



GROWING GRAPES IN THE HOME GARDEN

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Growing table grapes is fun and easy because they do well in most soils and are suited to Arizona's diverse climate. Choosing a site with full sunlight, selecting the right variety for your elevation, and caring (culture) for the vines properly will produce tasty fruit. Vines require several years from time of planting to the first harvest. This phase of vine establishment should not be rushed! Full production can be obtained in five to six years. Vines can survive for 50-100 years if properly cared for. Grapes require special care for maximum production of excellent quality fruit. The most important practice is the training and pruning of vines once they are established.

Varieties

Select the right variety for your elevation. European grapes (*Vitis vinifera*) are well adapted to Arizona's lower elevations (70 to 4,500 ft.), doing best where summers are warm and winters moderate. They are good for fresh eating, raisins, jelly, juice and wine. Some cultivars (cultivated "varieties") are seedless. Not very cold hardy.

American grapes, (*Vitis lubrusca*) and French Hybrids have berries known as "slip-skins" which may be tougher than the European types. They are better adapted to the higher elevations (greater than 4,500 feet) due to greater cold hardiness compared to European types. They are ideal for eating, juice, jellies and wine. Most cultivars have seeds. They have excellent cold hardiness.

European grape varieties for below 4,500 feet

Thompson Seedless — One of the more popular grapes for eating fresh; matures early in the season. Berries are seedless and are light green; neutral in flavor; firm and tender. Used for raisins. For large clusters and berries, fruit must be thinned. Berry size can also be increased by berry thinning prior to bloom, also known as flower cluster thinning.

Ruby Seedless—Produces large seedless red berries with large clusters. Cluster thin for best results, very productive.

Cardinal—Matures slightly earlier than Thompson Seedless, with round, dark red berries and grayish bloom. Each berry has one to four seeds.

Exotic—Berries are large and blue with a flesh that is crisp and sweet. Matures later than Cardinal (about 7 to 10 days); produces about three seeds per berry.

Perlette—Produces compact bunches of sweet and seedless pale green berries. Matures about two to three weeks ahead of Thompson Seedless. Has a distinct Muscat flavor. Berry thin prior to bloom.

Beauty Seedless — Berries about the size of Thompson are blue-black, firm and sweet. An early and heavy producer. Thin clusters for maximum flavor.

Flame Seedless — Good producer of seedless, red, round berries. Skin is tender and berries are good for fresh eating not processing. Berry thin to improve size.

Other adapted varieties — Black Monukka, Pierce, Golden Muscat and Muscat Hamburg.

American grapes for above 4,500 feet

Concord — One of the best known and widely planted American grape cultivars. Berries are blue-black with a heavy bloom (waxy coat on the berry). Despite a thick and tough skin, it's excellent for eating, juice, jellies and wine. Some find Concord less desirable than other varieties for eating fresh.

Campbell's Early — Similar to Concord but 10 to 14 days earlier; does not produce as heavily as Concord. Berries are light red with thick skins.

Catawba—Very hardy to low winter temperatures and very productive. Berries are purplish-red with lilac-like bloom. Skin is thick and tough. High sugar content.

Niagara—Vigorous growing vines produce amber-colored berries with thick skins. Berries are sweet and juicy, with a typical Concord flavor. Excellent for home gardens. Good for processing.

Himrod Seedless —Golden fruit with large loose clusters. Ripens a month earlier than Concord. Excellent for table use.

Seneca—Vigorous vines produce white seeded berries. Excellent producer for table use.

Reliance — Mid-season, red grape with excellent quality. Very productive, seedless, and very hardy. Berry thin for larger berries.

Soils

Grapes do best in loamy soils with good drainage. Avoid heavy clay soils when possible. Soils should be at least two (2) feet deep for best results. Root systems may extend 3 to 4 feet deep. Avoid areas of shallow caliche layers that will not allow water drainage. Don't plant where soil and water are highly alkaline. Have water and soil tested if in doubt. Do not plant in bottom of ravine or lower areas where cold air can accumulate. Sheltered home surroundings and sites are usually warmer.

Soil Preparation and Planting

Soil Preparation: Soil should be free of grass and weeds.

Vines can be planted in native soil only or compost can be added to retain moisture and improve organic matter. Mix compost in with soil when planting vines. No additional soil amendments or root stimulators are recommended. Grapes root very easily and can be propagated by taking one year old dormant wood cuttings and placing 6-12 inches in the ground, leaving 6-12 inches or 2-3 buds above ground. Keep moist and wait for growth.

Grape vines are generally sold dormant as bare root in the winter months or in pots or bags during spring and summer.

Planting: If bare root vines are to be used, make sure the roots remain in a moist environment to insure that roots don't dry out before planting. Potted or bagged vines should retain potting soil or soil mix when planted. Plant vines in early spring or after last spring frost date to avoid freeze events. At planting, prune off broken roots and trim all roots back to 4-5 inches. If vines have multiple shoots remove all but one and cut back to two buds (Figure 1). This may seem drastic but is necessary. Set vine in a hole that is 12-18 inches wide and 1-2 feet deep. Backfill with soil or soil-compost mix. Firm soil around vine and water thoroughly. Do not water again until vine begins to develop leaves. Keep vine free of grass and other weeds. Vines cannot compete with weeds

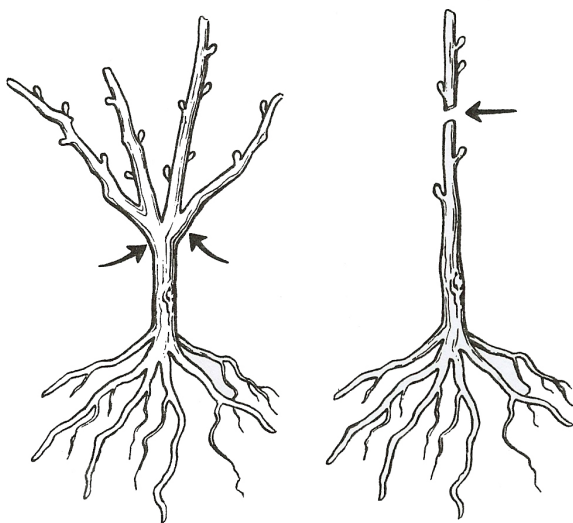


Figure 1. The vine "as is" from the nursery (left). Prune off all but the most vigorous cane and cut it back to 2 buds (right).

and will become stunted. Mulch is suggested to control weeds and retain moisture. Do not fertilize the first year. No soil amendments or root stimulators are recommended. Spacing between vines depends on the variety to be planted. In general, European vines are spaced 6-7 feet apart and American or French hybrids are spaced 8-9 feet apart. Spacing of vines on an arbor are generally dependent upon the architecture of the arbor with a vine planted at each post.

Support Systems: Grape vines need a support system for maximum production. Support systems include: fences, trellises, single stakes and arbors of all types such as patios and arches. Avoid using chain-link or hurricane fences because over time either the fencing or grapevine will need to be cut because the vines grow larger than the fence openings. Development of a mature vine on an arbor will take considerably more time compared to a trellis or fence. If a trellis or single stake system is to be used, drive a seven foot stake (wooden or metal) about two (2) feet deep next to the vine after planting. This stake will be used to develop a straight trunk.

Training

The objective of training is to develop a straight trunk and a well-established root system. During the first growing season after the vines have grown new shoots (there will be several) about 10-12 inches long, select the straightest one and tie to the stake. Remove all other shoots after tying (Figure 2). Allow vine to grow to the top of stake (5 feet) and cut back to a height of approximately 42 inches at the end of the growing season. This pruning will result in branching below the cut. Note: at elevations of 6,000 feet or above, do not expect significant

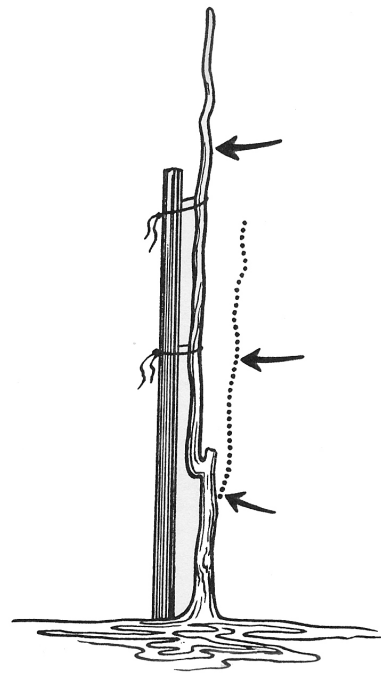


Figure 2. Tie newly emerging canes to a stake. Prune off the least vigorous cane during mid-summer and allow the other to grow to a height of 54 to 60 inches above ground level before cutting back to approximately 42 inches.

side branching. It may take an additional growing season to produce branches. During the first two years of training protect the new growth from sand blasting, wind, rodents or livestock by fencing or the use of grow tubes. A grow tube is a 4 inch cylinder three feet tall placed over the vine and attached to the stake. They provide a good growing environment.

Pruning

There are two methods of training and pruning grapevines. Cane pruning is the most appropriate type for the home garden. The other most common method is spur pruning which is most commonly used in the production of wine grapes. This publication will only discuss cane pruning techniques. For cane pruning there must be a wire support system at approximate 42 inches in order to develop vine framework. Another wire or support system should be 14 inches above the first wire. This wire is a catch wire to prevent shoot breakage or can be used to tie canes to during the pruning season. Do not produce fruit on a vine until the third year. Remove clusters before bloom in the second year. It will be tempting to leave fruit on the vine the second year but the vine needs to grow and mature. The vine framework must be developed prior to fruiting. Too much fruit will stunt the vine.

Pruning during the first dormant period: Once the newly planted vine has grown through one season and has gone dormant, it's ready for pruning. If the vine produced lateral canes, after topping, select two near the top of the main trunk and two near the middle of the main trunk and remove all others. The four remaining should be cut back to two buds (see Figure 3). These will develop into the fruiting canes. If the vine does not grow to the first wire in the first year, cut it back to two buds

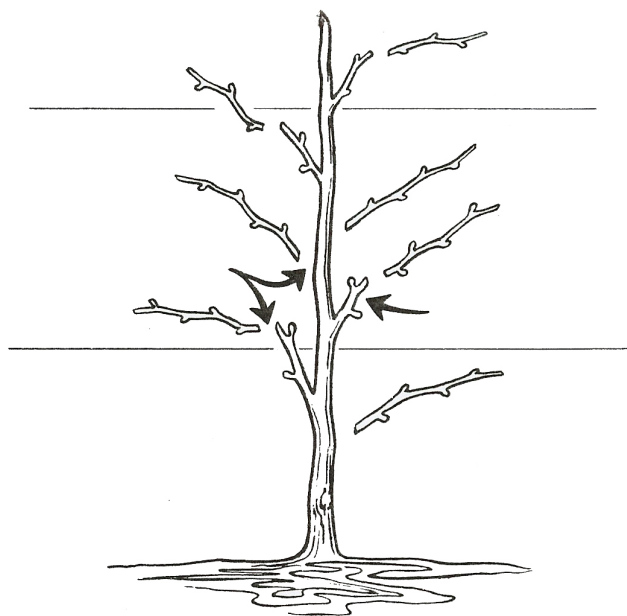


Figure 3. At the end of the first growing season, select four canes – two near the top and two farther down. Prune out all other canes. Trim the four selected canes back to two buds each.

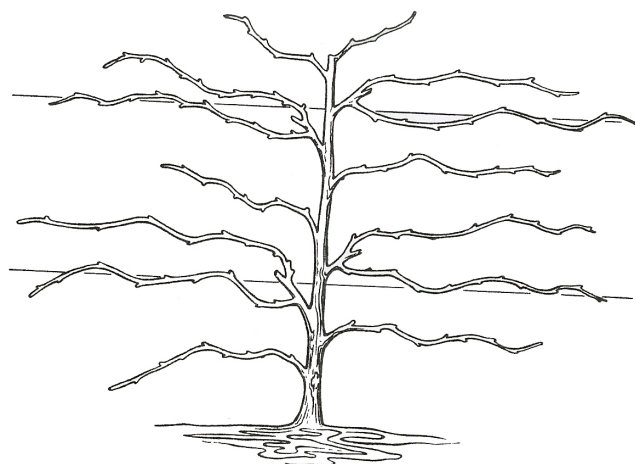


Figure 4. At the end of the second growing season, the same grape vine has developed numerous smooth canes. If left unpruned before the next growing season each bud on each of these one year old canes will produce fruit causing the vine to produce many small clusters with small fruit.

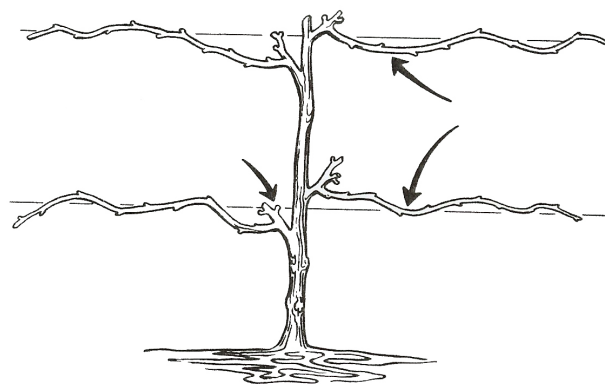


Figure 5. Carefully select two canes near the top of the vine and two farther down the main trunk. Next to each select another cane and cut it back to two buds (renewal spurs). Prune out all other canes closely. The four remaining canes should be cut back so each has 8 to 12 buds.

and retrain as described earlier. Grapes fruit on one-year-old wood (canes that grew the previous summer). Thus, pruning is a balance between fruit and shoot growth. Correct pruning is essential for consistent production. Un-pruned or under-pruned grapes give many small-clusters of tiny grapes and induce alternate bearing. Correctly pruned, grapes give high yields of large clusters of high sugar grapes. Over pruning simply cuts the yield.

Pruning during the second and later dormant periods: Along with many others, the four stubs containing two buds each will have developed into canes during the growing season (See Figure 4). Allow all of the growth to remain during the summer, but

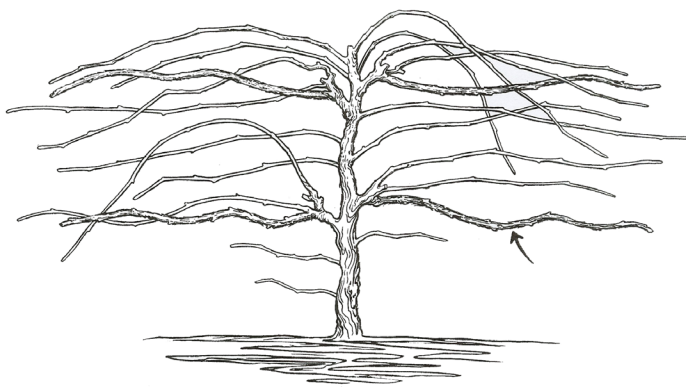


Figure 6. The vine after going into dormancy the next winter. The four fruiting canes left on the vine in Figure 4 produced a fruit crop and can be easily identified by their size and shaggy bark. These fruiting canes will be removed and replaced with four smooth canes which emerge during the growing season. To prune this vine properly, each dormant season repeat the steps described in Figure 4.

when winter comes: (1) Select two vigorous canes near the top of the trunk and two farther down. Next to each of these, choose another cane and cut it back to two buds (renewal spurs) (see Figure 5). (2) After selecting four canes and the renewal spurs, cut off all others (see Figure 5). (3) Each of the four canes should have from 8 to 12 buds, depending on the vigor and age of the plants (see Figure 5). These 8 to 12 fruit buds will produce the grapes; the most vigorous varieties will support the most fruit (12 buds per cane) and the least vigorous less fruit (8 buds per cane). The fruiting canes should be at least $\frac{1}{4}$ inch in diameter, smaller canes should not be allowed to fruit. Note: At elevations above 6000 feet few, if any, varieties will be able to support 12 fruit buds per cane. Figure 6 indicates how the vine will look once it is mature and the vine has finished a growing season. The four fruiting canes left on the vine in Figure 5 produced a fruit crop and can be easily identified in Figure 6 by their size and shaggy bark. These fruiting canes will be removed and replaced with four smooth canes which emerge during the growing season. To prune this vine properly each dormant season repeat the steps described in Figure 5. Leave a two bud spur for each fruiting cane retained for fruiting.

For cordon training follow the method described above except leave only two bud spurs on the lower wire only. Remove the growth above the wire. As new canes are developed tie to the wire to make a permanent cordon. As new shoots are developed from the cordon cut them back to two bud spurs each year to produce fruit.

Irrigation

Grapes can have deep roots, growing three to four feet into the soil. Water when soil is dry 3 to 4 inches down. Water slowly, deeply and infrequently. During the summer water every seven to ten days, depending on soil moisture and texture. Grapes respond to drip irrigation very well. It

is important to maintain even moisture during bud swelling in spring and during the period of leaf development and formation of the grape clusters. Since grape vines are deciduous, (shedding their leaves in winter) they need no watering during this period unless rains are scanty.

Fertilization

Grapevines do not need a lot of fertilizer. Begin a fertilizer program in the third year after planting. Apply 10 ounces of a 10-10-10 fertilizer per vine each year and double it every three years for 6 years. Apply every year thereafter.

Fruit Thinning

There are two ways to improve grape berry size and quality of seedless grapes. (1) thin berries within a cluster and (2) reduce the number of clusters per vine. To thin berries within a cluster, conduct the process prior to bloom. Hold a cluster in the palm of your hand and rub the cluster with a hair brush until 75% of the berries are removed. Tip the cluster so that the remaining berries will set. If the vine has too much fruit, thin out entire clusters. Leave one or two clusters per shoot. Cluster thin during bloom by pinching off the unwanted clusters. Leave basal clusters as they are the best quality. Leave about 20-25 clusters per vine.

Pests

Insects—Western grape leaf skeletonizer (*Harrisina brillians*) larvae will eat grape leaf tissue leaving the veins. Excellent control is achieved using *Bacillus thuringiensis* (Bt.) containing insecticide. Grape leafhoppers (*Erythroneura* comes) feed on grape leaves by sucking out leaf sap, giving the leaves a stippled-bronze look. These insects are quite small and fly around plants in large numbers. Many people confuse grape leafhoppers with whiteflies. Treat with insecticidal soap or an insecticide.

Diseases—Powdery mildew (*Uncinula necator*) causes white fungal growth on leaves, which decreases photosynthetic activity. Treat with a fungicide. Crown gall (*Agrobacterium tumefaciens*) causes a tumor like growth at the soil line or just below, causing the infected plant to decline and then die over several years. There is no practical control of this disease for homeowners.

Weeds—Unwanted weeds can be managed with hoeing, hand pulling, mulches or herbicides. Note: Grapes are extremely sensitive to the fumes of the herbicide 2,4-D, which is widely used to control dandelions in the lawn. Severe exposure results in deformed leaves and destroyed flower clusters. Those who use 2,4-D around their grape plants after they have leafed out may find it impossible to grow grapes.

Birds—Although birds can destroy a crop of grapes just before they are ready to harvest, controlling them with pesticides or shooting is illegal since most bird species are protected in Arizona. The only practical protection is to place netting over your grapes.

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