

Rabbiteye Blueberries

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Introduction

Rabbiteye blueberries (*Vaccinium ashei*) are an important commercial fruit crop that is also native to the southeastern U.S. Rabbiteyes' are grown commercially from Virginia and Tennessee, south to Florida and west to Arkansas and Texas in areas that have acid soils. Rabbiteye blueberries are "calcifuges"; plants that do not tolerate alkaline or basic soils or water. Plants will not thrive if the soil pH is not in the range of 4.0 to 5.5 and the irrigation water has little to no calcium bicarbonate. Rabbiteye plants are also extremely sensitive to sodium. Attempts to grow rabbiteyes' on alkaline soils by lowering soil pH with organic matter and acidifying fertilizer usually fail due to complexities of soil chemistry. Likewise, there are no cost-effective methods of removing calcium from water. Containers or raised beds with mixtures of peat moss and pine-bark as a growing medium can give satisfactory production, but growers attempting to grow blueberries commercially should plant them on soil with a naturally favorable pH.

If grown on the right soil, Rabbiteye blueberries are a relatively easy fruit crop to grow, because they have very few serious pests and low nutritional requirements. They are an excellent choice for organic or Earth-Kind orchards. Blueberries are presently experiencing popularity and consumer demand because of the high concentration of antioxidants contained in their pigmented fruit. Varieties vary in ripening date, productivity and fruit size, with

some bearing quite large, sweet fruit (dime to nickel-size). Harvesting may be done by hand or machines, with the majority of fruit grown in Texas picked by hand and sold for fresh consumption. As increasing numbers of northerners move south, the demand for blueberries should remain strong.



Varieties

Rabbiteyes' are spring blooming, with flower appearance affected by chilling hours (# hours below 45 °F). The lowest chilling varieties typically bloom and set fruit early, and thus are at the greatest risk for crop injury from late spring frosts. Higher chilling varieties may yield poorly if grown in areas that are marginal for the needed chill hour accumulation. The harvest season extends from May through July in most locations. Growers desiring an extended harvest should plant early, mid-season and late-ripening varieties.

Most rabbiteye blueberry varieties need a pollinizer variety for maximum fruit set. A few varieties are somewhat self-fruitful. When se-

lecting pollenizers, identify those that bloom in the same part of the season as the main variety being grown. This insures reciprocal pollination of each planted variety (Table 1).



Climax; typical fruit size and variability in stage of maturity.

Soil and Climate

In addition to proper pH, soils for rabbiteyes' should be well drained. Roots are shallow and fibrous, thus sandy soils pose problems without drip irrigation. Soil drying should be prevented with good irrigation and use of



TifBlue; four-year old plant, early part of ripening period.

Table 1. Recommended Rabbiteye Varieties for Texas

Variety	Chill Hours	Pollenizers	Harvest Season	Comments
Prince	350	Climax, Brightwell	Mid May-Early June	New variety for very early marketing; frost damage risk is high
Premier	550	Austin, Alapaha	Late May-Early June	Medium to large fruit, young limbs too limber for heavy fruiting
Climax	450	Austin, Premier	Late May-Early June	Concentrated ripening season, small-medium sized fruit
Woodard	350	Climax, Premier	Mid/Late May-Early June	Older variety, excellent quality, fruit are softer, home variety
Alapaha	500	Austin, Premier	Late May-Early June	Vigorous plants, medium-sized berries
Austin	500	Climax, Premier	Early June-Late June	Productive, medium-large berries, less firm than some
Vernon	550	Austin, Premier, Alapaha	Early June-Late June	Good productivity and vigor
Brightwell	400	Austin, Premier	Early June-Early July	Partially Self-fertile; Blooms with 500s ; Fruit sensitive to wet conditions and splitting, medium-large fruit size.
Tifblue	650	Brightwell , Bright-blue	Late June-July	Small-Medium berries, must get fully ripe or will be tart; self fertile
Powderblue	600	Tifblue, Brightwell	Late June-Late July	Medium, light-blue fruit, good production.
Ochlockonee	700	Powderblue, Brightwell	Early July to Late July	Very vigorous, productive plants, medium-large fruit size

mulches. Do not plant on heavy clay soils with poor internal drainage, which will cause root decline and poor vigor.

Late spring frost can negatively impact rabbiteyes' in some years, especially on lower chilling/early blooming varieties grown in the northernmost locations of Texas. Site selection (avoiding depressed/low-lying topography) is important to lessen the risk for crop damage. Protection with irrigation sprinklers, row cover material and plastic-covered high tunnels or cold-frame greenhouses may be needed for commercial endeavors.

Spacing and Planting

Most cultivated varieties are mature in 7 to 8 years and will be 15 feet tall and 10 feet wide. The bush will consist of numerous trunks, which develop from the crown area. The fruits are borne in the top of the bush on shoots which grew the year before.

New rabbiteye blueberry sites should be treated with glyphosate herbicide and well-tilled three months before planting to kill all weeds. In low flat areas, the beds should be



raised to improve drainage of surface water away from the plants. Incorporate organic matter as thoroughly and as deeply as possible into each planting spot before setting out plants, using approximately 1/4 to 1/2 bushel per plant. Shredded pine bark or peatmoss are good sources of organic matter, due to their acidic properties. Bare-root or container-grown plants obtained from a reputable nurs-

ery may be used for new plantings, with preference given for healthy, two-year old stock.

Make certain the bare root plants do not dry out, and, where container plants are used, separate the roots from the container ball when planting. Set plants at the same depth that they grew in the nursery. Cut tops of bareroot plants back one-half at planting to balance the tops with the roots. Lighter pruning may be sufficient with container stock. Plants should be spaced six feet or more apart in rows that are spaced a minimum of twelve feet apart. Higher in-row spacing can be used for hedge-row plantings using mechanical harvesting.

Fertilizer and Mulch

Rabbiteye blueberries are sensitive to overfertilization and to certain types of fertilizers. Split applications (2-3 times per year) of fertilizer at low rates is preferable to single, high dosage feedings. Slow-release synthetic fertilizer and organic forms are beneficial for this reason. Avoid fertilizers that contain nitrate forms of nitrogen, which may be detrimental to plant growth. Fertilizers with nitrogen in the form of urea or ammonium are appropriate. Ammonium sulfate (21-0-0) is the most commonly used nitrogen fertilizer for blueberries, and is good for Texas soil conditions where needs for phosphorus and potassium are rare. Complete fertilizers (incl., N, P & K) can be used, especially those that are formulated for acid-loving plants like azaleas or camellias.

Newly planted blueberry plants should be fertilized very cautiously. Fertilization may be delayed until the second season if plants fail to establish well and grow vigorously. A feeding of 1/2 to 1 oz of 21-0-0 may be delivered to plants in the summer of the planting year, if plants are well watered and appear to be thriving.

Beginning the second year after planting, blueberry plants may be fertilized with 21-0-0 at a rate of 1 oz per year of plant age up to a maximum of 8 oz per plant per year for plants that are 8 years old or older. This should put the

annual nitrogen application at or near 1.6 oz actual nitrogen per plant per year for mature plantings (60 lbs N acre/year for orchards with 605 bushes per acre). Broadcast the fertilizer evenly around the plant, avoiding concentrations of fertilizer in small areas. Regular usage of ammonium sulfate over time can cause pH to drop below the ideal range of 4.0, so soil pH should be regularly monitored. Fertilizer with urea-nitrogen are less acidifying than ammonium sulfate. Late winter to early budbreak and early summer after fruit harvest is complete are good times to fertilize rabbiteyes'.

Rabbiteye blueberry plants do not produce root hairs necessary for the uptake of water and nutrients. Instead, rabbiteye plants are entirely dependent on symbiotic relationship with mycorrhizal fungi. The plant provides nourishment for the fungi and the fungi act as root hairs for the plant. Typically, when rabbiteye blueberries are planted in an unsuitable soil or irrigated with unsuitable water, the fungi die and the blueberry plant suffers. Plants grown under these conditions typically exhibit a plethora of nutritional deficiency symptoms. Addition of these elements will not help overcome this type of rooting deficiency.

Mulch is very important for growing blueberries, especially during the first two years of establishment. It is beneficial for acidifying the soil, moderating soil temperature, conserving soil moisture and controlling weeds. Mulch



Pine-straw mulch in mature rabbiteye orchard

may be applied at a depth of 4-6 inches, covering an area of two feet or more outward from the crown of the plant. Various organic materials such as peat moss, pine straw, pine bark, leaves and grass clippings can be used. Barnyard manure is not recommended, because of high salt content. Some weeds will grow through the mulch, and these may be removed by hand or with grass-selective contact herbicides.

Irrigation

The volume of water applied in irrigation should correspond to season, plant size and soil texture. Initial spring watering should be relatively light. Once in full growth, one year-old plants should receive a rate equal to approximately 1/2 gallon per day. Rates should double during the second year, adding a gallon each year per plant to a maximum of 5 gallons per plant per day, or 35 gallons per week. Water is especially important during the long fruit-ripening period.



Dormant blueberry plant. Lines indicate location for heading back cuts made to reduce height, and circles represent where cuts should be made to thin out the number of older trunks in the plant.

Pruning

Rabbiteye blueberries require little pruning. Lower limbs can be thinned out to keep the fruit from touching the soil, and excessively vigorous upright shoots can be thinned out several feet from the ground to keep the center of the bush open and to keep the bearing surface within reach. As trees begin to age and form thick, gray branches, an annual branch thinning practice where approximately 20% of the branches are removed at ground level is recommended. Such thinning out of old wood encourages new and productive shoots to emerge from the basal crown area, keeping the plant younger and smaller.

Harvest

Rabbiteye fruit ripen unevenly within a fruiting cluster and must be harvested over an extended period of time as individual berries ripen. The fruit are non-climacteric and should be allowed to ripen on the bush to get maximum flavor and minimize bitterness.



A mature Rabbiteye bush can produce 15 lbs of berries (about 9,000 lb per acre).

Most varieties will ripen over a 4 to 6 week period. Once the berries begin to ripen they should be picked every 5 to 7 days. Birds are a major problem in many locations, requiring special protective measures such as noise-makers and netting.

Insects and Diseases

The Blueberry Maggot is the main fruit-attacking insect, which requires monitoring annually and control applications in locations where the pest has become established. Infested fruit will have small larvae (worms) in fruit which decay and drop prior to or during the harvest period. The adult is a small species of fly with black/white speckling. Yellow sticky traps are an effective monitoring tool to identify when eggs are being laid on maturing fruit and can be used to accurately time spray applications.

Mummy Berry is a fungal disease that infects leaf petioles, then small twigs and branches, and then flower stigmas, causing developing fruit to be off-color and wrinkled or shriveled in appearance (mummies). Destroying fallen mummies with cultivation and copper sprays to both the tree and soil surface in late winter aids in prevention. Orchards which have a serious mummy berry problem should make a series of fungicide sprays when the flower buds swell and continuing until the flower petals fall; usually one or two sprays.

Botrytis Blight is seen as a powdery decay of flowers and small, growing fruit. Cool, wet weather spurs this disease. Frost damaged flowers are more susceptible and damage from this disease may be hard to separate from frost injury. Fungicides during bloom aid in control.

Anthracnose (Ripe Rot) may hasten rotting of ripe fruit. Fruit not harvested promptly during periods of warm temperature with precipitation may result in an excessive amount of rotting fruit during and after harvest. Prompt harvest and expedient movement of fruit into cold storage minimizes the problem. This fungus sometimes infects developing leaves in warm, wet weather, causing leaf spotting and defoliation, and then contributing to more infested fruit in successive harvests.

For More Information:

<http://aggie-horticulture.tamu.edu>

<http://www.extension.org/blueberries>