



Asparagus

Variety

Jersey Knight, one of the New Jersey hybrids, an all-male variety. Jersey Knight is extremely vigorous and has large, succulent spears. The flavor is excellent, and the plant is resistant to rust, crown rot and fusarium.

Soils and Soil Preparation

Well drained soils are a must for successful production, sandy soils are preferred. Good drainage is important in control for crown rot disease of asparagus. Commercial plantings of asparagus should not be made in soil that is heavier than a sandy loam. Avoid sites which retain standing water for more than 8 hours after a heavy rain. Soil pH should be in the 6.2 to 6.8 range.

Planting

Crown Planting- Plant asparagus crowns (roots plus plant buds) so the top of the crown is 6 inches below the undisturbed soil level. This means the planting furrow will have to be 8 inches below the undisturbed soil level. (Fig.1) Plant crowns 12 inches apart in the row with the buds upright, and 5 feet between rows to have 8,700 crowns per acre. Cover crowns with 2 to 3 inches of soil after planting. As plants grow, gradually fill in the rest of the furrow with 1 to 2 inches of soil in 3 to 5 cultivations, but do not completely cover plants. The furrow should be completely filled by July of the first year. These timely cultivations can control weeds.

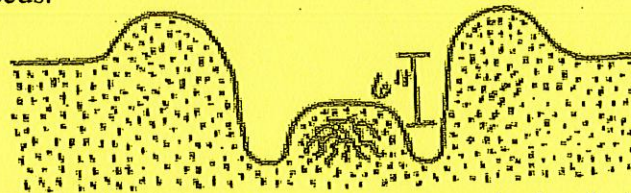


Figure 1. Single row asparagus crown planting depth.

Care

Following freezing weather in the fall, the asparagus tops should be removed to decrease the chances of rust disease overwintering on the foliage.

Weed Management

Weed control in asparagus production is very important. Timely cultivation is a critical part of any asparagus weed control program, especially during the first two years. The first year asparagus should be cultivated at least once a month until September, or 6 times.

Harvesting

Asparagus can be harvested on a limited basis (2 to 3 weeks, or 8 spears per plant) during the first year after planting. Harvesting should be limited during the second year; watch for slight reduction in spear size as an indication of when to stop.



Blackberries For The Home Garden

Where to Plant: Plant in full sun. Train semitrailing blackberries to trellises. The erect blackberry varieties do not require support if the tops of new canes are pruned during the summer to keep growth below 3 to 4 feet.

Spacing: Plant blackberries 4' apart in 10' rows. Prepare a planting hole large enough to allow the roots to spread out naturally. DO NOT prune the roots except to remove damaged ones. Two-foot crossarms are attached to the posts at a height of about 4 feet, and two wires are secured at the ends of the arms. The new canes will grow between and be supported by the wires with a minimum of tying. Remove first-season blooms to help plants get established and increase vegetative growth. DO NOT attempt to produce a crop the first season.

Planting: Construct the blackberry trellis by stretching a wire between posts set 20 feet apart in the row. For erect blackberries, use one wire attached to the post about 30 inches from the ground. For semitrailing blackberries, use two wires at heights of 3 feet and 5 feet from the ground. Set plants at the same depth they were planted in the nursery. The crown (the point where the stem and root merge) should be one inch below ground level.

Pruning: Erect blackberries such as Cherokee and Cheyenne require pruning out of the root suckers that arise from the crown. During the growing season, it is desirable to allow root suckers to develop to about a 12-inch wide row. Any growth beyond this should be eliminated. When the new shoots of erect blackberries reach 30 to 36 inches in height, cut off the tips. This will force branching lower on the canes and will cause the canes to thicken, making them better able to support a heavy fruit crop. As soon as the last fruit has been picked in summer, cut all the old canes and burn them. This is also a good time to tip prune and thin new shoots.

Fertilization: Mixed fertilizers are satisfactory for blackberries. For best results, apply fertilizer in early spring when growth starts and again in summer just after harvest. Use a 10-10-10 commercial mix at the rate of 5 pounds per hundred linear feet of row. For late-ripening thornless blackberries, apply the fertilizer mix no later than July to avoid forcing late-season growth that would be subject to winter injury. For the first year or two, before the root system of the plants develops fully, spread 3 or 4 ounces of fertilizer in a 12-inch radius around the base of each plant.

Disease and Insect Control: These fruits are relatively easy to grow and they need relatively few sprays for pest control. If problems arise, contact your local North Carolina Cooperative Extension Service Center for the latest recommendations.

Winter Protection: During the winter, prune the laterals to 12 to 14 inches for convenient harvesting and larger berries. In late winter, remove any remaining dead or weak wood. Leave healthy, vigorous canes spaced at six canes per linear foot.

Soil Type: It is best to test the soil four to six months before planting to allow adequate time to amend the soil based on test results. If the pH is too low, raise it to the level suggested by the soil test with dolomitic lime.

Soil Drainage: Blackberries require abundant moisture while the berries are growing and ripening. If rainfall is not adequate, provide irrigation water equivalent to 1 inch of rainfall per week. A minimum rate of drip irrigation for mature blackberry plants is 2 gallons of water per day while berries are developing.

Planting: Plant as soon as possible, weather permitting. If weather does not permit, heel-in (cover roots with moist soil or sawdust) in a shady location to reduce chance of bloom. Blackberry plantings should be cultivated thoroughly and frequently or mulched very well to keep grass and other weeds from getting a start. Once started, weeds are difficult to control. Begin cultivating in the spring as soon as the soil is workable.

Harvesting: Generally, only a small crop of fruit is produced in the first season. Pick when the fruit is dull black in appearance.



Blueberries for the Home Garden

Where to Plant: Plant in full sun for best berry production. Blueberry bushes are attractive and make ideal borders, backgrounds and screens. Blueberries are dual purpose plants, serving both an ornamental and edible purpose in the landscape.

How Many to Plant: For an average size family, ten to twelve plants should furnish an adequate supply of berries for fresh use with plenty left over for freezing, jelly or jam. Blueberries require cross-pollination to produce maximum yields; therefore, two or more varieties should be planted not more than 100 feet apart.

Spacing: Space plants 8-10 feet apart in a row. Closer spacing is acceptable if the plants are kept under control with proper pruning. Allow at least 10 feet between rows. If a continuous hedge is desired, space the plants 4-6 feet apart in the row.

Planting: Blueberries can be planted anytime during the dormant season. Well developed 2 yr. old plants are best. The planting hole should be 3 feet across and at least 12 inches deep. Fill the hole to receive the plants with a mixture of 1/3 decayed sawdust or woods mold, 1/3 sand and 1/3 topsoil. Blueberries are very shallow rooted; therefore, never plant them deeper than they were planted in the nursery. After planting, mulch the plants with sawdust, pine needles, or bark for the life of the planting by adding 2-4 inches of mulch each year. Hand pull weeds and no cultivation should be necessary. Sod may be established between the rows if kept mowed.

Pruning: At the time of planting, the young plants should be cut back sufficiently to remove all fruit buds. After one growing season, prune during the winter to remove weak and bushy growth. Cut back the remaining shoots to remove 1/2 of the fruit buds. Pruning in succeeding years consists of removing bushy growth, moderate thinning and tipping back of the fruiting shoots to leave 5 or 6 fruit buds.

Fertilization: After newly set plants start growing in the spring, apply one level Tablespoonful of 8-8-8 in a circle 12 inches in diameter around each plant. Repeat this application twice more at 6 week intervals the first year. Gradually increase the fertilizer each year, still making three applications 6 weeks apart until a total of one pint of fertilizer per plant is being used by the 5th year.

Disease and Insect Control: If problems arise, contact your local North Carolina Cooperative Extension Service Center for the latest recommendations. During ripening season, the bushes may be covered with cheesecloth or similar material to avoid bird damage.

Nutrition: Blueberry fruit is low in calories (62/100g) and sodium, contains no cholesterol and is an excellent source of fiber, a good source of vitamin C and a fair source of vitamin A. A major constituent of the fiber in blueberry is pectin, known for its ability to lower blood cholesterol. Blueberry juice also contains a compound that helps to prevent urinary infections.

VARIETY INFORMATION CHART

<u>Blueberries</u>	<u>Season</u>	<u>Berry Size</u>	<u>Flavor</u>	<u>Winter Hardiness</u>
Blue crop	Mid-season	Large	Excellent	Excellent
Blue ray	Mid-season	Large	Excellent	Excellent
Blue jay	Mid-season	Medium	Good	Excellent
Patriot	Early	Large	Good	Excellent
Coville	Mid-season	Medium	Good	Excellent

Note: Since cultivated blueberries are partly self-sterile, it's best to plant at least 2 varieties for good cross-pollination. Any combination of varieties will work.

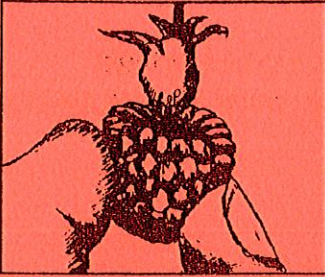
Soil type: Blueberries require acidic, well-drained soil, but with good moisture retention. Blueberries grow on most soil types, however a sandy loam with pH of between 4.0 and 5.2 is considered best.

Soil drainage: Blueberries can not tolerate wet soil conditions. Plant roots should not stand in water for extended periods during any part of the year. Dig a hole 6 to 8 inches deep and observe water level following heavy rains. Water should not remain for more than 24 hours, otherwise it is best to prepare a raised bed large enough for several plants.

Planting: Plant as soon as possible, weather permitting. If weather does not permit heal-in (cover roots with moist soil or sawdust) in a shady location to reduce chance of bloom.

Harvest:

- Bird Protection:** Birds also harvest blueberries--often the complete crop from a small planting--plastic or cloth netting draped over the bushes or supported on a framework is the only practical control.
- Frequency:** Highbush blueberries will be of best quality when picked every 5-7 days depending upon temperature. Rabbiteye flavor improves if berries are picked less often--about every 10 days allows for maximum flavor with few soft overripe fruit.



Raspberries For The Home Garden

Where to plant: Plant in full sun. Red raspberries are better suited to the mountains of Western North Carolina. As most of the fruit production is concentrated in the top one-third of new shoot growth, they should be trellised.

Black raspberries: DO NOT need to be trellised at all.

Spacing: Set plants 3' apart in 10' rows. Prepare a planting hole large enough to allow the roots to spread out naturally. DO NOT prune the roots except to remove damaged ones. Train Dormanred to a vertical trellis with a narrow wall of foliage. Space posts 20 feet apart and attach wires at a 5-foot height. For the Heritage variety, use a crossbar or a horizontal trellising system. Two-foot crossarms are attached to the posts at a height of about 4 feet, and two wires are secured at the ends of the arms. The new canes will grow between and be supported by the wires with a minimum of tying. Remove first-season blooms to help plants get established and increase vegetative growth. DO NOT attempt to produce a crop the first season.

Planting: Spade or till into the bed 1 pound of 10-10-10 fertilizer per hundred square feet of soil. Cultivate by hand and hoe between rows to a depth of 1 to 2 inches to prevent suckers from taking hold. Set plants at the same depth they were planted in the nursery. The crown (the point where the stem and root merge) should be one inch below ground level.

Pruning: During late February, thin the canes to 4 to 6 inches apart over the width. Be sure to select healthy canes and remove weaker ones. After the harvest in summer, remove all canes that fruited to allow better growth of new season shoots and to prevent disease. Make cuts close to the ground. It is preferable to thin new shoots in mid-summer, leaving three to four canes per foot of row. For Dormanred, tie the new shoots loosely to the trellis. Summer prune by pinching back in June when new shoots reach 18 to 24 inches. It is sometimes necessary to do this a number of times, as not all shoots will be tall enough for pinching on the same date.

Fertilization: Fertilize just after new growth starts in the spring (May) with a 10-10-10 commercial mix at a rate of 5 pounds per hundred feet of row. Repeat in July with another 2 to 3 pounds per hundred feet of row if vigor is low. In subsequent years, apply 8 pounds per hundred feet of row in March and repeat in May. Spread the fertilizer uniformly in a foot-wide band over the row, or sidedress with one-half the recommended amount of fertilizer on each side of the row.

Disease and Insect Control: You can avoid many pest problems by:

- Planting only quality nursery stock
- Keeping plants well spaced with a narrow wall of foliage well exposed to light.
- Removing diseased or sick plants and all canes that have fruited, either burning them or removing them
- Replanting with quality stock every 5-7 years
- Removing wild brambles in vicinity of your garden.
- Keeping red and black raspberries separated by 700 feet.

This fruit is relatively easy to grow and they need relatively few sprays for pest control.

Winter Protection: In colder regions of the state it is quite likely that the canes and buds of Dormanred will be winter injured if left up in the air in an exposed condition. In late fall untie canes from the trellis wires or stakes and lay them on the ground before the ground freezes to protect them from winter injury.

VARIETY INFORMATION CHART

Raspberries	Season	Yield	Size	Flavor	Remarks
Red Varieties					
Heritage	Everbearing	High	Medium	Very good	Both spring and fall crop
Black Varieties					
Bristol	Mid	Medium	Large	Good	Anthranose susceptible
Jewel	Early-Mid	Medium	Large	Good	

Soil Type: It is best to test the soil four to six months before planting to allow adequate time to amend the soil based on test results. If the pH is too low, raise it to the level suggested by the soil test with dolomitic lime.

Soil Drainage: Plants need about one inch of water a week from bloom time to end of harvest. Plants should also be watered during prolonged dry periods after harvest as well. When watering, add enough water to wet the soil to a depth of 6 to 8 inches.

Planting: Keep plant roots moist until planting time by either heeling them into the ground temporarily or wrapping them in wet burlap. DO NOT leave the roots exposed to the drying effects of sun and air.

Harvesting: DO NOT attempt to produce a crop the first season. Harvest twice a week when fully ripe. Pick in the morning when the air is cool and berries are firm.



Strawberries For The Home Garden

Where to Plant: Full Sun - a southern slope will encourage earlier blossoming and earlier fruit, but this may not be desirable in locations where late spring frosts often nip the flower buds, unless protection can be given in such emergencies.

How Many To Plant? In proportion to the size of the plant, strawberries are very productive. If 25 plants are set in the garden, these original plants and the resulting runner plants could produce a total of 25 quarts.

Planting: Set plants 2' apart in the row. Plant as soon as possible, weather permitting. If weather does not permit heal-in (cover roots with moist soil or sawdust) in a shady location to reduce chance of bloom.

Spacing: The rows are usually spaced 3 to 4 feet apart. *Double-row-hill system*--set plants 12 inches apart in double rows. Leave 2½ to 3½ feet between rows. Cut off all runners as they form. Large individual hills will produce abundant crops of excellent quality fruit. Hill training is ideal for most everbearing strawberry varieties.

Planting: Set plants during March or April in the Piedmont and Western North Carolina. Place the plants in the soil so the roots are spread out. Cover the roots until the crown (where the leaves arise) is just above the soil surface. Water newly set plants and press soil firmly around roots.

Pruning: Most of the runners from mother plants are permitted to grow during first season, with only fruit buds being removed to strengthen plants.

Fertilization: Broadcast about 4 pounds of 10-10-10 fertilizer for each 100 feet of row, 2 to 3 weeks before planting. First season fertilizer--if new plants appear light green and don't grow well, sidedress with nitrogen about one month before planting. Apply 1½ pounds ammonium nitrate per 100 feet of row. A topdress application of ammonium nitrate at 1½ pounds per 100 feet of row should be made from August 15 to September 15. When broadcasting fertilizer over top of plants be sure foliage is dry and brush all fertilizer off leaves to protect from fertilizer burn.

Disease and Insect Control: Use only certified virus free plants for setting. During harvest remove berries damaged by diseases and insects as this reduces the amount of fruit rot. Properly renovate beds to remove older diseased foliage and keep them from getting too crowded. Don't keep a planting in production too long; start a new planting every year or two to replace old plantings after their second or third crop. Follow recommendations in Fruit Disease #5 -Strawberry Diseases and Their Control, to achieve control of pests. (From the Department of Plant Pathology).

Nutrition: Nutritionists rate strawberries as an excellent source of Vitamin C; ten large berries provide 60 milligrams of Vitamin C or 133% of the Recommended Daily Allowance. A single cupful of berries has only 55 calories, comparable to a thin slice of bread or half a cup of whole milk. Strawberries are low in sodium and contain measurable quantities of ellagic acid, which has inhibiting effects on chemically induced cancer in laboratory studies.

Soil type: Strawberries can be grown in most garden soils, well supplied with plenty of humus and a pH factor between 5.5 and 6.0.

Soil drainage: Strawberries are very shallow rooted and grown best in sandy loam soils which drain well. If drought comes during any of the following "*critical*" times, irrigate enough to wet the soil 6 to 8 inches deep once a week:

- ◆ When plants are set and during dry following setting
- ◆ Just before harvest and during harvest when berry size appears to be suffering
- ◆ After renovation, as needed, to encourage new runner plant
- ◆ In late August, September, and early October when fruit buds are forming for the next season's crop

Harvest: Pick strawberries every other day or three times a week. Pick the fruit with about ¼ of the stem attached. The best time to pick is in early morning, when berries are still cool. Not all berries ripen at the same time; pick only those that are fully red.



Elderberries for the Home Garden

Where to Plant: Plant in full sun for best berry production. When growing elderberries, keep in mind that they cross-pollinate. You will need to have at least two different varieties.

Spacing: Elderberries grow between 6-12 feet tall, depending on the variety, and just as wide. Place plants 6-10 feet apart.

Planting: Cover the plug with $\frac{1}{2}$ " of soil and do not prune.

Irrigation: Elderberries are not drought tolerant. It is important to keep soil moist throughout the establishment period. From flowering through harvest, be certain the plants receive 1" of water per week. More water may be necessary if the soil is sandier, and during periods of very hot weather. Drip irrigation is the healthiest and most efficient method.

Fertilization: No fertilizer should be applied in the planting year. In succeeding springs, spread 1 cup of 10-10-10 fertilizer around each plant. Apply manure or compost only after plants begin to grow.

Weed Control/Mulching : Thorough manual weeding is necessary, but do not cultivate deeply. Roots are fibrous, shallow and easily injured. Use a combination of hand weeding (when weeds are small), mowing and mulching. Wood chip mulch can aid in water retention. Compost or straw mulch can also be used. Once the plants are established, a thick planting will generally suppress weeds on its own.

Harvest: Berries are generally harvested in late summer. Harvest entire clusters from the shrub. Use the fruit as soon as possible or keep it cool for later use. Strip the berries from the cluster for use.

Pruning: New canes usually reach full height in one season and develop lateral branches in the second. Flowers and fruit develop on the tips of the current season's growth, so the best fruit production happens on second-year canes with good lateral branching. Older wood tends to become weak and loses productivity. In early spring, while the plants are dormant, remove all weak, broken, 4-year-old, and dead canes as close to the ground as possible. Your goal should be to have an equal number of canes between one and three years old.

Tip: Though elderberry plants are generally free of pests, birds absolutely love elderberry, and an unprotected bush can be stripped clean as soon as berries reach their dark color! Netting seems to be the best protection.