'Lipan' Pecan

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'Lipan' (Lē'pän) is a new pecan [*Carya illinoensis* (Wangenh.) K. Koch] cultivar released by the U.S. Department of Agriculture (USDA), Agricultural Research Service. The Lipan are a Native American Apache tribe (Hodge, 1975). 'Lipan' was released because of its high nut quality, high yield potential, medium-early nut maturity, and scab disease (*Fusicladium effusum* G. Winter) resistance. 'Lipan' should be adapted to all pecan-growing areas of the world except the extreme northern production area of the United States. Pecans from this cultivar can be sold in-shell or shelled to produce a large proportion of halves and large pieces.

Origin

The 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 12-year testing phase at College Station. Superior clones and then enter the National Pecan Advanced Clone Testing System (NPACTS), where they are tested across the U.S. pecan belt in cooperation with federal and state researchers and private growers. After several years, the best clones are given Native American tribe names and released to nurseries for propagation to sell to growers. USDA pecan cultivars are not patented, and after release, growers can propagate the new cultivars as much as desired.

Not all selections are tested at all NPACTS locations. 'Lipan', for instance, was extensively tested in replicated yield tests at Brownwood

and Hempstead, TX. In addition, trees of this selection were grown and evaluated at several other nonreplicated NPACTS locations where various characteristics were monitored.

'Lipan', tested as selection 1986-3-624, is a progeny from a cross between the 'Cheyenne' and 'Pawnee' cultivars made by T.E. Thompson at Brownwood, TX, in 1986

(Fig. 1). 'Cheyenne' is a USDA cultivar released in 1970 and originated from a cross of the 'Clark' and 'Odom' cultivars (Madden, 1969). 'Clark' is a native pecan from San Saba County, TX. 'Odom' is a seedling from Ocean Springs (Newton County), MS. It may be a seedling of the 'Russell' cultivar (Thompson and Young, 1985). 'Cheyenne' was chosen as a parent based on its high nut quality and productiveness. 'Pawnee' is also a USDA cultivar released in 1984 (Thompson and Hunter, 1985). It is from the cross 'Mohawk' and 'Starking Hardy Giant'. Mohawk is a USDA cultivar released in 1965 from the 'Success' and 'Mahan' cultivars (Thompson and Young, 1985). 'Success' originated in 1903 in Jackson County, MS, and 'Mahan' originated in Attala County, MS. 'Mahan' is a parent of six of the 29 released USDA cultivars, and 'Success' is a

Fig. 1. Pedigree of the 'Lipan' pecan.

Table 1. National Pecan Advanced Clone Testing System (NPACTS) data from Brownwood, TX, comparing the yield of nuts of the 'Lipan' pecan with other cultivars.²

Cultivar	Yield (kg/tree)								Total	ABI ³
	1999	2000	2001	2002	2003	2005	2006	2007		
Lipan	0.19	0.13	6.87	5.62	6.63	8.92	10.60	30.67	69.63	0.49
Pawnee	0.75	0.37	6.40	11.08	1.91	14.21	11.15	26.87	72.75	0.59
Desirable	0.05	0.18	3.15	4.50	10.27	17.79	5.14	24.93	66.02	0.65
Wichita	0.65	0.83	12.68	11.33	4.47	24.43	2.85	0.00	57.24	0.66

²Rootstocks were planted 1983 through 1986, and trees were grafted from 29 Apr. through 30 June 1996. A flood destroyed the yield in 2004.

³Alternate Bearing Index (Pearce and Dobersek-Urbanc, 1967), which includes the 2004 year of no yield for any cultivar.

Table 2. National Pecan Advanced Clone Testing System (NPACTS) data from Brownwood, TX, comparing nut quality of 'Lipan' with other cultivars.²

Cultivar	Avg kernel content (%)	Avg nut wt (g)	Avg nut maturity ³	Avg kernel color ⁴
Lipan	53.0 b ^w	9.80 a	4 Oct. b	2.60 c
Pawnee	57.9 a	7.89 c	20 Sept. a	2.96 b
Desirable	51.4 b	8.92 b	21 Oct. c	2.04 d
Wichita	56.6 a	7.41 d	24 Oct. c	3.28 a

²Average kernel content, average nut weight, average kernel color, and average nut maturity refer to the period between 2005 and 2007.

³Recorded at 70% shuck split date.

⁴1 = lightest color.

^wMeans within columns followed by a common letter are not significantly different according to Duncan's multiple range test at the 0.05 level.

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parent of four of these cultivars. ‘Starking Hardy Giant’ is a native variety from Carroll County, northern Missouri. ‘Pawnee’ was selected as a parent as a result of its early nut maturity, nut quality, and yellow aphid complex resistance.

Description

The ‘Lipan’ clone was initially grown and evaluated on its own roots at College Station, TX. On the basis of preliminary performance, extensive testing was started in Apr. 1996 by grafting an NPACTS yield and performance test at Brownwood, TX. This test had eight

replications (single-tree) with a tree spacing of 9.1×10.7 m. Yield data indicate that ‘Lipan’ has adequate precocity, similar to ‘Pawnee’ (Table 1). ‘Lipan’ produced ≈ 70 kg of nuts per tree compared with 73 kg for ‘Pawnee’ and 66 kg for ‘Desirable’. When considering total kernel produced per tree over the life of the test, ‘Lipan’ produced ≈ 37 kg and ‘Pawnee’ produced ≈ 42 kg compared with 34 kg for ‘Desirable’. Number of nuts per cluster was 2.5 for ‘Lipan’, 3.3 for ‘Pawnee’, and 2.2 for ‘Wichita’. The alternate bearing tendency of ‘Lipan’ appears less than ‘Pawnee’, ‘Desirable’, and ‘Wichita’ (Table 1).

Average nut weight was 9.8 g for ‘Lipan’ compared with 7.9 g for ‘Pawnee’, 8.9 g for ‘Desirable’, and 7.4 g for ‘Wichita’ (Table 2). Nuts have $\approx 53\%$ kernel. Kernels are cream to golden in color (Fig. 1; Table 2) with open, non-trapping dorsal grooves and a rounded dorsal ridge. The nut is elliptic with a slightly pointed apex and rounded base and is round in cross-section (Fig. 2). The shell suture is very strong and should be very resistant to splitting if harvest is delayed.

‘Lipan’ has proven to be a consistent producer of high-quality nuts that mature and are ready to harvest ≈ 2 weeks after the

Table 3. National Pecan Advanced Clone Testing System (NPACTS) data from Brownwood, TX, comparing the budbreak date of ‘Lipan’ with other cultivars.

Cultivar	Budbreak ^z	
	2003	2009
Lipan	2.7 c ^y	3.4 b ^y
Navaho	4.3 a	5.0 a
Wichita	3.5 b	3.3 b
Desirable	2.9 c	3.4 b
Pawnee	2.9 c	3.3 b

^zRatings were made 2 Apr. 2003 and 1 Apr. 2009 (1 = dormant, 2 = bud swell, 3 = inner scale split, 4 = leaf burst, and 5 = leaf expansion).

^yMeans within columns followed by a common letter are not significantly different according to Duncan’s multiple range test at the 0.05 level.

Table 4. National Pecan Advanced Clone Testing System (NPACTS) data from Brownwood, TX, comparing the scab resistance of ‘Lipan’ with other cultivars.

Cultivar	Scab ratings ^z	
	Leaves	Fruits
Lipan	1.8 b ^y	1.4 c
Pawnee	1.9 b	1.9 b
Desirable	1.9 b	2.0 b
Wichita	4.0 a	4.5 a

^zRatings recorded in 2004, 2005, and 2007 using the Hunter-Roberts (Hunter and Roberts, 1978) 1 to 5 scale (1 = no scab and 5 = greater than 50% coverage with scab lesions).

^yMeans within columns followed by a common letter are not significantly different according to Duncan’s multiple range test at the 0.05 level.

Table 5. National Pecan Advanced Clone Testing System (NPACTS) data from Hempstead, TX, comparing the fruit scab resistance of ‘Lipan’ with other cultivars.

Cultivar	Scab ratings ^z
Pawnee	2.5 a ^y
Desirable	1.9 b
Kanza	1.7 c
Lipan	1.4 d
Nacono	1.3 e
Caddo	1.0 g

^zRatings recorded in 2007 using the Hunter-Roberts (Hunter and Roberts, 1978) 1 to 5 scale (1 = no scab and 5 = greater than 50% coverage with scab lesions).

^yMeans followed by a common letter are not significantly different according to Duncan’s multiple range test at the 0.05 level.

Fig. 2. Nuts and kernels of the ‘Lipan’ pecan.

Fig. 3. Pollen shed and pistil receptivity for the ‘Lipan’ pecan and control cultivars at Brownwood, TX, in 2011. Type I = protandrous cultivars; Type II = protogynous cultivars.

early-maturing Pawnee cultivar and ≈ 2 weeks before 'Desirable' (around 4 Oct. at Brownwood) (Table 2). Like with most cultivars, fruit thinning of 'Lipan' in midsummer may be needed in some years. Time of spring bud-break is midseason (similar to 'Pawnee' and 'Desirable') (Table 3). 'Lipan' is protandrous with early pollen shed and midseason pistil receptivity, similar to 'Creek' and 'Cheyenne' and later than 'Caddo' (Fig. 3). 'Lipan' should be a good pollinizer for and well pollinized by 'Choctaw', 'Kanza', and 'Wichita'. Preliminary data indicate that 'Lipan' is superior to 'Wichita' at Brownwood for scab resistance (Table 4). In a second NPACTS test with high scab pressure (Table 5), 'Lipan' showed significantly better scab resistance compared with 'Pawnee' and 'Desirable'. 'Lipan' has not been adequately tested in the southeastern United States where different races of the scab organism probably exist, but results here indicate that 'Lipan' should have adequate

scab resistance to be successfully grown in all pecan production areas.

Availability

'Lipan' was released on 22 July 2011. As stated, 'Lipan' is not patented and can be grafted and budded as much as desired by anyone. Graftwood will be supplied to nurserymen in late winter of 2012. The USDA does not have any trees for distribution. Genetic material of this release 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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