

BERRIES



***Strawberries**

***Bramble Berries**

***Blueberries**

***Mulberries**

***Che**

***Poha (Cape Gooseberry)**

***Goji Berry**

***Elderberries**



STRAWBERRIES



- Plant in full sun
- Prefer a soil pH of 5.8 – 6.2
- Very susceptible to verticillium wilt. Do not plant where tomatoes, potatoes, peppers, eggplant have been planted.
- Live & are productive for about 5 years
- Do not ripen after they have been picked.
- Listed as one of the top 12 foods which have pesticide residues!

Types of Garden Strawberries

Fragaria × ananassa or *F. vesca*

Spring (June) Bearing

- Produce one main heavy crop over a period of two to three weeks, on average.
- Varieties are classified into Early Season, Midseason and Late Season.
- They typically produce the largest strawberries and the plants produce many runners.



Favorite Varieties

- Benicia
- Mojave
- Douglas
- Sequoia

Types of Garden Strawberries

Fragaria × ananassa or *F. vesca*

Everbearing

- Everbearing strawberry varieties generally produce two harvests per year: one in the spring and another in the late summer or fall. Under ideal conditions, it is possible for some everbearing strawberry varieties to produce three berry harvests.
- In general, everbearing strawberry plants put out less runners than the June bearing varieties.

Favorite Varieties

- | | |
|----------------|--------------|
| • Fort Laramie | Ozark Beauty |
| • Quinault | Tristar |



Types of Garden Strawberries

Fragaria × ananassa or *F. vesca*

Day Neutral

- Produce fruit lightly most of the year. They flower and set strawberries whenever the temperature is between 35 and 85 degrees.
- Day neutral strawberries will produce a good yield in the first year they are planted.
- The drawback to day neutral strawberry plants is that they produce smaller strawberries than do the June bearing and everbearing strawberry varieties.
- Plants do not produce many runners.

Favorite Varieties

- Albion (2006 release)
- Monterey (2009 release)
- Portola (2009 release)
- San Andreas (2009 release)
- Seascape (1991 release)



Alpine Strawberries *Fragaria vesca*



- Plants produce small, intensely flavored fruit throughout the spring, summer and fall.
- Plants often propagated by seed. No runners are produced.
- Fruit color may be red or yellow (white).

Favorite Varieties

- | | |
|--------------------------------|--------------------------|
| • Charles V (Red) | • Mignonette (Red) |
| • Pineapple Crush (Yellow) | • Yellow Wonder (Yellow) |
| • Tristan (Red - Pink Flowers) | |

Pineberry Strawberries

*(Fragaria chiloensis X
F. virginiana)*



- Pineberry plants are albino strawberry cultivars that yield fruit with white- to pinkish-hued fruits that start out green, and have red seeds. The pink blush may be more prominent on fruit that gets more sun exposure.
- The fruit has a pleasantly pineapple aroma and taste, and is smaller than most modern domestic garden strawberries.
- Plants have an everbearing fruiting habit.
- Plants are partially self-pollinating. Cross-pollination between a red strawberry variety and a Pineberry will likely increase fruit yield in both plants.

Musk Strawberries

(*Fragaria moschata*)



- Also called hautbois or hautboy strawberries, they are native to parts of Europe where they are more common than they are here in North America.
- Musk plants are large, even larger than garden variety strawberries. At maturity they stand about 18" tall. They are strong growers and put a lot of their energy into producing runners, though not all varieties produce the same quantity of runners.
- Fruit are generally produced in early June and it is possible in some areas to get a small fall crop.
- They will tolerate shade but do best in full sun with rich soil.

Musk Strawberries

(Fragaria moschata)



- Fruit size is larger than an alpine strawberry but smaller than most garden strawberries.
- It is hard to describe the taste of a musk strawberry. Some describe it as the tastes of strawberry, pineapple and raspberry all at the same time. One thing is for sure. You will never forget it once you've tasted it.
- Musk strawberries are hexaploid. They are not self-pollinating and neither female plants nor hermaphrodite plants are self-fertile; they require pollination from a male or a different hermaphrodite to get a crop

Cultivars:

- 'Capron royal', hermaphrodite
- 'Askungen' (Truedsson) hermaphrodite
- 'Marie Charlotte' (Hans) hermaphrodite
- 'Bauwens', female
- 'Capron)', female
- 'Profumata di Tortona', female
- 'Siegerland', female
- 'Cotta', male

Bramble Berries



Both Raspberries and Blackberries are now available as either primocane or floracane fruiting varieties. Floracane fruiting – bear fruit on 2nd year wood. Primocane fruiting – bear two crops each year. A spring/summer crop on 2nd year wood and a fall crop on current season growth.

Blackberries

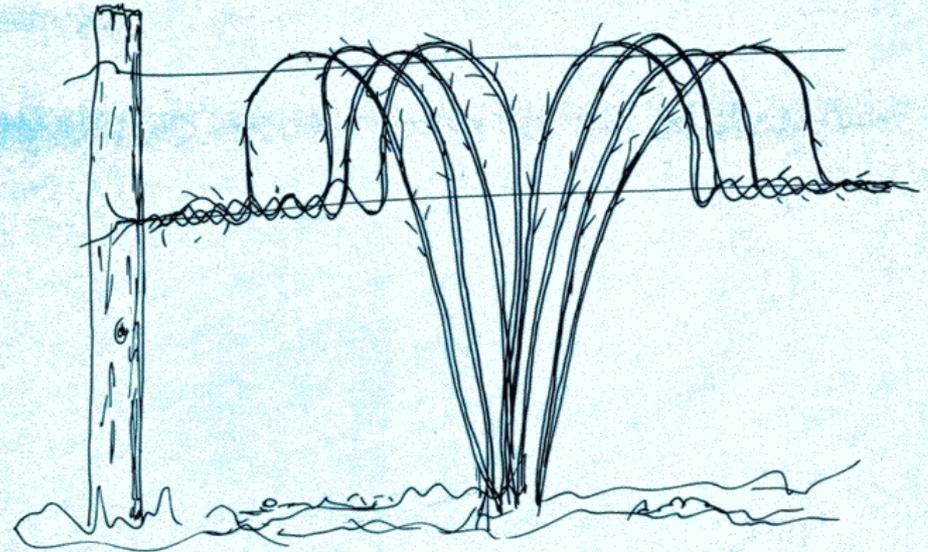
- Fruit has a solid central core when it is picked.
- Vines can have thorns or be thornless. Thorns are fewer and larger than raspberry thorns and are very sharp.
- Fruit is black or deep purple-red.

Raspberries

- Central core of fruit remains on stem when fruit is picked.
- Vine has numerous, fine thorns.
- Red, yellow or black colored fruit.

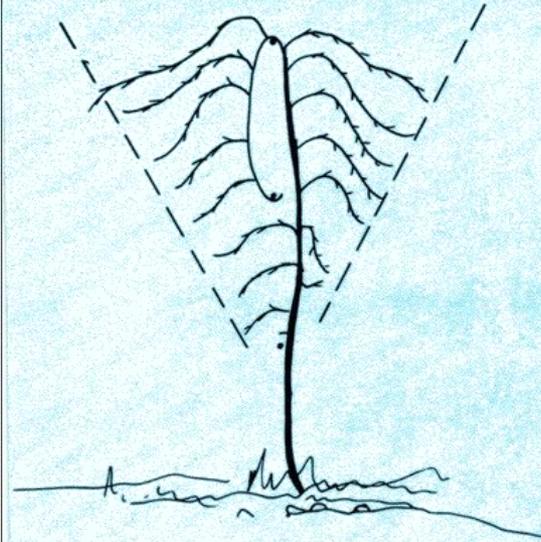
Pruning Floracane Varieties

Blackberry pruning

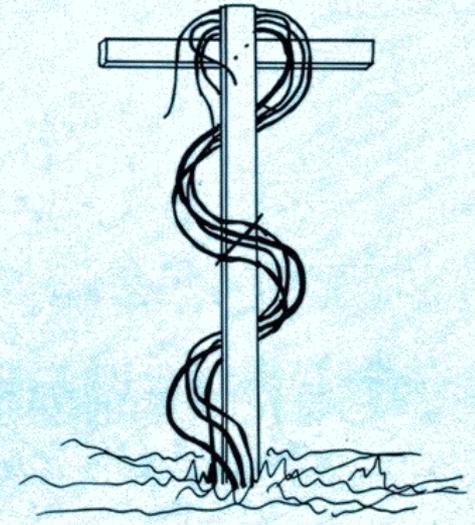


1. Immediately after harvest remove fruited canes and train new ones on trellis. In hot climates new canes will sunburn if left on ground. Trellis only strong, new canes and remove weaker ones. About 8 to 10 canes are sufficient for established plants. A fan-like arrangement of canes is best because it allows for good fruit and leaf development. Several canes can be bundled together for ease of handling. Erect blackberries send up root suckers in addition to new canes that rise from the crown. Pull root suckers out.

Head canes at about 6 to 8 feet in hot climates, 8 to 10 feet in cool climates. The farther berries are borne from the base of the plant, the smaller they will be at maturity.



2. In winter after leaf fall, remove all laterals within 2 feet of the ground. Head any long laterals to 12 to 15 inches. Head shorter laterals less to increase fruit size. The result should look similar to above.



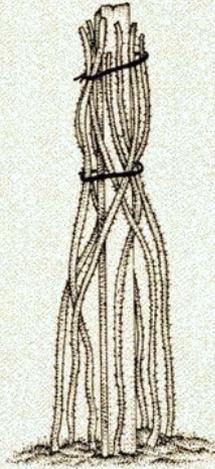
3. Where space is limited, blackberries can also be tied to a post with a crossbar.

- Fruit is borne on 1 year old canes.
- Head canes at 6-8 feet. The farther berries are borne from the base of the plant, the smaller they will be.
- Cut canes to the ground after the 2nd year.
- Keep track of canes by marking them with latex paint at the end of each growing season.

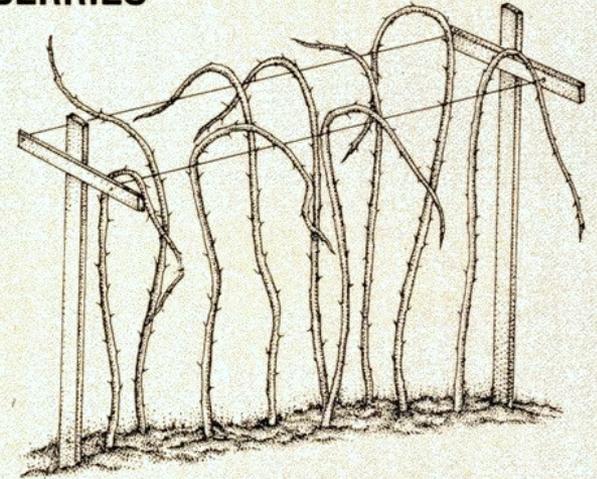
Pruning Primocane Varieties

- Primocane fruiting – bear two crops each year. A spring / summer crop on 2nd year wood and a fall crop on current season growth.
- Primocane fruiting varieties can have all canes cut to the ground each winter to bear fall fruit on current seasons growth.

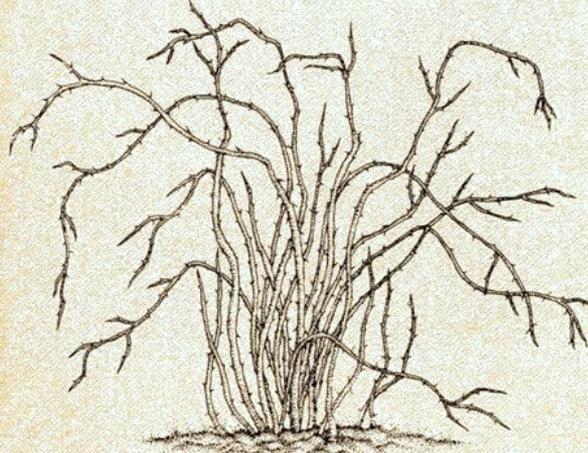
TRAINING AND PRUNING RED RASPBERRIES



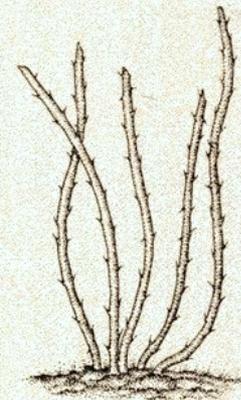
Single red raspberry plants can be trained by tying canes to a stake.



Red raspberries can be supported by two parallel, horizontal wires. Wires are spaced 18 inches apart and held by crossbars. Pull headed canes between wires.



Red raspberries can be left free-standing. If plants are allowed to grow too long, fruit rubs against ground.



To prevent loss of fruit from free-standing raspberry bushes, head all canes over 4-1/2 feet long.

Raspberry Shortcake® Raspberry

Rubus idaeus 'NR7' Plant Patent #22,141

- Raspberry Shortcake® is a revolutionary thornless raspberry. This dwarf Raspberry variety with full-size berries grows to a height of 3' with a compact nature and rounded growth habit, making it perfect for compact spaces and container gardening.
- Plants are self-pollinating and require no staking.



Common Diseases of Brambleberries

Rust



Phytopthera

Health benefits of Raspberries & Blackberries

- High in ellagic acid & phytonutrients
- High in B vitamins and vitamin C
- High in manganese
- High in dietary fiber

Favorite Brambleberry Varieties

Primocane berries produce fruit on both previous-year and first-year canes

Blackberries

Floracane Varieties

- Apache (Thornless)
- Arapahoe (Thornless)
- Boysenberry
- Cherokee
- Kiowa
- Olallie
- Triple Crown (Thornless)

Primocane Varieties

- Prime-Ark 45
- Prime-Jan
- Prime-Jim

Raspberries

Floracane Varieties

- Heritage

Primocane Varieties

- Bababerry
- Fallgold
- Fair Dinkum
- Himbo Top
- Jaclyn
- Oregon 1030

BLUEBERRIES

Types of Blueberries for Southern California

Rabbiteye

- Most adaptive
- Most productive
- Most pest tolerant



Southern Highbush

- Best quality and flavor
- Most self-fruitful



Blueberries require a soil pH of 4.8 to 5.4!

Soil pH can be adjusted using:

- Peat Moss



- Soil Sulfur



- Iron Sulfate
- Cottonseed Meal
- Coffee Grounds
- Pine Needles
- Any other Acidifying Horticultural Products

Blueberries rarely grow well in the ground!

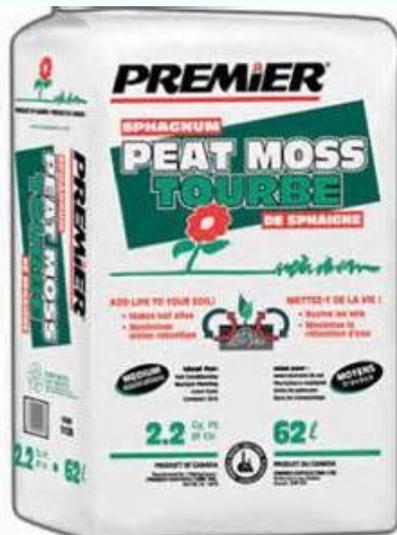


For best results grow blueberries in:

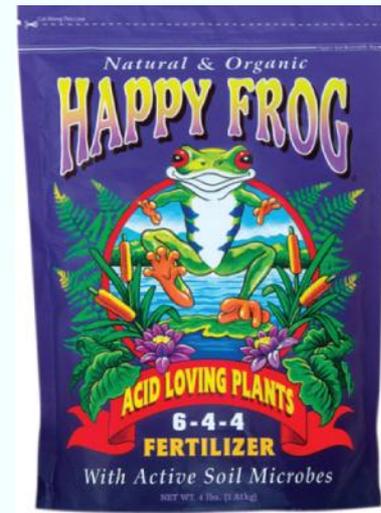
- Containers
- Raised Planter Beds
- Mounds or Mounded Rows

My Preferred Container or Raised Bed Soil Mix

- Use a mixture with 80% Peat Moss and 20% Cactus Soil.



- Mix in an acidic organic fertilizer that has mycorrhizae



Grow Blueberries in Full Sun to Part Shade



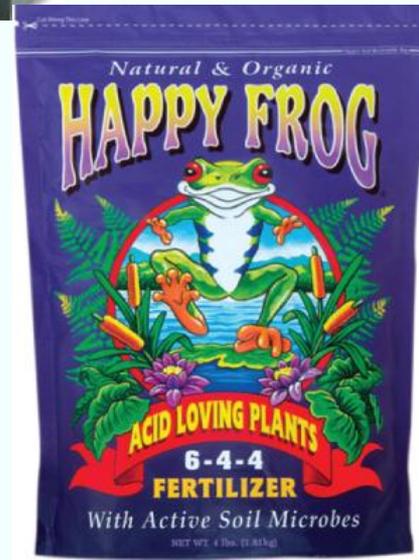
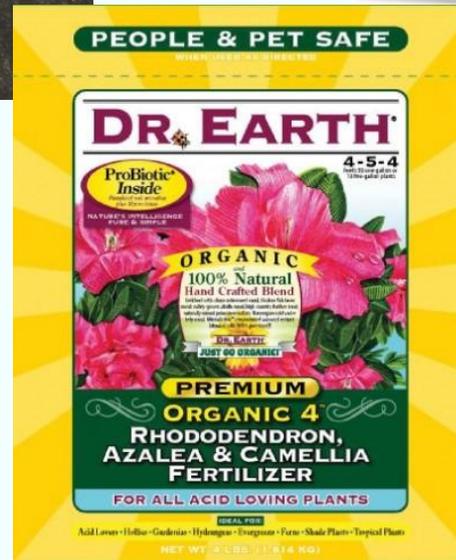
Keep plants moist but not wet!



Blueberries require soil with good drainage!

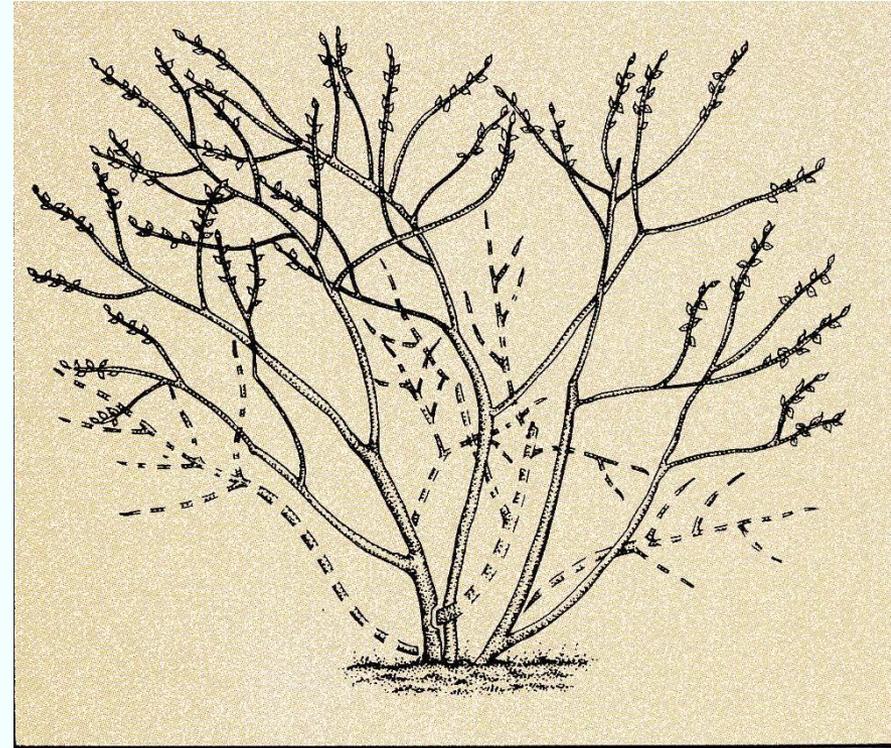
Fertilize Blueberries using acidic fertilizers

Fertilize lightly during the growing season



Pruning Blueberries

- Prune to an open vase shape, leaving 4 to 6 large canes to form the vase.
- Fruit is produced from buds on 1 year old wood.
- Thin small canes and small fruiting branches to reduce over fruiting.
- Allow fruiting in the 3rd season after planting.
- After 4-6 years, remove and replace 1 or 2 of the oldest canes each year.



Health Benefits of Blueberries

- Highest antioxidant value out of 60 fruits tested by Tufts University
- Lowers cholesterol
- Improves nighttime vision acuity
- Lowers risk of macular degeneration
- High in vitamin C, manganese, dietary fiber, vitamin E

Favorite Blueberry Varieties

Rabbiteye

- Beckyblue
- Bonita
- Briteblue
- Delight
- Powder Blue
- Woodard

Southern Highbush

- Avonblue
- Biloxi
- Jewel
- O'Neal
- Sharpblue
- Snowchaser
- Southmoon
- Star
- Sunshine Blue



MULBERRY



- Three species have been recognized for their economic importance.
- The white mulberry (*Morus alba*) is native to eastern and central China.
- The red or American mulberry (*Morus rubra*) is native to eastern United States.
- Black mulberry (*Morus nigra*) is native to western Asia.

WHITE MULBERRY Morus alba

RED MULBERRY Morus rubra and Hybrids



- Mulberries are large, deciduous trees native to warm, temperate, and subtropical regions of Asia, Africa, and the Americas.

WHITE MULBERRY Morus alba
RED MULBERRY Morus rubra and Hybrids



- Technically, the mulberry fruit is an aggregation of small fruits arranged longitudinally around the central axis as in blackberry or loganberries. Each fruit measures 2-5 cm long.
- In most species, these berries are purple-red when ripe; however, they can be white, red, purple or multiple colors in the same fruit.

PERSIAN MULBERRY

Morus nigra



- Smaller trees than other mulberries. The fruit has more of a tangy, boysenberry-like flavor than other mulberries

Health benefits of mulberries

- Mulberries are low in calories (just 43 calories per 100 g). They contain health promoting phyto-nutrient compounds like polyphenol pigment antioxidants, minerals and vitamins that are essential for optimum health.
- Mulberries have significantly high amounts of phenolic flavonoid phytochemicals called **anthocyanins**. Scientific studies have shown that consumption of berries have potential health effects against cancer, aging and neurological diseases, inflammation, diabetes, and bacterial infections.
- The berries contain **resveratrol**, another polyphenol flavonoid antioxidant. Resveratrol protects against stroke risk by altering molecular mechanisms in the blood vessels; reducing their susceptibility to damage through decreased activity of angiotensin (a systemic hormone causing blood vessel constriction that would elevate blood pressure) and increased production of the vasodilator hormone, *nitric oxide*.
- In addition, these berries are an excellent source of vitamin-C (36.4 mg per 100, about 61% of RDI), which is also a powerful natural antioxidant. Consumption of foods rich in vitamin-C helps the body develop resistance against infectious agents, counter inflammation and scavenge harmful free radicals.
- Further, the berries also contain small amounts of vitamin A, vitamin E and in addition to the above-mentioned antioxidants. Consumption of mulberry provides another group of health promoting flavonoid polyphenolic antioxidants such as *lutein*, *zea-xanthin*, *β-carotene* and *α-carotene* in small but notably significant amounts. Altogether, these compounds help act as protect from harmful effects of oxygen-derived free radicals and reactive oxygen species (ROS) that play a role in aging and various disease processes.

Health benefits of mulberries

- **Zea-xanthin**, an important dietary carotenoid selectively concentrates into the retinal macula lutea, where it thought to provide antioxidant functions and protects the retina from the harmful ultraviolet rays through light-filtering actions.
- Mulberries are an excellent source of iron, which is a rare feature among berries, contain 1.85 mg/100 g of fruits (about 23% of RDI). Iron, being a component of hemoglobin inside the red blood cells, determines the oxygen-carrying capacity of the blood.
- They also good source of minerals like potassium, manganese, and magnesium. Potassium is an important component of cell and body fluids that helps controlling heart rate and blood pressure. Manganese is used by the body as a co-factor for the antioxidant enzyme, *superoxide dismutase*.
- They are rich in B-complex group of vitamins and vitamin K. Contain very good amounts of vitamin B-6, niacin, riboflavin and folic acid. These vitamins are function as co-factors and help body in the metabolism of carbohydrates, proteins and fats.

Favorite varieties of Mulberries

- Kaester - *M. nigra*
- Persian - *M. nigra*
- Illinois Everbearing – *M. alba* or *M. alba* X *M. rubra*
- Pakistani – *M. alba* or *M. alba* X *M. rubra*
- Pakistani White (Shahtoot) – *M. alba* or *M. alba* X *M. rubra*
- Phil's White – *M. alba* or *M. alba* X *M. rubra*
- Sullivan – *M. alba* or *M. alba* X *M. rubra*
- Tehama – *M. alba*

Che or Chinese Mulberry

Maclura tricuspidata (Cudrania tricuspidata)

- The che requires minimal care and has a tolerance of drought and poor soils.
- A very tough, pest free and drought resistant tree, withstanding temperatures of -20° F.
- The deciduous trees can eventually grow to about 25 ft. in height, but often remains a broad, spreading bush or small tree if not otherwise trained when they are young.
- Immature wood is thorny but loses its thorns as it matures.



Che or Chinese Mulberry

Maclura tricuspidata (Cudrania tricuspidata)



- The che is dioecious, with male and female flowers on different plants.
- The male flowers turn yellow as the pollen ripens and is released.
- The wind-pollinated female flowers develop many small stigmas over the surface of the immature fruit.
- Male plants occasionally have a few female flowers which will set fruit.
- Female trees are larger and more robust than male trees.

Che or Chinese Mulberry

Maclura tricuspidata (Cudrania tricuspidata)

- Like the related mulberry, the che fruit is not a berry but a collective fruit, 1 to 2 inches in diameter.
- The ripe fruits are an attractive red or maroon-red color with a juicy, rich red flesh inside and 3 to 6 small brown seeds per fruit.
- When fully soft ripe the flavor is watermelon-like that can be quite delicious.



POHA (Cape Gooseberry)

(*Physalis peruviana*)



- An herbaceous perennial. Hardy to 28 degrees.
- Grow in full sun or partial shade.
- Propagate by seed.
- Rich in vitamin A, C, and some B vitamins. Also high in protein and phosphorous.
- Fruit can be stored for 3 months!

Goji or Wolfberry

Lycium barbarum



- Goji berries grow on a deciduous sprawling shrub found in temperate and subtropical regions in China, Mongolia and in the Himalayas in Tibet.
- Adult Goji plants can grow up to 8-10 feet high and wide.

Goji or Wolfberry

Lycium barbarum



- Goji berries are rich in antioxidants, particularly carotenoids such as beta-carotene and zeaxanthin.
- Goji berries are usually found dried. They are shriveled red berries that look like red raisins.
- Goji berries have a mild tangy taste that is slightly sweet and sour.

Goji or Wolfberry

Lycium barbarum



Selections of Goji that are considered to be superior for fruit quality include:

- Sweet 'Lifeberry' and 'Big Lifeberry.' The difference between the two cultivars is that 'Sweet Lifeberry' has a greater quantity of smaller berries, while 'Big Lifeberry' will provide fewer, larger berries.
- Crimson Star -This productive Northern Chinese cultivar has large, tasty bright red berries
- Da Me Ye
- NQ-1

Elderberry

[Sambucus canadensis](#) (syn. *S. nigra* ssp *canadensis*; **American Elder**; eastern North America; with blue-black berries)

[Sambucus cerulea](#) (syn. *S. caerulea*, *S. coerula*, *S. glauca*; **Blue Elderberry**; western North America; dark blue-black berries with glaucous bloom on surface, giving them a sky-blue appearance)

[Sambucus nigra](#) (**Elder** or **Black Elder**; Europe and western Asia; with black berries) This is the species most often used medicinally.



- Elderberries are popular for their unusual taste in pies, jellies, and jams. They are occasionally used in winemaking.

- In Italy, Germany and Austria, the flowers of the elderberry are batter coated, fried and then served as a dessert.

- The flowers of *Sambucus nigra* are used to produce elderflower cordial.

- The French, Austrians and Central Europeans produce elderflower syrup, commonly made from an extract of elderflower blossoms.

- Based on this syrup, "Fanta" markets a soft drink variety called "Shokata" which is sold in 15 countries worldwide.

- In the United States, this French elderflower syrup is used to make elderflower marshmallows.



Elderberry - Sambucus sp.

- The ripe, **cooked** berries (pulp and skin) of most species of *Sambucus* are edible. **However, most uncooked berries and other parts of plants from this genus are poisonous.** *Sambucus nigra* is the only variety considered to be non-toxic, **but it is still recommended that its berries be cooked slightly for culinary purposes.**
- The leaves, twigs, branches, seeds and roots of *Sambucus* plants can contain a cyanide-inducing glycoside. Ingesting a sufficient quantity of cyanide-inducing glycosides can cause a toxic buildup of cyanide in the body.
- In 1984, a group of twenty-five people were made sick, apparently by elderberry juice pressed from fresh, uncooked *Sambucus mexicana* berries, leaves and stems. However, all twenty-five recovered quickly, including one individual who was hospitalized after drinking five glasses. Such reported incidents are rare.
- Black elderberry has been used medicinally for hundreds of years. Some preliminary studies demonstrate that elderberry may have a measurable effect in treating the flu, alleviating allergies, and boosting overall respiratory health.



Elderberry Benefits

- Used for its antioxidant activity, to lower cholesterol, improve vision, boost the immune system, improve heart health and for coughs, colds, flu, bacterial and viral infections and tonsillitis. Elderberry juice was used to treat a flu epidemic in Panama in 1995.
- Elderberries (*Sambucus*) have been a folk remedy for centuries in North America, Europe, Western Asia, and North Africa, hence the medicinal benefits of elderberries are being investigated and rediscovered.
- Elderberry is used for its antioxidant activity, to lower cholesterol, to improve vision, to boost the immune system, to improve heart health and for coughs, colds, flu, bacterial and viral infections and tonsillitis.
- Bioflavonoids and other proteins in the juice destroy the ability of cold and flu viruses to infect a cell. People with the flu who took elderberry juice reported less severe symptoms and felt better much faster than those who did not.

Beneficial components in Elderberries

- Elderberries contain organic pigments, tannin, amino acids, carotenoids, flavonoids, sugar, rutin, viburnic acid, vitamin A and B and a large amount of vitamin C.
- They are also mildly laxative, a diuretic, and diaphoretic. Flavonoids, including quercetin, are believed to account for the therapeutic actions of the elderberry flowers and berries.
- According to studies these flavonoids include anthocyanins that are powerful antioxidants and protect cells against damage

Elderberry - Variety Selection

- Although relatively little breeding has been done, several elderberry varieties are readily available. Since elderberries are only partially self-fruitful, plant at least two varieties no more than 60 feet apart.
- **Adams #1 and Adams #2:** The oldest varieties, which are vigorous and productive, with large fruit clusters and berries. They ripen in early September.
- **Johns:** Also very vigorous, producing 10-foot canes on fertile soils. It ripens about 10 days earlier than the Adams varieties.
- **Scotia:** Yields berries with a higher sugar content than other varieties, although the bushes are somewhat smaller.
- **Nova:** Has larger, sweeter berries than the Adams varieties. It also lacks the astringency of some varieties.
- **York:** Productive and matures relatively late. Plants are large and vigorous.
- **Black Lace Elderberry - Sambucus nigra** -Dark purple-black leaves and pink flower clusters. Foliage stays dark throughout the growing season. Very ornamental





BERRIES



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