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Pecan Cultivars Differ Greatly in Susceptibility to June Drop

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In Spring 1993, 'Oconee' pecan [*Carya illinoinessis* (Wangenh.) K. Koch] (Thompson et al., 1991) had a heavy pistillate bloom, indicating a usual good crop; however, the June drop, frequently attributed to poor pollination (Smith, 1982; Sparks and Madden, 1985), appeared unusually severe, resulting in only 18 kg nuts per tree. This low yield seemed to be an excessive drop problem that did not affect other cultivars in 1993. A similar heavy pistillate bloom and subsequent drop of 'Oconee' in 1994 stimulated this study to determine if 'Oconee' had a higher June drop than other cultivars.

Sixteen cultivars were planted in a randomized complete-block design with four replications and single-tree plots in Spring 1979. Later, 29 additional cultivars were planted upwind from the 16 cultivars. Trees in both parts of the planting shed pollen when 'Oconee' was receptive; therefore, opportunity for pollination was optimum (Worley et al., 1992). Trees were spaced 12.2 × 12.2 m and were not crowded. Four routine Super-Tin fungicide (Griffin Corp., Valdosta, Ga.) sprays, but no insecticide, were applied by 9 June. A subthreshold infestation of spittlebug appeared uniformly across all cultivars.

Beginning 9 June, the number of nuts and scars where nuts had dropped were counted on 100 nut clusters per tree for the 11 cultivars that bore pistillate flowers in 1994. The scar count omitted the small raceme scar at the apex of the flower cluster (Yates and Sparks, 1994). 'Caddo', 'Gloria Grande', and 'Owens' cropped consistently in both years (Table 1). Most cultivars set about the same number of nuts initially (nuts + scars) (Table 1). 'Forkert' started with fewer nuts per cluster and 'Caddo' and 'Shawnee' started with more nuts per cluster than the others in 1994. After the June drop, 'Shawnee' kept more nuts per cluster than 'Caddo'. The high nut set for 'Shawnee' in 1994 may be related to the light crop in 1993. Total nut set (nuts + scars) was significantly and negatively correlated with yield in 1993 ($r = –0.42$, $P \leq 0.01$), but yield in the off year of 1994 was not related to total nut set (nuts + scars) the same year.

'Oconee' started with an intermediate nut set but dropped the highest percentage of nuts and left the fewest nuts per cluster of the cultivars surveyed (Table 1). 'Oconee' averaged only 1.2 nuts per cluster in June, but its yield (34 kg/tree) was in the highest yield category (Table 1). Obviously, a high nuts-per-cluster count in June is not necessary for good yield, and other cultivars dropped more nuts before harvest. In 1994, yield was correlated negatively with nuts per cluster in June ($r = –0.43$; $P \leq 0.01$) and positively with the number ($r = 0.54$) and percentage of nuts dropped ($r = 0.56$) in the June drop. A June drop that would leave about one to two nuts per cluster seems desirable to have a good crop of nuts.

'Shawnee' set more nuts per cluster than any other cultivar and dropped few of them (Table 1), causing overload and poor fill (data not shown). 'Owens' ranked second in percentage of nuts dropped but had excellent yield and better than usual kernel quality.

A moderate June drop in pecan might be desirable in some years to prevent overloading and stress that may create shuck decline problems (Sparks et al., 1994). The extent and implications of the June drop for 'Oconee' at other locations remains to be investigated.

Table 1. Yield and nut drop of 16 pecan cultivars.

Cultivar	Yield (kg/tree) 1993	Yield (kg/tree) 1994	Nuts/ cluster	Scars/ cluster	Total (nuts + scars)	Percent dropped
Caddo	36 b–e	29 ef	2.95 f	1.08 e	4.03 c	28 d–f
Cape Fear	49 de	10 b–d	2.82 ef	0.27 a	3.10 b	9 a
Cheyenne	44 b–e	7 a–c	2.71 d–f	0.51 ab	3.22 b	16 a–c
Forkert	45 c–e	14 cd	1.74 b	0.69 b–d	2.43 a	28 d–f
Gloria Grande	48 de	36 f	1.98 bc	1.04 de	3.02 b	34 f
Linberger	55 ef	18 d	2.32 cd	0.70 b–d	3.02 b	23 c–e
Oconee	18 a	34 f	1.17 a	2.19 g	3.36 b	65 h
Osage	27 ab	18 d	2.37 c–e	0.99 c–e	3.36 b	29 ef
Owens	46 c–e	28 ef	1.56 ab	1.50 f	3.06 b	48 g
Shawnee	11 a	18 d	3.56 g	0.54 ab	4.10 c	13 ab
40-9-266	45 c–e	3 ab	2.70 d–f	0.66 bc	3.36 b	20 b–d

[z]Mean separation in columns by GLM TDiff option at $P \leq 0.05$.

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