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Bedford Extension Master Gardeners

Fruits in the Home Garden

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This module was developed by Phyllis Turner, PhD, Extension Master Gardener with input from Melanie Barrow, Extension Agent.

Welcome to ‘Fruits’

In this module you will learn about site selection, soil preparation, buying, planting, soil management, pruning and training, pest control, sanitation, and harvesting fruits.

- Read Chapter 10, in your Master Gardener Handbook before viewing these slides
- Browse the Suggested Readings at the end of these slides. They contain online sources that will be helpful for your learning
- The Test Your Knowledge section is for fun and review

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What I Will Learn in This Module (Objectives)

- General information concerning site selection, soil preparation, buying plants, planting, soil management, pruning and training, pest control, sanitation, and harvest
- How to plant, prune and care for fruit trees

What I Will Become Familiar With:

- Cross pollination of tree fruits
- Definition of self-fruited or self-fertile and self-sterile
- Definition of rootstocks and scions of grafted varieties; what each contributes to the plant
- Recommended pH for fruits
- Most common pests and diseases of fruits and their recommended management
- Recommended varieties for the area

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Small Fruit

Photo credit: Strawberries. Colostate.edu (2023)

Photo credit: Blueberries, P. Turner, EMG

Photo Credit: P. Turner, EMG

Photo credit: Gooseberries

Photo Credit: Blackberries, P. Turner, EMG

Photo credit: Currants.umn.edu

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Strawberries: Site Selection

- Well drained soil
- Avoid frost pockets
- Sandy loam (pH 5.9 – 6.5)
- Avoid planting early varieties on south facing slope
- Do not grow where tomato, potato, or eggplant was grown in the past
- Set out virus-free 1-year-old dormant plants 3 to 4 weeks before average last date of frost
- Plant no less than 12 inches apart

Strawberries: Plant selection

- Order plants from reliable nursery
- Order cultivars appropriate for your area
- Virus free
- Usually bundled in lots of 25

Strawberries: Planting

- Mid to Late March is preferred time
- Three training systems:
  - Matted Row
  - Spaced Row
  - Hill System

Read the following references to see how these systems differ

[Growing Strawberries]

[Small Fruit in the Home Garden]

Photo credit: oregonstate.edu

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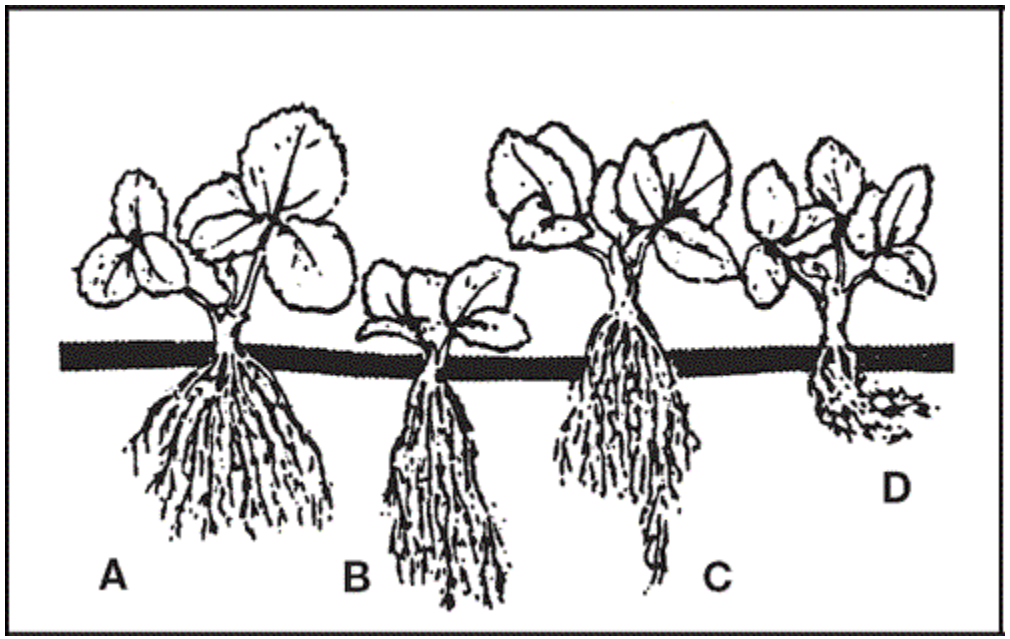
Strawberries: Planting Depth

- Plant same depth as plants grew in nursery
- Too deep (Crown will suffocate)
- Not deep enough (Roots will dry out)



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Strawberries: Space Requirements

For information on space requirements for strawberries read the Virginia Cooperative Extension Master Gardener Handbook, Chapter 10 , Fruits in the Home Garden.

This reference includes information on minimum distance between rows and plants; average yield per plant, bearing age, and life expectancy.

Strawberries: Fertilization

- 1 pound of 10-10-10 cultivated into 100 foot row before planting and again in late August or early September
- Do not apply spring fertilizer in heavy soils

  (causes excess vegetative growth, reduced yield, increased rot, later ripening, & poor fruit quality)

Strawberries: Harvesting

- Remove all flower stems during the first season
- Strengthens plant and allows early and vigorous runner production; early formed runners provide best fruit next season
- Allow berries to develop an overall red color and become fully ripened
  - Will not ripen further once removed from the plant
- Harvest by the stems above the caps to prevent bruising
- Pick all that are ripe
- May need to pick everyday during peak season

Strawberries: June Bearing

- **Allstar:** Resistant to Red stele & Verticillium wilt; some resistance to leaf scorch & powdery mildew
- **Delite:** Highly resistant to Red stele & Verticillium wilt; vigorous; produce runners freely
- **Delmarvel:** Productive on a variety of soils; excellent disease resistance; Good winter hardiness
- **Earliglow:** Noted for disease resistance; very vigorous; very productive; blooms early but is susceptible to frost injury
- **Honeoye:** One of the most highly regarded & popular varieties; performs best on lighter soils; lacks disease resistance
- **Surecrop:** Vigorous; tolerant of drought & other environmental stresses

Strawberries: Everbearing

- Begin bearing in May; end with frost in fall
- Less vigorous and less productive than June bearing varieties
- Vigorous; good quality fruit
- Red, wedge-shaped berries
- Slightly acidic
- Fresh eating or freezing

Strawberries: Day Neutral

- Do not rely on determined amount of light during the day to initiate production
- May be listed with Everbearers in catalogs but they are heavier producers; Examples: Tribute, Tristar

Type	Distance between rows (feet)	Distance between plants (feet)	Annual Yield per plant (quarts)	Bearing Age (years)	Average Life Expectancy (years)
Juneberry & day neutral	3	2	1-2	1	3
Everbearer	3	1	1/2	1-3	2

Strawberries: Pyramid

- Well drained soil
- Easy irrigation
- Need winter protection
- Common in home gardens
- Limited space
- Handicap accessible
- Each step should have a flat surface not less then 6”-8” in width
- Soil mixture: 2 parts good garden soil, 1 part peat, 1 part sand

Photo credit

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Strawberries: Pests

Birds are one of the biggest pests of strawberries. It may be necessary to cover the plants with plastic netting to keep the crop from being eaten before the berries are ripe enough to harvest. Aluminum pie tins, suspended by a string or wire above the plants in such manner that they twist and turn in the breeze, may be successful in keeping birds away.

Snails, turtles, and rodents are also pests of berries that lay on the ground.

Photo credit

Photo credit

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Strawberries: Renovation

- Vigorous plants may be renovated to produce a second year

- After harvest:
  - Remove mulch
  - Cut plants to within one inch of crown, fertilize and water

Grapes

Photo: P. Turner, EMG

Table & Wine grapes

This information does not pertain to commercial production

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Grapes: Fruiting Characteristics

- Grapes bear on year old wood
- Try to enhance fruiting canes and eliminate older canes
- Each node has capability of producing one to three clusters of grapes

Photo: P. Turner, EMG

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Grapes: Varieties

American Bunch Grapes

Seneca, Himrod, Delaware, Concord, Stuben, Niagra, Mars seedless

Hybrids for Wine

Chambourcin, Chardonel, Traminette, Vidal blanc

Vinifera

Lack winter hardiness; susceptible to fungus disease

Examples: Cabernet Franc, Chardonnay

Muscadine

Many varieties have imperfect flowers and require pollination from either male or perfect-flowered varieties; Examples: Carlos, Magnolia, Dearing, Scuppernong, Magnolia; Relatively cold hardy, disease resistant & productive

Photo credits: P. Turner, EMG

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Grapes: Site Selection

- Plant where they have benefit of the sun most of the day
- Fertile, sandy loam high in organic matter
- Deep sands or heavy clays may be used with adequate amendment, fertilizer, moisture & soil drainage
- Tolerant of a wide range of soil pH:
- Prefer 6.0 – 6.8

Photo credit: P. Turner, EMG

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Grapes: Planting

- Deep-rooted: 6’ – 8’ under good soil conditions
- Set in early spring: 3 - 4 weeks before average date of last frost
- Allow plenty of room between plants
  - American Bunch – 8’ between plants
  - Muscadine – 10’ or more between plants
- Trim roots to 6” in length
- Dig holes large enough so roots can spread out
- Depth should be the same they grew in the nursery
- Prune to a single cane
- Head back to 2 buds

Grapes: Space Requirements

	Minimum Distance Between Rows	Between Plants	Average Annual Yield Per Plant	Bearing Age	Life Expectancy
	Feet	Feet	Lbs	Years	Years
American	10	8	15	3	20-30
French American	10	8	15	3	20-30
Muscadine	10	10	15	3	20-30

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Grapes: Soil Management

- Do not thrive in competition with weeds or grass
- Mulch to a depth of 4”-6”
  - Hardwood or softwood
- If mulching material is unavailable, make sure to keep weeds away from around grape vines

Grapes: Fertilization

- 1st year
  - 1 ounce ammonium nitrate per vine after growth begins in spring
  - Spread in a circle around plant 10”-12” from trunk
  - Repeat application about 6 weeks later
- 2nd year
  - 4 ounces before growth begins
  - 4’ circle around each plant 1’ from trunk
- 3rd year
  - Repeat 2nd year application
- Mature, bearing vines
  - If average cane growth is less than 3’ – additional nitrogen may be needed
  - If average cane growth is greater than 3’ – will not need to go beyond 3-year old vine recommendation

Grapes: Training Systems

To be productive, grape vines must be pruned rather severely. When you finish pruning, about 90% of last year's growth will be removed. Old canes that produced fruit last year will not produce again.

Geneva Double Curtain (Overhead Arbor System)
Four permanent arms are retained from year to year. As the shoots grow, their weight will pull them downwards in a curtain-like fashion.

- Requires more space
- Better light and air penetration

Photo credit: wsu.edu

A study conducted in the Winchester, VA area of training systems for grapes: "Comparative results of three training systems in Winchester" by T. Wolf, Professor of Viticulture

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Grape: Training System

Four Arm Kniffin (trellis system)

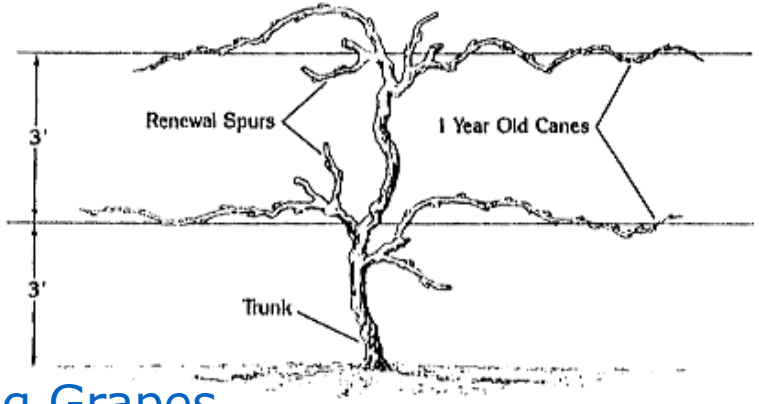
- Requires less space; easy to construct; vines are planted 8 to 10 feet apart
- The first year cut the vine back to 2 or 3 buds
- The second year tie the strongest of the new canes straight up to the top wire; clip off all the other canes at their source
- The third year tie four laterals along the wires (this season's fruiting); cut arms back to 6 buds each; next choose another lateral close by each wire, close to the trunk, and cut it back to 2 buds to form the renewal spur. These spurs will produce the following year's fruiting arms
- The fourth year and from then on replace last year's fruiting arms with new canes from the renewal spurs; select 4 new renewal spurs; cut off all other wood

Reference: New Mexico State University

Four Arm Kniffin System

Cane pruning is a system where a permanent trunk is established, and every year new canes are selected from the head of the vine, where trunk and wire intersect. One or two canes on either side, each 8-10 buds long, are selected and tied to the wire, and all other canes cut out. Choose canes that are about the thickness of your little finger, that come out as close to the head as possible, and that have buds fairly close together. Try to avoid large thick canes with buds spaced far apart. Also leave one or two spur canes, cut to two buds each. They will provide additional canes to select from for the next year's pruning.

Pruning Grapevines



Video: Pruning Grapes

Photo credit

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For more detailed information on pruning grapes, see Chapter 10 of the MG Training Handbook.

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Grapes: Harvesting

- Fully ripe
  - Will not improve in sugar content or flavor after being removed
  - Use immediately

- Cut clusters off with a knife or shears to avoid bruising the fruit

Photo credit: P. Turner, EMG

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Grapes: Pests

Insects:

Grape Berry Moth; Grape Root Borer; Rose Chafer; Japanese Beetle; Grape Phylloxera; Grape Tomato Gall; Grape Flea Beetle

Several pesticide manufacturers have one-package, general-purpose fungicide and insecticide mixtures prepared for home fruit growers.

Used in accordance with the recommendations on the label, they should provide satisfactory control of the pest for which they are recommended.

For any protectant pesticide to be effective it must be applied thoroughly at the proper time and cover all leaves and fruit.

Since protectants are based on prevention of disease and insect damage, they do not provide a curative effect.

Grapes: Diseases

Black Rot: Caused by a fungus that attacks the leaves, shoots, tendrils, canes, blossoms, and fruit. Only the youngest tissues are susceptible, and the fruits are susceptible from bloom to 4-5 weeks after bloom; widespread disease

Downy Mildew: Fungus; primarily on foliage; in spring; between bloom to 4-5 weeks after bloom is the critical time for berry infection

Powdery Mildew: Fungus; primarily attacks the foliage, cluster stems, and the berries

Anthracnose: (Birds-Eye Rot) fruit, young shoots, tendrils, petioles, leaf veins, and fruit stems may be attacked severely

Phomopsis: Fungus disease of the trunks and main branches of grape vines**.** The fungus overwinters in the infected tissue and produces spores April-June to cause new infections

The Pest Management Guide “Home Grounds and Animals” (PMG) provides a spray schedule for grapes. You can find a copy of the PMG on www.ramga.org > Class. It is updated each year and can also be found at www.ext.vt.edu (type ‘PMG’ in the search box)

You may want to download (from the ext.vt.edu website) this document since it is used extensively in this course

In the PMG, Scroll down to the chapter on Fruits. Scroll down in this Chapter to find the table “Spray Schedule for Grapes” (PMG)

Brambles

Blackberries

Raspberries

Dewberries

Boysenberries

Photo credit

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Brambles: Site Selection

- Deep, sandy loam soils
- Full Sun
- Can be grown in most any good garden soil; Well-drained
- High moisture holding capacity
- 6.0 – 6.5 pH is optimum
- Do not grow where tomato, potato, or eggplant has grown in the past
- Susceptible to Verticillium wilt which can live in the soil for many years (especially black raspberries)

Brambles: Planting

- Early spring (at least 4 weeks before average date of last frost) or late fall
- Set plants at about same depth they grew in the nursery
- Crown should be at least 2” below soil line
- Spread out roots and firm soil carefully around them
- Most come with old cane attached
  - Serves as handle to set plants
- Once established cut and destroy old cane to safeguard against disease

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Brambles: Space Requirements

	Minimum Distance Between Rows	Between Plants	Average Annual Yield Per Plant	Bearing Age	Life Expectancy
	Feet	Feet	Quarts	Years	Years
Erect Blackberry	8	3	1½	1	5-12
Trailing Blackberry	8	6	1½	1	5-12
Red Raspberry	8	3	1 ½	1	5-12
Black Raspberry	8	4	1 ½	1	5-12
Purple Raspberry	8	3	1 ½	1	5-12

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Brambles Trellis System

Photo credit:P Turner

Prune to about five feet; just so you can reach the top to pick the fruit.

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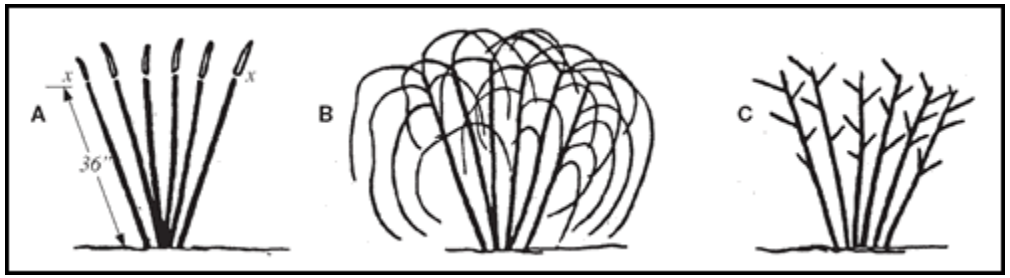
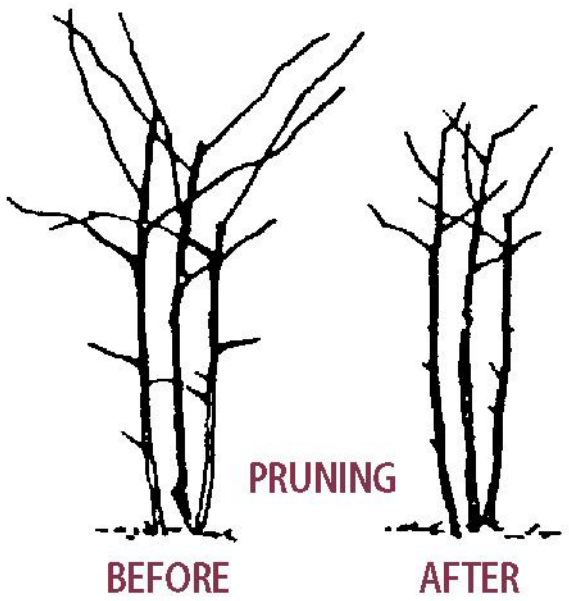
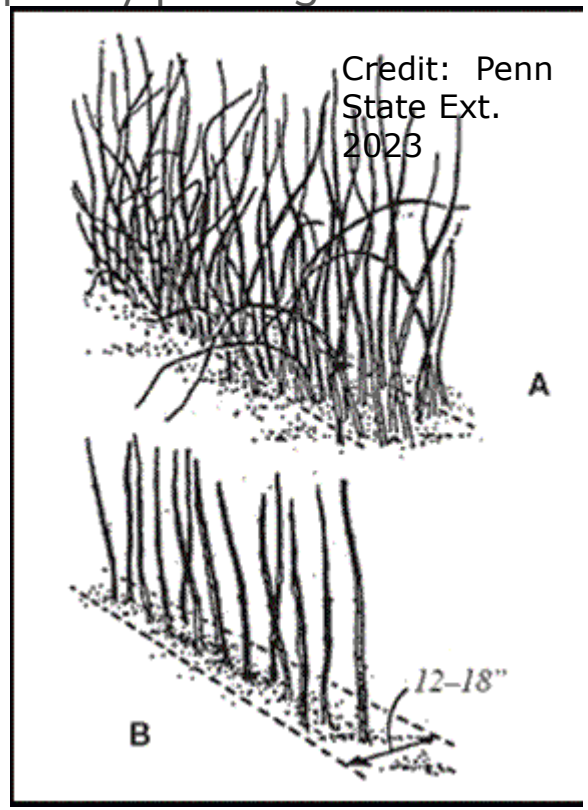
Brambles: Pruning



Black and purple raspberry pruning



Blackberry



Red Raspberry

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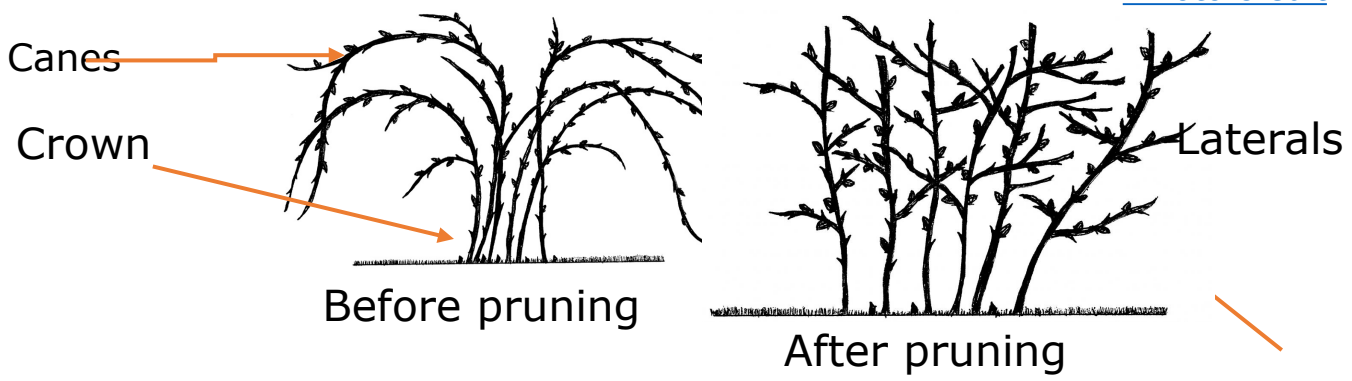
Pruning Blackberries

- Canes of blackberries are biennial in nature; the crowns are perennial. New shoots grow from buds at the crown each year. Late in the summer, the new canes develop lateral branches with fruit buds on them. Early in the second season, fruit-bearing shoots grow from these buds. After fruiting, the old canes die, and new shoots spring up from the crowns. The old canes are removed anytime after fruiting
- Pruning consists of the removal of all dead, weak, and severely damaged canes and the selection and pruning of the fruiting canes for the coming season. Leave no more than 4-6 new canes and prune laterals to 12-18 inches
- Erect blackberries without support are pruned to about three foot in height; Erect or trailing blackberries that are supported on a trellis or stakes are pruned to a height of about five foot

Small Fruit in the Home Garden

Video: Pruning Blackberries

Photo credit:



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Brambles: Fruiting Characteristics

Primocanes

- First year growth from crown
- Most do not produce fruit this first year; see exceptions below

Floricanes

- Two year old canes
- Bear fruit
- Die after fruiting

- **Exception**: New varieties of everbearing raspberry grow vegetatively and fruit in same growing season; the first fruit is produced in fall of the first year. A second fruiting occurs in June of the second year.

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Blackberry: Types/Cultivars

Erect

- Darrow
  Most cold hardy
- Cherokee, Cheyenne, Comanche & Shawnee
  Very productive
- Navaho
  Thornless

Semi-Erect (Thornless)

- Black Satin
  Very productive
  - Very hardy
  - Large fruit
- Dirsken
  - Productive
  - Hardy
  - Slightly smaller than Black Satin

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Blackberry & Raspberry: Diseases & Pests

Anthracnose: fungus

Cane blight

Leaf Spot

Blackberry Psyllid (insect blackberries in spring)

Borers

PMG (found on www.ramga.org > Class) provides information on diseases and pests of black and raspberries.

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Dewberry

- Trailing form of blackberry
- Lucretia
  - Best of the trailing blackberries
  - Relatively winter hardy
  - Vigorous
  - Productive
  - Very large fruit (1 ½” long)

Photo credit

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Boysenberry

- Boysenberry
  - Loganberry + various blackberry/raspberry species
  - Bramble hybrid
  - Easily winter killed
  - Should be only planted in areas of mild winters
- Lavaca
  - Seedling of Boysenberry
  - Superior to parent in production, size & resistance to cold

Photo credit:.

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Red Raspberry

Generally more successful in warmer regions than other types

- Latham
  - Spring-bearing
  - Vigorous
  - Very productive
  - Somewhat tolerant of viral diseases
- Heritage
  - Everbearing
  - Fruits in June and fall
  - Mow tops in late winter
  - Will yield 1 crop in fall of year

.Photo credit

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Black Raspberry

- Susceptible to viral diseases
- Readily infected when grown near red raspberries carrying viruses; should be separated by at least 700’

Bristol

- Hardy; vigorous; highly productive

Titan

- Early-bearing; winter hardy; largest berry in eastern US; high yielding

New Logan

- Heavy crops; drought tolerant; relatively tolerant to viruses

Cumberland

- Favored because of its attractive, large, firm berries; vigorous; productive

Purple Raspberry

- Hybrid of red and black types
- Hardy, vigorous & very productive

- *Brandywine*
  - Best available
  - Ripens later than most red or black types

- *Royalty*
  - Very large fruit
  - High productivity
  - Resistant to mosaic-transmitting aphids & raspberry fruit worm

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Blueberries

- Require acid soil
  (pH 4.2-5.2)
- Mulching is very beneficial
- Have relatively few pest problems

Photo credit

Blueberries: Site Selection

- Full sunlight
- Plant far enough from the roots of trees to prevent competition for moisture & nutrients
- Shallow-rooted: Irrigate & mulch heavily
- Prefer porous, moist, sandy soils high in organic matter (cannot tolerate saturated soil)
- 6 month to 1 year before planting, incorporate peat moss, oak leaves, pine needles, and sulfur to lower pH (if needed)
  - 1 ½ - 2 lbs. per 100 ft² for each full point pH tests above 4.5
- Proper acidity may be maintained annually by applying acid fertilizer
  - Ammonium sulfate
  - Cottonseed meal

Blueberries: Planting

- Set in early spring about 3 – 4 weeks before the average last frost date
- Give roots plenty of room
- Not recommended to incorporate organic matter or other soil amendments into backfill soil
- Trim off diseased & damaged portions of the top & roots
- Set the plants at the same depth that they grew in the nursery
- Spread roots out, carefully firm soil, water thoroughly

Blueberries: Maintenance

Mulching is important

- Around & between plants
- Hardwood/softwood & sawdust applied 5”-6”
- Combination mulch
  - Bottom layer of leaves
  - 2-3 inches of sawdust top layer
- Renew annually
- Retains moisture
- Keeps soil cool
- Adds needed organic matter

Blueberries: Fertilization

- Not usually needed during the first growing season
  - 2 oz of ammonium sulfate should be spread in a circle around each plant 6”-8” from its base before the buds begin to swell the 2nd spring
- Increase the amount by 1 oz each succeeding spring until each mature bush is receiving 8 oz annually
- Cottonseed meal = excellent organic fertilizer for blueberries
  - ½ lb per plant
  - Should be doubled when the plants come into bearing

Blueberries: Pruning

- Prune mature shrubs every year; late fall until early spring
- Prune out canes older than six years
- Thin remaining canes leaving most vigorous shoot growth (leave 6-7 canes per bush)
- Remove weak fruiting branches
- Head back terminal growth for convenient berry picking

For more detail see Chapter 10 of the MG training Handbook

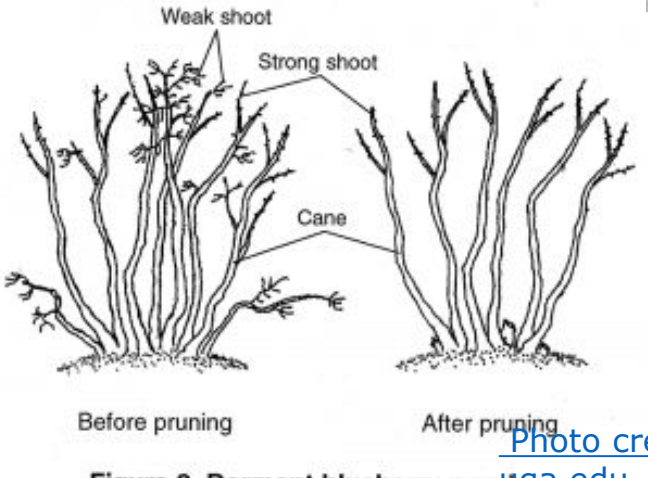

Photo credit: uga.edu

Figure 2. Dormant blueberry pruning
Northern Highbush

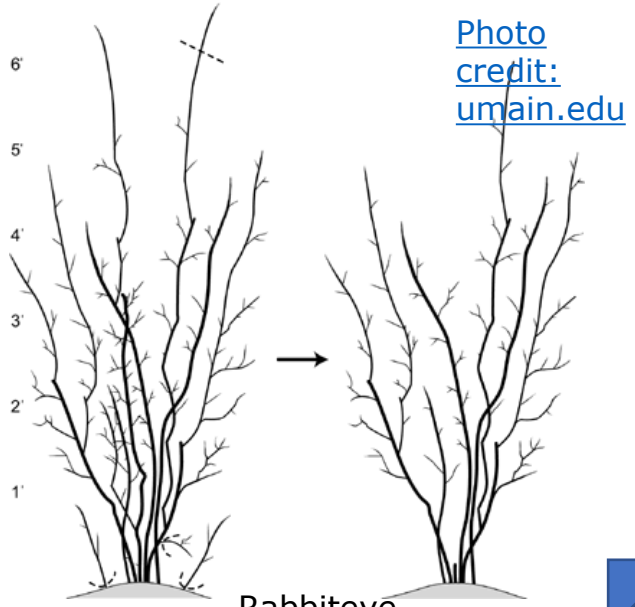

Photo credit: umain.edu

Rabbiteye

[Pruning blueberries](#) (video; U. of Maine)

[Home Garden Blueberries](#)

[Growing Blueberries](#)

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Blueberries: Space Requirements

Minimum Distance Between Rows	Between Plants	Average Annual Yield Per plant	Bearing Age	Life Expectancy
Feet	Feet	Quarts	Years	Years
6	4	4-6	3	20-30

Blueberries: Harvesting

- Full production is reached in about 6 years
- Blueberries hang on bushes well
- Not as perishable as brambles
- Pick every 5-7 days
- Will keep several weeks in cold storage

Blueberries: Highbush

Coville

- Resistant to cracking
- Fruit hangs well in clusters even after ripening

Elliott

- Upright growth habit
- Ornamental appeal
- Late-blooming
- Long-lasting orange-red fall color

Bluecrop

- Lacks vigor
- Very hardy
- Drought resistant
- Resists cracking

Berkley

- Inconsistent yield
- Spreading growth habit
- Attractive ornamental

Jersey

- Home garden favorite
- Vigorous
- Hardy
- Heavy crops

Blueberries: Rabbiteye

- Dull colored fruit
- Tolerates drier soils
- More productive than highbush

Cultivars: Climax, Premier, Powderblue, Tifblue

Blueberries: Diseases

Mummy-berry Disease - The fungus overwinters in dropped, infected fruit

Phomopsis Twig Blight - Caused by Phomopsis fungi. Buds and tips die first, followed by a downward spread of blighted tissue

Stem Cankers - Several fungi enter stems and destroy the bark tissues. Severe damage to plants

Leaf-spots - Fungal-caused leaf spots can defoliate plants

Root Rot - Associated with poor site selection or planting practices. Cuttings placed too deep in soil or planted in heavy, poorly-drained sites seem especially prone to fungi that destroy the roots and, of course, the entire plant

Viruses - Virus infected plants are poor producers and have short lives. They also serve as reservoirs of disease for passing insect or nematode vectors. (Examples: shoestring stunt (a virus-like disease); mosaic; red-ring spot; witches-broom

PMG provides information on treatment for blueberry diseases

Blueberries

The key to control and management of blueberry diseases is prevention.

- Start with virus-free plants
- Follow proper site selection and preparation
- Use recommended cultural practices and carefully monitor your planting

Currants

- Hardy & easy to grow
- Bears flowers in racemes
- Fruit Colors: Red, White, Yellow, Black

Photo credit

- For detail on pruning currents see Chapter 10, MG training Handbook

Specialty Crop Profile: Ribes (Currants and Gooseberries)

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Gooseberries

- Hardy & easy to grow
- 1-2 flowers per stem
- Fruit Colors: Red, Yellow, Green

Photo credit Wikipedia

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Gooseberries & Currants: Site Selection

- Location: cool, moist, semi-shady
- Very resistant to low temperatures
- Do not thrive where the summers are hot and dry
- North side of a building may protect them from summer heat
- Good air & soil moisture drainage
- Bloom very early in the spring & need to be protected from the frost
- Shallow rooted
- Silt & clay loams most suitable soils
- pH range: 6-8

Gooseberries & Currants: Planting

- Prepare soil as you would for a garden crop
- Set plants slightly deeper than they grew in the nursery
  - Promotes shoots to arise forming bushes rather than single stems
- Pack soil firmly around roots
- Cut tops back to 8” – 10”

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Gooseberries & Currants: Space Requirements

	Minimum Distance Between Rows	Between Plants	Average Annual Yield Per Plant	Bearing Age	Life Expectancy
	Feet	Feet	Quarts	Years	Years
Curant	8	4	4-6	3	10-20
Gooseberry	8	4	4-6	3	10-20

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Gooseberries & Currants: Maintenance

- Mulching is the preferred soil maintenance
- Hardwood/softwood bark in a 3’ circle around each bush
- Pull it back each winter
- Eliminates a nesting place for rodents that like to feed on young shoots

Gooseberries & Currants: Fertilization

- Annual fall or late-winter application of barnyard or poultry litter
  - In the absence of manure 4 oz of ammonium nitrate per plant applied just before bud break

- Spread about 1” deep in a 3’ circle around each plant

Gooseberries & Currants: Pruning

- Any time during the dormant period
- Primarily thinning out excess stems
- Very little pruning is done until plants are 4 years old
- Mature bush should have 3-4 stems each of 1-, 2- & 3-year-old wood; Actual number is determined by vigor
- Heading back is done only to reduce the height of extra long 1-year-old shoots

For detail on pruning gooseberries see Chapter 10, MG training Handbook

Gooseberries & Currants: Pruning

- Remove all wood over 3 years old
- Cut off damaged and prostrate stems
- Retain only most vigorous 2- & 3-year-old shoots; remove the rest
- Head back young shoots that are too long

Gooseberries & Currants: Harvesting

- Begin bearing when 3 years old
- Unlike other fruits, currants & gooseberries may be left on the bush several weeks after they are ready to pick – 4-6 weeks, some varieties of currants even longer
- Gooseberries will quickly sunscald
- Should be placed in the shade soon after picking

Gooseberries & Currants: Pests

Disease problems:

Powdery mildew and Leaf spot (Anthracnose) (most common)

Insect Problems:

Aphids, mites, scale, and cane boring insects.

Prevention and control:

- Careful site selection
- Choose resistant cultivars
- Proper pruning
- Plantings should be monitored through the season
- Pesticide applications may be required

Gooseberries & Currants: Pests

Weeds:

- Cultural controls such as mulching and cultivation are the primary preventatives.
- There are limited registered herbicides for weed control. Spot spraying with glyphosate (Roundup™) and paraquat (Gramoxone™), and selective grass control with clethodim (Select™) are registered uses.
- Knowing the modes of action is important:
  - Glyphosate is nonselective and translocates; it should never contact green tissue
  - Paraquat is also nonselective, but is not translocated, thus contact with green tissue should be avoided, but it will only damage the plant at the point of contact
  - Clethodim is selective

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Photo credit

Tree Fruit: Considerations

Mature Size

Dwarf fruit trees come into bearing earlier than standard; occupy less space and can be more easily pruned and sprayed. Rootstock used in grafting determines the mature size of the tree and the earliness of production of fruit (the more dwarfing the rootstock, the earlier the tree will bear fruit).

Life Span

Some dwarf trees only live about five years.

Site for Planting

Select late blooming varieties for low lying sites.

Variety

Select those with the fewest insect and disease problems; several varieties of the same fruit may be planted to prolong the harvest season; many fruits need cross-pollination for satisfactory fruit set.

Tree Fruit: Considerations

Age at Purchase

1-year old plants are preferred

Cross Pollination

Many fruit trees require cross pollination; For apples, plant at least three varieties; Sour cherries cannot be used to pollinate sweet cherries

Note: Apricots are not recommended for planting in Virginia; usually killed by frost

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Tree Fruit: Site Selection

- Good air drainage (cold air flows downhill)
  South facing slopes for late bloomers
- Deep, well drained, moderately fertile soil
- Adequate water drainage (most important)
- Avoid low wet spots and locations exposed to strong winds
- South facing slopes for early bud development

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Fruit Trees: Planting Time

Recommended:

- A month after the first killing frost in the fall or
- A month before bloom in the spring

- Trees should be dormant
- Soil should have proper moisture content

Fruit Trees: How to Plant

- Dig hole a little deeper and wider than necessary to accommodate the roots
- Leave soil loose in bottom of hole
- Prune only broken or damaged roots or those that are excessively long
- Set tree at same depth it grew in nursery
- Fill hole with pulverized topsoil, shaking tree to filter soil among the roots
- Tamp soil firmly
- Water when hole is about ¾ full

Fruit Trees: Cultural Practices

Mulch or cultivate (shallow) until begin bearing
Extend mulch beyond spread of branches

Eliminate weeds

Fertilize young trees three times:

- Two weeks after planting
- Six weeks after planting
- Ten weeks after planting
- Note: avoid over fertilization as it may lead to excess vegetative growth, delayed fruiting and possible winter injury

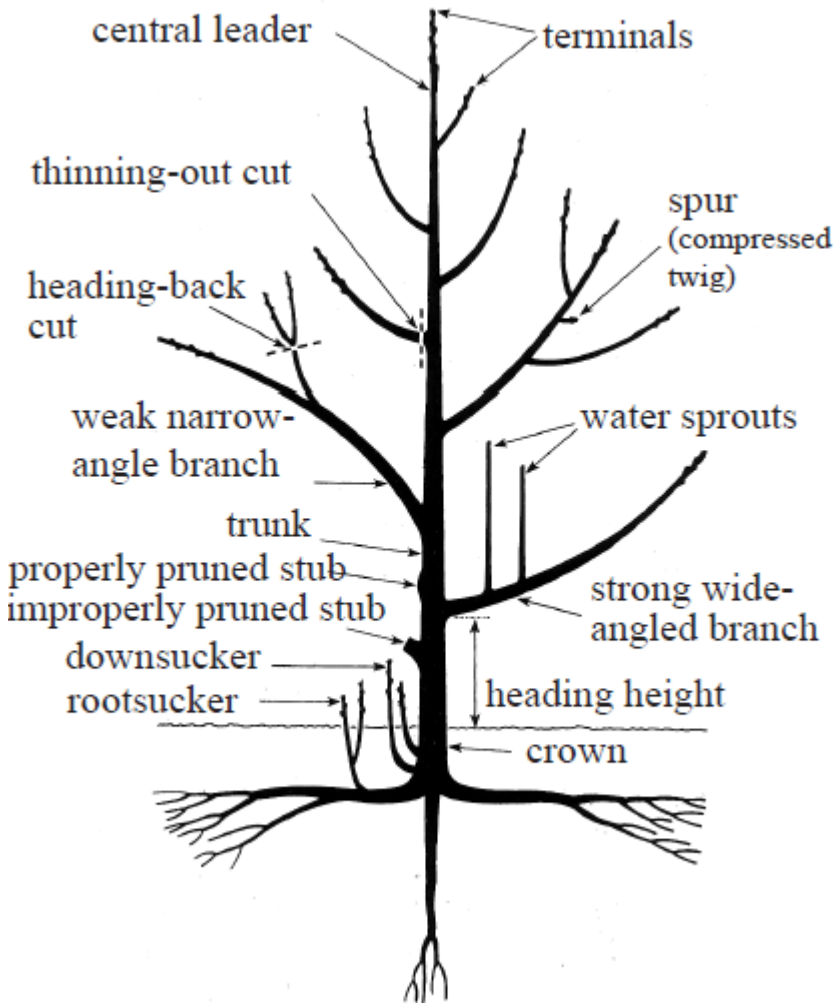
Adjust pH to between 6.0 and 6.5

Fruit Trees: Pruning

Purpose: to regulate growth, improve fruit size and quality, control tree size, reduce production costs, shape trees and repair damage

Done during dormant season, just before active growth to stimulate lateral bud development
Summer prune to help train young trees to shape and remove water sprouts

Thinning: removing excess fruit to improve size, color & quality of fruit



Terms used in fruit tree pruning

Photo credit: umd.edu

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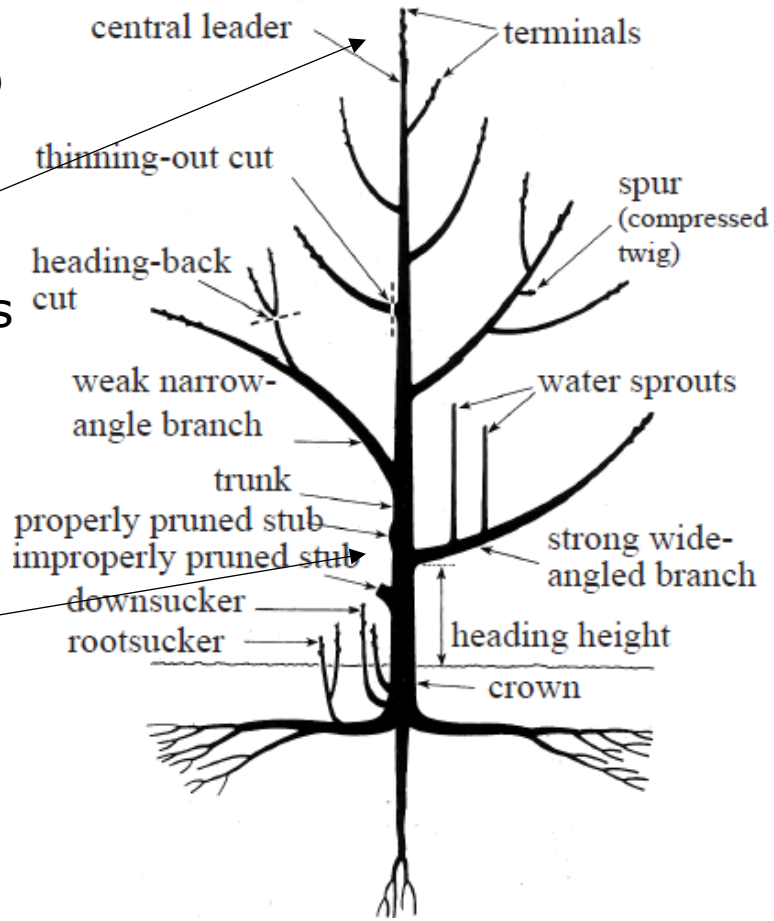
Young Fruit Tree Pruning

- It is easier to shape branches when trees are young than to prune larger branches later. Some low branches should be left for several years to protect bark from sun scald, add strength to the trunk and help produce food for the growing tree. They can be removed after 2-3 years
- Prune to shape young trees, but don't cut back the leader
- Remove crossing branches and branches that grow back towards the center of the tree
- Young trees often have too many branches and branches may grow upright. For greatest strength branches selected for permanent scaffolds should have a wide angle of attachment with the trunk. Branches with angles less than 30 degrees result in a higher percentage of breakage. Less vertical limbs tend to favor development of fruiting spurs. For more detailed information on pruning fruit trees, see Chapter 10 of the MG Handbook.



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Fruit Trees: Pruning

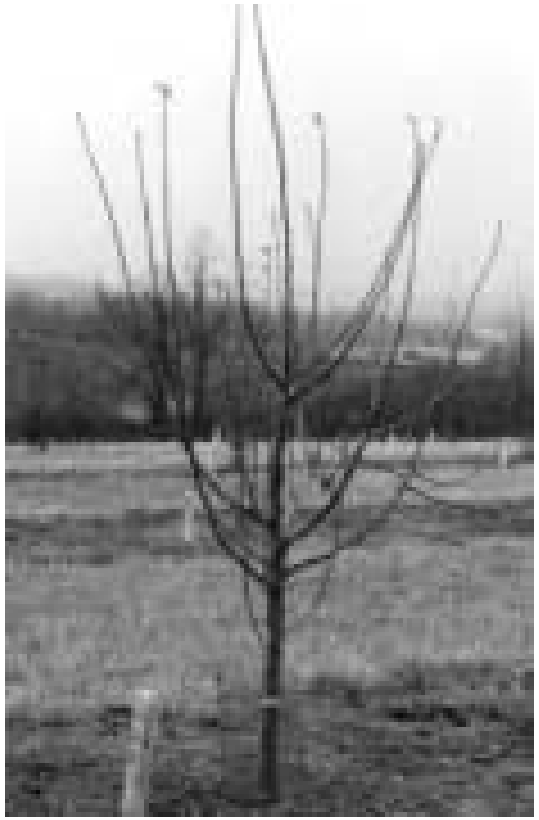


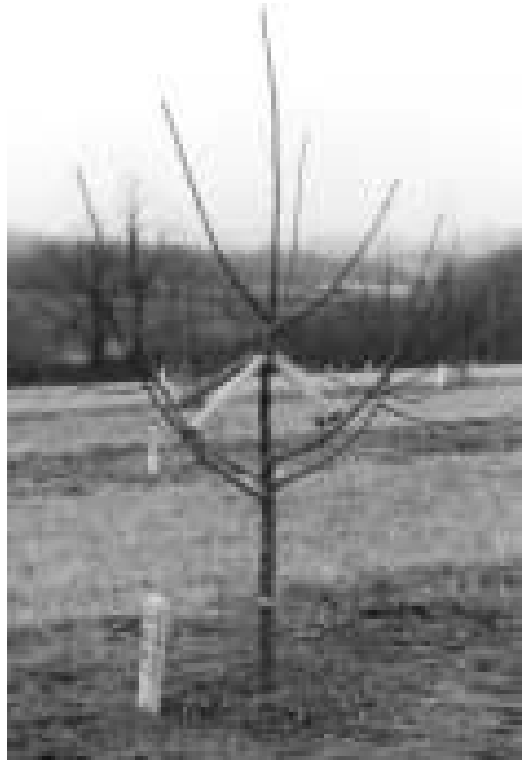
Photo credit: vt.edu

Two-year-old tree before (Left) and after (Right) dormant-season pruning.

Note the removal of low branches, heading of the leader and scaffolds and spreading of branches. Two layers have been developed in this tree.

Physiology of Pruning Fruit Trees

Video: Pruning Peach Tree



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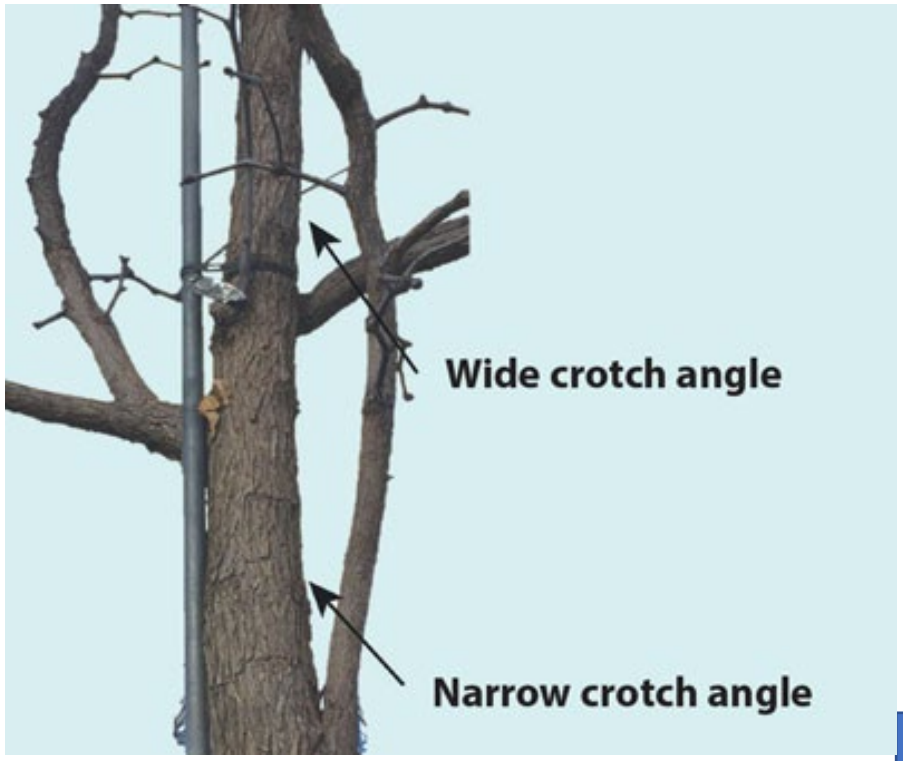
Fruit Trees: Limb Spreading

Should begin early as some cultivars naturally develop narrow crotch angles. A very upright limb produces trees that exhibit vegetative vigor (less fruit production). A limb orientation of 60 degrees is desired.

Photo credit: nmsu.edu



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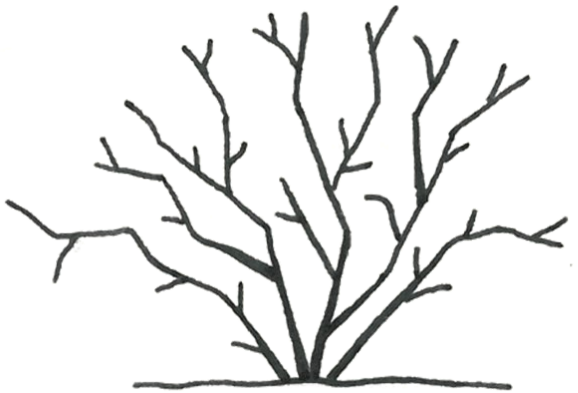
Fruit Trees: Pruning

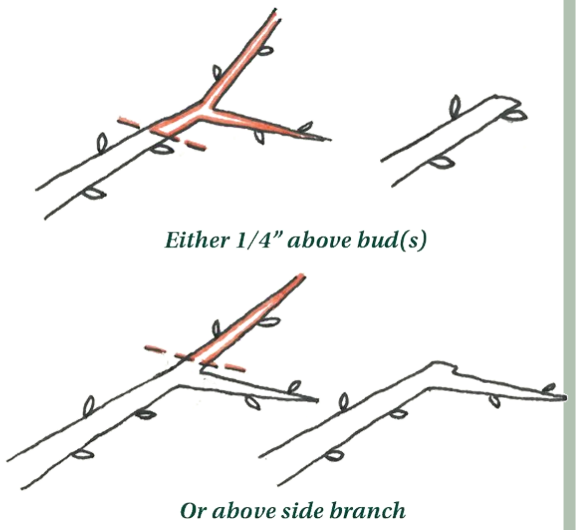
Two types of cuts:

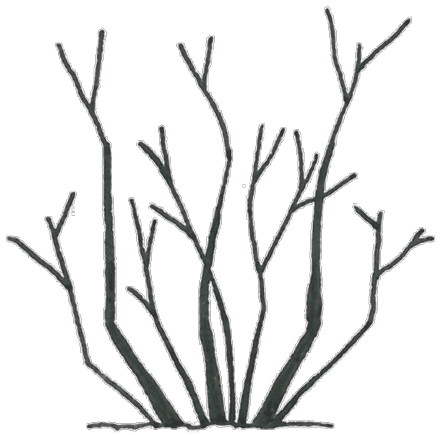
Heading back: control the way plants grow; cuts the terminal portion of branch or bud

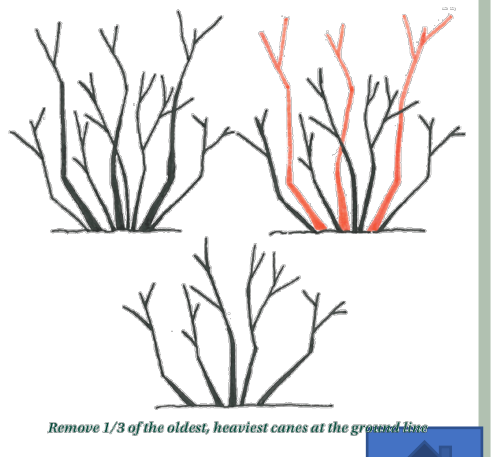
Thinning out: remove entire shoot or branch to improve light and redirect limb Thinning cuts reduce the canopy density but generally have little impact on height

Heading cut









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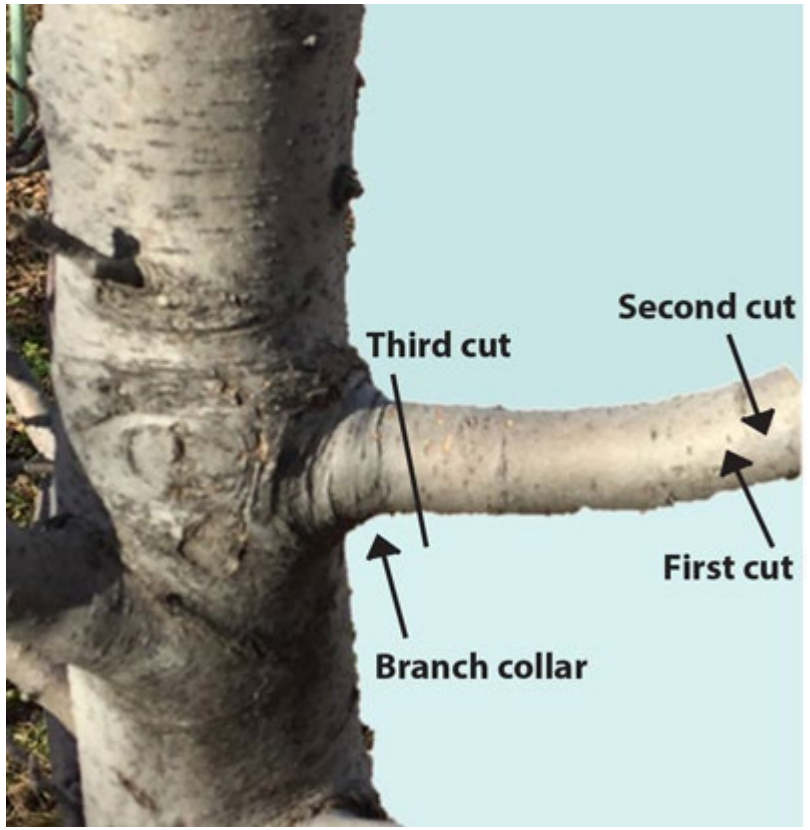
Fruit Tree: Pruning: Three step cut

Pruning limbs from a mature tree requires a three step approach:

1. Make an undercut a few inches from the trunk/ branch collar
2. Make the second cut just above the first cut
3. Make the third cut near the branch collar

The branch collar is the wrinkled, swollen area at the base of the branch that contains tissue that will become active and seal the cut wound.

[Pruning the Home Orchard]



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Fruit Trees: Harvesting

Fruit is best ripened on the tree-- except pear

- This is especially true of peaches, nectarines, plums and cherries
- Apple can be ripened off the tree but develop best color and flavor when tree ripened
- Pear will develop better flavor if picked before it is ripe (when color begins)

Fruit Trees: Pests

Rodents: Chew off bark

- Prevention: Keep mulch away from base of tree; mechanical guard (galvanized screen or hardware cloth); weed control
- Treatment: traps; poison bait

Fruit Trees: Apple

Common Insects

- Aphids
- Codling Moth
- Plum Curculio
- Leaf Roller
- San Jose Scale
- Mites*

- *Not an Insect

Common Diseases

- Apple Scab (most common)
- Powdery Mildew
- Apple Rust
- Black Rot
- Sooty Blotch & Fly Speck
- Fire Blight
- Boron Corking & Bitter Pit (Physiological)

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Fruit Trees: Peach (& Other stone fruits)

Common Insects

- Peach Tree Borer
- Oriental Fruit Moth
- Tarnished Plant Bug
- White Peach Scale

Common Diseases

- Blossom Blight
- Brown Rot
- Peach Scab
- Peach Yellows
- Black Knot

Major Insect Pests of Peach
Peach Insect Pests

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Fruit Trees: Insects & Diseases

Prevention: Good sanitation

Treatment: Spray program: proper time; spray thoroughly

PMG (www.ext.ve.edu, or www.ramga.org > Class) provides information on treatment for fruit tree insects and diseases

Figs

Not very hardy

- Plant in well protected sites
- Needs year old wood or older to fruit
- Protection of trunk with organic insulation has proven to be of benefit
- Brown Turkey & Celeste are recommended varieties

End of Slide Set

This is the end of the slides on Fruits.

You can continue to next slide:
'Suggested Readings'

OR

Click on the house below to return to the Navigation Page

Photo credit: P. Turner, EMG

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Small Fruit: Suggested Reading

Note: While there are many websites outside of our Virginia Cooperative Extension resources that have good information, that information may not be applicable for your geographic area. This is especially true regarding the life cycle and treatment times for insects.

Click on titles below to go to websites:

Small Fruits (2 pages) Multiple articles on different fruits

Pruning Blackberries, Raspberries, Gooseberries

Home Fruit Production: Grape Training Systems (8 pages)

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Tests of Knowledge

What do you know about Strawberries

What do you know about brambles?

What do you know about blueberries?

What do you know about grapes?

What do you know about Fruit Trees?

Help Desk Questions

Apply What you Have Learned

Use the PMG

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Apply What You Have Learned

1. If you raise strawberries, what kind do you grow and what kind of training system do you use? Why?
2. If you have fruits in your garden, what kind of pests have you identified on the fruit or plant in the past? What have you done about them?
3. If you have fruit trees on your property, which ones? Why did you choose these? What is the micro-environment in which they are planted?
4. Describe a place on your property which would be ideal for planting a fruit tree. Why is this spot ideal?

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What do you know about Strawberries?

Answers on next slide

1. Strawberry plants are set out dormant, after danger of frost. True? or False?
2. Strawberries should be planted: a) 4 inches deep; b) to the top of the leaves; c) with the crown above soil level.
3. If you have clay soil you should not fertilize strawberries: a) in the spring; b) in the fall; c) not at all
4. Everbearer strawberries are more productive than Junebearers. True? or False?
5. Strawberries should be picked partially ripe and allowed to ripen off the plant. True of False?

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What do you know about Strawberries?

1. Strawberry plants are set out dormant, after danger of frost. True? or False?
   False. While they are set out dormant, they are set out several weeks before the last frost.
2. Strawberries should be planted: a) 4 inches deep; b) to the top of the leaves; c) with the crown above soil level.
   c. With the crown above the soil level
3. If you have clay soil you should not fertilize strawberries: a) in the spring; b) in the fall; c) not at all
   a. Spring fertilizer may cause excess vegetation, reduced yield and increased rot.
4. Everbearer strawberries are more productive than Junebearers. True? or False?
   True
5. Strawberries should be picked partially ripe and allowed to ripen off the plant. True of False?
   False?

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What do you know about Grapes?

Answers on next slide

1. When pruning grapes, cut all canes to the ground. True or False?
2. A node on a grape vine produces only one cluster of grapes. True of False?
3. Grapes grow best at what pH range?
4. The roots of grapes are shallow. True or False?
5. A new grape plant should be pruned to a single cane and 2 buds. True or False?
6. To protect grapes from their many pests it is important to: a) establish a spray schedule before pests and diseases appear; b) wait until diseases and insects appear so you know what you are treating; c) use multiple insecticides and fungicides.

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What do you know about Grapes? Answers

1. When pruning grapes, cut all canes to the ground. True or False?

   False. Grapes produce fruit on year old canes

2. A node on a grape vine produces only one cluster of grapes. True of False?

   False. One node can produce from 1 to 3 clusters of grapes

3. Grapes grow best at what pH range? 6.0-6.8

4. The roots of grapes are shallow. True or False? False. The roots of grapes may be 6-8 foot deep

5. A new grape plant should be pruned to a single cane and 2 buds. True or False? True

6. To protect grapes from their many pests it is important to: a) establish a spray schedule before pests and diseases appear; b) wait until diseases and insects appear so you know what you are treating; c) use multiple insecticides and fungicides.

   a. To ***protect*** grapes, a spray schedule must be established before pests and diseases appear. ……. End of test…….

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What do you know about brambles?

Answers on next slide

1. Brambles grow best at what pH?
2. Why should brambles not be grown in soil where tomato, potato, or eggplant has grown in the past?
3. How deeply should brambles be planted?
4. Primocanes are two year old canes which bear fruit. True or False?
5. Blackberries & raspberries are susceptible to what diseases?
6. Red raspberries are somewhat tolerant to viral diseases. True or False

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What do you know about brambles? Answers

1. Brambles grow best at what pH? 5.8-6.5
2. Why should brambles not be grown in soil where tomato, potato, or eggplant has grown in the past?
   These plants tend to harbor Verticillium wilt which can stay in the soil for many years and infect the bramble
3. How deeply should brambles be planted?
   Crown should be planted 2 inches below the soil line
4. Primocanes are two year old canes which bear fruit. True or False?
   False. Primocanes are one year old canes and bear no fruit
5. Blackberries & raspberries are susceptible to what diseases?
   Anthracnose; Cane blight; Leaf Spot
6. Red raspberries are somewhat tolerant to viral diseases. True or False
   True

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What do you know about blueberries?

Answers on next slide

1. What is the ideal pH for growing blueberries?

2. Blueberries are shallow rooted and need good irrigation. True or False?

3. Blueberries grow well in our clayey soils True or False?

4. Pruning required for blueberries includes:

5. Blueberry plants reach full production in how many years?

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What do you know about blueberries? Answers

1. What is the ideal pH for growing blueberries?

   4.2-4.5

2. Blueberries are shallow rooted and need good irrigation. True or False?

   True

3. Blueberries grow well in our clayey soils True or False?

   False. They prefer sandy or loamy soil

4. Pruning required for blueberries includes:

   Renewal pruning and branch thinning

5. Blueberry plants reach full production in how many years?

   6 years … end of questions…..

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What do you know about fruit trees?

Answers on next slide

1. A disadvantage of dwarf fruit trees is:
2. The best age for a fruit tree to plant at home is?
3. What should you know about 'air drainage' when planting a new fruit tree?
4. The most important factor in site selection for planting fruit trees is:
5. Fruit trees are best planted dormant. True or False?
6. What depth should a fruit tree be planted?
7. The pH for planting most fruit trees is:

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What do you know about fruit trees? Answers

1. A disadvantage of dwarf fruit trees is: They may only live 5 years
2. The best age for a fruit tree to plant at home is? 1 year old
3. What should you know about 'air drainage' when planting a new fruit tree?

   Air drains downhill
4. The most important factor in site selection for planting fruit trees is: Water drainage
5. Fruit trees are best planted dormant. True or False? True
6. What depth should a fruit tree be planted?

   So root flare is visible above soil level; usually same as at nursery
7. The pH for planting most fruit trees is: 6.0-6.5

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Help Desk Questions Answers on next slide

1. Concord Grapes – when should you pick them?

2. Type of small fruit best for planting in their area: blueberries raspberries, etc.

3. 30 - 40 year old grape vine, declining in production last few years. What can they do to rejuvenate vine for next year.

4. I want to buy a dwarf apple tree that will grow only 7 or 8 foot tall; however, I read that 'dwarf' apple trees can grow anywhere from 7 to 18 foot tall. How can I find one that will not grow larger than 7 or 8 foot?

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Help Desk Questions Answers

1. Concord Grapes – when should you pick them?
   Answer: Best telltale sign of ripeness is to taste them. Fully ripe grapes are soft and tender - plump & well formed
2. Type of small fruit best for planting in their area: blueberries raspberries, etc.
   Answer: Small fruit in home garden 30 - 40 year old vine, declining in production last few years. What can they do to rejuvenate vine for next year.
   Answer: Get a soil test from VT and follow recommendations; Clean up / remove weeds around vines; Prune according to VT Small Fruit in the Home Garden recommendations
4. I want to buy a dwarf apple tree that will grow only 7 or 8 foot tall; however, I read that 'dwarf' apple trees can grow anywhere from 7 to 18 foot tall. How can I find one that will not grow larger than 7 or 8 foot?
   Answer: The rootstock determines the height of the tree. A Malling Merton (MM) 9 root stock produces the smallest tree, about 7-8 foot tall. Unfortunately, most apple trees offered to consumers that are labeled as dwarf do not tell you what rootstock was used. You can ask the seller if they know the kind of rootstock. Nurseries that graft their own trees would know this information.

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Use the PMG to answer the questions

- When do I spray grape vines to prevent black rot?
- What do I spray with?

- Instructions on next slide…. But try to answer using the PMG first.

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Use the PMG

- When do I spray grape vines to prevent black rot?
- What do I spray with?

- Go to the PMG Scroll down to fruit chapter
- The section on diseases and insects says that Mancozeb has ‘excellent’ effectiveness for black rot on grapes.
- The section on control says that for black rot, a spray of Mancozeb + Seven + Sulfur dust should be applied in the new shoot stage.

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