



Hardy Kiwi in the Garden

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Introduction

There are over 50 species of kiwi, with only a few being of commercial importance. The most familiar kiwi, *Actinidia deliciosa*, is the fuzz-covered type commonly sold in grocery stores. It requires a long growing season and warm climate and cannot be grown successfully in Utah. Hardy kiwi, *Actinidia arguta*, sometimes called smooth kiwi or Chinese gooseberry, is a fruit-bearing vine that can be adapted to some areas of Utah. Where commercial kiwi fruit are covered with fuzz and need to be peeled before eating, hardy kiwi do not have fuzz and can be eaten out of hand. Hardy kiwis are about half the size of the commercial kiwi fruit, have a very powerful flavor and when fully ripe have high sugar content. A third species, *A. kolomikta*, is often grouped with the hardy kiwi and is very similar, but does have some differences. The fruit are typically slightly smaller than *A. arguta* but otherwise look the same. The fruit also have higher vitamin C and sugar content but may have a bitter taste. For the adventurous gardener looking to try something new, *A. arguta* or *A. kolomikta* are great options.

Plants: All kiwi plants are dioecious, meaning male and female flowers are on separate plants. In order for pollination to occur and fruits to develop, a male and female plant must be present. The kiwi plant is a perennial vine that requires support, similar to a grape vine, and can grow to be 40 feet long if left unpruned. The fruit of both *A. arguta* and *A. kolomikta* are typically green and are slightly larger than grapes. The skin does not need to be peeled before eating and when cut open, it looks very similar to a commercial fuzzy kiwi with the familiar bright green flesh and small black seeds.

A. arguta is hardy to -10 to -25°F and *A. kolomikta* is hardy to -40°F. It is important to realize that these temperatures are for midwinter hardiness. These species have a low chilling requirement, and as a result are prone

to early bud break during the first spring warming. Unfortunately, the young shoots are then susceptible to freeze damage. However, frost protection methods may be effective at protecting these shoots and early blossoms. *A. kolomikta* is slightly more prone to early bud break than *A. arguta*.

A. kolomikta in particular is very ornamental with beautiful foliage and growth that looks wonderful on a pergola or trellis. For some landscaping purposes, only male plants are used to avoid fruit formation, and the vine is grown simply as an ornamental plant.

Recommended Cultivars

A. arguta: The hardy kiwi ‘Ananasnaya’, sometimes referred to as ‘Anna’, is only hardy to zone 5, but in a protected area can be grown in zone 4. Fruit are of a very good quality with excellent flavor and are green but can develop a purple-red tint in full sun. The vine is very vigorous. ‘Issai’ is the only self-fruitful hardy kiwi. It can produce fruit without a male pollinator, but fruit set is often increased with the presence of a male. The fruit are cylindrical and have a very good flavor and aroma and vines can bear fruit just one year after planting. It has less vigorous growth than other cultivars.

A. kolomikta: ‘Arctic Beauty’ is a good option for areas with very cold winters. The fruit are very sweet and the vines have moderate vigor. Male and female plants are sometimes sold as a set, simply called Arctic Beauty. ‘Pautske’ has large fruit and good quality and has a moderately vigorous vine. Many male plants and some females of *A. kolomikta* will develop variegated white and pink leaves that have excellent ornamental qualities.

Although male cultivars of one species may be able to pollinize the female blossoms of another species, it is recommended that the male pollinizer be from the same species as the female plants.

How to Grow

Site Selection: Site selection is one of the most important parts of successfully growing hardy kiwis. Although the plants can withstand cold winter temperatures, the young shoots are very susceptible to spring freezes. When freeze damaged, the shoots will not bear fruit and all that is left is a pretty vine. Planting on a north facing slope or in a protected microclimate can reduce the risk of frost damage. Microclimates are areas that differ in climate from their general surroundings. Protected areas of the yard, such as those surrounded by mature trees or near the north or east side of a home, can slightly reduce the risk of frost. Most cultivars require a 150 day frost free period. To determine the typical number of frost free days in your area visit <https://climate.usurf.usu.edu/>.

Soil and Irrigation: Plants will perform best in a slightly acidic soil, pH level of 5 to 7. They can grow in a range of soil types but do best in a loamy soil. Incorporating organic matter into the soil before planting will help improve performance in a clay or sandy soil. Kiwi vines are sensitive to water-logged soils and root damage occurs if soils are too wet. Apply 2 to 3 inches of water each week throughout the summer months. With a very heavy crop load, additional watering may be necessary.

Planting and Spacing: Hardy kiwis need to have both male and female plants present for fruit to form. One male kiwi plant will provide enough pollen for about eight female plants. The male plant should not be more than 40 feet away from the females. Hardy kiwis are vigorous growers and producers. A mature vine can produce up to 100 pounds of fruit in one season. As such, it is critical to build a very sturdy support system at, or soon after planting. Plants should be placed every 10 to 14 feet within the row and a tall wooden stake driven into the ground by the base. Train one or two vines to go vertically up the stake without twisting. Leave 15 feet between rows if multiple rows are desired. Young plants benefit from trunk protection during winter and wrapping the trunks of plants younger than 5 years is recommended.

Trellising: Place one trellis post between each plant (about 10 to 14 feet apart) and at the ends of the row. Use trellis wire with at least 300 pounds of tensile strength. The cross-arm should be 5 feet long and centered on the support post, leaving 2.5 feet on both sides. This allows for five lines of wire to run along the top of the cross-arm. Use a good wire tensioner to achieve a strong tension. Place the cross-arm anywhere from 5 to 7 feet above the ground, depending on how tall you would like the vine to be. Train the main vine up the support stake to the cross-wire and then begin training the vines along the wire. Attaching the vine to the wire will help ensure vines stay put, particularly when it is windy.

Fertilizer: No fertilization is needed during the first year of planting, and should not be applied as the roots are susceptible to fertilizer burn. The second year, apply about ¼ cup of a balanced fertilizer (such as a 10-10-10) around the base of each plant. The amount of fertilizer can be increased each year, until you are applying 1 cup of fertilizer per plant by the fifth year after planting. Do not exceed this amount. Excessive fertilization leads to excess vegetative growth and can reduce overall fruit production. Do not use fertilizer containing chloride (such as KCl) since the plants are sensitive and can be damaged.



Training: Training begins the first year of planting. Establishing the trunks of the vine is important for a healthy, long-lasting plant. At planting, prune back to two buds. Place a stake next to the shoot to add support as you train it up to the wires of the trellis. Each bud will produce a shoot, select the healthier one of the two and train it to become the trunk. In year one, remove all other shoots during the growing season. Do not allow the trunk to wrap around the stake. Tie the shoot to the stake to help keep it in place. Let the trunk grow beyond the wire of the trellis and then prune back to just below the top wire. Choose two shoots near the wire and allow them to grow in opposite directions along the middle wire, forming the permanent lateral trunks (cordons). During the dormant season of the first year, head cordons back to ¼ inch diameter (see Figure 1).

During the second year, establish the two permanent cordons. As it grows, attach the shoot to the wire every 18 inches with tie tape. Leave shoots that come off of the main cordon every 8 to 12 inches and tie them to the outer trellis wires. Other shoots that grow between the selected During the second year, establish the two permanent cordons. As it grows, attach the shoot to the wire every 18 inches with tie tape. Leave shoots that come off of the main cordon every 8 to 12 inches and tie them to the outer trellis wires. Other shoots that grow

between the selected ones should be removed. Again, during the dormant season prune the main cordons and the new lateral canes back to ¼ inch diameter wood. Fruit will form on shoots from these canes in the third year. As the lateral shoots continue to grow in the third year, do not allow them to wrap around the wire. Train laterals to be perpendicular to the cordon and then prune growth once they reach the outer wire. This will keep the vine manageable and reduce sunlight competition. After the first 3 years, the permanent vine is established and future pruning will be to renew canes and keep the planting manageable.

Pruning: Due to the hardy kiwi's vigorous growth, pruning is critical to maintain a balance between vegetative and reproductive growth and to allow for sufficient light penetration. Similar to grapes, a large percentage of wood (up to 70%) should be removed each year. Flowers develop on current-season shoots that come from last year's growth (1-year-old canes).

During the dormant season, remove all canes that fruited during the previous year. This will account for most of the wood removed. Also, remove any dead or diseased canes. New fruiting canes will have developed at the base of last year's lateral shoots. Every 8 to 12 inches along the cordon, leave the best replacement lateral canes. Tip these canes back, leaving about eight buds to force growth the next season and tie them to wires. Short

fruiting branches called spurs often originate from the older wood. These do not need to be removed and will increase yield.

Male vines also require some pruning. The purpose of the male vine is to pollinize the female flowers. It is best to only lightly prune during the dormant season, just removing damaged and tangled shoots. However, after they flower in the spring, the same pruning techniques as were described for the females can be applied.

After the first 3 years of establishment, the cordon needs to be replaced every 3 to 4 years. To do this, lay a vigorous vegetative shoot from the trunk along the center wire in each direction one year before you plan to remove the old cordon. The following season, train lateral shoots from this new cordon the same as you did with the old one. Once the new cordon is established, the old one can be removed. Take care as you prune out the old one to minimize damage to the new laterals.

Protected Cultivation: As previously discussed, one of the biggest challenges for hardy kiwi production is the risk of freeze damage to new shoots. The plants begin growth very early and are extremely sensitive to cold temperatures. In some areas, protecting the vines by planting inside a high tunnel (an unheated greenhouse) has been successful. It might also be helpful to pull tarps or frost blankets over the trellis when spring freezes are predicted.

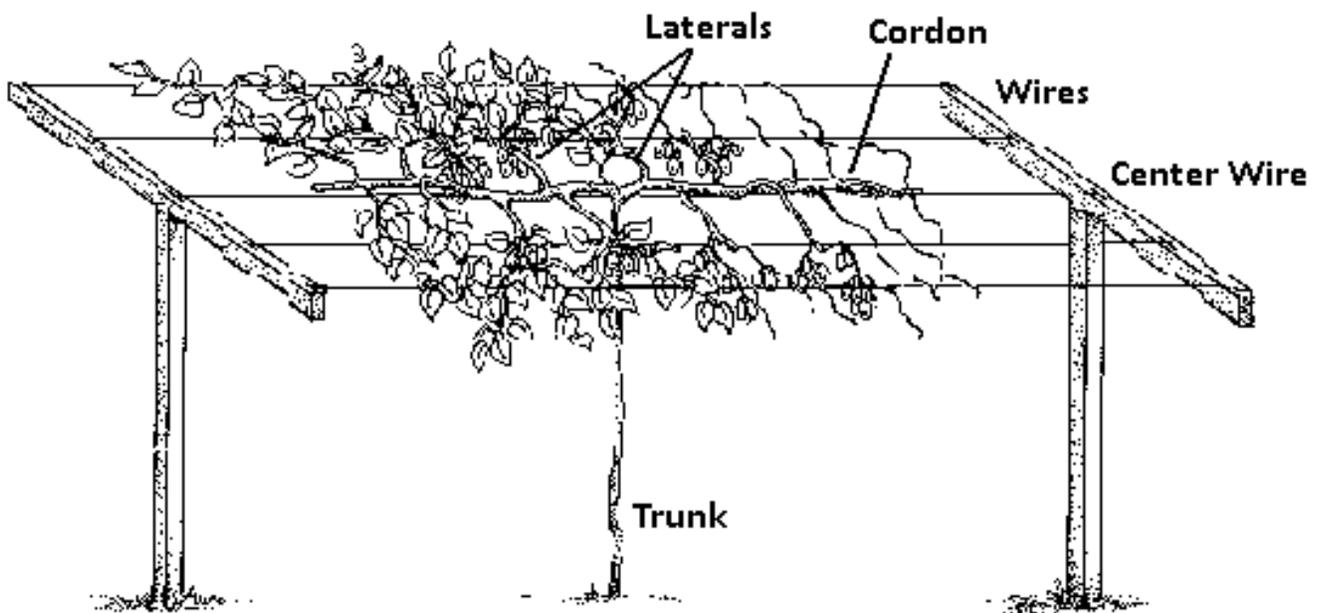


Figure 1. Kiwifruit vine in third growing season during fruiting. Leaves not shown on right to simplify drawing. Drawing reprinted with permission from Oregon State University Extension Bulletin PNW 507.

Problems

Insect/Disease	Identification	Control
Crown and Root Rot <i>Phytophthora</i> spp.	Weak plant growth and development of small yellow leaves, advanced cases have die back. Most common in heavy wet soils. Roots and crown turn black.	Avoid water-soaked soils and do not over irrigate. Remove infected plants and plant into a new site.
Two-spotted Spider Mites <i>Tetranychus urticae</i> Koch	Very small mite that feeds on the undersides of leaves. Has two dark spots on the back. Stippled leaves are a sign of mite feeding. Heavy infestations will have fine, silken threads on leaves and stems.	Keep dust levels low around plant. Use miticides registered for use on hardy kiwi.
Leafroller <i>Archips argyrospila</i>	Green caterpillars feed inside the protective shelter of a rolled leaf. Adults are mottled brown moths that lay eggs on stems.	Encourage natural enemies such as lacewing larvae or assassin bugs.

Weeds: To maintain plant health and vigor, weeds should be controlled. Before planting, eliminate perennial weeds through chemical control. Hardy kiwi plants benefit from a heavy mulch application at the base. This will reduce weed pressure (as well as keep soil more moist). Also, an early spring application of a pre-emergent herbicide will significantly cut down on annual weeds.

Harvesting, Storage and Use

Hardy kiwis may take up to 5 years before they start producing fruit, although many cultivars will fruit sooner. Kiwi fruit reach full size by mid-summer but usually are not ripe until late-August, September or even into October. Kiwi fruit should not be exposed to frost. If a frost is expected, harvest all of the fruit. Fruit ripen unevenly on the vine. Ripe fruit become very soft and will not store long after picking. The kiwi fruit will continue to ripen after it is harvested, even in the refrigerator. Harvesting the fruit just before fully ripe will help extend storage life, up to 3 weeks if kept cool. Fruit can be picked when they are still firm and the seeds are black; these store the longest and will ripen slowly in the fridge. Generally, the best time to pick at this stage is when some early fruit start to soften.

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Productivity

A mature vine can produce 50 to 100 pounds of fruit each year (with the average being closer to 50 pounds), but remember that one of the vines will be a non-productive male plant., yield will be much lower during establishment, and in years when the blossoms are exposed to a spring frost.

Additional Reading

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