Minor Fruits and Nuts
In Georgia

Cooperative Extension Service
The University of Georgia College of Agricultural and Environmental Sciences

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Minor Fruits and Nuts
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Many types of fruits and nuts can be grown in Georgia due to our mild climate. Your county extension office can give you publications on fruits and nuts commonly grown in the state. This publication provides an outline of the culture and management of the exotic and uncommon fruits and nuts that can be grown in Georgia.

If you are interested in commercial culture of fruits and nuts, contact your county agent for more detailed information.

Banana

Bananas *(Musa spp.)* are attractive landscape plants popular with many gardeners in Georgia. They may be grown with limited success outdoors in south Georgia. They usually require 12 to 18 months to produce a flower stalk. The fruit takes four to eight months to mature, depending on the temperature during the growing season. When winters are mild in south Georgia or when the plants are protected in north Georgia, the stalk may survive the winter and produce fruit in the second year. When winters are cold (below 25 degrees F), the tops are usually killed, so no fruit is produced. Some people grow bananas by potting the plants in tubs each fall and carrying them through the winter in a basement. Others build an insulating cage around the trunk using chicken wire and pine straw, enabling the plant to survive outdoors during the winter. A third method of overwintering the plant is to remove most of the soil under the large rhizome but leave some roots attached on one side. Then lay the plant on the ground and cover both the rhizome and stalk with about one foot of soil. In the spring, after danger of freezing is past, remove the soil, stand up the plant, and tie it to a fence post set near the base.

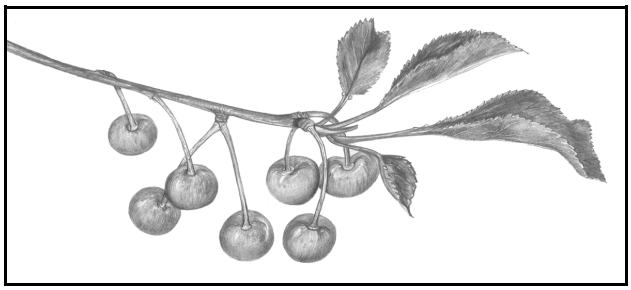
Bananas require plenty of water and fertilizer for good fruit production. Adjust soil pH to 5.5 to 6.5 before planting. Mulching is very beneficial because it conserves moisture, retards weeds, and protects the rhizomes from winter freezing. Water regularly and deeply during the summer if rainfall is poor. If the soil is extremely wet, root rot may develop. From late spring through summer, fertilize monthly with about 1 pound of 10-10-10 per mature plant cluster and 2 to 4 ounces of 10-10-10 per young plant. Scatter the fertilizer evenly in a large circle under the plants.

You need to prune bananas. In the beginning, let only one main stalk develop from each rhizome (underground bud). After six months, allow a replacement sucker to grow, because the main trunk is removed after fruiting. Unneeded suckers can be used to establish new plantings. The rhizomes may be dug up and divided for propagation of additional plants.

The ‘Cavendish’ variety is probably the banana variety best adapted to Georgia. The plant grows about 7 feet tall, produces good quality fruit, and is slightly more cold hardy than others. The ‘Raja puri’ variety is

reputed to produce bananas in the first growing season. Plants set in the spring, 1998, in Savannah, Georgia, produced fruit, but it did not mature before frost. Additional information will be available in subsequent years. Many of the ornamental bananas grown in Georgia produce small fruit full of very hard, large seeds and usually are not edible. Bananas have few pests in Georgia.

Cherry



Two major species of cherry are grown for fruit: sour cherry *(Prunus cerasus)* and sweet cherry *(Prunus avium).* Climate, specifically temperature, determines the success of cherry growing. In general, cherry does poorly in areas where summers are long and hot and winter temperatures are high for short periods. As a result, cherry does not do well in the south except at higher elevations. Cherry trees bloom very early in the spring (sweet cherries earlier than sour cherries) and are susceptible to damage by spring frost, so they are not reliable producers of fruit.

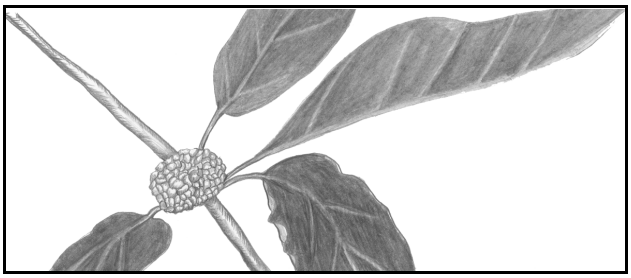
Cherries are similar to other stone fruits such as plums and peaches in respect to site requirements. Cherry grow on a wide range of soil types, so long as the soil is well-drained. Avoid soils that are extensively heavy or areas that remain wet for long periods. Plant cherry on a site that has good elevation and air drainage to reduce changes of spring frost.

Information on variety selection is limited. Trials at Athens, Georgia, show fair success with 'Early Richmond' (sour), 'Montmorency' (sour) and 'Ranier' (sweet). In Virginia, trials show success with the sweet cherry variaties 'Hedelfinger,' 'Viva,' 'Valera,' 'Venus' and 'Hardy Giant.' Sour cherry varieties are self-fertile (producing fruit with its own pollen) and are limited to areas such as the Piedmont and Mountains that receive 1,000 to 2,000 hours of winter chilling. The sweet cherries, with the exception of 'Stella,' are self-infertile (at least two varieties must be planted together to ensure cross-pollination) and are also limited to the Piedmont and Mountain sections of Georgia.

Cherry trees are typically trained to a central leader system similar to that used for apples and pears. This produces a central trunk with a lateral scaffold extending from the trunk. Pruning of young trees should be very light until trees come into bearing. Remove dead and broken limbs at first notice.

Like peach and plum trees, cherry trees are very susceptible to an array of diseases and insects. Cherry leaf spot, brown rot and numerous viruses are the most serious diseases affecting cherry trees. Birds are another common problem and may consume an entire crop. Fruit splitting or cracking caused by rain on a maturing crop can cause losses of 75 to 80 percent.

Chinese Mulberry (Che)



Chinese Mulberry *(Cudrania tricus pidata)* is also known as che, cudrang and silkworm tree. It is a small, thorny tree up to 30 feet tall. It flowers in late spring and the fruit ripens in the fall. The fruit has a raspberry-like appearance and a mulberry flavor. Propagation is usually by root suckers. Variety information is very limited. Che appears to be free of pest problems in Georgia.

Elderberry

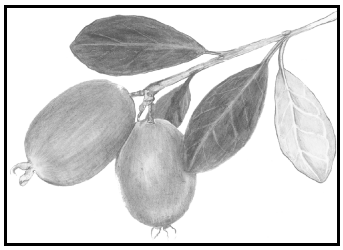
The American elderberry *(Sambucus canadensis)* is a large shrub that produces white flowers in the spring and large clusters of small, black fruit in late summer. The tree is drought hardy, winter hardy and attractive

during blooming and fruiting. The small berries may be eaten raw when fully ripe or made into jelly, pies or wine. The berries should be picked when they are fully ripe and the color is dark purple-black, but well before the time the berries begin to wither. Green berries and stems are toxic and must not be eaten.

Plant elderberries on well-drained or damp soil that has been limed to a pH of 6.0 to 6.5. Plant the bushes at least 5 feet apart and scatter a small amount of fertilizer ($^1/_2$ pound of 10-10-10) evenly under each bush every spring.

Elderberries need limited pruning to remove dead and/or broken canes. They are easily propagated in the dormant season by transplanting sucker plants growing around the base of the other bush. Available varieties of elderberries include 'Adams,' 'Johns,' 'Nova,' 'New York 21' and 'York.'

Feijoa



The feijoa or pineapple guava *(Feijoa sellowiana)* is a small, evergreen tree with attractive flowers and whitish-backed leaves. The plant is hardy to about 14 degrees F, so it is adapted to south Georgia. Severe freezes will kill the plant to the soil line, but it will regrow rapidly the following summer. Feijoas bloom in late spring and ripen in the fall. The fruit is egg-shaped and has a green skin with a yellowish pulp. The fruit has a pineapple/spearmint flavor, and the flowers have fleshy edible petals. The petals are sweet, and many people enjoy them as much as the fruit. In some countries, birds eat the petals and help with cross-pollination.

Adjust the soil pH to 6.0 to 6.5 prior to planting, and plant the bushes 8 to 12 feet part. Little is known about the fertilizer requirements of feijoa, but 1 to 2 ounces of 10-10-10 in March and July of the first year is suggested. Increase the amount by 1 ounce per application per year until the bushes are 8 years old; then use that amount for each application. Water as needed to keep the bushes growing.

Prune feijoas into small, single-stemmed trees. As the trees mature, remove selected branches to keep the trees somewhat open and productive. Keep the top of the tree narrower than the bottom to increase light penetration.

Available varieties of feijoa include 'Mammoth,' 'Triumph,' 'Coolidge,' 'Apollo,' 'Gemini,' 'Nazemetz' and 'Trask.' Most feijoas are partly self-pollinating but produce better crops if planted with three varieties for cross-pollination. In Georgia, feijoas appear to have problems with transfer of pollen, since the blossoms are visited by few insects and birds. Hand pollination by snapping off a recently opened blossom of one variety and dusting it on the recently opened blossom of another variety may prove beneficial to increase fruit size and set.

Gooseberry and Current

Gooseberries *(Ribes Uva-crispa* and *R. hirtellum)* and currants *(Ribes sativum* and *R. nugrum)* form small, beautiful arching bushes similar to blackberries in appearance.

The crops can be used for making pies and jelly and for fresh eating. They are relatively pest-free but are not heat tolerant, so they are best adapted to north Georgia. They are very winter hardy.

Adjust soil pH to 6.0 to 6.5 prior to planting. Fertilize twice a season with 2 ounces of 10-10-10 for each foot of plant height; keep well watered. These plants are marginally adapted to the south.

Common gooseberry varieties are 'Clark,' 'Fredonia' and 'Pixwell.' Common currant varieties are 'Red Lake,' 'Stephens No. 9,' 'White Grape' and 'Wilder.'

Gooseberries and currants are intermediate hosts of white pine blister rust fungus. During the Depression, WPA crews destroyed wild and domestic gooseberries and currants in an effort to stem the disease. In recent years, it has been concluded that these plants are not a significant factor in the spread of the fungus.

Jujube

The Chinese jujube or Chinese date *(Zizyphus jujuba)* is adaptable to many areas in Georgia. It is drought hardy and produces a graceful, open-growing ornamental tree up to 40 feet tall. The plum-sized fruit has a thin, edible skin surrounding white flesh. The single hard stone contains two seeds. The immature fruit is green; mahogany-colored spots appear on the skin as the fruit ripens, and the fully mature fruit is entirely brown. When the fruit is brownish-green, it is similar to a mealy apple in texture and flavor. However, when fully dehydrated in a shriveled brown condition, the fruit is much better tasting and very similar to a date. The trees are quite cold hardy and bloom late enough in the spring that freezes seldom affect fruit production. The trees are self-fertile, but you can increase yields by cross-pollination with another variety.

Jujubes can tolerate a very poor soil if it is well drained. Adjust the soil pH to 5.5 to 6.5 prior to planting. For best growth, watering may be needed during droughts. Fertilize lightly during the spring and summer with a balanced fertilizer such as 10-10-10.

Pruning is seldom needed on jujubes, because the trees have an open, upright growth habit. Jujubes are propagated by budding or grafting onto a thorny rootstock. Jujubes usually produce numerous thorny root suckers that are useful for propagation but may become pests in some situations. Jujubes can be propagated from softwood cuttings.

More than 400 varieties of jujubes are known in China, but two of the best varieties in Georgia are the 'Li' and 'Tigertooth.' Jujubes have few pests in Georgia. Avoid spraying jujubes with dormant oil sprays used to kill scale insects on most fruit plants. Damage has been noted from dormant oil application in Florida.

Juneberry

Juneberry *(Amelanchier)* is the common name for more than 25 species of small fruit-bearing trees or shrubs also called Serviceberry, Pacific Serviceberry, Saskatoon, sugar pear, Running Serviceberry and Allegheny Serviceberry. Most domesticated varieties have developed from Saskatoon Serviceberry *(A. alnifolia).*

Juneberry is widely adapted and extremely winter hardy. It is native to states from Maine to Iowa and south to northern Florida and Louisiana. Down Serviceberry is native to the Piedmont woods of Georgia. Other species are found as far north as Canada and as far west as the Great Plains. Prairie Indians mixed the fruit with buffalo meat and fat to make pemmican, their major winter food staple.

Juneberry is valued as an ornamental shrub and is commonly available. It forms multi-stemmed large shrubs or small trees that are usually 15 to 25 feet tall; they may grow to 40 feet under ideal conditions. The plant suckers form a bush-type growth if suckers remain. Small white flowers appear in mid- to late April during leaf development. In the fall, the foliage is highly colored, ranging from yellow to orange to rusty red.

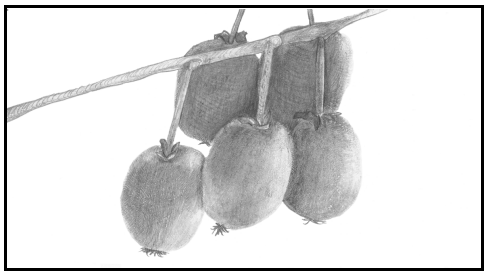
Fruit are berry-like pomes, ranging in size from that of a pea to $^1/_3$ inch in diameter. The fruit of the Downy Serviceberry *(A. arborea)* is round; it is green, changing to red and to purplish-black upon maturity. The fruit ripens in June and is slightly sweet and juicy, with a mild flavor that has been compared to a combination of blueberry and cranberry. Birds are very fond of the berries.

Juneberry seems to thrive on a wide range of soil types, but it prefers a moist, well-drained acid soil. It will tolerate full sun or partial shade. It is susceptible to various pests including rust, powdery mildews and fruit rot as well as leaf miner, borers, pear leaf blister mite, pear slug sawfly and willow scruffy scale.

Propagation is through softwood cuttings, but it is not very successful. Cold stratification of seed for 90 to

120 days at 41 degrees F is required. Division of parent plant and root cuttings are also used. 'Shannon,' 'Indian,' 'Success,' 'Regent,' 'Ovalis,' 'Grandiflora,' 'Prince Charles' and 'Jennybelle' are improved varieties of Juneberry.

Kiwifruit



No minor fruit has received more attention in recent years than the kiwifruit or Chinese gooseberry. It has been planted as an experimental commercial crop in many southeastern states and is available through some garden catalogs. There are two types of kiwifruit, the most common of which is the grocery store or commercial type *(Actindia chinensis* or *A. deliciosa).*

The fruit grows on a vigorous vine with large, nearly round leaves the size of a saucer. The fruit is the size of a hen's egg and is brown on the outside and covered with fuzz. The pulp is green and white with black seeds. The fruit has an acid flavor reminiscent of strawberries and watermelon. The vines are extremely cold-sensitive when young and may be damaged or killed to the ground by early fall freezes or late spring freezes. In midwinter, the vines are about as cold hardy as figs, withstanding temperatures to 10 degrees F.

The second type of kiwifruit is cold hardy enough to be grown in New England. Several species will grow in Georgia, including *Actindia arguta, A. kolomikta* and *A. polygama,* but there are few reports of heavy fruit production in Georgia. Most of the named varieties are derived from the *A. arguta* species. The fruit also grows on a vine, but these leaves are pointed and smaller than those of commercial kiwifruit. The fruit is usually green, smaller than commercial kiwifruit and fuzzless. Fruits may be eaten like seedless grapes.

'Hayward' is the major commercial variety of female kiwifruit and has fruited fairly well in Georgia. The 'Bruno' variety has also performed well in Georgia. Several varieties of male flowered commercial kiwifruit are available, but 'Matua' is probably the best in Georgia. Several varieties of cold hardy kiwifruit are available. 'Meader' and 'Anna' (Ananasnaya) are female varieties. 'Issai' is a self-fertile variety from Japan. Male vines may enhance the fruit set of 'Issai,' and the pollen from 'Issai' or male vines is needed for fruit set of the female varieties.

Like muscadine and bunch grapes, kiwifruit produce flowers on current season's growth that sprouts from last year's buds. Male and female vines of commercial kiwifruit must be planted to produce fruit. Usually one male is planted for every eight female vines. There are a few varieties of self-fertile cold hardy kiwifruit, such as the 'Issai' variety, but male vines are usually needed for cold hardy kiwifruit production.

Kiwifruit require careful attention to water management. Irrigation is a must in growing kiwifruit to keep the vines from dying the first year. They are the most drought sensitive fruit grown in Georgia, but they are also one of the most sensitive to overwatering. Kiwifruit grow best on a soil such as a sandy loam or sandy clay loam with good internal drainage. Raised beds are suggested in areas with marginal soil drainage at any time of the year. Adjust soil pH to 6.0 to 6.5 before planting.

Fertilize kiwifruit with 4 ounces of 10-10-10 in March, May and July of the first year. Scatter the fertilizer over a circle 24 inches in diameter around the plant. Increase this amount to 8 ounces the second year and to 1 pound the third year if the plants are growing well. Increase to 2 pounds per application for plants 4 or more years old if they have filled the trellis. Increase the area of fertilizer distribution as the plant grows. Kiwifruit need a strong trellis and require a significant amount of pruning. They may be grown on an overhead arbor (pergola) or on a T-bar trellis (Figure 1, page 8).

Set plants 8 to 15 feet apart depending on the amount of space available. The trellises should be 15 to 20 feet apart. In training a kiwifruit vine on a T-bar trellis, grow the vine as a single trunk to 6 inches below the wire. Then pinch out the top bud and train one shoot in each direction down the center wire to form a permanent arm or cordon. Kiwifruit have a habit of growing vigorously for several feet and then going into a twining phase. It is best to prune off this growth and allow the next stage of vigorous growth to occur down the wire. Wrap the vine loosely on the center wire as it grows and tie it to the wire with degradable string, tape or cloth.

Allow fruiting arms to develop on both sides every 10 to 14 inches for commercial kiwifruit and every 24 to 30 inches for cold hardy kiwifruit. Allow fruiting arms to grow over the edge of the trellis and, if desired,

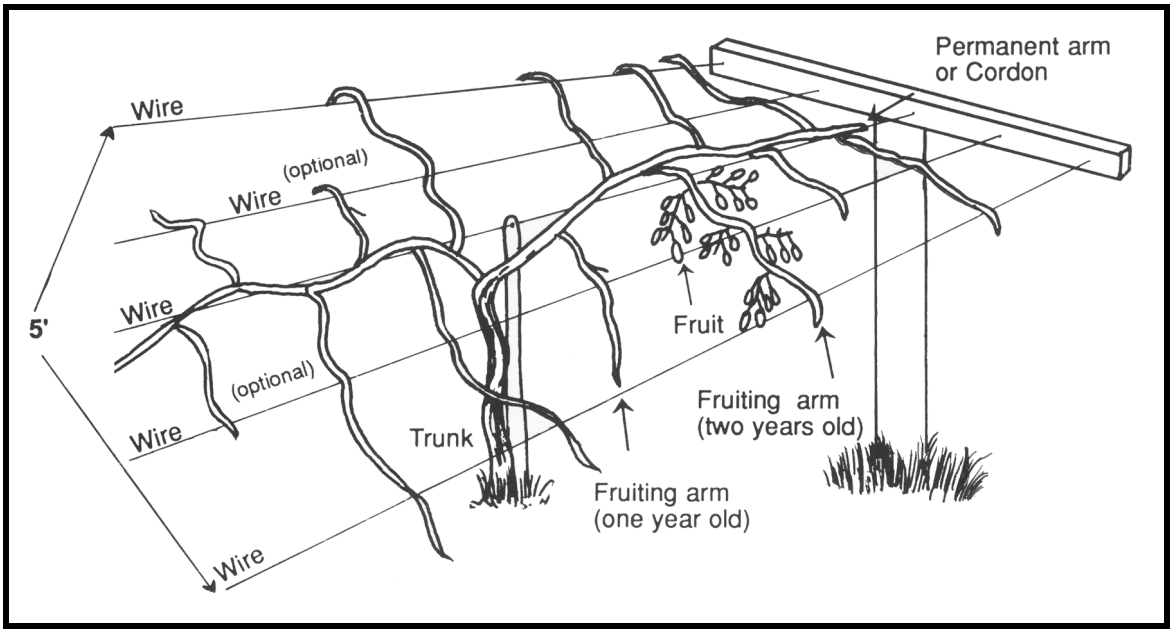


Figure 1: A Horizontal T-Bar Trellis for Kiwifruit

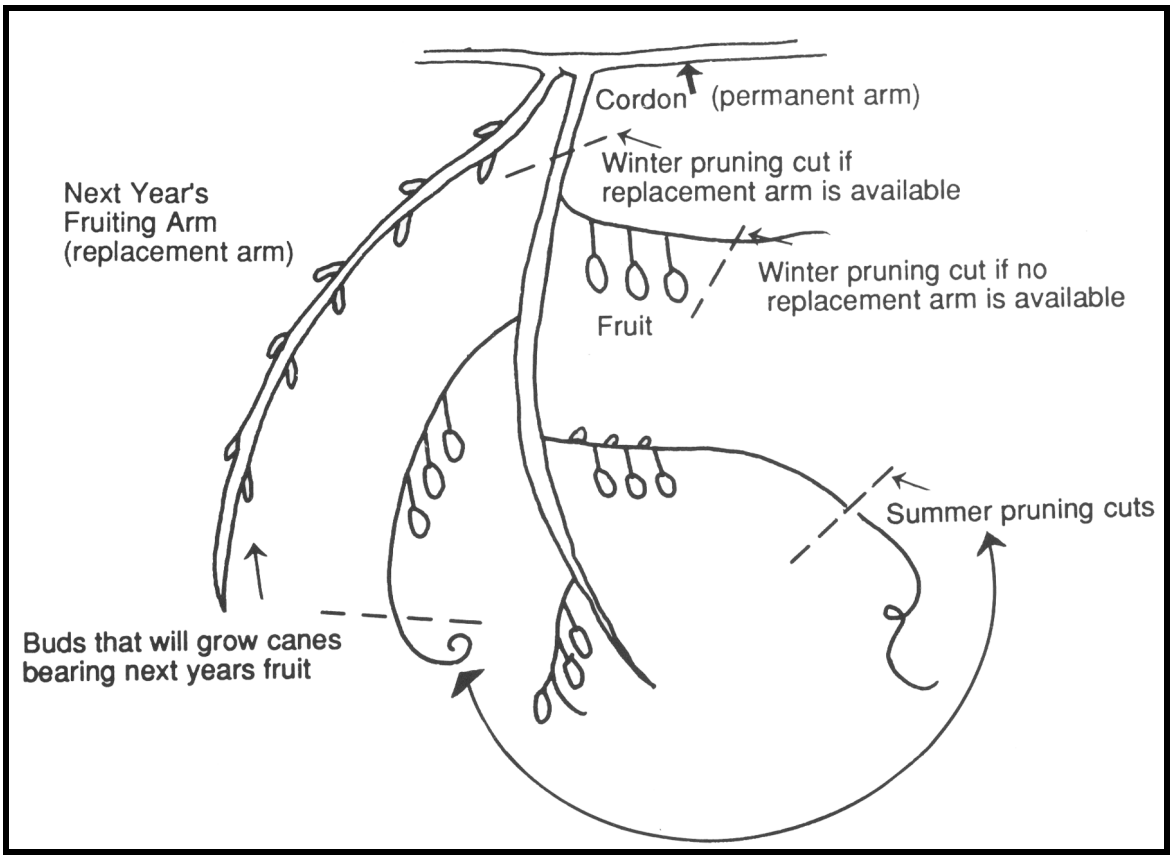


Figure 2: Pruning of Kiwifruit Fruiting Arms

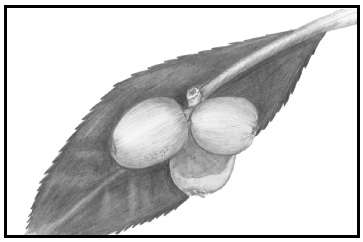
to trail nearly to the ground. In the following year, the buds on these fruiting arms emerge and fruit is borne on the current season's growth (Figure 2, page 8). The next winter, remove the old fruiting arm if a replacement arm has grown. If no replacement arm is available, save the old arm and cut off last year's side shoots at 6 to 8 inches. New kiwifruit growth is very subject to wind damage, so tie new canes to the trellis as soon as possible.

Kiwifruit can be propagated from cuttings in summer or winter is the right techniques are used. They may also be grown from seed, and budded or grafted to improved varieties. Cuttings are the best choice for commercial kiwifruit to reduce the danger of killing cold. The regrowth will always be true to variety for a cutting.

Kiwifruit have a number of pest problems. Root-knot nematodes are widespread in Georgia and are very destructive to kiwifruit. The home grower should sample his or her soil and plant kiwifruit in an area free of root-knot nematodes. Soil fumigation usually increases growth of kiwifruit and is recommended for the serious grower who is capable of handling the poison gas used in the fumigation process. Root rot of kiwifruit is a serious problem when soils are too wet. Mulching is advised; however, do not use peanut hulls or peanut straw. Peanut litter can carry a root disease that is very destructive to kiwifruit.

Several problem-causing insects have been observed on kiwifruit. Alder flea beetles (tiny, metallic greenish-blue beetles), cucumber beetles and grasshoppers may feed on the leaves. White peach scale and other scales are know to attack the plants. Deer and rabbits like to feed on the plants, and cats may damage some species of young kiwifruit.

Loquat



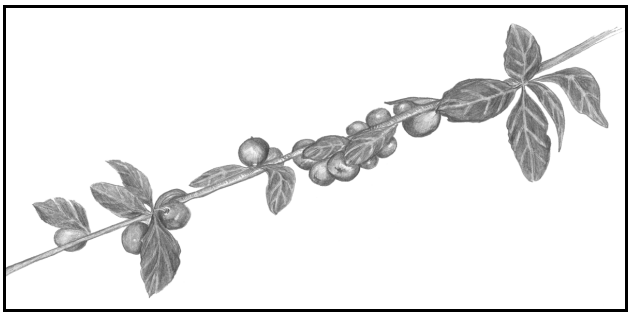
Loquat or Japanese plum *(Eriobotrya japonica)* is a handsome evergreen tree with a compact, rounded crown. Attractive white flowers are borne at the ends of the stems in the fall and winter, and fruit ripens in the spring. In Georgia, the new flowers and fruit are often destroyed by freezes if temperatures fall below 27 degrees F. Loquats are self-fruitful. The white, yellow or orange fruit are sweet with a mild plum-like flavor.

Mature loquat trees can survive temperatures as low as 12 degrees F but, because of their early blooming habit, they seldom fruit in north Georgia unless they are in a very protected location. In south Georgia, fruit production occurs about every three years in slightly protected locations. Plant loquats in the most protected location you can find with sun for at least half the day. Good choices are on the south side of a heated building and under tall pines.

Loquats are drought-tolerant but respond well to irrigation. They will not tolerate continuously wet ground. Adjust the soil pH to 5.5 or 6.5 prior to planting. Fertilize the trees lightly two or three times during the summer with a balanced fertilizer.

Little pruning is needed except to remove dead and crossing limbs. Loquats are propagated by budding or grafting improved varieties onto seedling rootstocks. Some varieties that perform well in the southeast are 'Advance,' 'Bartow,' 'Fletcher Red,' 'Hardee,' 'Champagne,' 'Thales' and 'Wolfe.' Loquats have few pest problems. Occasional fire blight can usually be controlled by the prompt removal and burning of diseased parts.

Mayhaw



Mayhaws *(Crataegus aestivalis, C. rufula* or *C. opaca)* are in the rose family and hawthorne genus. They produce small apple-like fruits that ripen during late April and early May in south Georgia. The trees usually grow in swampy areas and may have their root systems flooded for several months each year. The fruits are highly prized for jelly. About 10 companies produce the jelly commercially, and it is available in many specialty stores in the southeast. Mayhaw trees are small- to medium-sized trees with beautiful white blooms and attractive fruit; they are desirable as

ornamentals and for wildlife cover and forage. Some varieties have a low chilling requirement and bloom early (late February to early March in south Georgia), so these varieties should be planted only in south Georgia. Although mayhaws are naturally found in low, wet areas, they will grow well on hilltops with irrigation. Planting on hilltops will reduce the chance of freeze damage to the blooms during a radiation (still night) freeze.

Mayhaws are tolerant of wet soils but grow best in moist, well-drained soil. Adjust soil pH to 6.0 to 6.5 prior to planting, using dolomitic limestone.

Fertilize the trees with 1 pound of 10-10-10 per inch of trunk diameter in early spring, up to a maximum of 5 pounds per tree. Repeat in July if the trees look pale. First-year trees should receive $^1/_4$ pound of 10-10-10 in March and $^1/_4$ pound in May and July. Broadcast fertilizer evenly under the tree to avoid burning the roots. Do not apply fertilizer within 8 inches of the trunk. Mayhaw trees are long-lived and may have a 30-foot diameter canopy after 17 years, so plant trees 15 to 20 feet apart in the row with 18 to 20 feet between rows. If mechanical harvesting is desired, adjust row spacing to fit the equipment.

Train mayhaw to a single trunk at the base. The first branches should start at 24-36 inches so equipment can be operated under the tree or people can get under the tree and pick up the fruit. Occasional pruning is necessary to open up the tree for greater light penetration. The trees will adapt to a modified central leader training system when one main trunk is promoted by pruning. This is a common method of training apple trees.

Mayhaws can be grown from seed collected from ripe fruit and sprouted immediately without cold treatment. A more dependable method is to clean the seed and store it in damp sand at 33 degrees F for eight months prior to planting. Plant seed in sterilized soil and cover with a screen to prevent birds from eating the young seedlings. The seed of hawthorns is unusual in that many of the seedlings will be true to type. Mayhaw seed viability varies greatly among trees.

Mayhaw cuttings can be rooted under intermittent mist or in a humidity chamber during the summer. Dipping in a root-promoting hormone (2,000 to 6,000 ppm IBA) may help rooting. Propagation from hardwood and root cuttings has been reported. Plants grown from cuttings will produce fruit like the plant from which the cuttings were taken.

Mayhaws are easily grafted in late winter. In south Georgia, a whip and tongue or simple whip graft can be used in early to mid-February. Cleft grafting can be used on larger trees. Mayhaws appear to be initially graft-compatible with any hawthorn, but using mayhaw rootstock is the safest bet. In Mississippi, the parsley haw is considered an excellent rootstock. The hoghaw, which grows on Georgia's sand ridges, can be used as a root-stock, but its slow growth rate may allow the mayhaw scions to grow over the hoghaw rootstock. Mayhaws grafted onto 'Washington' hawthorn are severely dwarfed and have performed poorly. Mayhaw seedlings are probably the best choice as rootstock, especially in damp soils.

About 70 mayhaw trees have been selected from the wilds of Georgia, Mississippi, Louisiana and Texas and named as varieties (Table 1, page 11). Information and observations are very limited on some varieties. Most ripen over a 20-day harvest period, but the 'Lori' variety may have 80 percent of the fruit ripe at one time. Early blooming, low chilling varieties face a significant danger from spring freezes, but they provide very early ripening fruit in south Georgia in years when they are not frozen out. In middle and north Georgia, plant only the highest chilling, latest blooming mayhaw varieties available such as 'Saline,' 'Crimson' and 'Texas Star' to reduce the change of spring freezes.

Insects, including plum curculio, aphids, flat-headed apple borers, white flies and foliage feeders are known to attack mayhaws. Plum curculio has caused extensive damage to fruit in some locations and requires a spray program in most areas. Deer and rabbits can destroy a grove in a short period of time.

There are numerous diseases known to occur on various hawthorn species. Information on diseases of mayhaw is limited. Quince rust is a common fruit disease of mayhaws. Cedar trees are an alternate host for the disease, and removing all cedar trees in the vicinity or planting mayhaws away from existing cedars should help. Brown rot blossom blight can attack the developing shoots in the spring during some years. Fire blight occurs on mayhaw but is usually not a severe problem.

Because few pesticides are labeled for mayhaw, commercial producers may have trouble controlling pests.

Promote maximum tree health through proper site selection, irrigation, fertilization and weed control to prevent many of the diseases that might occur in the woody parts of the tree.

Table 1. Some Promising Mayhaw Cultivars Tested in South Georgia in Approximate Order of Ripening.

Cultivar	Typ. date ripe	Typ. bloom date	Fruit size (mm)	Fruit color (skin/flesh)	Firm	Retention	Comments
T.O. Superberry	late Apr	mid Feb	15-18	dk. red/pink	8	7	early bloom a problem
Mason's Superberry	late Apr	mid Feb	17-18	dk. red/pink	8	8	early bloom a problem, holds on tree tightly
Superspur	late Apr/ early May	late Feb/ early Mar	17-18	lt. red-yellow/ yellow	5	5	productive, poor color, soft, shatters
Saline	late Apr/ early May	early-mid Mar	15-19	mostly red/ lt. pink	8	8	late blooming, productive, good firmness & retention
Big Red	late Apr/ early May	early Mar	18-19	red/pink	7	7	good size and color
Crimson	late Apr/ early May	mid Mar	16-18	mostly red/ lt. pink	6	5.5	late blooming
Big V	late Apr/ early May	late Feb/ early Mar	16-18	lt. red/ pinkish-yellow	5	5	most of crop ripens in early May, soft, shatters
Turnage 57	early-mid May	early-mid Mar	13-16	red/yellow	5	5	late ripening, late blooming, soft, shatters
Texas Star	early-mid May	early-mid Mar	19-22	red/yellow	6	8	promising but not extensively tested yet
Turnage 88	mid May	early-mid Mar	15-17	red/yellow	5.5	6	late ripening, late blooming, some-what soft

Ratings are on a 1-10 scale where 7 is very good and 8 excellent, except in the case of fruit retention where 8 is slightly excessive.

Medlar

The medlar *(Mesphilus germanica)* is a small shrub-like tree in the rose family. It is cold hardy as far north as New York. Large, white blossoms appear in the spring and develop into small russet brown fruit, which are hard and acidic. The fruit are harvested after a light frost and stored where they are allowed to mellow, at which time they become edible.

Medlars can easily be grown from well-matured seed, or they may be grafted on pear or quince root-stock. Common varieties include 'Hollandish,' 'Nottingham' and 'Dutch Royal.'

Mulberry

Mulberries are large, fast-growing trees that are good fruit producers for humans and wildlife. The fruit resembles a slender blackberry and have a mild flavor. The fruit drops when ripe and may be harvested by shaking the tree. The fruit are borne on current season's growth and ripen in May in Georgia. The three species cultivated are the red mulberry *(Morus rubrum),* native to the United States; the black mulberry *(Morus nigra),* native to Iran; and the white mulberry *(Morus alba),* native to Japan and China. There are usually few problems with plant hardiness in Georgia's

climate; the plants, however, can be damaged by late spring freezes.

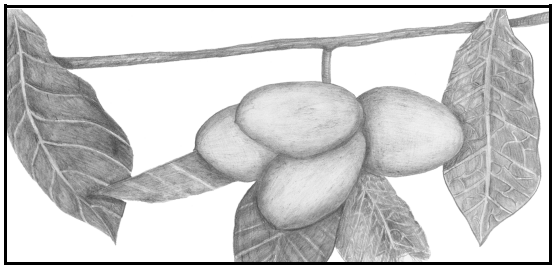
Mulberries grow best on a deep, well-drained soil, but they are tolerant of poorer soils. Adjust the soil pH to 5.5 to 6.5 prior to planting. Fertilize the trees in late winter and in mid-summer, using about 1 pound of 10-10-10 for each inch of trunk diameter.

Prune trees each winter to remove dead and crossing branches. Mulberries are easily propagated from hardwood cuttings in late winter. Many mulberry varieties are available, including White Mulberry ('Downing,' 'New American' and 'Wellington'), Black Mulberry ('Black Persian' and 'Noir'), and Red Mulberry ('Hicks,' 'Johnson,' 'Stubbs,' 'Townsend' and 'Travis').

Mulberry trees are relatively pest-free except for white peach scale, which attacks twigs and trunks of the trees and may kill them. White peach scale can be controlled by several dormant oil sprays in late winter. Birds are extremely fond of ripe mulberries and compete with humans for the fruit.

Some white mulberries occasionally suffer from popcorn disease. The disease is caused by a fungus that causes individual fruit carpels to swell until they look like unpopped popcorn kernels. Collect and destroy diseased fruit.

Pawpaw



The pawpaw *(Asimina triloba)* is the only cold hardy species of the "custard apple" family. The pawpaw is a native American fruit with northern growing limits of New York, Michigan and Ontario, Canada. The range extends south to Florida and west to Nebraska and Texas.

Tree pawpaw forms a small tree with a short trunk and spreading branches, forming a rounded crown. Tree height and width at maturity is 15 to 20 feet, and trees will grow to 30 to 40 feet under ideal conditions. Trees tend to send up root suckers, resulting in the formation of a thicket or grove of trees.

The dwarf pawpaw *(Asimina parviflora)* is a low growing shrub, seldom more than 6 feet tall. The flag pawpaw *(Asimina incana)* is another type of dwarf pawpaw. It has attractive white flowers in the spring, but the fruit is small.

Tree pawpaw leaves have a medium green upper surface and a lighter green lower surface. Leaves tend to droop, giving the tree a sleepy appearance.

Flowers are inconspicuous, maroon to purple in color and 1 to 2 inches in diameter. Pawpaws bloom in early May, just as leaves are developing.

Fruit are borne in clusters of one to six, depending on the success of pollination. Fruit size and shape vary greatly. Fruit is from 2 to 6 inches long and is elongated or rounded. Fruit contain numerous medium- to dark-brown seeds resembling elongated lima beans. Seed size varies from pea size to $1^1/_4$ inches long. Fruit have a very thin green skin, which turns yellowish-black when ripe, like an overripe banana. Fruit ripen from September until frost. After ripening, fruit soften and perish rapidly. The flesh has a rich, sweet custard consistency and a strong nutty banana flavor. Fruit are high in food value, with more than 430 calories per pound.

Pawpaws are relatively free of disease and insects compared to most cultivated fruits.

They do best on fertile, well-drained soils that are slightly acid, and they grow well in full sun or dense shade. Transplanting is difficult and should be done when trees are small (3 to 6 inches tall). The transplants should be balled and burlapped and should receive special care to keep stress such as drought and weeds at a minimum during establishment.

Trees can be propagated by seed or by layering and root cuttings. Suckers are difficult to transplant. Seed should be stratified in a moist medium for 60 days at 41 degrees F before being sown in the spring. Germination may be erratic. Seeds can also be sown outside in the fall to germinate the following spring.

Many different varieties are available including 'Davis,' 'Mango,' 'Mitchell,' 'P A Golden,' 'Sunflower,' 'Taylor,' 'Taytow,' 'Wells,' 'Wilson' and 'Overleese.' In the early 1990s, there was a pawpaw variety trial at Tifton, Georgia. 'Overleese' was the best performing variety in this trial. The 'Mango' variety was selected from Georgia.

Pomegranate

Pomegranates *(Punica granatum)* are dense, bushy shrubs 6 to 12 feet tall with thorny, slender branches that may be trained into small trees. Orange-red flowers appear on new growth in the spring and summer and are bell-shaped and vase-shaped. The vase-shaped flowers are normally sterile, so they will not develop into fruit. Pomegranates generally fruit poorly in Georgia. The fruit contains numerous seeds surrounded by sweet pink, juicy, subacid pulp covered with leathery-brown to red, bitter skin, which is easily peeled. Pomegranate juice stains can be difficult to remove from clothing.

Pomegranates may be damaged by unseasonably low temperatures in the fall, winter or spring and in mid-winter by temperatures below 10 degrees F.

Pomegranates can tolerate many soil types and some flooding. Pomegranates grow best on a deep, fairly heavy, moist soil at a pH range of 5.5 to 7.0. Proper watering is important in growing pomegranates because adequate soil moisture is necessary to control fruit splitting and reduce fruit drop. Fertilize young pomegranates with 1 pound of 10-10-10 in March and July. Increase the rate as the plants grow until the mature tree is receiving 3 pounds of 10-10-10 in March and July.

Most growers prefer to train pomegranates into a multiple-trunk system. Select five or six vigorous suckers and allow them to grow. Pomegranates require some pruning each year, and unneeded vigorous shoots should be removed. The short spurs on two- or three-year-old wood growing mostly on the outer edge of the tree produce flowers. Light annual pruning encourages growth of new fruit spurs. Heavy pruning reduces yield, so be careful to leave adequate fruit-bearing wood on the tree while removing branches that may cross over or interfere with growth.

Hardwood cuttings are usually used for propagation. Cuttings 8 to 10 inches long of wood ¼ to ½ inch in diameter are cut in winter from the previous season's growth and planted with 2 to 3 inches of the top exposed.

Several varieties are available, including 'Belgal,' 'Granada' and 'Early Foothill' (early ripening), 'Ruby Red,' 'Sweet Spanish Papershell' and 'Wonderful.' How-ever, most of these varieties only set a few fruit each year in Georgia. In north Florida, 'Belgal' has been more productive than other varieties and usually produces about 10 fruit per year. There are many dooryard trees of unknown varieties around old home places and plantations that set good crops of fruit most years. These can be propagated by hardwood cuttings.

Pomegranate leaf blotch or fruit spot are occasionally problems.

Quince

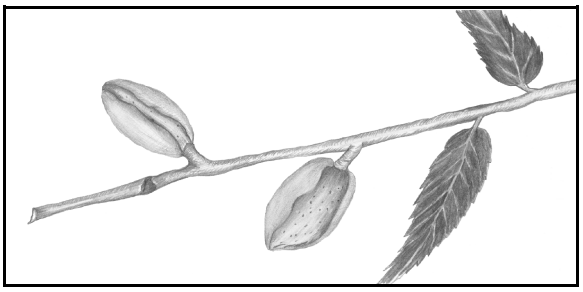
Several types of quinces are grown in Georgia. The common quince *(Cydonia oblonga)* forms a small tree with attractive flowers and leaves. Flowers form on the end of new growth in the spring and usually are self-fertile. Fruits are round or pear-shaped and weight up to 1 pound. They are very hard and are edible when cooked or made into jelly. A second species of quince, common or Japanese flowering quince *(Chaenomeles speciosa),* is grown as an ornamental for its red blossoms, which appear early in the spring. This bush produces oblong, yellow fruit that makes good jellies and jams.

Quinces can survive neglect and are tolerant of a wide range of soils. Fertilize lightly to discourage vigorous growth that may succumb to fire blight.

Train common quince trees to a vase shape. Drooping branches may need to be shortened. Little pruning is needed on mature trees except for removing water-suckers. Available varieties include 'Champion,' 'Apple,' 'Pineapple' and 'Smyrna.'

Quince is subject to many of the diseases that attack apples and pears, including fire blight, but it is generally much less affected. Quince rust is an exception, and some quince varieties may suffer crop losses in heavy rust years. Fire blight can be a problem, particularly if trees are excessively vigorous.

Almond



The almond *(Prunus amygdalus)* is a close relative of the peach. The tree and snow white blooms are similar to those of the peach, but the seed is the edible part of the almond.

Climate requirements are quite exact for almonds, and commercial production is limited to areas with dry summers. The necessary chilling hours (300 to 500 below 45 degrees F) are much like the peach varieties grown in south Georgia, but rain and high humidity during the growing season (late July and August) cause nut rot and inhibit nut opening. The outer flesh of the almond must have dry weather to dry and split open properly.

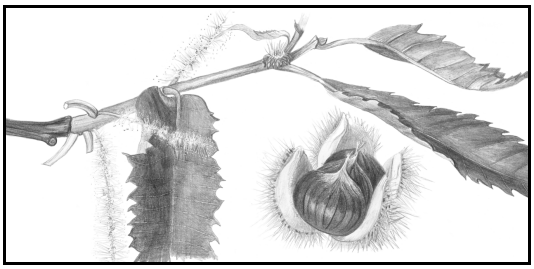
Most almond varieties require cross-pollination, but some self-fertile varieties are available.

Almond culture is the same as peach culture, and the recommendations on planting, fertilizing and pruning peaches are applicable to almonds. (See Georgia Extension Circular 741, *Home Garden Peaches and Nectarines.*)

For Georgia, the best home orchard variety is 'Halls Hardy.' This variety is late blooming, self-fertile and hard-shelled.

The same pests are a problem for almonds and peaches, and a regular spray schedule is required to produce a good yield.

Chestnut



The major chestnut species found in Georgia are the American chestnut *(Castanea dentata)* and Chinese chestnut *(Castanea mollissima).* Minor chestnut species such as Japanese, Korean, European or Italian, and chinkapins are occasionally seen.

The chestnut blight fungus *Endothia parasitica* was introduced from Asia in the late 1800s. It spread through the east, and by the early 1950s, virtually all American chestnuts had been destroyed. The blight does not kill the root system, so new sprouts grow and form small trees that are reinfected and killed.

The blight resistance of the Chinese chestnut was recognized in the early 1900s, and most plantings since then have been of the Chinese variety. Chinese chestnut is as hardy as the peach and is adapted to most of Georgia.

Chestnut is monoecious, with separate male and female flowers on the same tree. The burr (fruit) of the true chestnuts (American, Chinese, European and Japanese) normally contains three chestnuts. The chinkapins *(Castanea pumila)* have one nut per burr.

Chestnuts grow best in well-drained soil. Adjust the pH to 5.5 to 6.0 prior to planting. Fertilizer and care recommendations are the same as for most temperate climate nuts, and spacing of 20 feet is ideal for chestnuts.

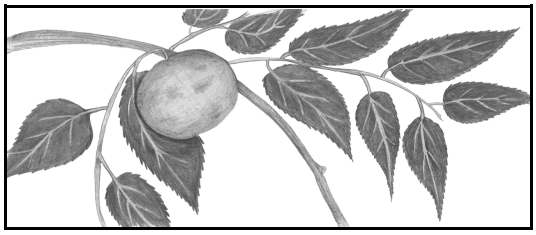
Chestnuts must be harvested every other day; numerous fungi and bacteria attack the nuts on the ground, causing rapid decay and spoilage. Use gloves when harvesting; the burrs can be painful to handle.

Propagation of chestnuts is by nursery graft and inlay bark graft.

The varieties of Chinese chestnuts recommended for home planting are 'Crane,' 'Nanking' and 'Meiling.'

Pests affecting chestnuts are chestnut blight, chestnut weevil and gall wasp.

Black Walnut



The black walnut *(Juglans nigra)* is a dual value tree because of its timber and nuts. Timber provides the greater income potential from black walnut.

The trees are massive, and some grow 98 feet high and more than 7 feet in diameter. Black walnut is

native to North America and does well in Georgia in well-drained soils.

Black walnut is monoecious, like other walnuts, pecans and chestnuts. Black walnuts grow best on deep, well-drained, moist and fertile soils with a pH of 6.0 to 7.0. Establish black walnuts by transplanting seedlings from nursery beds or by planting nuts directly in the field. Spacing depends on whether the primary crop is nuts or timber, but 30 feet by 30 feet is acceptable, followed by later thinning.

The trees should be pruned to a central leader to produce a straight, long, single trunk because of the high timber value. Nut production is generally secondary.

Of the many varieties available, 'Thomas' is one of the best for nut production. Two varieties – 'Victoria' and 'Captain' – are reported to be resistant to anthracnose, which is a fungal disease that attacks trees.

Carpathian Walnut

The Carpathian walnut *(Juglan regia),* also known as Persian or English walnut, is believed to have originated near the Caspian Sea in Iran. The Greeks and Romans brought it to the west, and it was eventually spread throughout the Far East and North America. Carpathian walnuts are sensitive to climate extremes and are marginally adapted to Georgia. They are quite susceptible to spring frost injury. Temperatures below 12 degrees F will kill some varieties, and temperatures above 100 degrees F will cause sunburn on limbs and shrivel kernels.

The walnut is monoecious, but cross-pollination is required; so at least two varieties should be planted.

Carpathian walnuts do best on deep, well-drained soils with a pH of 6.0 to 7.0. A spacing of 25 feet by 25 feet is ideal. Carpathian walnuts are propagated like pecans, but no specific variety recommendations can be made.

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Gale A. Buchanan, Dean and Director