Blueberry Production

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Different Types of Blueberries Grown in North America

Lowbush

1 – 1 ½ ft.

Half-High

3 – 4 ft.

Highbush

6 – 8 ft.

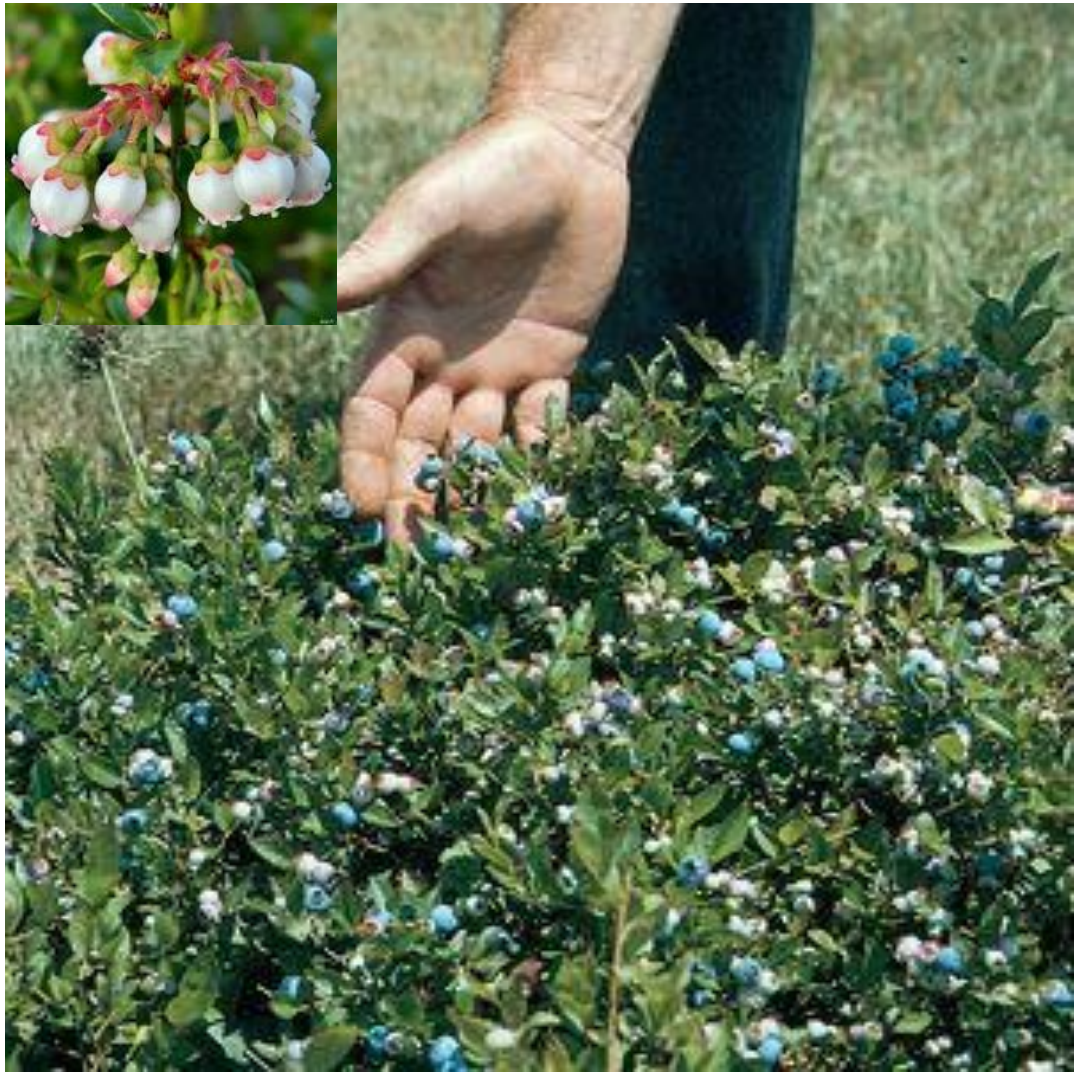
Rabbiteye

10 – 14 ft.

Lowbush Blueberries

Native to Canada and the far northern United States & as far south as the Great Smoky Mountains

Lowbush Blueberry (*Vaccinium angustifolium*)



- Usually under 1 1/2 ft. in height
- Needs little pruning
  - Cut back to the ground every 2 – 3 years
- Needs cross pollination for a second lowbush variety
- Few commercial cultivars exist
  - Harvest is often from wild plants

TopHat is a dwarf lowbush variety used for ornamental purposes

Lowbush vs. Highbush Blueberry

Northern Highbush Blueberries *(Vaccinium corymbosum)*

- Longer chilling requirements (1,000+ hours)
- More tolerant to mid-winter cold
- Blooms later that Rabbiteye
- More sensitive to:
  - Soil pH
  - Organic matter levels
  - Low soil moisture
- Ripens earlier than Rabbiteye
  - Early June – early July
  - Harvest over about a 4-week period
- Requires the most consistent pruning

Northern Highbush Blueberries (Vaccinium corymbosum)

- Native to eastern Canada and the eastern & southern United States
- Needs full sun
- Soils:
  - Prefers sandy soils
    - Difficult to grow in clay soils
  - Well-drained
  - High organic matter (>3%)
  - pH 4.8 – 5.2

Southern Highbush Blueberries (hybrids of *V. corymbosum* & *V. darrowii*)

- Created to allow for production in areas having mild winters (requiring fewer chilling hours than Northern Highbush)
- Better tolerance to higher temperatures and longer growing seasons
- Self-fertile varieties
  - Higher yields & quality with cross pollination

Highbush

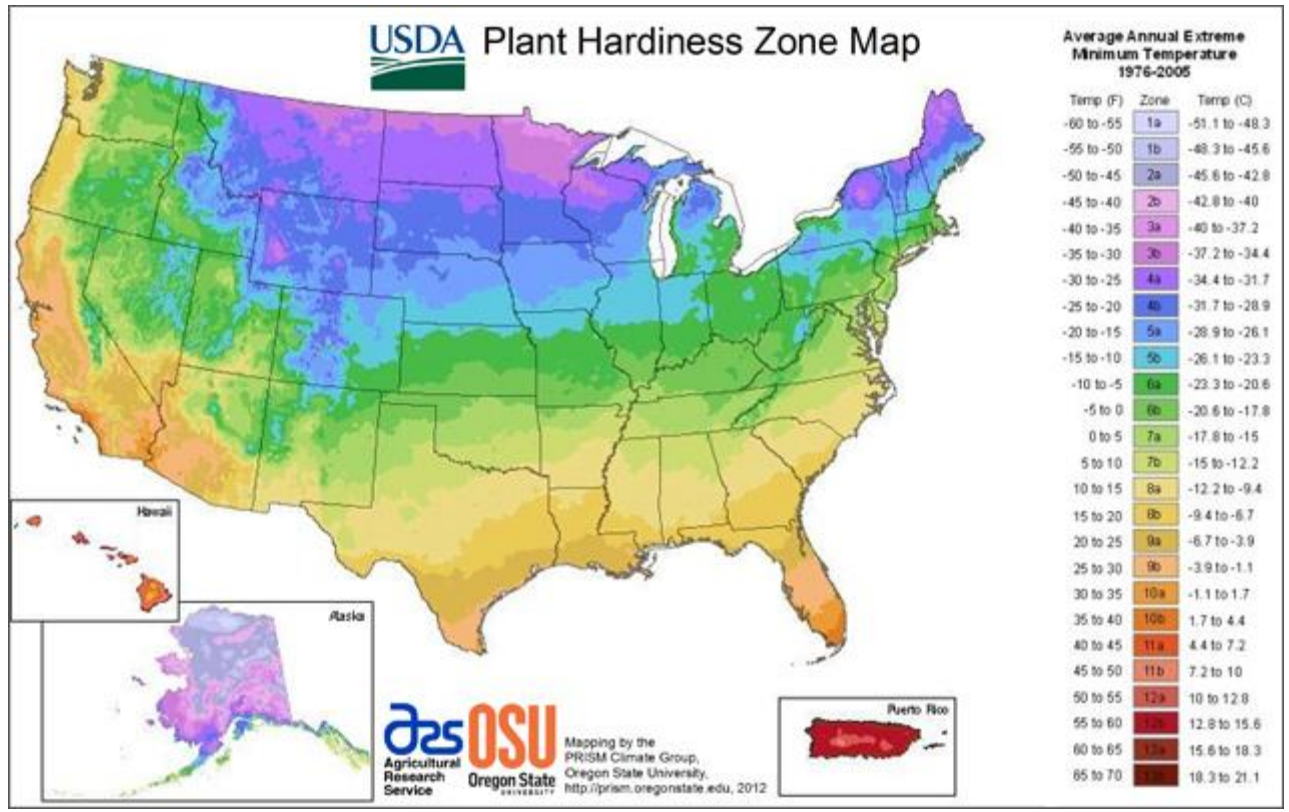
Northern Highbush Distribution Map

Southern Highbush Distribution Map

Characteristics of Highbush Plants

- Mature plants 6 to 8 ft. tall
- Several canes produced from the crown annually
- Canes live for many years
- Flower buds form in fall
- Plants produce fruit about 2 months ater flowering in spring
- Typical yields 4,000 – 6,000 lbs./acre

Rabbiteye


USDA Plant Hardiness Zone Map
Average Annual Extreme Minimum Temperature 1976-2005
Temp (F) Zone Temp (C)
-60 to -55 1a -51.1 to -48.3
-55 to -50 1b -48.3 to -45.6
-50 to -45 2a -45.6 to -42.8
-45 to -40 2b -42.8 to -40
-40 to -35 3a -40 to -37.2
-35 to -30 3b -37.2 to -34.4
-30 to -25 4a -34.4 to -31.7
-25 to -20 4b -31.7 to -28.9
-20 to -15 5a -28.9 to -26.1
-15 to -10 5b -26.1 to -23.3
-10 to -5 6a -23.3 to -20.6
-5 to 0 6b -20.6 to -17.8
0 to 5 7a -17.8 to -15
5 to 10 7b -15 to -12.2
10 to 15 8a -12.2 to -9.4
15 to 20 8b -9.4 to -6.7
20 to 25 9a -6.7 to -3.9
25 to 30 9b -3.9 to -1.1
30 to 35 10a -1.1 to 1.7
35 to 40 10b 1.7 to 4.4
40 to 45 11a 4.4 to 7.2
45 to 50 11b 7.2 to 10
50 to 55 12a 10 to 12.8
55 to 60 12b 12.8 to 15.6
60 to 65 13a 15.6 to 18.3
65 to 70 13b 18.3 to 21.1
Hawaii
Alaska
Puerto Rico
Agricultural Research Service
Oregon State University
Mapping by the PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, 2012

Rabbiteye vs Highbush

- **Rabbiteye**
  - **not as sensitive to soil types**
  - **more heat & drought tolerant**
    - **loses less water through transpiration**
    - **deeper rooted**

- **Highbush (Northern)**
  - **more winter hardy**
  - **less prone to frost damage**
  - **ripens earlier**
  - **more concentrated harvest season**

(Southern)

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; high risk of frost damage
Woodard	350	Climax, Premier	Mid/late May–early June	Older variety; excellent quality; softer fruit; home variety
Brightwell	400	Austin, Premier	Early June–early July	Partially self-fertile; blooms with 500s; fruit sensitive to wet conditions and splitting; medium–large fruit
Climax	450	Austin, Premier	Late May–early June	Concentrated ripening season; small–medium fruit
Alapaha	500	Austin, Premier	Late May–early June	Vigorous plants; medium-sized berries
Austin	500	Climax, Premier	June	Productive; medium–large berries; less firm than some
Premier	550	Austin, Alapaha	Late May–early June	Medium–large berries; young limbs are too limber to fruit heavily
Vernon	550	Austin, Premier, Alapaha	June	Good productivity and vigor
Powderblue	600	Tifblue, Brightwell	Late June– late July	Medium-sized, light blue fruit; good production
Tifblue	650	Brightwell, Brightblue	Late June–July	Small–medium berries are tart if not fully ripe; self-fertile
Ochlockonee	700	Powderblue, Brightwell	July	Very vigorous, productive plants; medium–large fruit

BLUEBERRY VARIETIES

SOUTHERN HIGHBUSH

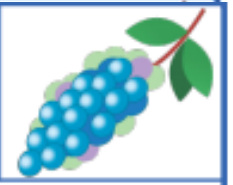
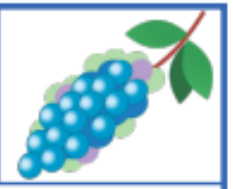
VARIETY	CHILL HOURS	SEASON	SIZE	FLAVOR	MATURE SIZE & SHAPE	FALL COLOR	OUTSTANDING CHARACTERISTICS
Bountiful Blue	150 Chill Hours	Mid-Late	L	Sweet & Juicy	3-4 Ft Compact Mounding	Red, Burgundy	
By far our most popular variety and rightfully so. Bountiful Blue has a compact form and is known for having the bluest foliage of any variety. It has white springtime blooms with a pink blush. It also produces good quantities of delicious, large, sky-blue berries that are especially sweet and flavorful. Just an all around great blueberry.							
Jubilee	500 Chill Hours	Mid	M	Fresh, Sweet	5-6 Ft Upright	Yellow-orange, Burgundy	
This variety was developed in Mississippi, which is known for its tough blueberry-growing conditions. It performs well in heavier soils and through summer heat and sudden winter cold. Jubilee has bountiful crops of especially delicious sky blue berries that grow in large clusters.							
Misty	300 Chill Hours	Early	M-L	Spicy, Sweet	4-6 Ft Upright	Blue-Green, Burgundy	
One of our more popular and most attractive varieties. Misty is vigorous and high yielding with the ability to tolerate relatively hot summers. The bright blue-green foliage is a perfect contrast to the pink and white spring flowers and the sky blue summer fruit.							
O'Neal	400 Chill Hours	Early	L	Juicy, Sweet	5-7 Ft Upright Spreading	Orange, Burgundy	
Considered by some to have the best flavor of all the Southern Highbush varieties. O'Neal has attractive gray-green foliage accented with red stems and branches. Perhaps a little more so than the other varieties, it is important to maintain a correct soil pH of 4.5-5.5 in order to have success with O'Neal.							

BLUEBERRY VARIETIES

SOUTHERN HIGHBUSH

VARIETY	CHILL HOURS	SEASON	SIZE	FLAVOR	MATURE SIZE & SHAPE	FALL COLOR	OUTSTANDING CHARACTERISTICS
Sharpblue	200 Chill Hours	Early	L	Abundant, Robust	5-6 Ft Spreading, Upright	Green	
Sharpblue is the leading and most adaptable variety for low chill areas throughout the world. Sharpblue can bloom and fruit almost year round with nearly evergreen foliage. This blueberry is certainly a top choice for areas with mild winters where frosts are uncommon.							
Southmoon	400 Chill Hours	Mid-Late	L	Complex, Robust	5-6 Ft Upright, Vigorous	Green	
Known for producing exceptional berries that are very firm and have an excellent balance of high sweetness and high acidity. Southmoon serves as a great companion/pollinator for most cultivars and performs especially well in lighter, sandy soils with generous amounts of organic matter.							
Sunshine Blue	150 Chill Hours	Mid-Late	M	Rich, Sweet	3Ft Compact, Upright	Blue-Green, Burgundy	
Great for gardens from San Diego to Seattle, this little variety can do it all. Sunshine Blue is a semi-dwarf (only about 3'), versatile evergreen blueberry. It features showy hot pink flowers that fade to white in the spring, yielding large berries later on in the summer. Sunshine Blue can tolerate a wider range of soil pH than most varieties and while it has one of the smallest chilling requirements (150 hours), it is surprisingly cold-hardy as well.							

NORTHERN HIGHBUSH

VARIETY	CHILL HOURS	SEASON	SIZE	FLAVOR	MATURE SIZE & SHAPE	FALL COLOR	OUTSTANDING CHARACTERISTICS
Bluecrop	800 Chill Hours	Mid	L	Classic, Sweet	4-6 Ft Open, Upright	Red	
A "berry-of-all-trades", known for its adaptability, long bearing season, high fruit yield and disease resistance. So consistent that it is the leading commercial variety in North America. If you want a proven strong performer look no further than Bluecrop.							
Blueray	800 Chill Hours	Mid	XL	Classic, Fresh	4-6 Ft Open, Upright	Yellow, Red	
An old favorite and versatile variety, Blueray does particularly well in areas with hot summers or very cold winters. Produces excellent quality berries with a sweet, slightly tart, aromatic flavor. Rosy pink flowers turn bright white when in full bloom. Has distinctly red wood that shows off in the winter.							
Chandler	900 Chill Hours	Mid-Late	XL	Full, Robust	5-7 Ft Slightly Spreading	Orange, Burgundy	
Chandler is famous for having the world's largest blueberry with berries the size of a quarter. Has a long, 6-week ripening season ensuring a steady supply of large delicious berries over a longer period of time. Foliage turns to a beautiful mix of orange and wine-red in the fall.							
Darrow	800 Chill Hours	Late	L	Juicy, Robust	4-6 Ft Upright	Orange, Red	
Prolific blooms in spring that lead to decent yields in the summer. Darrow berries are known for being one of the largest and most delicious berries one can grow. The berries are slightly flat, light blue with a delightfully tart flavor.							

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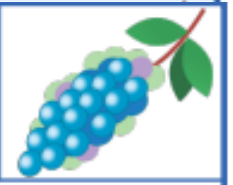
Bluecrop	800 Chill Hours	Mid	L	Classic, Sweet	4-6 Ft Open, Upright	Red	
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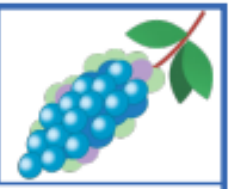
Chandler	900 Chill Hours	Mid-Late	XL	Full, Robust	5-7 Ft Slightly Spreading	Orange, Burgundy	
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VARIETY	CHILL HOURS	SEASON	SIZE	FLAVOR	MATURE SIZE & SHAPE	FALL COLOR	OUTSTANDING CHARACTERISTICS
Patriot	950 Chill Hours	Early	L	Delicate, Sweet	3-5Ft Open, Spreading	Yellow, Orange, Red	
A great cold-hardy variety that bears consistent crops even in wetter soils. Has one of the most low and spreading forms of any Northern Highbush. Patriot has excellent ornamental qualities with its showy white blooms in spring, dark-green summer foliage and fiery orange-red fall colors, making it great in the landscape and in containers.							
Spartan	800 Chill Hours	Early	XL	Robust, Fruity	4-6Ft Upright	Yellow, Orange	
Spartan is an easy to pick upright bush which features one of the most attractive and best flavored berries of any cultivar, making it a favorite at farmers markets as well as in the home garden. It is an old time variety, developed in New Jersey in the 1960's and has the largest early-season berry. Spartan is particular about its soil type, requiring light, well-drained soil with an abundance of organic matter.							

Half-Highs (Crossed between the Northern Highbush and wild Lowbush varieties)

Northblue Half-High	900 Chill Hours	Mid	M	Juicy, Wild	3-4 ft Open, Upright	Red, Burgundy	

Northblue is a great landscape plant and a proven producer of quality fruit in cold climates. The berries have that distinctly "wild" flavor common to the half-highs and are excellent for baking or eating fresh. This bush is an excellent cold-hardy variety with high yields and a great form.

Northsky Half-High	900 Chill Hours	Mid	M	Fresh, Sweet	1-2 Ft Low Spreading	Yellow, Orange, Red	

Here is a short, extremely hardy blueberry that produces even after the hardest of winters. Has a show of snowy white flowers in spring followed later by varied and vibrant foliage in the fall. Northsky is an especially great choice for containers and in colder regions such as Tahoe.

Rabbiteye Cultivar	Chilling Requirement
Premier	550 hours
Climax	400 to 450 hours
Brightwell	350 to 400 hours
TifBlue	600 to 700 hours
Powderblue	550 to 650 hours
Vernon	500 to 550 hours

Varieties Evaluated:

Variety	Developed Location	Year Released	Cultivar Type	Fruit Characteristics	Chill Hours	Cultivar Comments
Alapaha	University of Georgia	2001	Rabbiteye	High yield, medium-sized berries with excellent firmness, color and flavor	450-500	Improved resistance to rain cracking
Camellia	University of Georgia	2005	Southern Highbush	Large berries (up to 2.5 g and greater), strong blue color	500	Adaptable across wide range growing conditions
Columbus	North Carolina State University	2002	Rabbiteye	Large berries, excellent color, and good firmness	600	Recommended for hand harvesting/good shelf life
Lenoir	North Carolina State University	2003	Southern Highbush	Medium berries, medium blue color, very good firmness and flavor	600-800	Excellent disease resistance
Magnolia	Small Fruit Research Station, Poplarville, MS	1995	Southern Highbush	Medium size berries, blue color, good firmness and flavor	550-650	Flower buds are sensitive to cold temperatures
Ochlockonee	University of Georgia	2002	Rabbiteye	Medium to large berries, high-quality berries; good color, firmness and flavor	650-700	Late flowering/spring freeze protected
Ozark Blue	University of Arkansas	1996	Southern Highbush	Very high yield, large berries (up to 2.4 g), light color, and sweet in flavor	800	Resistant to powdery mildew, some susceptibility to Botryosphaeria stem blight
Pamlico[1]	North Carolina State University	2003	Southern Highbush	Small-sized berries, blue color, and good firmness and flavor	600-800	Botryosphaeria stem blight resistant
Tifblue	University of Georgia	1955	Rabbiteye	Small to medium berries, good color, firmness and flavor	600-700	Fruit cracking during wet weather/excessive cane growth

Source: http://www.smallfruits.org/assets documents/crops/blueberries/06bbcvpro

Rabbiteye Blueberry Varieties

- Alahapa – late flowering, early ripening
- Briteblue – med./large berries
- Bluebelle – large berries
- Climax – high yields, blooms early
- Delite – late ripening, excellent flavor
- Garden Blue – small/med. berries
- Tifblue – high yields, dependable cropper
- Powderblue – reliable cropper, excellent flavor
- Premier – mid to late season ripening, fruit stores well
- Onslow – mid to late season ripening, good fruit size

Most varieties need cross pollination, however, all varieties benefit from it.

Effects of Soil Amendments on pH

Amendment	Effect on pH
Biological Reactions	
Organic matter	Reduction in pH is due to microbial degradation & production of organic acids. Large amounts are needed
Ammonium fertilizers	Minor effect on pH when used in amounts recommended as a fertilizer. Ammonium sulfate will have a much greater impact on lowering soil pH than ammonium nitrate or urea. Calcium nitrate & potassium nitrate will cause a rise in soil pH.
Elemental sulfur (S)	Creates acidity as bacteria form sulfuric acid
Nonbiological Reactions	
Aluminum sulfate Iron Sulfate	Chemical reactions create acidity. Less temperature dependent than for biological reactions

Acidifying Soils

- ~ 1 yr. is required for supplemental S to oxidize & reduce soil pH
- Oxidized sulfur is available as aluminum sulfate and ferrous sulfate
  - They are required in larger amounts (6 & 8-fold, respectively) than elemental sulfur & they can be toxic to blueberries (Al & Mn become very available when pH is < 5.0)
- Soils high in organic matter rarely need supplemental N

Blueberry Varieties

Rabbiteye:

- Briteblue – med./large berries
- Bluebelle – large berries
- Climax – high yields, blooms early
- Garden Blue – small/med. Berries
- Tifblue – high yields, dependable cropper

**need cross pollination*

Highbush:

- Duke – early ripening, large berries
- Bluecrop – large fruit, may overcrop
- Berkley – large fruit, keeps well
- Blueray, large fruit, excellent flavor
- Patriot – large fruit, attractive plant

Root System of Blueberry

- Fine, fibrous roots, no root hairs, mostly in upper 9 – 12” of soil
- Form symbiotic relationships with mycorrhizal fungi which aid root functions
- Spread
  - About the width of the canopy
- Depth
- most roots at 9 to 12” depth
- Almost no roots below 16”

Raised Beds

- The use of raised beds will provide better drainage in the root zone, especially where plantings are in low areas or in soils having poor internal drainage characteristics.
- Construct beds 8 to 10 inches high and 4 to 5 feet wide.
- Incorporation of organic matter in raised beds will create a more favorable soil environment for the plants.

Root System

- Composed primarily of:
  - Fine, fibrous roots near the soil surface
    - (upper 8 – 12 inches)
  - Some larger roots may go a bit deeper
  - Fibrous roots lack root hairs
    - Relatively low absorptive capacity
    - Endomycorrhizal fungi on outer portion of roots aid in uptake of nutrients and water

Blueberry Site Selection:
Get it Right Before You Start

- Full sun
- Elevation (frost & disease protection)
- Soils:
  - pH 4.8 to 5.2
  - High organic matter content
  - Well-drained (internal & surface)
  - Min. of 30 – 36” rooting depth
  - Moderate fertility
  - Avoid soils having a high/very high calcium content
- Available water supply

Blueberry Fertilization

- Maintain soil pH around 5.0
  - Above 5.3 to 5.5, iron deficiency is apt to develop
  - Below pH of 5.0, aluminum toxicity can be a concern
- Inorganic fertilizers (nitrogen):
  - Use multiple applications at low rates
  - Consider using ammonium sulfate to help in maintaining soil pH in desired range
    - Fertilize at bloom, 6 weeks postbloom & 12 weeks postbloom
    - Use ~ 2 ounces ammonium sulfate/plant/application
- Organic fertilizers: 1 application/season @ budbreak

Mulching

- Since blueberries are a shallow-rooted crop, the use of a mulch under plants is important in moderating soil moisture and temperature conditions in the root zone.
- Mulching will result in increased plant survival, growth and fruiting as well as reducing weed competition .
- Avoid using hardwood mulches

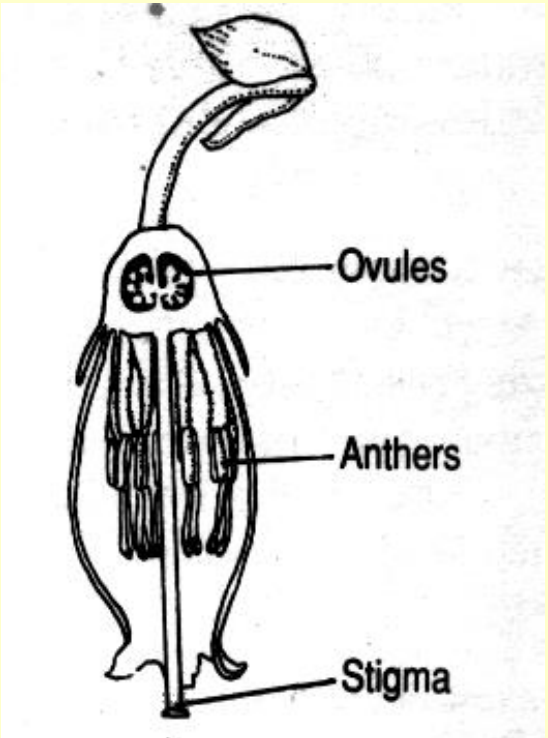
Mulches:

- Increased survival
- Increased growth
- Maintained more uniform moisture levels in the root zone
- Reduced temperature fluctuations in the root zone
- Increased yields

Site Development: Consider Raised Beds

- Reduce water drainage concerns
- Modify only the soil in the raised beds
- Ease of:
  - pH adjustment
  - Organic matter incorporation
  - Easier to prune/harvest

Pollination



Cross Pollination Requirements

- Rabbiteye: most varieties need cross pollination
- Highbush: cross pollination not essential, but more fruit & higher quality fruit results with it
- Rabbiteye & highbush varieties do not cross pollinate (bloom times often do not coincide)

Root System of Blueberry

- Fine, fibrous roots, no root hairs, mostly in upper 9 – 12” of soil
- Form symbiotic relationships with mycorrhizal fungi which aid root functions
- Spread
  - About the width of the canopy

Depth

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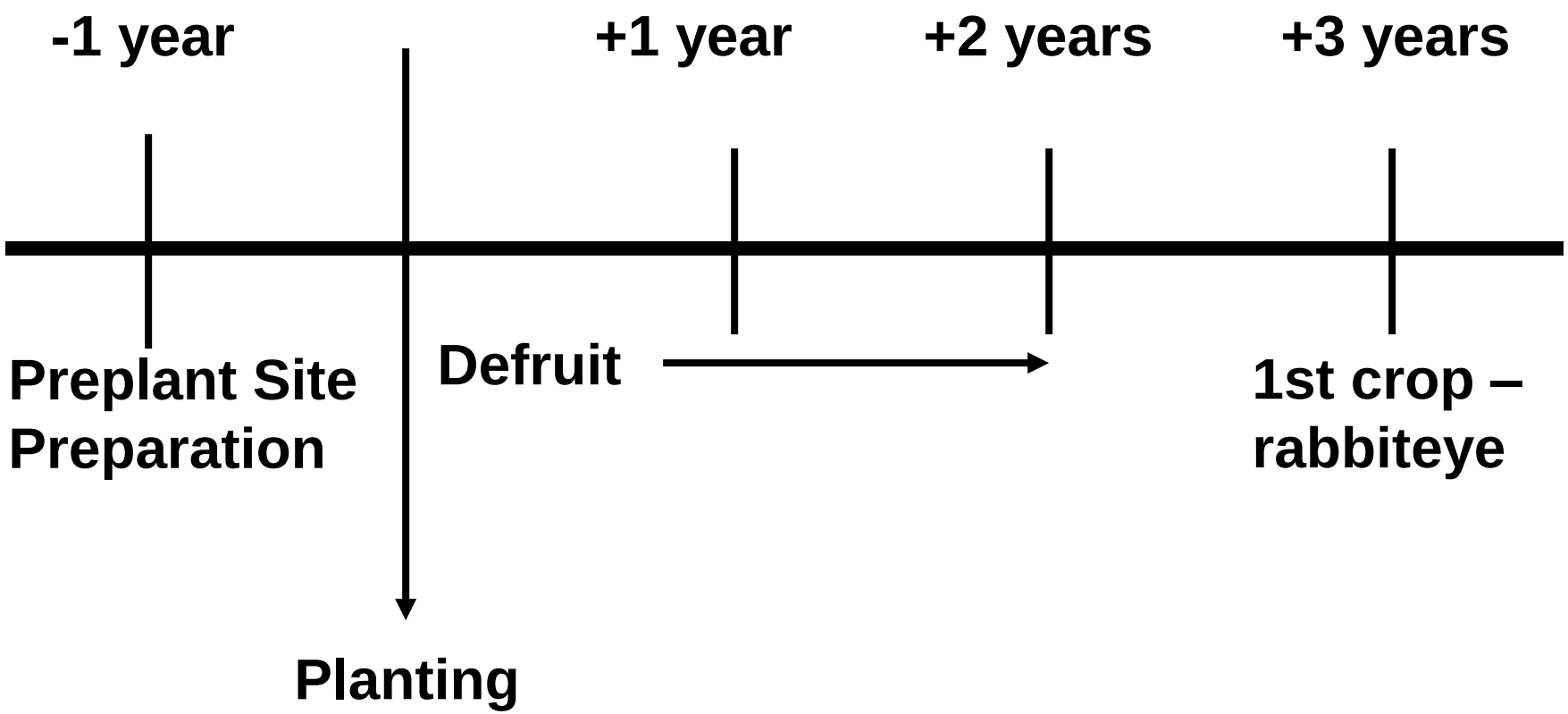
Blueberry Production Timeline



Ease of Pest Control

- Blueberries
  - Rabbiteye
  - Highbush
- Muscadines
- Blackberries
- Raspberries
- Grapes
  - American bunch
  - French-American hybrid
  - *V. vinifera*

Cultural Practices

- **Preplant:**
  - **Adjust soil pH (4.8 to 5.2)**
  - **Incorporate organic matter in row**
  - **Build raised beds if soil is poorly drained**
    - **(internal and surface drainage)**
  - **Eliminate problem weeds**

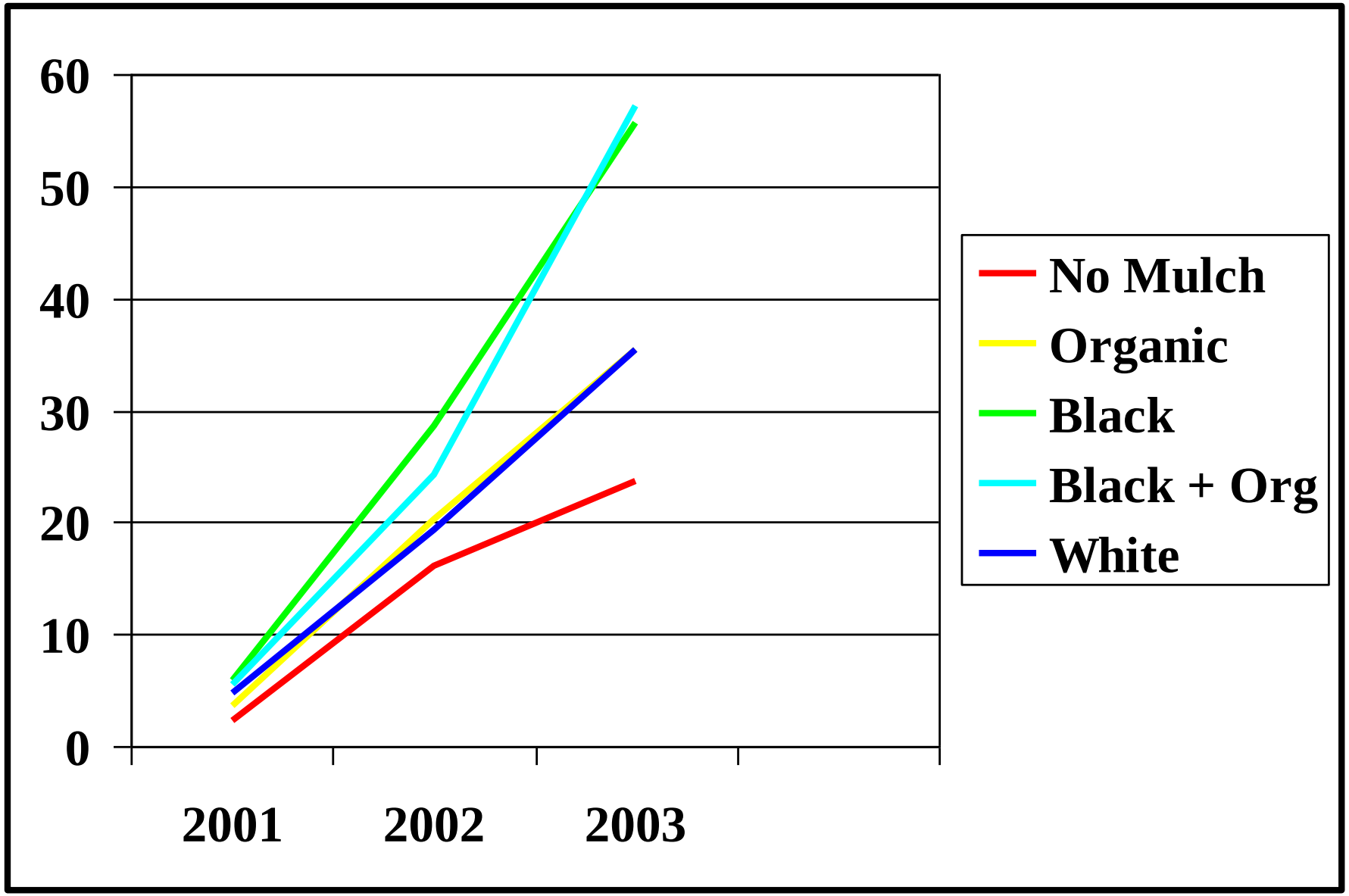
Applying Sulfur

- Elemental sulfur –
  - Apply at least 6 months prior to planting
  - Thoroughly incorporate in soil
    - Direct contact with roots can injure or kill them
  - May need to make split applications
- Injecting sulfuric aid or phosphoric acid through the drip irrigation system
  - Thoroughly mix acid with water in irrigation line
  - Monitor water pH (4.5 – 5.5)

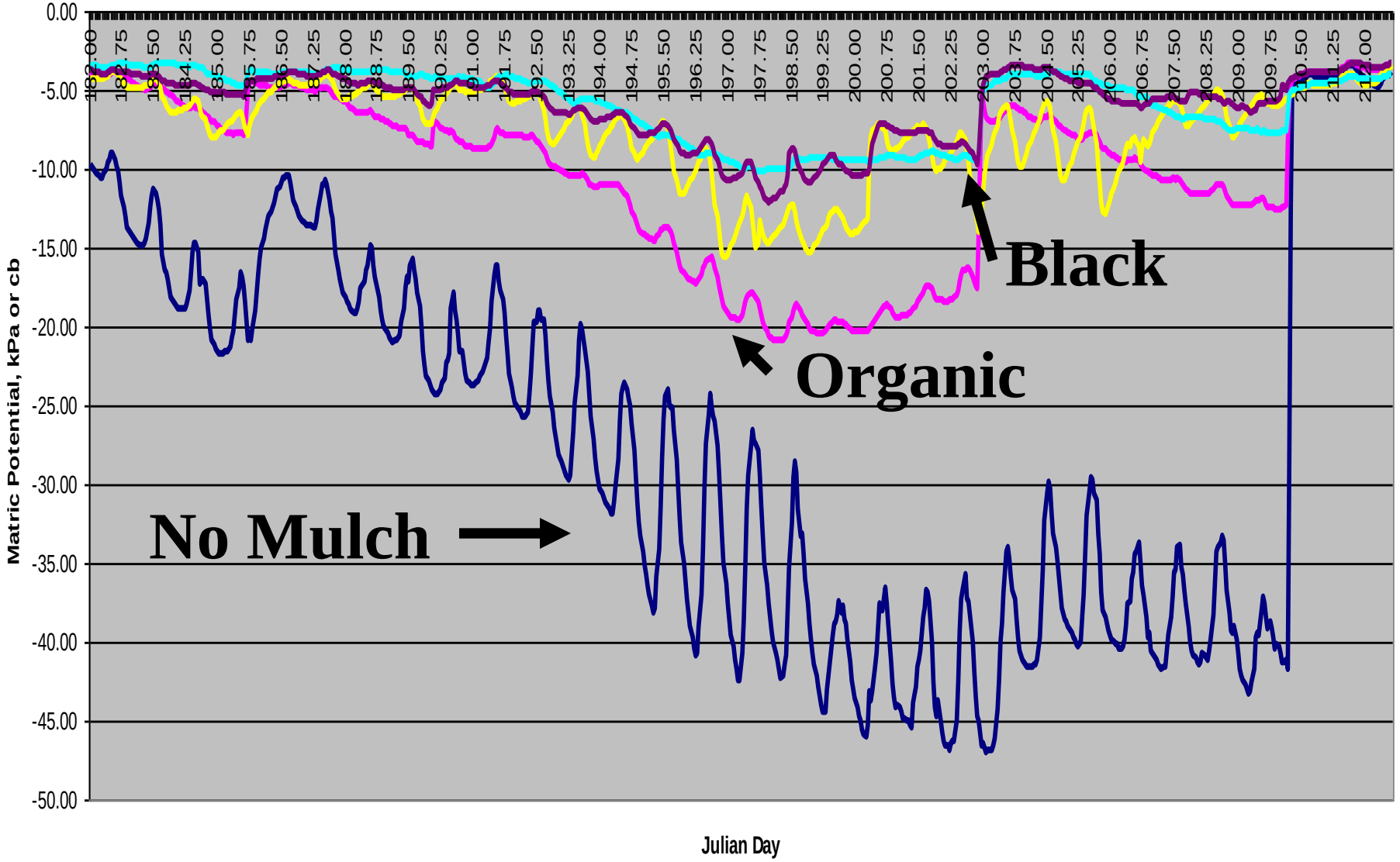
Mulches:

- Increased survival
- Increased growth
  - Especially with Black Fabric & Organic/Black
- Maintained more uniform moisture levels in the root zone
- Reduced temperature fluctuations in the root zone
- Increased yields

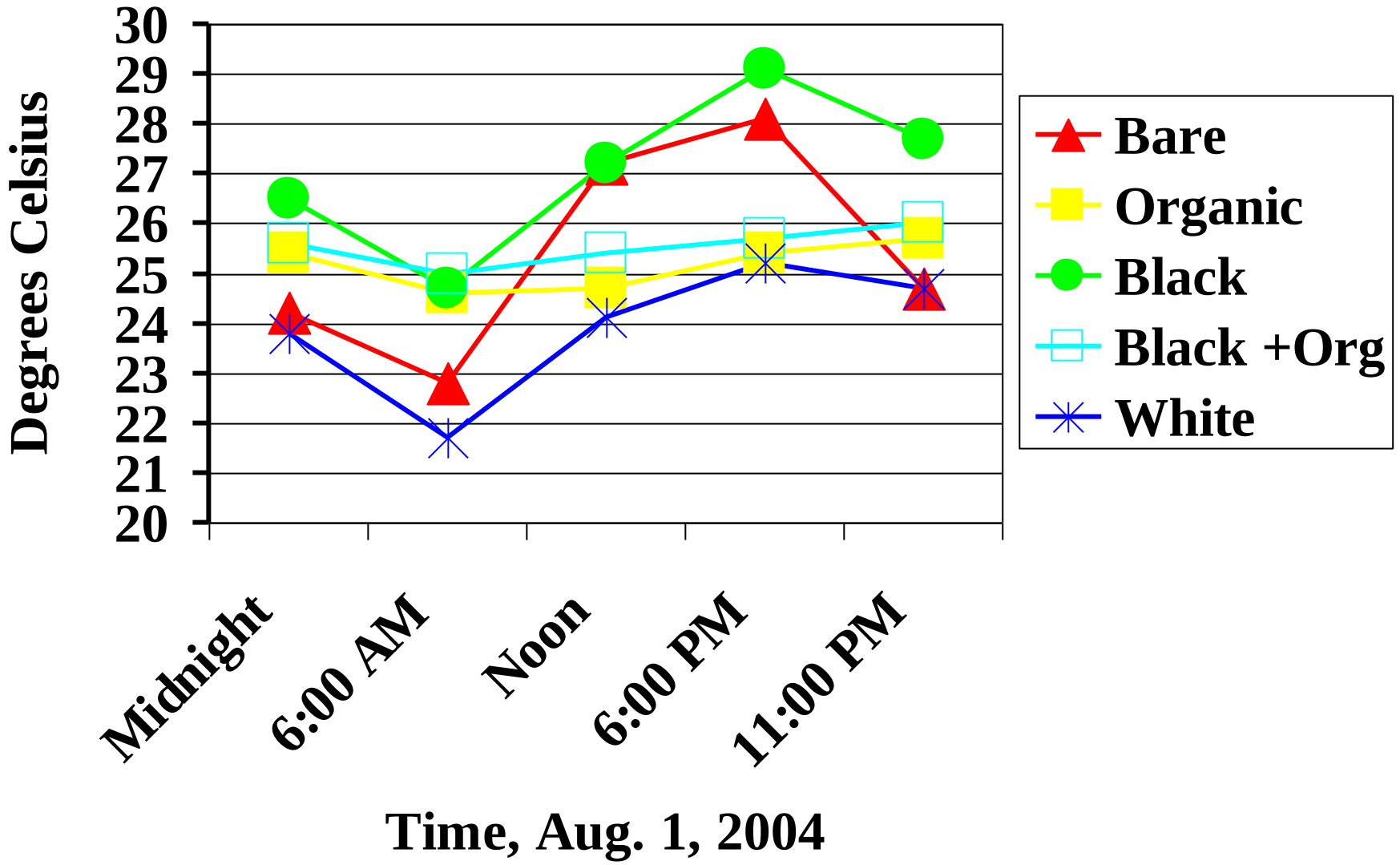
Canopy Vol. (ft^3) by Tmt & Year



Ave. Soil Moisture - July '01



Effect of Mulches on Soil Temperature



Cultural Practices Nonbearing & Bearing

- **Soil test (maintain soil pH 4.8 to 5.2)**
- **Maintain mulch cover**
- **Prune**
- **Remove fruit for at least 2 years**
- **Fertilize**
- **Irrigate**
- **Control pests**
- **Harvest**

Leaf Analysis - blueberries

- Do annually
- Detect trends in nutrient levels
- Sampling procedures:
  - One variety/sample
  - Max. area of 10 acres/sample having
    - Same soil type, fertilization & irrigation
  - Collect mature leaves from mid-potion of current season's growth about 2 weeks after harvest
- Take soil samples form same areas

Blueberry Fertilization

- Multiple applications
  - Young plants: every 4 – 6 weeks (bud break to early Aug.)
- Mature plants:
  - 2 to 3 applications of N (30 # N/A/ application*)
    - 1st at bud break
    - Last after harvest

    * For 12 ft. between row spacing

Nitrogen - blueberries

- Effect of organic matter:
  - For each 1% of soil organic matter, about 15# of N is released/acre/year
  - Ammonium form is preferred over the nitrate form
  - Excess N results in
    - Reduced fruit size
    - Delayed ripening
    - Fruit softening
    - Reduced cold hardiness

Fertigating Blueberries

- N rates:
  - 1st yr. plants — 1 to 1 ½ pounds/week
  - 2nd yr — 2 – 2 ½ #
  - 3rd yr — 3 – 3¼ #
  - 4th+ yr — 4 – 5 #/week
  - Reduce rates during fruit ripening
- Phosphorus & potassium
  - ½ the rate of nitrogen
    - During ripening, use equal amounts of N & K
    - Do not use P if water iron levels are high

Pruning Nonbearing Blueberry Plants

- At planting:
  - Remove weak shoots
  - Remove fruit buds
- 1st Dormant Pruning:
  - Remove fruit buds
  - Remove weaker, shorter shoots at the base of plants

Pruning Mature Blueberry Plants

- Remove weak, shaded, lower shoots
- Prune plants to 4 – 5 ft. in height and width

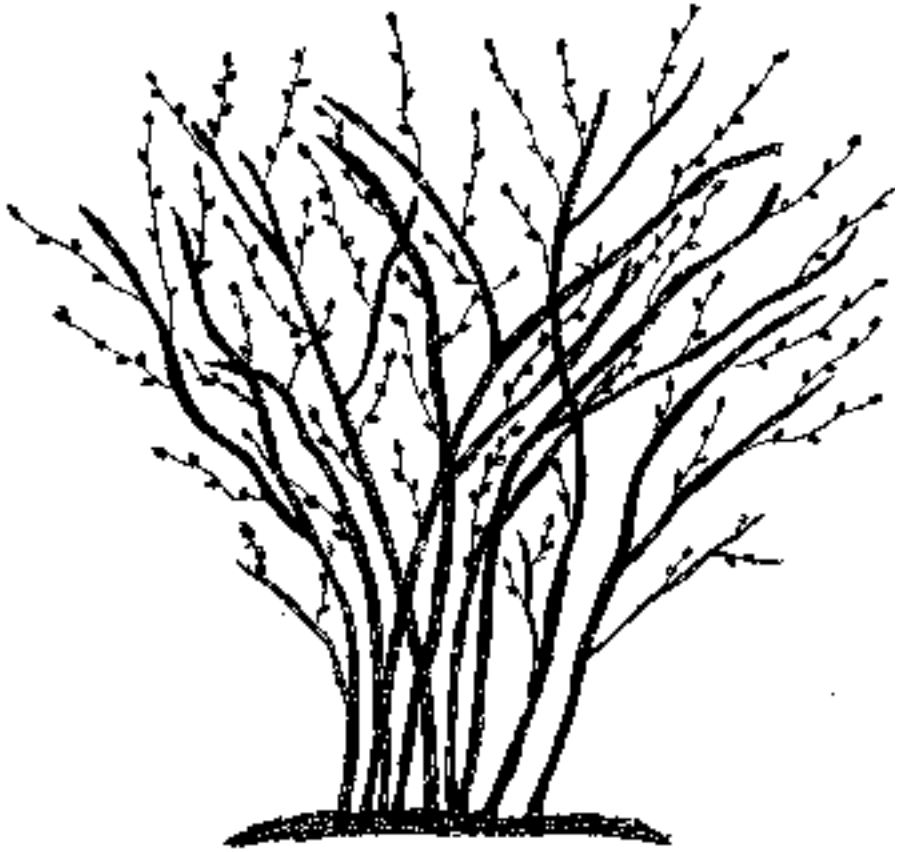
Highbush varieties > 5 yrs. old:
remove 20% of canes/yr

Rabbiteye varieties > 6 yrs. old:
remove 10 – 15% of the canes/yr.

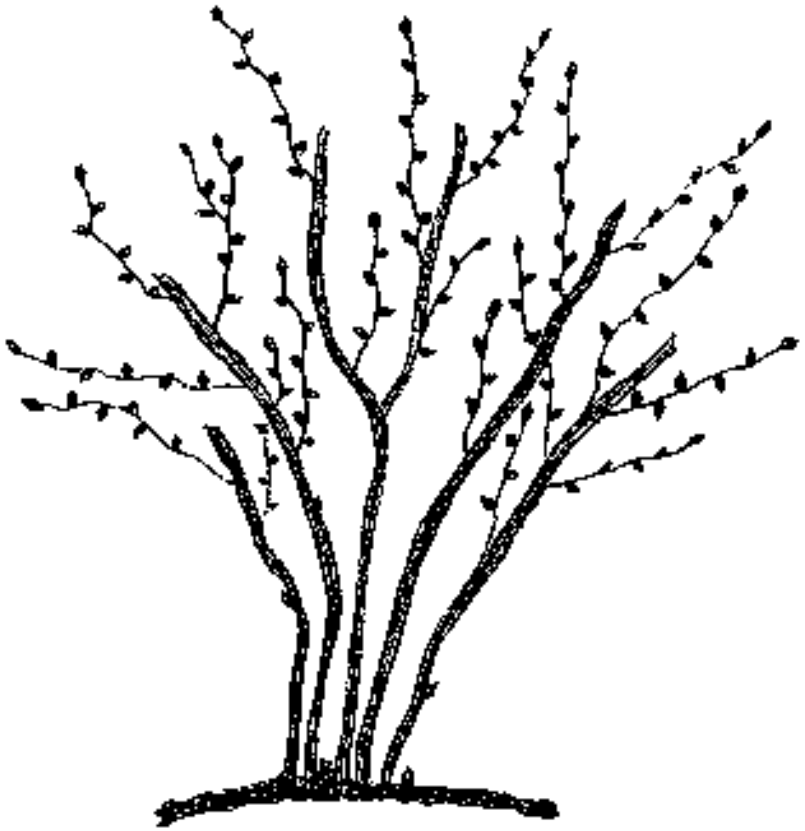
During growing season – top vigorous canes at 4-5 ft.

Pruning Mature Blueberries

Before



After



Rabbiteye Blueberries

- Easier to grow than highbush
  - Not as pH sensitive
  - Tolerate soils having a lower organic matter content better
  - Not as dependent on supplemental watering
- Select varieties having a chilling requirement of at least 500 to 600 hours
- Some varieties need to be cross pollinated by a 2nd variety
- Fruit ripening begins in early July and lasts 6 to 8 weeks or longer
  - ~ 90 days from bloom to 1st harvest

Highbush Blueberries

- ~ 60 days from bloom to harvest

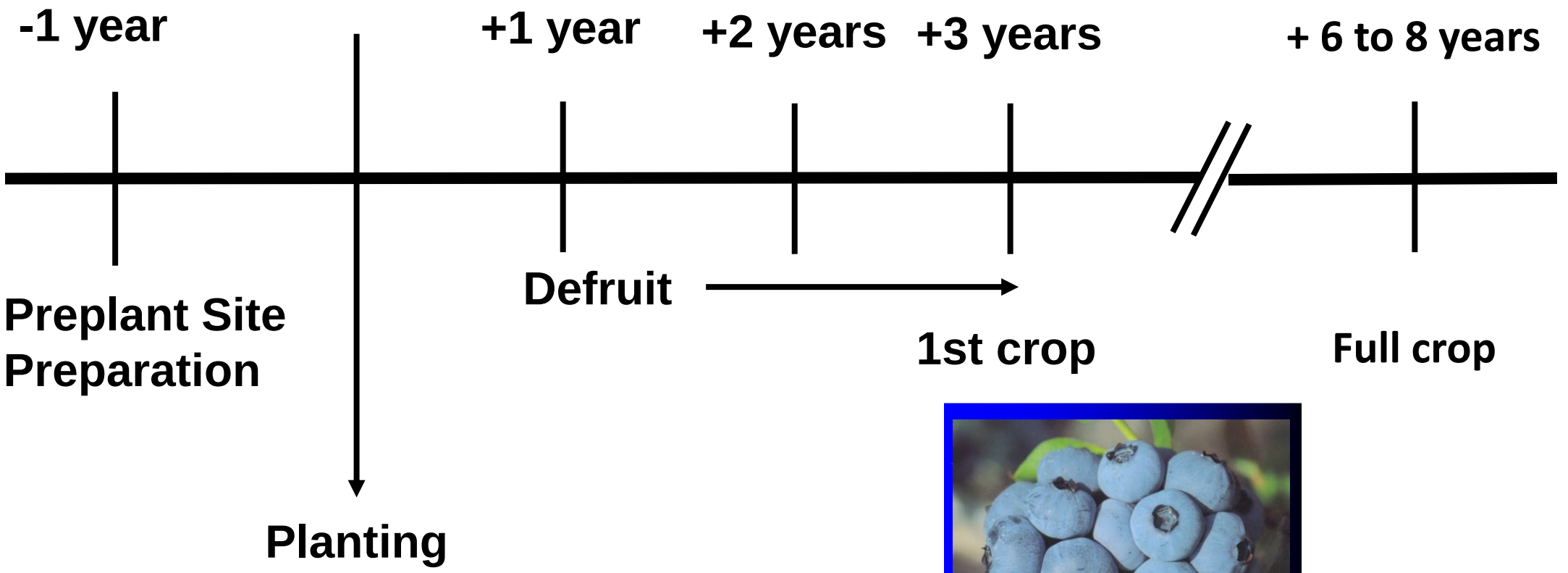
Northern Highbush

- More cold tolerant in winter
- Blooms later
  - (less frost sensitive)
- More difficult to grow – soil pH, organic matter content, water
- Long chilling requirements
  - (800+ hours)
- All varieties are self-fertile

Southern Highbush

- Select varieties having about an 800 hour chilling requirement
- Ripens over the same period as northern highbush
- Needs cross pollination

Blueberry Production Timeline



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Blueberries: estimated yields

Plant age	Per plant (lbs.) Plant spacing: 5’ X 12’	Per acre (lbs.)
1 year	No yield	
2	No yield	
3 (first harvest)	2 (highbush) 3 (rabbiteye)	1,500 2,500
6 to 8 (full harvest)	8 to 10	6,000 to 8,000

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Blueberries – Planting Tips

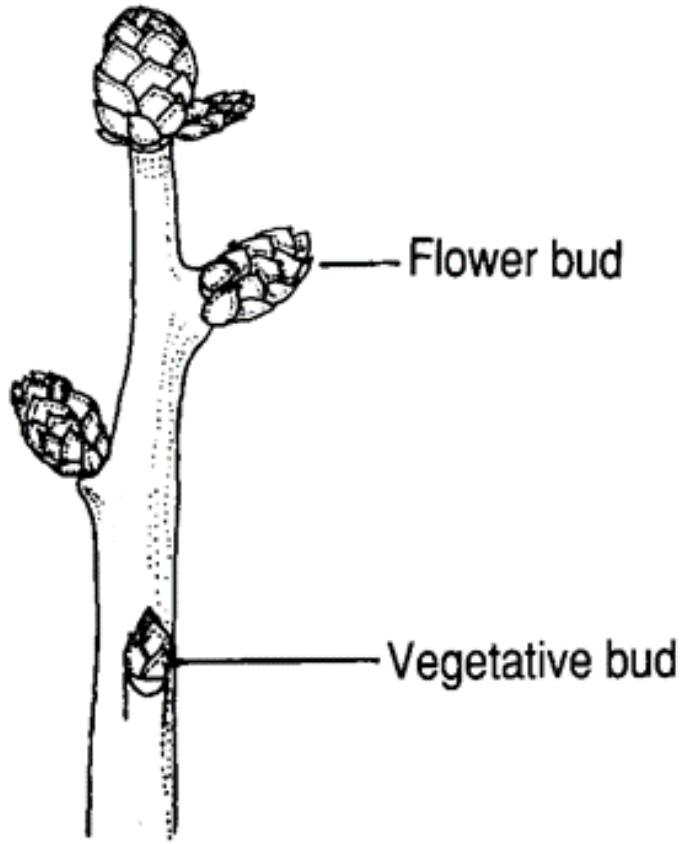
- What to plant
  - Age of plants – 2 year old
  - Bare root vs. container
  - When to plant: late winter to early spring for bare root plants
- Spacing (orient rows north/south if possible):
  - Rabbiteye: 5 ft. inrow X 12 ft. between rows
    - 5’ X 12’ = 726 plants/acre
  - Highbush: 4 ft. inrow X 10 to 12 ft. between rows
    - 4’ X 10’ = 1089 plants/acre, 4’ X 12’ = 907 plants/acre
- Pruning at planting
  - Remove fruit buds, low, weak branches

Irrigation (trickle or drip)

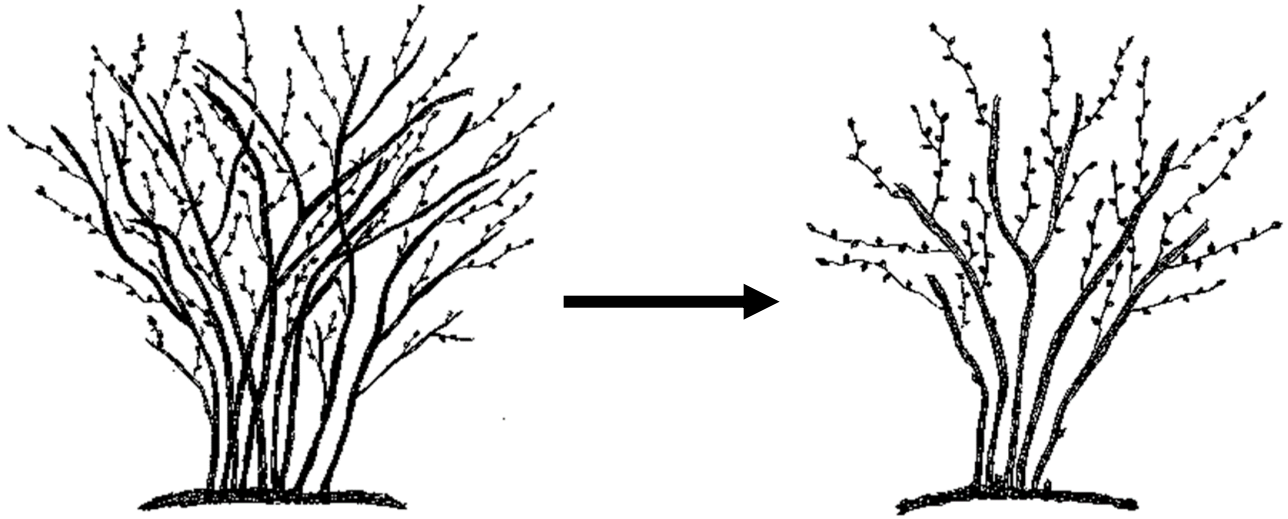
- Increased:
  - Plant survival
  - Growth
  - Fruit size & quality
  - Fruit bud initiation for next year
- Suggested water requirement:
  - 1 inch per week for mature plants during the growing season
    - Supplement natural rainfall

Pruning

- First 2 to 3 years:
  - Remove fruit buds to encourage more vegetative growth
- Every year:
  - Remove lower, shorter, weaker branches
  - Thin the canopy of bushes to assure good light penetration for fruit bud development, good disease control, ease of management

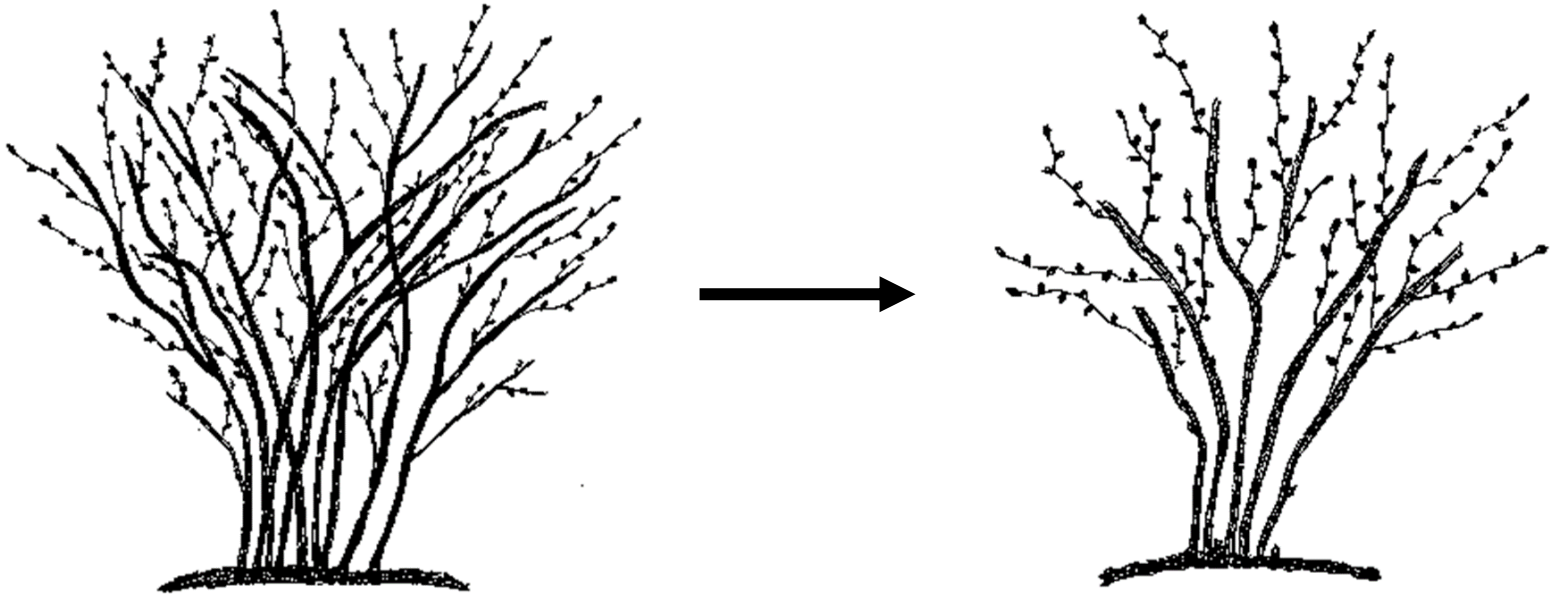


Annual Pruning



- Every year:
  - Remove lower, shorter, weaker branches
    - Low yields, shading
  - Thin the canopy of bushes to assure good light penetration for fruit bud development, good disease control, ease of management
    - Necessary for fruit bud initiation throughout the canopy
- Maintain plants 5 to 6 ft. in height
- Canopy diameter: 4 ft.

Mature Bushes



- begin a systematic removal of old canes throughout the canopy to encourage development of new canes more capable of producing heavy, high quality crop
  - Highbush - beginning the 6th year, remove about 20% of canes each year
    - Results in total renewal of the crown of the plant every 5 years
  - Rabbiteye – beginning about the 7th year, remove about 15% of the canes every year
    - Results in renewal of the entire crown every 7th year

Fertilizing Blueberries

- Soil test annually to monitor pH
  - Most frequent cause of problems in blueberry production
- Tissue analysis to determine nutrient needs
- Nitrogen
  - Use an ammonium form of nitrogen
  - Use multiple applications at low rates
    - Timing: Bloom
    - Bloom + 6 weeks
    - Bloom + 12 weeks

Harvest Tips

- Berry color is not a good indicator of ripeness
  - Blueberries turn blue well ahead of ripening
  - Berries should separate easily from the stem
  - Pick frequently – do not allow fruit to get overripe.
- Earliest ripening, largest & sweetest fruit are those having the most sunlight exposure (top & outer part of canopy)
- Pick into clean containers.
- Minimize the time between harvest and storage or usage.
- **Do not** wash berries prior to cooling or freezing
- **Do** wash fruit immediately prior to use

Suggested Blueberry References

- The Southern Region Small Fruits Consortium publishes the following guides for blueberry producers:
  - 2021 Southeastern Regional Blueberry Integrated Management Guide
  - 2021 Southeastern Regional Organic Blueberry Pest Management Guide
  - Southeastern Regional Blueberry Horticulture and Growth Regulator Guide
- The above guides may be accessed online at www.smallfruits.org. Click on “IPM/Production Guides”