The content of this article was prepared by the West Virginia University Extension

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Blueberries are rich in antioxidants, high in fiber and a good source of vitamin C. Fresh picked, they are a favorite of children and adults. They store well frozen, can be processed into jams or jellies, and baked into pies, breads and muffins. The plants are perennials, so once an initial investment is made, they will keep producing for years if properly cared for.

Site Selection and Preparation

Select a site with good air movement that receives full sun at least eight hours a day. Blueberries will tolerate soils with pH from 3.8 to 5.5, but prefer a soil pH closer to 4.5, which will require the addition of elemental sulfur to lower the pH in most areas. Sulfur should be incorporated to a depth of at least 12 inches.

The West Virginia University Soil Testing Lab provides free crop-specific soil testing for West Virginia residents, and it is suggested that all gardeners test their soil annually and make decisions regarding fertilizing and pH adjustments based on those recommendations.

Select and prepare a planting site in the fall for spring planting to allow time for pH adjustment, if necessary. Weeds should be suppressed before planting to reduce their competition with the blueberry plants.

If this is accomplished in the fall, a cover crop, such as annual rye, can be planted and tilled under in spring to decrease weed growth and increase organic matter for soils. Once blueberry plants are planted, adding 3 to 5 inches of mulch around each plant will help with water retention and decrease weed growth.

Choosing Varieties

Blueberry varieties should be chosen for climate, soil and taste preference. Two or more varieties blooming at the same time will ensure cross pollination and larger fruit, even in the varieties that are classified as self-fruitful, meaning they do not need cross pollination to set the fruit.

In general, there are several types of blueberries. There are lowbush, rabbiteye, half-bush, southern highbush and northern highbush varieties. Rabbiteye varieties are not commonly

recommended in West Virginia as they aren’t very winter hardy.

Half-bush blueberries are the result of interspecific hybridization between the low-bush and high-bush species to improve winter cold tolerance and fruit size while adjusting the height of a shrub to about 3 to 4 feet. Ornablue is the variety developed in West Virginia to be used as an edible hedge in the landscaping industry.

Southern highbush varieties have lower chill requirements and respond to warmer temperatures by starting vegetation and bloom very early in spring, making them more prone to damage by late spring frosts.

Northern highbush varieties offer high yields once established. Berry size, flavor, and disease or insect resistance depends upon the specific variety chosen. Northern highbush varieties are best suited for most regions of West Virginia. If there is sufficient space available, planting a few varieties each of early, mid- and late season blueberries will allow for fruit production throughout the summer.

Suggested Varieties

Season	Variety	Characteristics
Early	Spartan	Large berry size, very sweet
Early	Patriot	Low-growing bush (good for containers), medium fruit size
Early	Duke	Medium/large berries, mild flavor
Mid	Legacy	Medium berry size, very productive, needs heavy pruning
Mid	Bluecrop	High yield, long production life, most common variety in U.S.
Mid	Blueray	Large berry size, sweet flavor
Late	Elliot	Medium berry size, milder flavor
Late	Jersey	High yield, large sweet berries
Late	Chandler	Large berries, excellent flavor

Planting

Blueberries have shallow roots and should be planted in loose, well-drained soil with an organic matter content higher than 3%. Organic matter can be increased by using cover crops before planting or incorporating peat or pine needles into the soil at planting, as well as annual mulching.

Phytophthora root rot also is a concern, which is why well-drained soil is essential. Fertilization should be based upon the soil test, with fertilizer applied in a circle about 6 inches away from the base of the plant. After the first year, proper fertilization will encourage root development, increase cane growth and help with fruit production.

Once varieties are chosen, order or purchase plants from a reputable supplier to ensure quality plants. Most dealers will ship the order according to your location’s desired planting time; have your site prepared to plant by the time the plants arrive.

Blueberries should be planted either in fall by mid-October or in early spring after severe freeze danger has passed. When you receive your plants, check them to make sure that they look healthy and the roots are moist. For best results, planting should be done within a day or two of arrival. They can be wrapped and refrigerated for a short time (a week or so), but it is best to plant as soon as possible.

At planting, dig a large hole two to three times the width of the plant's container to allow for the roots to spread out and grow unrestricted, setting them to the depth they grew in the container. Backfill with a mixture of wood chips, wet peat moss and original soil by loosely fitting that mixture around them.

Peat moss must be soaking wet or it will act as a wick, pulling the moisture away from the roots and drying them out. Water immediately to push out any possible air pockets, ensuring roots have good contact with the soil.

Blueberry plants should be spaced at least 3 to 5 feet or 6 to 8 feet apart, depending on individual variety requirement. Highbush varieties require 6 to 8 feet of spacing within the row and 10 feet of spacing between the rows. New plants must be watered well and often to prevent drought stress.

Mulch 3 to 5 feet around the bush by adding a layer 3 to 5 inches thick of saw dust, leaves or wood chips to keep that area weed-free and limit competition for moisture and nutrients. This thick mulch layer will protect the plant's shallow root system from the drought. Apply additional mulch annually to help with water retention.

In the first year after planting, remove all flower buds from the canes to direct all the plant's energy toward root development. Every two to three years, pull a soil sample to be tested, paying attention to the pH levels. If needed, do necessary amendments.

In most situations, annual application of mulch, using a combination of pine-needle, oak and maple leaves, and acidifying fertilizers, like ammonium sulfate, will be sufficient to maintain the required low pH. In some instances, lowering pH will require adding powered or pelleted sulfur.

If leaves show interveinal chlorosis or some other growth abnormality, it may be an indication of soil pH above the suitable range for blueberry plants and warrant a soil test.

Amount of Sulfur Needed to Adjust pH

Present pH	4.5 Target Soil pH			5.0 Target Soil pH		
	Sand lbs./acre	Silt lbs./acre	Clay lbs./acre	Sand lbs./acre	Silt lbs./acre	Clay lbs./acre
4.5	0	0	0	N/A	N/A	N/A
5.0	175	520	610	0	0	0
5.5	350	1,050	1,130	175	520	610
6.0	520	1,520	1,610	350	1,050	1,130
6.5	650	2,000	2,090	520	1,520	1,610
7.0	830	2,530	2,610	650	2,000	2,090
7.5	1,000	3,010	3,090	830	2,530	2,610

Source: 2010 Mid-Atlantic Berry Guide

Pest and Disease Issues

Netting, open-weave cloth or wire cages can be used to keep birds and deer from eating berries. Noisemakers, such as pie tins, and decoys, such as owls and snakes, provide limited control of wildlife.

A suitable location with proper spacing and annual pruning, allowing for air circulation, will decrease foliar disease. Choosing resistant varieties and providing optimum conditions for a healthy plant will make blueberry plants less susceptible to diseases overall.

However, some diseases, like mummy berry, anthracnose, Phomopsis and Fusicoccum canker, may appear over time that will require management with fungicidal products. Sanitation and removal of infected berries from the plant and ground, together with application of Actinovate or Double Nickel, should reduce mummy berry and anthracnose severity.

Removal of stems with canker by careful pruning and application of copper will reduce Phomopsis and Fusicoccum canker. Selecting sites with well-drained soil and avoiding clay will help prevent diseases related to root rot. Root rots, such as Phytophthora root rot, are common when roots are saturated, bedding has been reused or new plants are planted in an area where berries have been planted before.

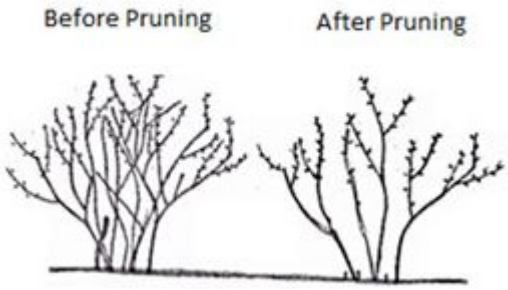
Replanting in the same area also can contribute to the buildup of soil nematodes, which feed on plant roots and cause plant decline and eventual death. Annual application of Aliette or Agri-Fos, together with good drainage, can keep Phytophthora root rot under control.

Blueberries also can be affected by several insect pests, including aphids, leafhoppers, Japanese beetles, borers and maggots. Spinosad is an organically-approved insect control, but it’s also harmful to pollinators, such as bees. It should only be used when plants are not in bloom, such as with Spotted wing drosophila, which lays eggs after berries are formed.

Overuse of any insecticide can lead to a creation of resistance in target populations, which has already occurred with many commonly used insecticides. Bt (*Bacillus Thuringiensis*), sold as DiPel, is a bacterium that is organically approved and effective in controlling several Lepidopteran insect pests, including caterpillars and many types of worms.

However, it will not control maggots and other larvae once they are already inside the fruit. Scales can be controlled with properly-timed applications of dormant or horticultural oil. Whenever using any pesticide, ensure that it is recommended for the pest identified and always read and follow all label instructions.

Pruning



Blueberry bushes should be pruned annually in the dormant season to remove any dead, diseased, damaged and rubbing wood. Those that aren't pruned may produce more canes than they can support, causing smaller fruit and lower productivity, and have a tangled growth pattern, which restricts light penetration and air movement, leading to increased potential for disease development.

Only two or three canes that grew from the previous year should be kept so that when the bush is fully mature in size, around year seven, it will have approximately twelve canes all with upright growth.

Remove any cane that is diseased or injured, grows horizontal instead of vertical, is too thin to support fruit, does not have adequate flowers or berries the previous year, or is too old with whitish-gray colored stems). Every year, about 20% of the older and otherwise non-desirable canes must be removed to maintain the health and productivity of the shrub.