

'Schley' Pecan

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Until this cultivar became susceptible to scab, 'Schley' was regarded by the industry as the standard of quality and, by far, was the cultivar most preferred by the consumer (20). As a result, 'Schley' was widely planted. 'Schley's' popularity decreased greatly after becoming susceptible to scab. Many trees were cut down or else topworked to less susceptible cultivars. However, the advent of effective fungicides and improved spray machines in the early 1970's, brought about renewed interest in 'Schley' as a commercially important cultivar. Once scab was controlled, growers found that existing plantings of 'Schley' were profitable. Nevertheless, 'Schley' is not generally planted in new orchards. The major reason for the lack of many new plantings is the long and well established record of scab susceptibility of this cultivar. In the early 1900's, 'Schley' was widely planted in the Southeastern United States and especially in Georgia. In old orchards in Georgia, 'Schley' is second only to 'Stuart.'

According to Taylor (24), 'Schley' is a seedling grown from an open-pollinated nut of 'Stuart.' This is difficult to believe because 'Schley' has no obvious 'Stuart' characteristics. Regardless, the tree grew from a nut planted in about 1881 by A. G. Delmas at Scranton, Jackson County, Mississippi. The original tree produced 125 pounds of nuts when it was 25 years old.

In 1898, Delmas named the tree 'Schley' in honor of Admiral Winfield Scott Schley, Commander of the United States Naval Forces during the Spanish-American War. Delmas began to propagate 'Schley' by topworking in 1900.

D. L. Pierson, Monticello, Fla. obtained scions from the original tree in 1902. Pierson introduced the cultivar as 'Admiral Schley,' and the cultivar was originally disseminated under this name (14, 24). 'Schley' is one of the best known cultivars and is widely disseminated, especially in the southeastern United States. 'Schley' has been used extensively in breeding and six cultivars with 'Schley' parentage have been released ('Apache,' 'Cherokee,' 'Oconee,' 'Shawnee,' 'Sioux,' and 'Woodroof'). In addition, 'Cape Fear' is a seedling of 'Schley' (7), 'Mahan' is possibly a selfed 'Schley' (26) and, most probably, 'Schley' is a parent of 'Forkert' (5), 'Moreland' (19), and 'Harris Super' (3).

Budbreak of 'Schley' begins about four days before that of 'Stuart' (21). Consequently, 'Schley' is more susceptible to late spring freezes than 'Stuart' (27). The foliage is glossy, but tends to be yellowish as in 'Cape Fear' (4). Under conditions of prolonged periods of high light intensity, the leaves of



Figure 1. Characteristically scaly bark of a mature 'Schley' trunk. Sprouts often develop from latent buds; sprouting from the trunk is characteristic of 'Schley.'

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Figure 2. Tree form of a mature 'Schley'. Note the arched growth pattern of the lower scaffold limbs. Profuse branching contributes to the closed canopy.

'Schley' may become somewhat bleached in appearance. Sometimes this symptom is mistakenly diagnosed as potassium deficiency. Leaf retention in the fall is average (15). Tree vigor is less than 'Stuart' (1). The mature bark of 'Schley' is very scaly (Fig. 1).

The tree is a dense (4), vigorous, and very spreading grower. The lower scaffold limbs on mature trees grow

in an arched pattern (Fig. 2). This pattern arises from the fact that as a young tree the growth habit is upright, but, as the tree gets larger, the branches bend under their own weight. Also, in mature trees, the fine branched, fan-like limbs often overlap each other with the result that denseness of canopy is increased and shading out often occurs. Shading out becomes noticeable beginning in July-August (Georgia). Leaves on severely shaded limbs turn bright yellow, defoliate prematurely, and the limbs eventually die. Limb death of this type sometimes causes alarm to the grower, however, the shading out and death of limbs is an inherent characteristic of 'Schley'. Because of the dense spreading canopy, the highest yielding 'Schley' orchards are those that have adequate space between trees to allow the canopy to receive near maximum exposure to sunlight. The dense canopy also makes scab control more difficult than in an open canopy.

The dense canopy, resulting from overlapping limbs, should theoretically make this cultivar a good candidate for selective limb removal. However, experience has shown that this is not the case as the space created by limb removal is quickly filled in by growth from latent buds along the exposed limb. The tendency for 'Schley' to break latent buds is also evident when mature trees are cut down during orchard thinning. Sprouts develop more readily from 'Schley' stumps than from most other cultivars. Also, sprouting from the trunk is common (Fig. 1). This tendency to sprout has been used to an advantage in attempts to propagate pecans by tissue culture (32). 'Schley' tissue responds more readily than that of some other cultivars.

The dense and spreading canopy makes 'Schley' susceptible to blowing over during severe wind storms. This was graphically demonstrated in wind storms that hit mixed plantings of 'Stuart' and 'Schley'. Tree loss in Georgia

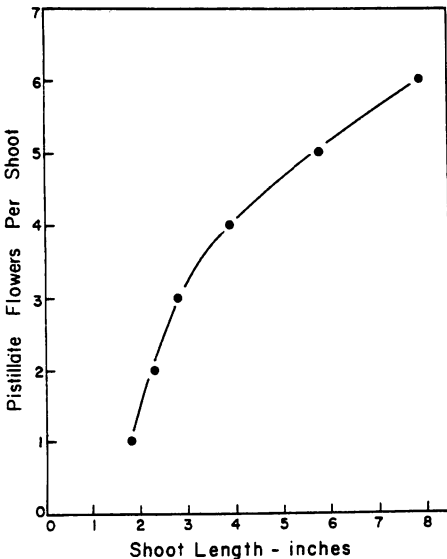


Figure 3. Relationship of pistillate flowers per shoot to shoot length in 'Schley' pecan. Adapted from Gossard (12).



Figure 4. 'Schley' fruit photographed August 7, Philema, Ga. Sutures are prominent; both base and apex are characteristically blunt.

was much greater in 'Schley' than in 'Stuart' (22). Similarly, tree loss was greater in 'Schley' when hurricane Hugo hit a 'Stuart'-'Schley' orchard in South Carolina.

'Schley' is protogynous. 'Schley' is a good late-season pollinizer in the Las Cruces, N.M. area (18), but is less effective in other areas (13, 17, 31). In Georgia, 'Schley' is a good pollinizer for 'Stuart'. 'Schley', in turn, is pollinated by either 'Cape Fear' or 'Desirable' (31).

'Schley' precocity is similar to 'Stuart'; but yielding capacity as a mature tree is about 20% less than 'Stuart' (21). The



Figure 5. Premature shuck opening in 'Schley' (points). This disorder is sometimes referred to as "tulip disease." The disorder can occur in many other cultivars and especially in years of high fruit set. Photographed October 12, 1988, Perry, Georgia.

low yielding capacity is a disadvantage of 'Schley'. However, the yield data for 'Schley' vs. 'Stuart' may be misleading because the yield comparisons were mostly made prior to the use of effective sprayers and fungicides. That is, 'Stuart' yields may have been higher because of having resistance to scab, whereas 'Schley' did not. Observations in well managed orchards repeatedly show that 'Schley' is a more consistent producer than 'Stuart', which may increase its long-term yield average.

As with 'Stuart', the importance of shoot length cannot be overemphasized. This is because pistillate flower formation and fruit cluster size increase greatly with shoot length (Fig. 3). Thus, vigorous shoot growth must be maintained to obtain high yields and to minimize alternate bearing.

The fruit is elongated with prominent sutures. Both the fruit apex and base are unusually blunt (Fig. 4).

Nut maturity in 'Schley' precedes that in 'Stuart' by about two days on the average. However, following mild winters, nut maturity can be about 10 to 14 days before 'Stuart'. In such cases, nut maturity in 'Schley' is not necessarily earlier than normal. Instead, nut maturity is delayed in 'Stuart' following a mild winter because 'Stuart' has a greater chilling requirement than 'Schley' for budbreak. The resulting delayed budbreak in 'Stuart' subsequently delays nut maturity (21). Shuck dehiscence is much more uniform than in 'Stuart'. In some years, the shuck of some fruits open prematurely (Fig.5). However, the disorder is minor compared to the severity that can occur in 'Success'. With premature shuck opening or "tulip disease," the kerned is underdeveloped and the shell is soft or semi-pliable. In another minor disorder, all fruits in some cluster are undersized. This disorder also occurs in low frequency and the fruits die on the tree before nut maturity.

Nut size and shape are variable on the same tree and size varies from

oblong to obovate. The base is mucronate and the apex varies from mostly cuspidate to occasionally asymmetrical. The apex is grooved along the suture. Within nuts, shell halves are predominantly equal in size, but occasionally are unequal. In cross section the nut is oblong with the sides decidedly flattened. The suture is not elevated and ridges are not evident. Shell topography is rough on the flattened sides, but is smooth otherwise. The shell is moderately marked with long narrow stripes and fine dots. Markings are dark brown on a brown background (21).

Size averages about 65 nuts per pound. The shell is very thin which can create two problems. First, the shell and shuck sometime split. This is the same disorder that occurs in 'Wichita.' Fruit split occurs at the maximum water stage of development, provided excessive soil moisture (as from heavy rain) and high humidity also occur at this stage of fruit development. The split occurs because of excessive pressure from the influx of water into the fruit. In southwest Georgia, fruit split in 'Schley' is neither as frequent nor as severe as in 'Wichita.' The reduced tendency of shuck split to occur in 'Schley' in comparison to 'Wichita' is due to the interrelationship of climatic conditions and fruit development. On the average there is less rainfall during the water stage of 'Schley' and more rainfall during the water stage of the earlier maturing 'Wichita.' Second, if the nuts are harvested early (when the nut contains 20-30% moisture) and are shaken on a sunny day, the shell often splits while lying on the ground. The shell splits because it dries and shrinks faster than the kernel (21).

The 'Schley' nut is well adapted to mechanical shelling so that a very high percentage of intact halves is obtained (30). This adaptability to mechanical shellings results from the thin shell, the thin and brittle central partition wall, and the shallow kernel grooves that readily release the packing tissue.

A percent kernel of 58 is good with 60 being excellent. When scab is controlled and soil moisture is adequate, percentage kernel is very consistent from year to year. Kernel flavor is outstanding. Kernel color is very good (21) with a color rating of 8.4 (1 = dark; 10 = light).

The thin shell, the attractive and uniform kernel color and the excellent flavor makes 'Schley' nuts highly preferred by the consumer, but the slender kernel is objectionable to the confectioner. In addition, kernel color and color uniformity do not hold up well during storage. A black streak tends to develop on the dorsal surface of the kernel. Kernel stability is better when the nut is shelled than when unshelled (30), which contrasts with most cultivars. Furthermore, the stored kernel is reported to be very susceptible to pink rot (2). Consequently, 'Schley' nuts need to be marketed very soon after harvest as is the common practice.

In the southeastern United States, scab is an economic factor in the production of 'Schley.' Because of 'Schley's' high susceptibility to scab (4) and the difficulty of fungicide sprays penetrating the dense foliage, more fungicide sprays are needed than in less susceptible cultivars such as 'Stuart.' Consequently, production cost is increased. In Louisiana, 'Schley' is highly susceptible to bunch disease (15). The foliage is highly susceptible to fungal leaf scorch (16).

The fruits of 'Schley' have been noted for a long time (29) for their high susceptibility to injury by stink bugs and leaffooted bugs (10). In the southeastern United States, severe damage frequently occurs from these insects. Damage during the water stage of fruit development results in fruit abortion. This abortion is often confused with abortion from fruit split which also occurs at this time.

'Schley' foliage is especially susceptible to damage by black pecan aphids (21, 25). In an orchard with mixed

cultivars, early season infestations often can be controlled by spraying only the 'Schley' trees (W. L. Tedders, personal communication). The leaves are also especially susceptible to leafminers (9). 'Schley' is highly resistant to sooty mold accumulation following a black-margined aphid infestation (21, 23). The fruit is highly susceptible to damage by hickory shuckworm (28). Susceptibility to both southern pecan leaf phylloxera (6, 8) and pecan phylloxera (4) is moderate to high. Compared to 'Stuart,' 'Schley' is susceptible to spittlebug. 'Schley' fruits may be especially susceptible to abortion during a severe drought (11). In contrast, 'Schley' nuts tend to fill better under drought conditions than nuts of most other cultivars. The relatively small nut and thin shell makes 'Schley' a favorite of bluejays, crows, and squirrels. 'Schley' is more resistant to zinc deficiency than 'Stuart.'

High quality 'Schley' nuts command a premium price and, under good cultural practices, mature 'Schley' trees are profitable if nuts are harvested early and marketed rapidly. The more or less annual production of high quality nuts is the major advantage of 'Schley.' The major disadvantage is 'Schley's' high susceptibility to scab. Economics of controlling this disease will be the dominant factor governing the future success of this cultivar.

Literature Cited

1. Alben, A. O., B. G. Sitton, F. N. Dodge, and O. W. Harris. 1953. Comparative growth and yield of Stuart, Success, and Schley pecan varieties. *Proc. Amer. Soc. Hort. Sci.* 61:307-310.
2. Anon. 1952. Panel discussion on pecan varieties. *Proc. Southeastern Pecan Growers Assn.* 45:28-46.
3. Anon. 1962. Harris Super. Simpson Nursery Company, Monticello, Fla.
4. Anon. 1970. Dooryard pecan trees in Louisiana. Circular Letter to Homeowner. USDA Pecan Lab., Shreveport, La.
5. Anon. 1984. The Forkert pecan . . . Old but still popular. *Pecan South* 11(1):18-19.
6. Boethel, D. J., R. D. Eikenbary, and R. W. McNew. 1977. Phylloxera affects varieties differently. *Pecan Quarterly* 11(2):12-13.
7. Brooks, R. M. and H. P. Olmo. 1956. Register of new fruit and nut varieties: List 11. *Proc. Amer. Soc. Hort. Sci.* 68:611-631.
8. Calcote, V. R. 1983. Southern pecan leaf phylloxera (Homoptera:Phylloxeridae): Clonal resistance and technique for evaluation. *Environ. Entomol.* 12:916-918.
9. Dutcher, J. D. and J. A. Payne. 1979. Bionomics and control of pecan leafminers. *Proc. Southeastern Pecan Growers Assn.* 72:143-146.
10. Dutcher, J. D. and J. W. Todd. 1983. Hemipteran kernel damage of pecan, pp. 1-11. In: J. A. Payne (ed.), *Pecan Pest Management—Are We There?* Misc. Pubs. Ent. Soc. Amer. 13(2).
11. Gammon, Jr., N., R. H. Sharpe, and R. G. Leighty. 1956. Relationship between depth to heavy textured subsoil and drought injury to pecan. *Proc. Southeastern Pecan Growers Assn.* 49:37-43.
12. Gossard, A. C. 1933. The importance of maintaining vigorous terminal growth on pecan trees. *Proc. Natl. Pecan Assn. Bul.* 32:84-89.
13. Hinrichs, H. A. 1962. Pecan industry and some research developments in Oklahoma. *Annu. Rpt. Northern Nut Growers Assn.* 53:80-85.
14. KenKnight, G. E. 1970. Pecan varieties "happen" in Jackson County, Mississippi. *Pecan Quarterly* 4(3):6-7.
15. KenKnight, G. and J. H. Crow. 1967. Observations on susceptibility of pecan varieties to certain diseases at the Crow farm in DeSoto Parish, Louisiana. *Proc. Southeastern Pecan Growers Assn.* 60:48-57.
16. Littrell, R. H. and R. E. Worley. 1975. Relative susceptibility of pecan cultivars to fungal scorch and relationship to mineral composition of foliage. *Phytopathology* 65(6):717-718.
17. Madden, G. D. and E. J. Brown. 1975. Budbreak, blossom dates, nut maturity and length of growing season of the major varieties grown in the west. *Pecan South* 2(3):96, 97, 112, 113.
18. Nakayama, R. M. 1967. Pecan variety characteristics. *New Mexico Agr. Expt. Sta. Bul.* 520.
19. O'Barr, R. D., W. Sherman, W. A. Young, W. A. Meadows, V. Calcote, and G. KenKnight. 1989. Moreland—A pecan for Louisiana and the Southeast. *Louisiana Agr. Expt. Sta. Circ.* 129.
20. Reed, C. A. 1926. Historical pecan trees. *Proc. Natl. Pecan Assn. Bul.* 25:139-156.
21. Sparks, D. 1992. Pecan cultivars—The orchard's foundation. *Pecan Production Innovations.* Watkinsville, Ga.
22. Sparks, D. and J. A. Payne. 1986. Notes on severity of tornado damage to Stuart vs. Schley pecan trees. *Annu. Rpt. Northern Nut Growers Assn.* 77:79-80.

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23. Sparks, D. and I. Yates. 1990. Pecan cultivar susceptibility to sooty mold related to leaf surface morphology. *J. Amer. Soc. Hort. Sci.* 116(1):6-9.
24. Taylor, W. A. 1906. Promising new fruits. Pecans, pp. 504-508. In: C. W. Hill (ed.). Yearbook of the USDA 1905, Gov. Print. Off., Washington, D.C.
25. Tedders, W. L. 1978. Important biological and morphological characteristics of the foliar-feeding aphids of pecan. USDA Tech. Bul. 1579.
26. Thompson, T. E. and L. D. Romberg. 1985. Inheritance of heterodichogamy in pecan. *J. Herd.* 76:456-458.
27. USDA, Agr. Res. Ser. 1955. Effects of the March 1955 freeze on peach, pecan, and tung trees in the South. *ARS* 22-18.
28. Walker, F. W. 1933. The pecan shuckworm. *Univ. Florida Agr. Expt. Sta. Bul.* 258.
29. Woodard, J. S., L. D. Romberg, and F. J. Willman. 1930. Pecan growing in Texas. *Texas Dept. Agr. Bul.* 95:151.
30. Woodroof, J. G. and E. K. Heaton. 1961. Pecans for processing. *Georgia Agr. Expt. Sta. Bul.* 80.
31. Worley, R. E., O. J. Woodard, and B. Mullinix. 1983. Pecan cultivar performance at the Coastal Plain Experiment Station. *Univ. Georgia Agr. Expt. Sta. Res. Bul.* 295.
32. Yates, I. E. and C. C. Reilly. 1990. Somatic embryogenesis and plant development in eight cultivars of pecan. *HortScience* 25: 573-576.

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Incidence of Blind Nodes in Low-chill Peach and Nectarine Germplasm

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Abstract.

Observational evidence is presented to support the idea that blind node incidence increases when shoot growth is rapid with higher mid-summer temperatures. Seventy-three low-chill cultivars and selections of peach and nectarine (*P. persica* (L.) Batsch) from the University of Florida breeding program were evaluated at Gainesville, Florida in January 1992 for the incidence of blind nodes. The incidence for blind nodes ranged from 10 to 85% indicating wide genetic diversity in the germplasm. Both melting and non-melting selections spanned the full range; however, more non-melting flesh selections appeared to be in the upper part of the range for blind nodes. Selection Fla. 4-4, which has been selected for flowering ability as an ornamental, had the fewest blind nodes.

Blind nodes, the apparent lack of floral and vegetative buds at the leaf axis, have been observed throughout the southern U.S. in both high-chill and low-chill cultivars of peach and nectarine (1), have undoubtedly been observed for a long time, as they were depicted in a 1896 Texas bulletin (2). Numerous observations and one report

(1) support the idea that the development of blind nodes is due to high temperatures during rapid summer growth. The incidence of blind nodes has been observed in the same clones to be less at high altitudes in Chapingo as compared to lower altitudes in Mexico, and less at Chapingo compared to Gainesville, Florida (J. Rodriguez-A, pers. observation). 'Earli-Grande' has been observed by W. Sherman to show less blind nodes at Gainesville than in McAllen, Texas. D. Byrne has observed more blind nodes in 'EarliGrande' at McAllen than at College Station, Texas. 'ArmKing' shows more blind nodes at Gainesville than in south Georgia (W. Sherman pers. obs.) and 'Sunblaze' shows less blind nodes at Bakersfield than in Indio, California (B. Mowrey, pers. comm.). 'ArmKing' shows more blind nodes in southern Spain than in north Florida (W. Sherman, pers. obs.). In

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