

## **Persimmon (*Diospyros Virginiana*)**

### **Notable Features:**

35:1:0 carb:protein:fat plus fat and protein in the seeds. Butterscotch/rum flavor; asians are bland. Late leaf out in June could allow for better interplanting. Deer resistant. All farm animals eat the fruit. Could replace industrial fruit pectin, sweeteners, dates, and modify smoothy/frozen treat market. In 2017, 5.75 million metric tons of persimmons were consumed (near avocado and kiwi quantities; 2x the weight of cherries; 10x blueberries). Prefers soil pH between 6.0 and 8.0. Can drop fruit from late August to April but the core harvest is from Mid September to late december in IN.

## Notable Varieties:

**Claypool F88** - Juhl x G2. Okay flavor. Drops all leaves very early and drops all fruit very early too

**Pieper** - Similar characteristics and hardiness as SAA. Overbears. Tends to be seedless even when pollinated. Ripens in Ontario. Low Seed. Small fruit.

**SAA Pieper** - Seedling of pieper even earlier ripening and larger. Much of fruit holds to tree in winter. Foliage turns yellow before falling. Very good flavor quite good. Red Fern says the offspring are especially hardy. Ripe when only slightly soft to the touch; supersweet. Ultra hardy, ripens in Ontario in late Oct. Tom's fifth favorite.

**I115** - Juhl x Garretson. Claypool. Earliest ripening persimmon according to Jerry; noted as Claypool's earliest on the claypool doc at claypool's property. 1.7"

**Dickie** - Ripens in early Sept in Ontario.

**NC-10** - early ripening; ripens in Ontario in early Sept. Small fruit. Productive. Upright form. 10-12 years to bear. Low seed.

**Osage** - H-69AxSzukis. Bred by Wes Rice. 2" large fruit. Deep orange flesh. Yellow fall foliage. Early ripening. Some say it is good of the tree and non-astringent. Tom's fourth favorite.

**NC-21** is super sweet and early ripening like Pieper. Ripe when only slightly soft to the touch; supersweet.

**Slate** - Very similar to SAA Pieper. Ripens in Ontario.

**Prok** - NY. Bred by Cornel, selected by John Gordon of Ontario. has good flavor, low sweetness and flavor, plus texture that is firmer and more gelatinous. Incredibly large at 3". One of the Earliest Ripening; late Aug in KY; ripens late Oct in Ontario. Recommended by Red Fern. Ripens off the tree well unlike most American persimmons (like Asian persimmons). Self fertile. Less sweet than Meader. Cliff's favorite fresh and when cooking. Tom's second favorite. Never ripens Ontario.

**Josephine** Ripens earlier than early Golden and a bit smaller

**Richards** - IN. Extra early ripening in warm areas but rarely in Ontario due to higher heat needs which varies by variety. Too mushy.

**Yates/Juhl** - IN. large fruit at 2 1/8". Overbears. Good flavor. Yellow but blush red. Slightly better than Hick. Ripen just before Garretson in late Aug to Sept. Firm fruit. Recommended by Jerry and Red Fern. Ripens in Ontario in late Oct; always ripens fully there. Very productive. Tom's sixth favorite. PURCHASED

**H118** - Juhl x George. Claypool. 1.7". Low quality fruit over all; some say good for pulping. Yellow color. Second earliest ripening; Late Aug in MD.

**Hick** - are yellow but blush red. Juhl is slightly better than hick. Ripen just before garretson. Variable size but average 1 ½" or similar to Juhl. Does not overbear.

**Garretson** - Seedling of early golden; better eat flavor, sweeter, and earlier; of the best flavor and a standard by which to compare; buzz says it is incredible. 1.5". High fiber.

**Morris Burton**, wild selected by farmer in Mitchell, IN, is one of the best flavored, sweetest fruit, very early ripening like Wabash from august to christmas though. One of the few that retains flavor very well when frozen for a year or two and when cooked! Smaller fruit. Mid season. Semi ripens in ontario. 1.4" Foliage is very healthy looking green even under stress.

**Florence** - McDaniel selected. Seedling of Killen and, likely, William. One of the best tasting northerners with smaller fruit.

**Wabash** - wild S. IL selected, has redder, smaller fruit and very early ripening (Sept likely). Leaves color in fall more than other varieties. Tend to be seedless even pollinated. Strong red/purple fall leaf color.

**Geneva Long** - Not very disease resistant. Ripens late oct in ontario. Likely a hybrid. PURCHASED

**L-32** - Yates x Killen. Early by Claypool Standard. 1.8". Notable color. Good all around

**K-6** - Juhl x EG. Early by Claypool Standard. 2".

**Campbell** - Early ripening according to POMONA in Ontario

**H63A** - Burton x Early Golden. E M L by Claypool standard. Has great flavor according to red fern. 1.8" size. Flat. Bright orange. 20 year old tree is 14ft (small). Taste test winner often.

**Blue Wafer/Hershey's Blue** - This is the only parent for Buzz with high hardiness. About 20% hardy compared to 1% for others.

**Donald Compton Rootstock** - Super high vigor plants.

Meader - NH. Garretson seedling. Overbears heavily. Thick skin, good flavor, and minor astringency in skin when ripe. Claimed as much worse than early golden. Extra early ripening like Pieper. May leaf out late according to Emily Steinway. Never ripened fully in Ontario though. Overproduces when near males; leads to small fruit and seediness. Yellow and Red leaves in fall. Used to be called New Hampshire No. 1. Seedlings' vigor is much lower than most of Compton's stuff. Tom says it is one of the worst.

Hess - Too late for ontario.

Jon's Pride, Upright, vigorous, Med - large, vanilla flavor, thick consistency, December ripening

Golden Supreme -

Lena/Mitchellena - IN. Wild seedling. Great flavor similar to Morris Burton. M L by claypool standard. 1.6" Best by Tom Wahl

Valeene Beauty - Mitchellena x Early Golden. Low fiber, high pulp, high sugar. Very large fruit. Annual producer. Recommended by Jerry

Keener - more solidness to it.

Elmo/A118 - Golden Supreme x G2. M L by claypool standard. 2.1" fruit, thin skinned

G-2 - Killen x Szukis. No notes taken.

100-42 and 100-43 are siblings and very good flavored.

WS8-10 - very good.

Dollywood/D128 -

100-46/"Lehman's Delight" with good flavor, reliable, very large fruit, thick skin, the highest productivity of cliff's trees, small tree, and tolerates shade (may mean works well in cooler areas). Likely mid season. Tom's third favorite.

Kasandra - is early ripening.

Evelyn - show promise in Ontario; not mentioned in "NGOS".

Utter - show promise in Ontario; not mentioned in "NGOS".

Prairie Sun/A-33 - Claypool. The earliest or claypools.

Munich - IN bred. Ranks high all around. 2" large fruit. Few seeds.

100-47 - Jerry's. Largest persimmon.

H-69A - E M L by claypool standard. Burton x Early golden. 1.5" fruit. Juicy. Less black leaves.

Craggs - Not early golden.

Beavers - Not early golden. Small fruit but great flavor. Great for puddings.

Medium to Late by standard. 1.4"

Russian Beauty - Survived -32F at Carandale. hybrid.

Tua/Miles -

Bolton -

Cemetery -

Runkwitz -

Ennis -

Acorn -

Woolbright - Soft fruit and splats when falls. Early Oct Ripening - Claypool Late. Excellent flavor.

Table Grove -

Knowles (Owen) Seedless -

Nolin River -

Weber - M L by Claypool standard. 1.6"

Moneymaker - Compton. Whole crop falls in 10 days and heavy producer.

Wannabee 2 - Compton. Great color, heavy producer

Wannabee 3 - Compton. PURCHASED

Shodo - At driveway of downtown mental hospital.

Early Golden - Alton, IL wild selected. Likely a naturally inbred which causes low seediness (low fertility) and relatively. 1½" fruit. true-to-type seedlings; great flavor; moderately early; first week of Oct in Ontario. E M by Claypool standard. Middle of the pack for flavor.

John Rick - McDaniel selected. Seedling of Killen and, likely, William. Large fruit and great flavor and texture with red blushing. Late by claypool standard (early Oct) . More susceptible to leaf diseases. Too sweet for Sheridan. 1.5" Best flavor of them all maybe. One of the only one that holds flavor after 1 year in the freezer

Nakitas gift - Hardy to -20F. Oct ripening. Dies in IA over winter. May ripen off the tree. Dwarf due to hybrid.

Miller/Marion - Not early golden. Ripens late Oct in KY. Large Red-yellow soft fruit. Good size and texture

Janet - Mid to late

Ruby - Late ripening.

Golden Gem - Not great tasting. Not hardy.

100-29/Deer Magnet by Jerry is very late ripening.

Deer Candy is very late ripening.

Killen - an offspring of Early Golden. Similar flavor as Meader. Oct ripening in KY. M by claypool standard. 1.5" Good flavor, med size, firm texture.

Rosseyanka - Dwarfed due to hybrid.

Szukis - (Sue-kiss) Seedling of Early Golden. Hermaphroditic but mostly male. Fruits are small and seedless males fruits. 1 in 3 or 4 grafted buds converts to female (maybe male fruit).

William - Male that produces heavy pollen over long period.

George - OP son of Killen. Males for breeding. Lowest percentage of good offspring in McDaniels' breeding work

Mike - Sons of Killen. Males for breeding.

G-70+ line - noted for early male flowering.

### **Breeding Goals:**

Naturalization: hardy, early flowering, ripening in season, color of leaves in fall changing, disease free

Quality: hold form on fall, flavor, flavor when frozen, flavor when dried, dark (not black) fruit color, large fruit (to reduce seediness), reduced seed size (so wolves, cayotes, fox, bears, and dogs distribute), reduce seed count (unless it means inbreeding)

Production: pulp weight, annual bearing,

### **Growing Notes:**

**Fruit Tips:** Jerry places straw beneath persimmon to prevent splatting. The fewer seeds, the earlier fruit ripen but their texture and taste tend to be worse when seedless. Ethylene catalyzes polymerization of the astringency molecule, making it unable to react with the mouth; astringent persimmons can be gassed with high concentrations of ethylene to stop astringency. Some persimmons are better for drying than others. Sheridan Bell says some of his that varieties would dry very well but wouldn't ripen. Orientals hold to tree. Smaller fruit may hold to tree better over the winter than large fruit. Fruit falls in warmth after 11a or in wind. The first fruit never taste as good as the middle season fruit. Much of the astringency held in ripe persimmons is held in the skin of the fruit which is pulped out. Ken Asmus says, ripe, non-astringent fruit can develop astringency on cooking but it may get better upon more cooking; this should be figured out.

Tom Wahl Uses Robot Coupe C80 pulper

**Transplanting:** Transplant when buds are breaking may help the taproot heal.

**Asexual Propagation:** Grafted scion must be in full sun and warm temps to mend. Graft after the stock has leafed out 1-3". Modified mega chip/barndoor/veneer grafting works best if grafted as buds are swelling when bark slips. Don't graft scion that has previously born fruit or it will die after 1 year. Top work 1m above ground line; unions often fail hardiness when grafted low. Graft easily but after care is rigorous. No tissue culture protocol exists. 11/1000 were hardy from seed for Buzz. Buzz has 8000 seed planted already. Graft onto 2nd year wood to make scion not die when grafting onto extra hardy rootstocks. Cliff says the rootstock should be starved of water if in the ground 2 weeks prior.

Graft at 21C. Donald Compton gets 3/100 air layers to work; root suckers as new trees works well, stooling only works on some varieties which are the same that root cuttings work well on according to cliff.

**Sexual Propagation:** When planting seed, place eye upwards. Rodent predation of seed is not typically a problem. Transplants require a lot of moisture the first year due to extensive loss of roots on transplant. Seeds air dry well and can store dry for 5-6 years; stratified seed will only store for 6 months at most. 1/200 females are all around

good. 75 to 80% males as a species according to Clifford. 50-55% male according to Don Compton.

Germination is higher and faster (can't read whole scientific article) when ingested by raccoon and elephants. Rates do not change when coyotes ingest.

Cliff seeds in the field and lets the grass and briars grow around to stop rabbits eating and deer rub; persimmon are fine with competition and will outgrow it.

Tom Wahl says this: "If you are planning on growing either persimmon or pawpaw in a bed for transplanting later, I have some specific recommendations. Neither persimmons or pawpaws do well when grown in soil and then transplanted later. Furthermore, both need warm/moist soil conditions in order to germinate. Seeds should be mixed with a damp (not wet!) medium such as peat, sawdust, or sand, and then refrigerated (DO NOT put in freezer!) until spring. No later than a few weeks before the last expected frost, take the seeds out of stratification and prepare them for germination. Start the seeds in a tray with 4-5" of a light, porous growing medium such as a mix of peat and either vermiculite or perlite, or a pre-made professional grower's mix. An "AFLAT5" tray from Stuewe & Sons works really well for the tray. DO NOT use "garden soil" or "topsoil" or anything else with "soil" in its name. Fill the tray to within 1" of the top with moist growing medium, place the seeds on top, then lightly cover with more moist medium. Place the whole tray inside a garbage bag to keep it from drying out, then place the whole thing in a warm place for 1-2 weeks. It does not need to have any light. For persimmons, temperature should be between 80 and 85 F. For pawpaws, 90-95 F. After 2 weeks, seeds should have several inches of taproot but probably no top. Now you can place the trays in your nursery. Persimmons should have about 30% shade, and pawpaws 60% shade. Keep medium moist. When seedlings are 2-3" tall you can transplant them into your growing bed. The growing bed should be raised and filled with the same light, porous growing medium. You can build a raised bed by taking treated 2 X 12 lumber and building a bottomless box and filling it with growing medium. Place landscape fabric on the ground inside the box to prevent roots from growing into the soil under the box, and to prevent weeds from growing up through your growing bed. You can grow the seedlings in this raised bed for 1 or 2 seasons, then transplant them to their final locations.

Avoid direct seeding persimmons or pawpaws into the ground. Soil does not warm up enough, soon enough for either of these. In southern Iowa, only about 5%-10% of pawpaw seeds direct-seeded will have germinated by the end of September, and they don't get big enough to make it through their first winter. Persimmons do a little better, but still germinate and grow very slowly in the ground their first year. Neither of these trees survive or grow well after being transplanted from the ground, due to excessive root damage. You can avoid this by growing them in a light, porous medium."

"I have observed 5%-10% of Iowa native pawpaw seed germinating from direct seeding *in southern Iowa*. I would estimate not one percent make it through their first winter. In

Wisconsin the percentages would be much lower, *if any*. You would not be happy with the results from direct seeding pawpaws near Madison. Persimmons are more likely to germinate, but they are less cold-hardy than pawpaws. I would recommend if you want to get these fruits naturalized, then do everything necessary to get some trees well-established, including stratifying in a refrigerator, growing them in air-pruning pots for a couple of years, planting them out with tree shelters and very effective weed control for 5-7 years. Then, after the trees are well-established and bearing fruit, you can see if they will naturalize. At least you would have a chance of success. Even where the climate is ideal for them, when Mother Nature direct-seeds persimmons and pawpaws, only about one out of 10,000 seeds makes it and grows into a mature tree. If you can get some trees established, they will direct seed several thousand per year, year after year. If you just direct seed a few hundred seeds, your chance of success will be very close to zero.”

Plant out seed 2 weeks before the last frost because they (any pawpaw) don't shoot out top until later anyways.

400 seed/lb says cliff;

**Disease/Problems:** Jerry says persimmon leaf drop (where leaves drop after tree flowers) is caused by low nitrogen. Twig girdler is main pest in monocultures; pick up fallen sticks to interrupt lifecycle. Dark veins are fungus that don't affect trees long term. Rabbits can eat the bark of persimmon.

Persimmons are much less hardy than pawpaw in zone 4b. Fall growth lasts too long and gets nipped by the cold in the fall dying back to previous seasons growth according to Buzz. 11/1000 didn't dieback in his superior seedling collection.

**Genetics:** Persimmons are either tetraploids (60c) or hexaploids (90c); crossing yields seedless fruit. 90c are larger diam (up to 2.5in), sweeter, more vigorous, hardier, and more drought tolerant. 60c's range is Southern Appalachia and 90c is more present in the North and West; ranges overlap in Kentucky. Hexaploids have punnett squares that are 20x20 rather than 2x2 so there is much less of a definite connection of genetics to parents. Claypool said you need 50 crosses to get cross you want. Males have 1 flower/bud; females have 3 flowers/buds. Grows up when young, and out when mature. Weak growing branches can be male on female trees; strongly growing branches can be female on males trees; this is especially true in inbred lines. Inbreeding depression is very strong in Asian and Americans; Lehman's inbreeding work was disappointing. Persimmon growth stalls below 60F. The early golden line tends to have more male branches. Male pollen is hard to get to females in time in the North for early bearing plants. Early bearing often means early flowering. Claypool often used pollen from bisexual plants, esp early golden. Male pollinators were generally selected for extended pollinating periods. Wild type asian persimmons are still present across asia and are



seedy, astringent, and small. Fruit time and size can change throughout lifetime to invert. Pollination variance in astringency occurs around the seed in both asian and americans with non-astringent tendencies. For most all parents, 1% of seedlings will have leaves that can tolerate 15F fall temps without damage to leaf or stem and extend the season due to continental temp variability; Blue Wafer persimmon has near 20% with this characteristic. Often Polygamodioecious. Many Americans are non-astringent unripe but they don't have good flavor and they were all descendants of morris burton, i believe, at least in Lehman's orchard.

In asian persimmons, some are astringent only if pollinated but are not astringent otherwise. Flavor doesn't seem to change with superior unpollinated fruit for americans.

**Culture:** Very shade tolerant but only produces fruit in full sun. Natively grows best on alluvial bottomlands and terraces as tall tree but stays less than 40 ft in sandy, dry soil. Prefers sandy soil though; tolerates pottery clay at Compton's. Ontario recommends interplanting with black walnut to produce early crop; anecdotal but typically gains 2 weeks. Black Walnut and Pine sawdust is no problem.

**Questions:**