OHIO STATE UNIVERSITY EXTENSION

Backyard Fruit Production

Eric Barrett – OSU Extension

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COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

IPM

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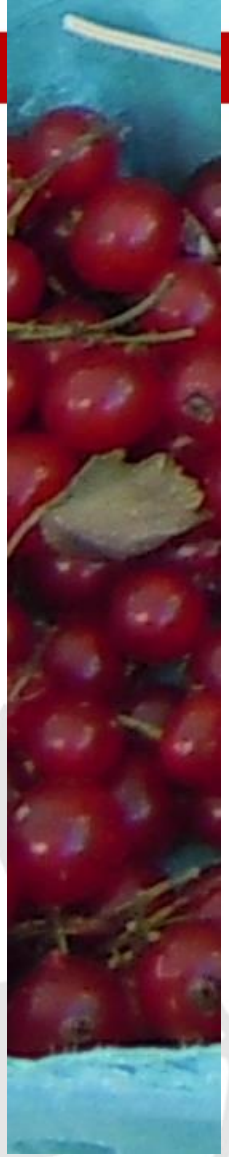
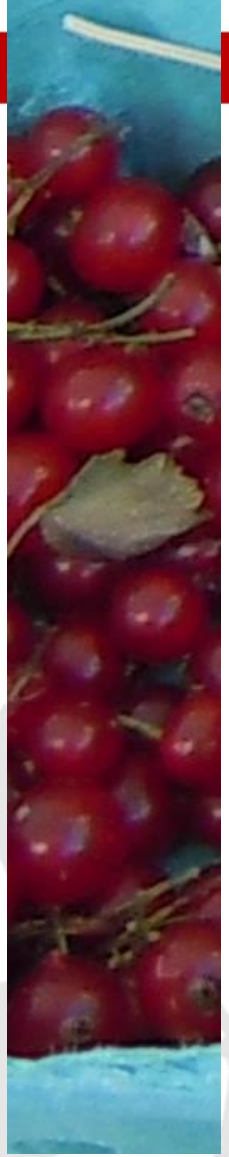


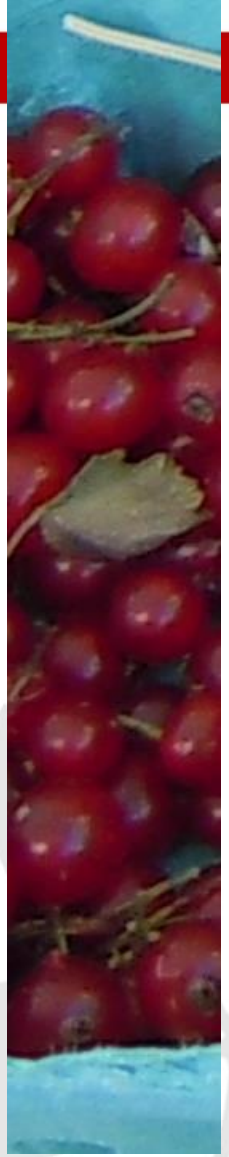
IPM

- What you do every day
- …just not always as well as you want to because of time
- …but…IPM can save you a lot of money down the road if done correctly!



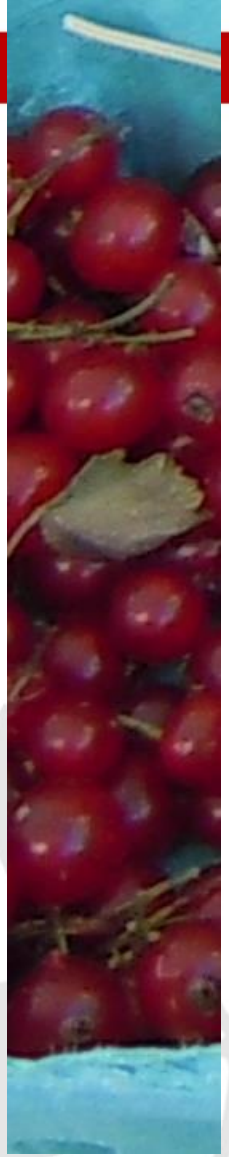
IPM

- Multiple strategies used to avoid economic damage to crops and to minimize environmental disturbance
  - ***cultural and mechanical*** *practices* to prevent pest outbreaks from developing
  - ***biological control*** to encourage the pest's natural enemies to survive and attack the pests
  - ***chemical control,*** which is usually used when cultural and biological controls are inadequate and a crop needs to be rescued from a damaging pest population.



IPM

1. Scout. Collect pest samples.
2. ID the pest causing damage.
3. Disease, Insect, Weed, Wildlife?
4. Use appropriate control measures directed at pest
5. “The label is the law.”
6. Avoid misuse - pest must be listed on label. (even on ‘organic’ chemicals)
7. Organic is possible! (just not always as rewarding)



IPM – PLAN before you plant

- Think about the basics
  - Location
  - Air circulation
  - Cultivar selection
  - Weed control
- Most Important
  - No wet roots!

Tree Fruit Production

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Pome Fruit

Apples & Pears

Dwarf varieties are easier to care for

Require regular care program

Planning & Selection

- Consider use, location, disease resistance, etc.
- Mature size is determined by the rootstock
- Consider pollinators!

Pome Fruit

- Planting
  - Full sun
  - Well drained soil, pH 5.5- 6.5
  - Plant in March/ April
  - Make sure the bud union is 2-3” above of soil lin
  - Water as needed
- Culture
  - Necessary!

Pome Fruit

- Fertilization
- Watering – necessary?
- Weed Control/ Mulching
  - Keep weeds out below canopy
  - Mulch 2-3 inches
- Pruning
  - Imperative to fruit production
  - Prune when dormant

Pome Fruit

- Thinning
  - Remove excess fruit by mid-June
  - Pears & Apples- 6”
  - You choose or Mother Nature chooses…
- Insects & Disease
  - The list is endless….
  - IPM!

Life on an orchard…

Calendar of Events of Apple (pome fruit) in Oklahoma.

Tree Growth Stages	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*
Dormant								
Silver tip								
Green tip								
Half-inch green								
Tight cluster								
Pink								
Full bloom								
Petal fall								
Fruit set								
Diseases								
Apple scab		P	O		S			
Powdery mildew		P	O		S			
Sooty blotch			P					
Bitter rot			P					
Black rot			P					
Fly speck			P					
Cedar apple rust			P					
Fireblight				P	S			
Insects								
San Jose scale	I		A		C		A	
Aphids				M				
European red mite	E		N		M			
Cankerworm	A	E		L				
Codling moth			A	L	P A	L	P A	L
Plum curculio			A	L	P A O	L	P A	
Leafrollers			L	P	A O	L	P A O	L
Two-spotted mite					M			

Diseases: Primary, Secondary, Overlap

Insects (predominant stage): Adult, Crawler, Larva, Mixed, Egg, Immature, Nymph, Overlap, Pupa

Tree Fruit Production

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Stone Fruit

- Tart cherries & plums- hardy
- Peaches, nectarines & apricots- challenging
- Dwarf varieties are easier to care for
- Require regular care program
- Planning & Selection
  - Consider use, location, disease resistance, etc.

Stone Fruit

- Thinning
  - Remove excess fruit by mid-June
  - Thin 4-6” apart for peaches
  - Thin 2-3” apart for plums
  - Apples- 6”
  - You choose or Mother Nature chooses…
- Insects & Disease
  - The list is endless….
  - Scout & spray!

Stone Fruit

- Varieties – page 20
- Pruning – different?

Small Fruit Production

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Raspberries

Raspberries *Rubus* sp. *(*subgenera *= idaeobatus)*

- Perennial herbaceous shrubs
- Biennial 1st year primocanes, 2nd year floricanes
- Trailing, semi-erect, and erect canes
- Thorny and thornless
- Perfect flowers, racemose and cymose
- Druplet = Aggragate fruit – united pistils

Raspberries

Raspberries (*Rubus* sp.) subgenera

idaeobatus

Red raspberry = *R. idaeus*

Black raspberry = *R. occidentalis*

Purple raspberry = black raspberry (female) X red raspberry (male)

Primocane and floricane fruiting

--Two crops per year! (Fall reds)

Raspberries

Planting

- Good quality plants, check crown and root system
- Spacing 2 ft. apart, 1ft. apart for some thornless varieties
- Remove all grass sod at least 2ft. from plants
- Deep till (if needed)
- Dig a hole big enough for root system
- Back fill with good top soil
- Apply complete fertilizer when finished
- Water in carefully

Raspberries

- Training systems, such as the V-trellis system, that maximize air circulation also are very important for control of fruit rots and cane diseases.
- Lime sulfur, the mainstay of traditional cane disease control programs, is available.
- Perhaps the way to keep fruit rots from spreading is simply to pick as often as possible, and to get rid of any fruits that are beginning to show signs of infection.
- Growing strawberries and raspberries ecologically is certainly possible, but it does require diligence.

Raspberries

Varieties

Red = Prelude, Latham, Nova, Caroline, Polana, Autumn Britton

Black = Bristol, Jewel, Mac Black

Yellow = Kiwigold, Anne

Purple = Royalty

Raspberries

Weed Management

Herbicides – Licensed for controlling broadleaves, grasses and sedges

- OSU Bulletin 506B "Midwest Commercial Small Fruit and Grape Spray Guide"
- Read and follow label directions
- Must be labeled for use around grapes

Natural Approach – Non-manufactured herbicides

- Bark mulch
- Newpaper
- Leaf much

Mechanical Approach – No chemical herbicides

- Pull and hoe weeds
- rototiller

Raspberries

Irrigation

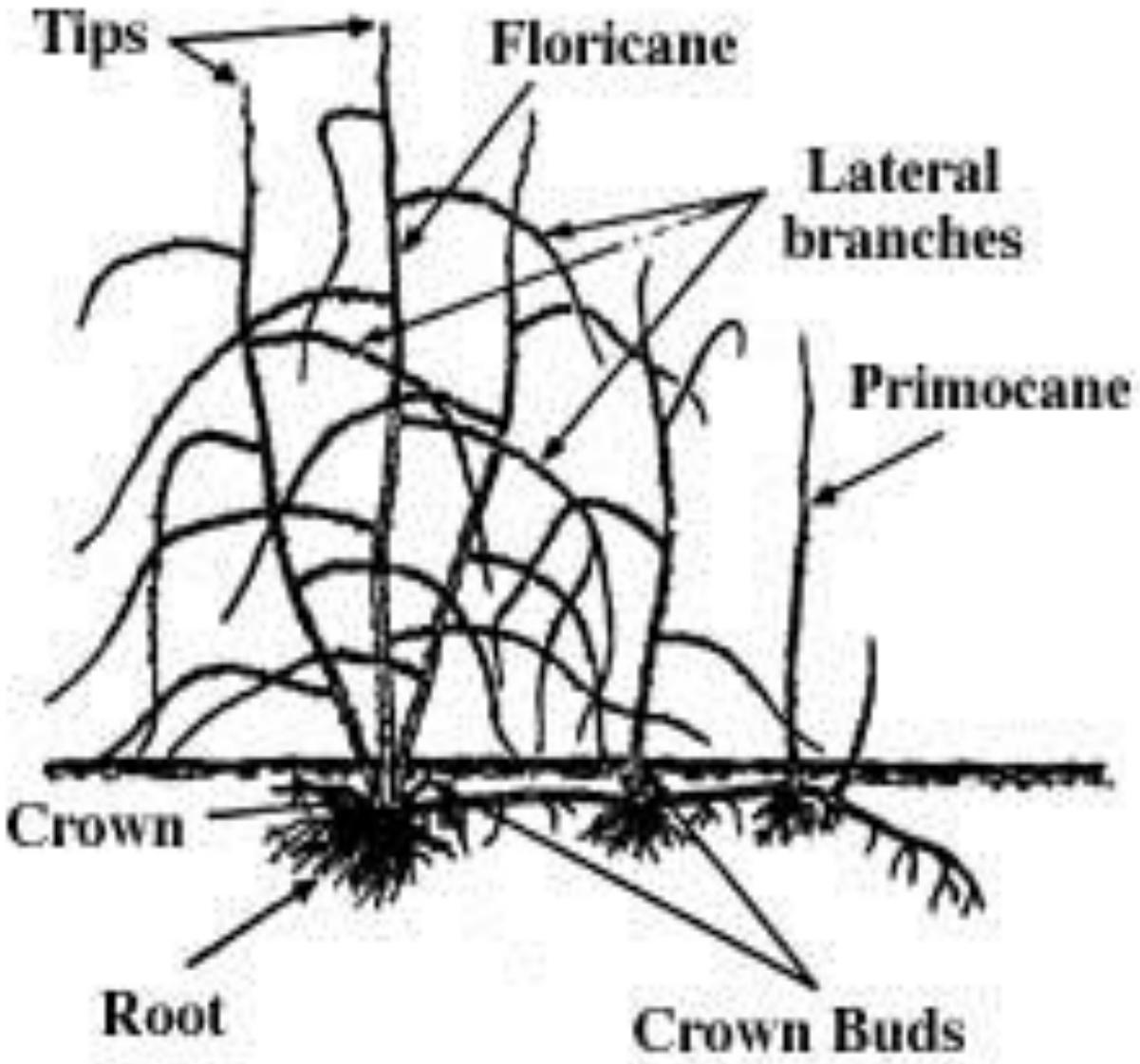
- Water as needed, avoid over watering
- Drip tape or tube – water slowly and directly to soil
- Water hose (spray wand) – water at the base of the plants
- Mulched plantings tend to hold soil moisture

Raspberries

- Fall-bearing raspberries (Primocane-fruiting raspberries)
- Canes are cut and removed annually, certain cane disease fungi and insect pests do not become well established in the planting.
- Heavy rates of manure can be used to provide nitrogen since winter injury is not a problem when overwintering canes are removed.

Raspberries

Pruning



In March or early April, remove all of the small, weak canes, leaving only four or five of the largest, most vigorous canes per clump or plant. Cut back the lateral branches to 12 inches in length for black raspberries and 18 inches for purple raspberries.

Spring pruning of black and purple raspberries

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Blackberries

Genus: Rubus

Subgenus: Eubatus

Erect: thorny and thornless

Trailing: trellis

Blackberries

planting

- Moist, well-drained soils
- Not adapted to areas with extreme cold
- Must be well mulched (6-8 inches) to protect crowns

Blackberries

Varieties

Thornless

Arapaho, Navaho, Triple Crown, Chester

Thorny

Cherokee, Eldorado, Shawnee, Darrow

Blackberries

Blackberry Planting Maintenance

- Irrigation – drip tape, garden hose
- Fertilize – Ammonium sulfate (12-12-12)
- Prune – Remove old floricanes
- Tip back - primocanes and lateral shoots
- Eliminate - broken or diseased canes
- Mulch - hardwood 2” (not walnut)

Blackberries

Blackberries – Weed Management

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Blackberries

Blackberries – Irrigation

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Strawberries

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Strawberries

- Strawberry plants are day length sensitive. Bloom and fruit set is variety dependent.
  - Photoperiod (length of uninterrupted darkness)
  - Short day plants flower in response to long periods of night darkness. (poinsettias, Christmas cactus, chrysanthemums, and single-crop strawberries)
  - Long day plants flower in response to short periods of night darkness. (onions and spinach)
  - Day neutral plants flower without regard to the length of the night, but typically flower earlier and more profusely under long daylight regimes. Day neutral strawberries provide summer long harvesting (except during heat extremes).

Strawberries

- Earliglow
- Honeoye
- Ozark Beauty
- Guardian
- Surecrop
- Redchief
- Tristar (day neutral)
- Tribute (day neutral)
- Jewel
- Allstar
- Sparkle
- Cavendish
- Darselect

Strawberries

- Variety Selection
  - Many varieties being used for plasticulture are not suited for multi-season plantings
  - Disease control is too difficult
  - Yields will be generally poor
  - Virginia research says they always have disasters after third season with plants
    - http://pubs.ext.vt.edu/2906/2906-1320/2906-1320.html

Strawberries

Strawberry (*Frugaria virginiana X F. chiloensis*)

- Bare roots; potted plants
- Matted-row system
- Plasticulture
- Hilled beds
- Crown placement
- Spacing
- Mulch – plastic, straw, etc.

Strawberries

Strawberry Irrigation

- Water as needed, avoid over watering
- Drip tape or tube – water slowly and directly to soil
- Water hose (spray wand) – water at the base of the plants
- Overhead sprinkler (mist) – frost protection

Strawberries & Raspberries

- More difficult using ecological methods.
- Both have high nitrogen requirements, yet raspberries are sensitive to winter injury if nitrogen is available too late in season.
- Virtually all important root and leaf diseases of strawberries (except black root rot) can be controlled by planting resistant cultivars. But, not for fruit rots.
- To minimize fruit rot losses without fungicides, concentrate on horticultural practices that maximize air movement (drying) within the fruiting zone (e.g., raised beds, narrow rows, and good weed control).
- An excellent mulching program after runner establishment will provide control of leather rot, in addition to suppressing weed growth.

Strawberries

Strawberries – Weed Management

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Strawberries

Strawberry Renovation

- Cut back plants (narrow up beds)
- Mow off old leaves
- New runners (daughter plants)
- Apply complete fertilizer (12-12-12)
- Irrigate as needed (drip or overhead)

Ribes

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Small Fruit Production

Ribes - Growth Habit

- Perennial, woody shrubs
- 3-5 ft. tall
- Canes – Vegetative and flower buds
- Terminal buds – apical dominance (hormone regulation)
- Thorny – Gooseberries (range from very spiny to smooth)
- Thornless – Currants, Jostaberries
- Early bud break – spring frost concerns
- Chilling requirements = 800-1600 hours (32 – 45^{o}F)
- Adapted to northern climate (commonly grown in Canada)

Small Fruit Production

Ribes

Gooseberries (Ribes sp.)

Currants (Ribes sp.)

and

Jostaberries (Gooseberries X Red Currants)

Small Fruit Production

Ribes - Growth Habit

- Perfect flowers (male and female parts)
- Self fertile = red and white currants
- Partial or self fertile = black currants
- Racemes = strigs =red/white currants; black are shorter
- Small clusters = singly (gooseberries and jostaberries)
- Fruit = berries

Small Fruit Production

Ribes – Pruning

Why do we prune?

1. Train *Ribes* plants into individual bushes
2. Black currants are sometimes trained into hedges
3. Rejuvenate plant
4. Maintain plant size and shape
5. Enhance fruit production
6. Improve fruit size and quality
7. Balance vegetation and crop load

Small Fruit Production

Ribes – Pruning

1. Remove broken or diseased canes
2. Remove old canes
3. Promote sunlight penetration
4. Increase air movement
5. Promote new cane growth

Small Fruit Production

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Blueberry

(*Vaccinium corymbosom*)

- High bush height = 5 to 23ft.
- Flower buds on terminal end of shoot
- Flower buds are spherical in shape
- Completely developed by late fall
- 800 hours of winter chilling
- Epigynous flower on racheme
- Flowers are urn shaped and inverted

Blueberry

Planting

Quality plants

Good fibrous root system

Acidify soil as needed (pH = 4.8 – 5.2)

Water in carefully

Mulch in plants (6-8 inches)

Apply a complete fertilizer

Blueberry

High Bush Varieties

- Bluecrop
- Blueray
- Elliott
- Duke
- Spartan
- Patriot
- Darrow
- Coville
- Toro

Blueberry

Pruning

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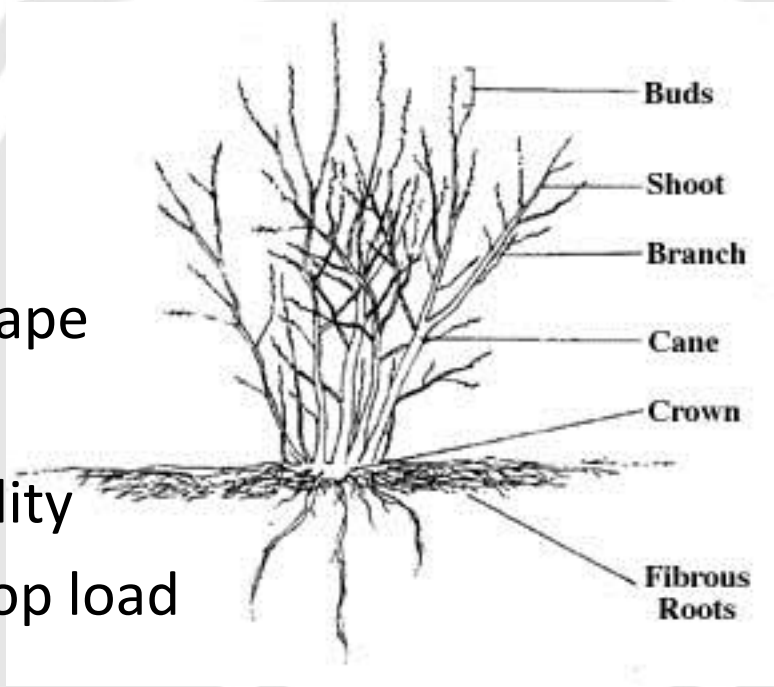

Blueberry

Pruning

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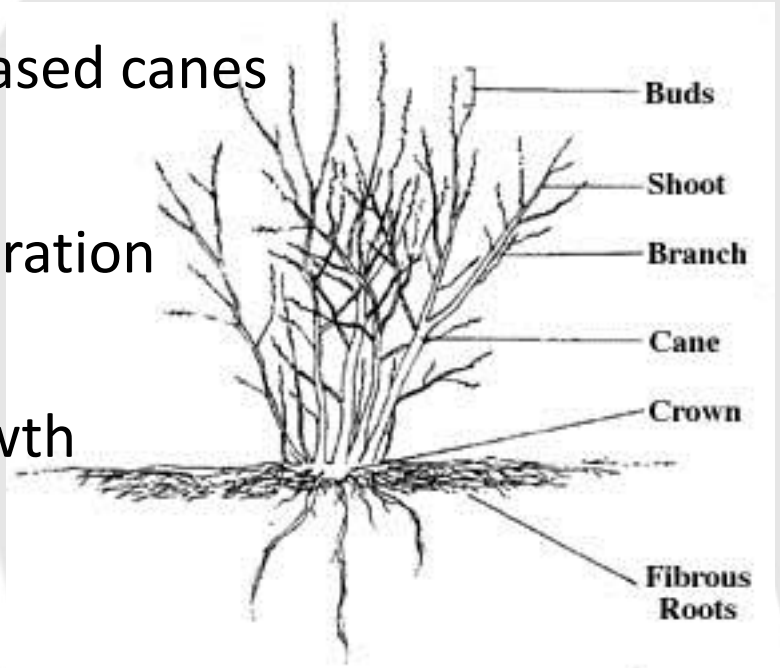


Blueberry

Soil Testing

- Soil test should be conducted to determine nutrient levels
- Follow soil test results to determine necessary soil amendments
- Sample soil in a random pattern (i.e., X, Z or Zig Zag)
- 0 to 8 inches deep
- Sub-samples should be deposited into a clean plastic bucket
- Mixed sample should be placed in a soil test sample bag
- Bag should be labeled with name of person, location and date
- OSU Extension offices have a list of Soil Testing Laboratories

Blueberry

Soil Fertility

- Soil test to determine if the pH is in the 4.8 to 5.2 range
- Amend with elemental sulfur to raise soil acidity (lower pH)
- Soil test should be conducted to determine nutrient levels
- Amend with complete (or specially blended) fertilizer
- Amend with Nitrogen (only) if all other nutrient elements are adequate
- Fertilizer – Ammonium sulfate (21-0-0)-23 (23% sulfur)

Plant Tissue Analysis

- Leaf tissue analysis is used to determine nutrient levels in plants
- Detect elemental deficiencies
- Detect toxic levels of an element

Blueberry

Blueberries – Weed Management

1. Grasses
2. Broadleaves
3. Sedges

- Perennials
- Annuals (Winter and Summer)
- Pre-emergent
- Post-emergent
- Pre-harvest Index (PHI) – specific manufactured herbicides

Blueberry

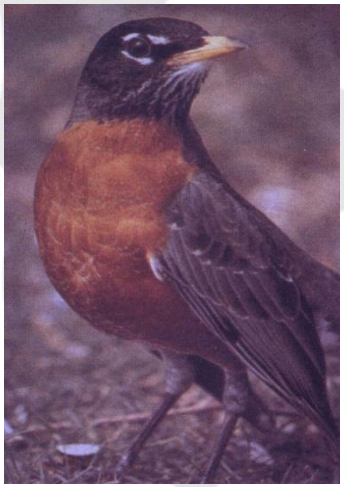
Irrigation

- Water as needed, avoid over watering (They must be high and dry, but watered 1” per week)
- Drip tape or tube – water slowly and directly to soil
- Water hose (spray wand) – water at the root zone

Blueberry

Birds

- Bird depredation – major problem
- Damage occurs as fruit colors and becomes ripe
- Bird netting, scare devices, mylar tape



Small Fruit Production

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Grapes

- Site & Prep
  - 1-yr old plants will produce in 3 years
  - pH of 5.5 - 6.5
  - Soil test
  - FULL sun
  - Watch out for frost pockets
- Trellising
  - Install trellis before the grapes…
  - Several methods
    - Single curtain, 4-arm kniffin, Umbrella kniffin
  - Arbors

Grapes

- Planting
  - Should be planted 3-4 wks before last frost
  - Dormant plants- soak
  - Plant 8 ft apart (arbor- 4 feet)
  - North-South orientation
  - Trim all but best cane
  - Watch the suckers
  - 8 oz of 10-10-10 a week after planting
- Fertilization
  - Apply after first year and third year
  - 6”- 12” from the trunk
  - Soil test!

Grapes

- Weed Control
  - Weed free zone 1-2 feet around plant
  - Read the herbicide label!
- Pruning
  - Important for production
  - Prune in late-winter (late Feb.- early March)
  - Pruning terms
- Insects & Disease
  - Bulletin 780- Controlling Disease & Insects in Home Fruit Plantings

Extension Resources

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Small Fruit Production

Publications

Midwest Grape Production Guide
(OSU Extension Bulletin 919)

Midwest Strawberry Production Guide
(OSU Extension Bulletin 926)

Midwest Small Fruit Pest Management Handbook
(OSU Extension Bulletin 861)

Brambles – Production, Management and Marketing
(OSU Extension Bulletin 782)

Controlling Diseases and Insects in the Home Planting
(OSU Extension Bulletin 780)

Midwest Commercial Small Fruit and Grape Spray Guide 2006
(OSU Extension Bulletin 506B2)

Fertilizing Fruit Crops
(OSU Extension Bulletin 458)

Small Fruit Production

Publications

Small Fruit Crop Management. 1990. (Editors) Gene J. Galletta and David G. Himelrick, Prentice Hall, Englewood, New Jersey. ISBN: 0-13-814609-8.

Insect and Mite Pests of Grapes in Ohio

(OSU Extension Bulletin 730)

Disease Management Guidelines for Organic Grape Production in the Midwest

(OSU Plant Pathology Department Series 121)

Disease Management Guidelines for Organic Strawberry Production in the Midwest

(OSU Plant Pathology Department Series 122)

Disease Management Guidelines for Organic Bramble Production in the Midwest

(OSU Plant Pathology Department Series 123)

OSU Extension Fact Sheets Ohioline: http://ohioline.osu.edu/