USDA Pecan Breeding Program.

Yield data indicate that 'Lakota' has adequate precocity, similar to 'Pawnee'. In a 7-year yield test grafted in 1988 at Chetopa, KS, 'Lakota' averaged 1095 kg·ha⁻¹, compared with 896 kg for 'Osage' and 528 kg for 'Witte' (Table 1). Note that this average includes 4 "on" years and 3 "off" years, so the yield figures may be slightly inflated if ever compared with an even number of years. In another test (data not shown) at Comanche, TX, data were collected for 5 years (1988 to 1992). Each plots consisted of two trees with four replications and spacing was 9.15 m × 7.32 m. 'Lakota' had 4.03 nuts per cluster compared with 2.86 for 'Pawnee' and 3.91 for 'Wichita'. In this same Comanche test, percent terminals with clusters was 44.9 for 'Lakota' compared with 30.3 for 'Pawnee' and 40.9 for 'Wichita'. Thus, the alternate bearing tendency (Pearce and Dobersek-Urbanc, 1967) of 'Lakota' (Table 1) appears to be at least partially the result of large cluster size and high percent fruiting shoots. It may be possible to reduce the effects of alternate bearing by midsummer fruit thinning.

Average nut weight is 6.8 g for 'Lakota' compared with 7.6 g for 'Pawnee' and 6.1 g for 'Kanza' (Table 2). Nut percent kernel averages 56.8 and kernel color is excellent (Fig. 1). 'Lakota' has proven to be a producer of high-quality nuts and has become a favorite among customers who buy pecans from the Kansas Agricultural Experiment Station.

Time of spring budbreak is similar to 'Kanza' and 'Pawnee'. 'Lakota' is protogynous (Fig. 2) with early to midseason receptivity and midseason to late pollen shed (similar to 'Kanza' and 'Hopi'). 'Lakota' should be a good pollenizer for, and well pollenized by, 'Pawnee', 'Osage', and 'Giles'. Time of nut maturity is early, similar to 'Giles' and ≈1 week after 'Pawnee'. 'Lakota' has performed well in tests in many northern pecan production areas (Kansas, Missouri, Illinois, Oklahoma, and northern Texas).

Trees are upright in growth habit and develop strong limb angles and a wind-resistant tree structure. 'Lakota' is very resistant to scab disease (Table 3) with moderate susceptibility to yellow and black aphids.

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Table 1. National Pecan Advanced Clone Testing System data from a replicated test at Chetopa, KS, grafted in 1988 comparing the yield (kg·ha⁻¹) of the Lakota pecan with other cultivars.

Cultivar	1999	2000	2001	2002	2003	2004	2005	Yearly mean	ABI ⁴
Lakota	1230.9 ^a	0.0	1320.6	376.7	1722.0	470.9	2542.6	1095.3	0.75 ^b
Osage	946.2	146.9	492.2	550.4	1525.8	357.6	2251.1	895.7	0.48
Witte	635.7	196.2	672.6	455.2	494.4	519.1	724.2	528.0	0.26
Canton	714.1	165.9	949.6	325.1	733.2	1014.6	1690.6	799.3	0.47
Least significant difference	309.0	100.7	416.6	113.5	689.0	335.7	924.8	272.2	

^aMeans of six replications with two-tree plots. Two values within the individual year columns that differ more than the least significant difference value for that column are significantly different ($P < 0.05$).

^bAlternate bearing index (Pearce and Dobersek-Urbanc, 1967) varies from 1 (complete alternate bearing) to 0 (uniform yield).

Table 2. National Pecan Advanced Clone Testing System nut quality data from a replicated test at Chetopa, KS, grafted in 1988 comparing the Lakota pecan with other cultivars.²

Cultivar	Nut wt (g)	Kernel wt (g)	Kernel (%)
Canton	5.42	2.65	48.86
Chetopa	6.17	3.21	52.09
Giles	5.20	2.61	49.45
Kanza	6.06	3.09	50.86
Lakota	6.81	3.89	56.75
Osage	5.27	2.76	51.93
Pawnee	7.61	4.72	61.24
Posey	7.33	4.08	55.67
Witte	6.20	3.17	51.05
Least significant difference	0.93	0.78	5.77

²Means of six replications with two-tree plots for the years 1999 to 2005. Two values within a column that differ more than the least significant difference value for that column are significantly different ($P < 0.05$).

Table 3. Leaf and fruit scab ratings recorded in 1995 for six pecan clones growing near Chetopa, KS, using the Hunter-Roberts scale (Hunter and Roberts, 1978).²

Cultivar	Leaf scab rating	Fruit scab rating
Canton	3.34	3.14
Lakota	1.00	1.00
Osage	2.64	1.45
Witte	3.50	2.50
USDA 62-12-1	3.17	4.73
USDA 63-16-182	2.83	3.73
Least significant difference	0.45	0.43

²1 = no scab, 5 = greater than 50% coverage of leaves or fruit with scab lesions. Means of six replications with two-tree plots. Two values within a column that differ more than the least significant difference value for that column are significantly different ($P < 0.05$).

Availability

Graftwood was supplied to nurserymen in the spring of 2007. The USDA does not have any trees for distribution. This cultivar will be deposited in the National Plant Germplasm System where it will be available for research purposes, including development and commercialization of new cultivars. It is requested that appropriate recognition be made if this germplasm contributes to the development of a new cultivar.

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Fig. 1. Nuts and kernels of the 'Lakota' pecan.

Fig. 2. Pollen shed and pistil receptivity for the 'Lakota' pecan and control cultivars at College Station, TX, in 2007. Type I, protandrous; type II, protogynous cultivars.

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