Black Walnut (Juglans Nigra)

Growth Advantages:
Tolerates wide range of pH 6.0-8.0 but prefers loam to clay texture. 1:1:5 carb:protein:fat. Understory grass burn tolerant. Only needs 2' usable soil to crop well and look good but needs 4' to produce great.

Production and Processing Advantages:
I'm not sure Black walnuts ever get moldy and they don't get weevil so there is no food safety concern here. Post harvest handling is very easy and not finicky. The squirrels don't harvest hulled nuts from the field in any noticeable amounts. They produce annually in fertile soil even in droughts when annual bearing hickories cut back on cropping heavily. Nuts store, problem free for 2 winters. Trees grow very quickly and produce early in life around 8 years until heavy bearing in a good sized canopy area. Fairly cheap to clone. Animals don't eat foliage but bucks will rub. Great lumber and firewood.

Production and Processing Disadvantages:
Your hands will be thoroughly tanned after harvest for 3 weeks. Hulling requires good equipment otherwise it is a mess. Cleaning hulled nuts requires a lot of water. Requires sturdy equipment to crack and may strain arms using master nutcracker for extended periods. Requires individually cracking each nut. Nut drop is in October when other staples are being harvested plus hulling takes lots of time during harvest.

Food Value:
Oil vapor point of 320F. Meat stuck in the shell from cracking are good chicken feed when put through a cracker with a small window. 60% oil content by variety.

Excels in:

- Black Walnut Ice Cream
- Pairing with Dates and Raisins especially when the kernel is frozen
    - Walnut and date pairing won first place in tastings

Benchmarks for a Good Black Walnut Tree:

Productive: *It is best to be heavy producing annually but incredible selections may be worthwhile producing biennially. This is dependent on soil fertility and often biennial trees will produce annually on fertile ground.*
High Kernel Percentage: *Nuts should be at least 28% kernel*
High Kernel Weight: *Dry Kernel should weigh at least 4g*

High Kernel Fill: *90+% of nuts should be plump on most years*
Great Crackout: *¾+ complete quarters should come out on the first crack head to heel with a master nutcracker with the large cup*
Thin Husk: *the thinner the husk, the better to ease hulling and reduce cargo volume brought to hulling station.*
Straight Branches and Spreading Form with strong limbs: *For firewood making and orchard nut production*

Locations and Breeders:

Notable Varieties:
S147 - IA - 33%, 5.7g kernel. Ohio x Myers. Lateral bearing, Good quality, large nut, good timber form, high kernel percentage 38%, 17g, 6.1g. MR to A. 131 days to maturity with May 11th MO bloom. Late. Low fertilization will cause summer nut drop.
S129 - IA. 125 days to maturity with April 27rd MO bloom, requires staking due to high vigor. Heavy annual producer when highly feed but very poor in low fertility areas. Archie bred but identified after passing away by his son
Emma K (Patterson) Ohio x Myers. - IL - 36%, 6.1g kernel. Excellent flavor; desert quality. but not all nuts will fill on heavy years, hulls hard to remove and can hang to tree, Moderate upright growth. Usually produces every year. R to A, lateral bearing. 148 days to maturity with April 25rd MO bloom.
Sparrow (Sauber #2, Scrimger) (IL) very good cracking. 5.1g Good disease resistance. Vigorous offspring. Color is the only complaint. Moderate upright growth. Good all around per ontario. Seedlings are recommended rootstock by missouri agroforestry. R to A. Few days to maturity at 118 days with May 11th MO Bloom. Early. Recommended all over Iowa. Archie selected according to bill hanson.
Beck - MI, lateral bearing, Very consistently high producing. Bill Heiman may have wood, 31%, 14g. Archie Probably had it. 128 days to maturity with May 15th MO bloom. Mid season bearing. Recommended all across Iowa.
Pfister (NE) - Lateral bearer, great wood grain, 27%, 19g, Anthracnose R. Archi probably had it
Eldora - Recommended everywhere IA. Similar or identical to sparrow but better quality. Early. 4.9g, 28%. 5.6 and 29% in NE.
Surprise - MO - 6.6g, 32% kernel. Lateral bearing, produces 10% blanks but is otherwise very very good, 34%, 21g, R to A. 143 days to maturity with May 6th MO bloom
Grimo 108H - Annually producer. Cracks out to large pieces. Buzz has it.
Pauls C3 - Buzz has it. Archie bred and identified after archies death
Stabler (MD) spreading form, slower growth than thomas, richer flavor than thomas. Many nuts develop with single lobe. Good for home cracking, only thrives in good soil, poor commercial bearing. Gets husk maggot and anthracnose. Sap is very sweet and

flows well. Vary variable in sports with quantity of single lobe. Second best single lobe behind throp. MR to A. Weschcke says it will mature nuts if grafted onto local roots but not eastern roots and has grown 17 years. 4.8g & 2.6g in IL at 30% & 23% kernel for C.G. Ulrich.
Kwik Krop (Sarcroxie) - KS, Lateral bearing, Excellent flavor, cracks pretty easily. High and low years. 31%, 17g, 4.7g in IA. MR to A. Mid season bearing. Recommended all across Iowa. Seedlings are recommended rootstock by missouri agroforestry. 148 days to maturity with May 5th MO bloom),
Wiard - High production, good in the north, produces so much it can be diseased some years. (Richard Goldern is maybe only Source). 125 days to maturity with April 28th MO bloom.
Hay #1 - Thomas x Myers. 6.7g, 32% kernel. lateral bearing, MO, 32%, 19g, R to A, poor production and doesn't fill nuts, requires lots of nutrients, Archie Probably has it, 135 days to maturity with May 14th MO bloom. Archie recommented
Sauber #1 - 4.9g, 33% kernel. lateral bearing, OH, 35%, 16g, R to A, Excellent quality all around. Med large nut. Bill Lane of Missouri has wood. Needs help to grow upright. Very bad "Limb socket" bears every other year.
Ohio - susceptible to diseases, great crack, semi hardy in st paul, excellent flavor, 5.6g and 28% in OH, 140 days to maturity with May 7th MO bloom. Probably the tree towards the elm of the school with a large nut on D&A property. Consistent heavy producer at archies if ID is right.

Cornell - (PA) Similar to Thomas (seedling of it), developed by Cornell and said to do well in the north near cornell.
Burns - (Ontario) Cracks to mostly halves, small but thin shelled, high kernel percent, great in North, Moderately upright growth.
Mintle (IA) Best flavor, stores at RT for 2 years. Small but cracks well. Does good in dry areas. Darkens after cracking. 129 days to maturity with May 14th MO bloom.
S127 - (IA) 5.1g, 33% kernel. Good production but only fair crackout. Does well in the north. Good all around per Ontario. Sparks bred. 37% kernel. 17g nut. 4.7g and 34% in IA. MR to A. 118 days to maturity with May 7th MO bloom. Lateral bearer. Recommended for production in all of Iowa. Early.
Clermont - Excellent quality, very thin shelled Archie Sparks is the main propagator. Very vertical growth with no training necessary. 34%
Weschcke - Native seedling of St Paul. Excellent crack and flavor. Very hardy. Not self fertile. Most vigorous walnut for the North. Buzz has it. One of the easiest to graft for Buzz.
Bayfield - N WI. Very hardy in St Paul, good cracking.
Paterson - IA. Very hardy in st paul, excellent cracking and flavor

Bowser - Incredibly easy kernel extraction and very very high kernel percentage (36%), great flavor. 14g. Low production but good at homes. Moderately upright growth. 128 days to maturity with May 9th MO bloom.
Brown Nugget - 35%, 4.5g. 4.8g and 31% in MO.
Edras (IA) Very high kernel percent, good crack out
Pinecrest (PA) not noted for thin shell and has high kernel percentage
Cannonball - 4x larger nut than thomas at 30% kernel
Compton #1 - English flavor and easy cracking
Pounds #2 - Seedling of thomas but higher kernel percentage. Buzz has it. One of the easiest to graft for Buzz. 143 days to maturity with May 8th MO bloom
Adams - IA. Fairly hardy in st paul, good cracking
Krause - 4.7g, 28% kernel. R to A.
Marvin - IA Seedling of P. Christoffersen. 5.4g at 31% in IA. High ranking cracker.
I-34 - IA seedling of Geri L. Hanson. High ranking cracker in contests. 5.0g at 32.5% in IA.
2-52 - IA seedling of Geri L. Hanson. High ranking cracker in contests. 5g and 25% in IA.
Farnsley 125 - IN seedling of K. L. Farnsley. 6g at 25% in IN. High ranking cracker
Farnsley 115 - 5.5g at 26% in IN. High ranking cracker
Barn - 5g and 33.5% in MO. High ranking in cultivar contests.
Rowher - 6.4g, 27% kernel
Titball - Geri L Hanson, 3.8g 31%
Sparks 228 - R to A.
Sparks 328 - R to A.
Thatcher - Owner of Charles Thatcher of PA. MR to A. PA source. 5.2g 30% in PA. 4.6 and 25% in NE
Farrington - Potentially really good but few reports. MR to A. 6g and 22% in OH. Low ranking in one contest.
Todd - (OH) Large nut with good kernel. Not propogated much. 6g and25% in Ne. High ranking in a cultivar contest
Tom Boy - Leafs out earlier than Thomas and is more regularly productive
Lamb - Ontario mentioned. Moderately upright growth
Perdue #1 - Timber tree that was genetically engineered. Columnar and grows nuts on lateral branches.
El-Tom (OH) Cross of Thomas and Elmer Myers similar characteristics
Cranz - Excellent production in IA, Doesn’t always get a crop for Sparks on short seasons, lateral bearer, recent selection, late foliator, very annual crop, Dr. Shelton described as his most dependable bearer, MR Anthracnose, 15g, 32%, 3.8g and 28% in IA, 3.4g and 27% in NE. Archie probably had it. 130 days to maturity with May 19th MO

bloom. Late. IA and recommended across the state. This is probably the small nutted tree over by D&A's shed
Elmer Myers - I forget but don't think it does well in the north according to hershey. Better than stabler in flavor, size, and crackability. 36%. 15.6. 128 days to maturity with May 10th MO bloom.
Theilenhaus - 5.9g and 27% in KS. High ranking in one contest.
Snyder - 5.7g and 27% in OH. High ranking.
Corwin Davis - 4.9g and 30% in NE, low ranking in one cultivar contest.

Bad: **Mulman** (a bad tasting single lober. Zone 4 hardy), **Grundy** (Low survival), **Harney** (low survival), **Homeland** (Shriveled meats), **Stambaugh** (susceptible to disease, 5g and 28.4% in OH), **Thomas** - ((PA) not good in the north due to late maturing nut but great commercial value and cracks in quarters and good flavor, good for poor soils, medium upright growth. Seedlings are recommended rootstock by missouri agroforestry. Bad for the midwest. Not hardy in st paul, 145 days to maturity with May 7th MO bloom, 4.96g in IA, 25% in IA), **Todd** (Doesn't fill well in N), Victoria (low flavor), Browser (production is poor but great cracking), **Vandersloot** (lateral bearing, PA, 28%, 19g, MR to A, thick shell but large nut, moderate upright growth, semi-hardy in st paul), **Pearl** (Semi-hardy in st paul, good flavor, IA), **Ten Eyck** (poor cracking, doesn't graft well), **McGinnis** (back cracking and quality lower), **Rohwer** (IA Okay cracker but grows well in the N and very hardy, poor production), **Davidson 629** (poor kernel Quality, lateral bearing, IA, 28%, 21g, R to A, Archie Probably Had it), **Football 2** (lateral bearing, very low disease tolerance unless very well irrigated, MS to A, 30% and 6.2g in MO, 20g, 156 days to maturity with April 27th MO bloom), **Football 1** (MS to A), **Ozark King** (hard cracking and low production), **Elmer Meyers** (IL Very thin shell, better flavor and easier cracking than stabler and thomas, Doesn't grow well north of missouri. Very vertical growth, usually produces every year, strong side branches), **Shesseler** (not notable), **Stanek** (not notable), **Rupert** (small nut), **Northwestern** (Fairly hardy in st paul, good flavor), **Crosby** (142 days to maturity with May 10th MO bloom), **Drake** (151 days to maturity with May 6th MO bloom), **Schessler (**129 days to maturity with April 13th MO bloom), **Jackson** (12g. 36%. 155 days to maturity with April 27th MO bloom), **Neel#1** (Adapted to SE but better flavor than thomas and similar crackout. 141 days to maturity with May 12th MO bloom), **Ness** (168 days to maturity with April 27th MO bloom), **Mystry** (141 days to maturity with April 29th MO bloom), **Shreve** (147 days to maturity with May 8th MO bloom), **South Fork** (158 days to maturity with May 9th MO bloom), **Hare** ((IL) Good shell structure for good crack out. MS to A. 143 days to maturity with May 7th MO bloom, 5.7g and 27% in PA), **Peanut** (Single lobed but smaller at Clifford's), **Hain** (Single Lobed at Clifford's that doesn't bear much at all. Zone 4 hardy), **Throp** (Single Lobed at Clifford's. Not hardy in st paul but zone 4 hardy. Best single lobed variety. MR to A, 2.1g at 17% kernel for Ken

Dooley of IN), **Wrights G/G-4/G4** (5g and 31% in NE. Top ranking in some crack contests. Recommended in Northern IA. Late Maturing.), **Ogden** (Med large nut. Very very productive and good quality, lower kernel percent. Not productive in all locations. 168 days to maturity with May 6th MO bloom)

English walnut can be very hardy by strain. Mark has zone 4 english (russian) walnuts https://growingfruit.org/t/black-walnut-named-varieties/13081/15

Breeding Goals:

Kernel Weights: Target 4-6g kernel with maximal extraction

- S147:6.1g
- Ohio: 5.4g
- S127: 4.7g
- Sparrow: 5.1g
- Brown Nugget: 4.5g

Growing Notes:

Asexual Propagation:
Epicotyl grafting works well for me.

Butternut on walnut rootstock grows larger nuts with easier peeling hulls. They hypocotyl graft well.

Juglans can graft greenwood to greenwood; just strip leaves prior to grafting. You can graft hickory walnut and oak with dormant buds even if there are no alive buds. Wrapping with parafilm has been said to cause more rejection than having a very good grafting machine (omega cut) to not need film. Graft when hot and dry above 1m of trunk or they bleed too much; bench grafting just above ground level works well too. Arrowhead graft, mega-chip graft, and bark graft work well. Cut, let bleed for a few days, make fresh cut 1” down, then graft. Wrap with Al foil to reduce sunburn. Should bud out in 3-4 weeks. Keep scion in cooler after checking size, while prepping rootstock cuts. Hold scion in the mouth to keep it moist without touching it with teeth if final cuts have been made and stock is not ready. Plastic bag around graft acts as greenhouse for helping graft to callus. Remove bag and stuff after 3-5” of new growth.
Grafting onto butternut is long-term incompatible but the inverse produces early production of butternuts. Don’t graft while bleeding; wait several days of bleeding before grafting. Graft while leaves are out a 1-2 inches. Let a sprout or two grow from the stock

if it is greater than 1 inch in diameter. The hardest tree to graft for buzz. Collect scion late feb early march in Missouri (late dormant).
Graft temps should be 80F +-5F. Must be leafed out and growing. Should be without rain or irrigation for 2-3 weeks prior when in the soil and up to 1 week after. Grafting cut doesn't matter.
Grafting outside works fine if the temps are right when starting even in zone 4: Heart nuts can be grafted outside as a field graft in your area. Black walnut rootstock is what we use in northern Indiana which is zone 5 as well. Heart nut, butternut and their hybrids all graft well onto J.nigra. Have actually found takes are tougher to get on heart nut , butternut rootstock. Plus , the J. nigra rootstock is more resistant to some diseases that plague the heart nut and butternut.
Bill Deeter - "We field graft, mostly bark grafts but you can try others, May 15- June 15th. There will be a good flush of growth at that time and the bark slips easily. When you get a take it will have enough time to callous and then "harden" off before winter dormant season. Grafting later in our area will lead to a union not ready for winter and you will lose your scion. Make sure to wrap or tie your graft Union well at the time of the field grafting, coat with a bit of tree kote (asphaltic type) and then use a slightly watered down cheap white latex paint to coat the tree kote area completely. This way you will protect the graft from excessive moisture or drying and let the cambium do it's thing. Buds on the scion will pop right through the latex paint. The white paint helps keep the Union from heating up too much in the sun. Also, make sure you place a "perch" stick against and above the scion so birds won't sit on the new flush of growth and break it off, they will use the perch stick instead. It's also a good idea to take a pruning saw and make a few diagonal slices on the larger rootstock about 3-5 days prior to grafting so excessive "bleeding" of the graft Union by the rootstock doesn't "wash" out the graft area. The rootstock will be ok it just has a place lower on the stem to bleed out." Then make a tube above the stump with plastic and fill it with sawdust to keep graft moist and for winter protection before hardening off.
https://www.youtube.com/watch?v=nd-U6KiEqaU&fbclid=IwAR2f4DVsXdTXtXr17vUOh2rL1qGVql2P24bhckUDpqxCiMTaGnSgOWKScBU&ab_channel=Orzechowomi

Sexual Propagation: Can plant walnuts in the hull; ideally, plant walnuts with stem attachment facing sideways. One in 10 seedlings is often good enough to not be grafted. Nobody could graft walnut in 1896 because it is so hard and different from fruit trees. Archie would graft walnut upside down to get nuts from wood the first year

Genetics: 80% of wild plants have weak side branches because they typically grow in forests and should be temporary. There are upland and lowland walnuts; just as there are upland and lowland hickories. Nut trees generally tend to bear slightly larger nuts as they get older. Walnuts are usually self-fertile. Eastern black walnuts are visibly different

trees than western, lateral bearing and late foliation are related to the most productive trees (in persians, lateral bearing can double productivity). Anthracnose resistance is highly heritable. Ukraine has everbearing B walnut that may be useful in the south; Eliza is going. Higher bearing walnuts tend to produce 3-4 lobe walnuts in english and black. Anything that applies to english applies to black walnut according to adam kunsniar.

With lateral bearing, walnuts can bear in 3 places; the current seasons growth (tip bearing), on the previous years wood on the bud below where the tree bore nuts last year, and at the terminals of short lateral shoots coming from branches.

Rapid timber growth is linked to low TCD resistance in tests. Heavy bearing may be the same. Water stress is a cause of TCD and heavy rain halts TCD.

Nut Eating/Processing: Moist curing and then drying build the most flavour (Nut Growing Ontario Style). De-hull, soak in water for a few hours to remove stain, dry in the shade as sun can crack shells.

Patriot nutcracker is what they use at the ashville nuttery. Sifting with 3/4",1/2", and 1/4" screens gives very good separation for hand picking and reducing small shards in meat bags.

Float sorting by soaking overnight in cold water makes nut flavor more mild sift before floating to stop shards from needing separation after floating

1 quart quarters and pieces is 15.2oz

Culture: Recommend starting growth with spruce when growing for timber because spruce forces growth straight but is killed by walnuts. Archie recommended 15x15 i believe.