Small Fruit in the Home Garden

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Agenda

• Introduction
• Grapes
• Blueberries
• Strawberries
• Raspberries/Blackberries

Small Fruit Production

• Considerations:
  — Bearing age and longevity

<table>
<thead>
<tr>
<th>Crop</th>
<th>Bearing Age (yrs.)</th>
<th>Longevity (yrs.)</th>
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<tr>
<td>Blueberry</td>
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<td>20-30</td>
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<tr>
<td>Blackberry</td>
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<td>Raspberry</td>
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<td>Strawberry</td>
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<td>Gooseberry</td>
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<td>Currant</td>
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<tr>
<td>Grape</td>
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Grapes

• Advantages
  — Low availability of local table grapes

• Disadvantages
  — Disease Management
  — Time to Bearing Age
  — Establishment Costs
  — Early Flowering
Glossary

- Cane – A mature, woody, brown shoot that develops after leaf fall
- Cordon – An extension of the grapevine trunk, oriented horizontally along the fruiting wire
- Curtain – The portion of the canopy that contains the current year’s growth
- Fruiting Wood – One year-old wood (cane) that produces the current year’s crop

Source: Midwest Grape Production Guide – The Ohio State University Extension

Vineyard Trellis Systems

- Single Curtain Bilateral Cordon
- Geneva Double Curtain (GDC)
- Vertical Shoot Position (VSP)
  - Smart-Dyson
  - Ballerina

Source: Midwest Grape Production Guide – The Ohio State University Extension

Glossary

- Node – The thickened portion of a shoot or cane where the leaf and compound bud are
- Shoot – The green, leafy growth (this year’s growth) that may arise from a count bud or elsewhere
- Spur – A cane on the cordon pruned to 1 or 2 nodes for shoot/fruit production in current year (contains the count buds)
- Trunk – The main, upright structure of the vine from which the cordons arise.

Source: Midwest Grape Production Guide – The Ohio State University Extension
Single Curtain Bilateral Cordon

- More expensive
- Best system for high vigor situations
- Can increase yields by ~50% compared to single curtain
- Not as well-suited for mechanical harvest

Geneva Double Curtain

Geneva Double Curtain Vertical Shoot Position (VSP)

- Well-suited for upright-growing cultivars
- More expensive
- Best suited for low vigor situations
- Can require more intensive canopy management
- Can be altered to Ballerina or Smart-Dyson

Vertical Shoot Position (VSP)
Ballerina

Planting Year
- Prune top growth to 2-3 buds after planting
- Train 2 shoots along a training wire to the cordon wire.
- Send shoots out along the cordon wire and tip when they reach the desired length.
- If shoots do not reach the cordon wire in the planting year, prune back to 2-3 buds before year 2.

Canopy Management Goals
- Put vegetative vigor in check
- Improve sun exposure to fruit, foliage, renewal buds
- Increase airflow to reduce disease pressure
- Improve effectiveness of spray applications
- Facilitate harvest and dormant pruning
- Promote ripening and increase fruit quality
- Reduce crop variability
- Balance vine growth

Smart-Dyson

Grapevine Management Techniques
- Dormant Pruning
  - Identifies the location and number of buds (count buds) to be retained for producing the upcoming season’s growth.
- Sucker Removal
  - Shoots that originate at ground level
  - Can retain suckers if winter injury has occurred or for trunk renewal
  - Best done when suckers are <6 inches long

Grapevine Management Techniques
- Water Sprout Removal
  - Shoots that originate from the trunk
  - Typical sign of excessive vigor
  - May be retained for cordon renewal, although typically not recommended
- Shoot Removal
  - Removing undesirable shoots
    - Basal Shoots (non-count bud shoots)
    - Non-fruiting shoots (count bud shoots)
Grapevine Management Techniques

• Cluster Thinning
  – Removal of all clusters during establishment years
  – Removal of excessive clusters during fruiting years
  • Prevents overcropping which can lead to:
    – Decreased vigor
    – Increased winter injury
    – Decreased fruit quality
  – Can be done prior to bloom when poor fruit set is expected (not recommended for tight cluster varieties)
  – More commonly done within 2 weeks of berry set

Cluster Thinning

• Rules of Thumb
  – Remove all clusters from shoots less than 12” long.
  – Leave one cluster per shoot for shoots 12-24” long.
  – Leave two clusters per shoot for shoots more than 24” long.
  – Remove small or poorly pollinated clusters
  – Remove late emerging clusters that probably will not ripen
• “Green Harvest”
  – Done at veraison
  – Leaving a heavy crop from bloom to veraison can reduce growth of vigorous plants

Grapevine Management Techniques

• Shoot Positioning
  – “Combing” increases airflow and sunlight penetration into the canopy
  – Makes dormant pruning much easier
  – Should be done early in the season when shoots are pliable
• Lateral Removal
  – Removing shoots that arise on fruiting canes near the fruiting zone
  – Completed after bloom, prior to veraison

Grapevine Management Techniques

• Leaf Removal
  – Should be done after fruit set (same as cluster thinning) and again before veraison
  – Leaf removal later in the season typically results in sunburn of fruit
  – Typically done on the shade side (East side of N-S rows, North side of E-W rows)
  – Some leaf removal on the sun side of rows can be done on particularly dense canopies
  – Goal – Expose fruit to sun, increase air flow to decrease wet periods, increase effectiveness of sprays

Additional Resources

• Sunlight into Wine
  – Book on vineyard trellis systems and canopy mgmt.
• Midwest Small Fruit and Grape Spray Guide
  – http://ohioline.osu.edu/b919/index.html
• A Pocket Guide for Grape IPM Scouting in the North Central and Eastern United States
  – http://www.ipm.msu.edu/GrapePocket.htm
Blueberries

**Advantages:**
- Hardy, long lived plants
- Consistent production
- Fruit is less perishable and may be stored for short periods of time
- Reduced pest management
- Early Flowering

**Disadvantages:**
- Specific soil requirements
- Bird management
- Fertility management
- Substantial initial investment
- Waiting period before production

Introduction

**Challenges facing blueberry growers in our area**
- Marginally suitable soils
  - High pH: 5.5-7.0
  - Low organic matter: <3%
  - High calcium content
  - Poor drainage, impervious soil layers
- Lack of ideally suited cultivars
- Climate

Site Selection

**Full sun is important**
- Choose a site that is well drained – air drainage, water drainage
- Locate away from trees, especially walnut trees – at least 60 feet
- Locate near a water source
- Previous use of the site
Site Selection

- Percolation test is valuable
- Observation of soil profile is valuable

Site Modification

- Soil pH modification
  - Soil test critical – accurate pH measurement
  - Modifying soil pH
    - Elemental sulfur in advance of planting
    - Iron sulfate in advance of planting
    - 6 months in advance of planting
    - Retest and apply additional sulfur if needed

Site Modification

- Soil organic matter modification
  - Green manure and cover crops
  - Organic matter additions before planting
  - Peat moss additions at planting
  - Mulches after planting

Site Modification

- Provisions for soil drainage
  - Subsoiling
  - Bering
  - Surface drainage
  - Other approaches
  - Disease issues

Cultivar Selection

- Ideal cultivar for our area
  - Adapted to mineral soils
  - Productive
  - Large, firm berries
  - Hardy
  - Disease resistant
Cultivar Selection

• **Recommended cultivars (highbush)**
  - Early season
    • Duke
    • Nui (T)
  - Midseason
    • Berkeley
    • Bluecrop
    • Blueray
    • Brigitta (T)
    • Legacy (T) (SH)
    • Reka (T)
  - Late season
    • Chandler
    • Coville
    • Darrow
    • Jersey
    • Lateblue
    • Nelson (T)

• **Late season**
  • Chandler
  • Coville
  • Darrow
  • Jersey
  • Lateblue
  • Nelson (T)

Cultivar Selection

• **Cultivars to avoid**
  - Spartan – sensitive to high pH
  - Bluetta – susceptible to stem blight
  - Patriot – blooms early

Production Practices

• **Consider growth habit**
  - Upright growth habit
    • Remove older center canes to open up bush
    • Bluecrop, Collins, Lateblue, Elliot, Reka, Duke, Legacy, Nelson
  - Spreading growth habit
    • Prune to upright growth
    • Blueray, Berkeley, Coville, Patriot, Nui, Summit, Toro, Chandler

Production Practices

• **Planting**
  - Nursery stock
    • One year (BR or container)
    • Two year (BR or container)
    • Three year (BR or container)

  1 gallon container plant
  1 year, 2 year, and 3 year BR plants

Production Practices

• **Water management**
  - Irrigation is critical
  - Trickle irrigation widely accepted

Production Practices

• **Spacing**
  - Spacing between rows: 10-12 feet
  - Spacing between plants: 3-4 feet
Production Practices

- Fertility management
  - Split N applications common
    - dry timing - blossom, 6 weeks, 12 weeks
    - injected - divide total into weekly applications
    - combination of dry and injected
  - other nutrients - as indicated by foliar test
    - Foliar applications of secondary and micronutrients practiced, especially iron

Production Practices

- Understanding the plant – age of canes

Production Practices

- Understanding the plant - fruit buds and cane age

Production Practices

- Pruning young blueberry plants -
  - Year 1-2
    - Minimal pruning
    - Remove weak twiggy growth
    - Remove damaged or diseased wood
    - Remove flower buds

Production Practices

- Pruning - Year 3 - 5
  - Minimal pruning
  - Remove weak twiggy growth
  - Remove damaged or diseased wood
  - Allow a small crop in year 3 (0.5-1 pint/bush), gradually increase crop in year 4-5

Production Practices

- Remove damaged or diseased wood
Production Practices

• Pruning mature blueberry plants
• Goals:
  – Maximize yield
  – Maximize fruit size and quality
  – Encourage consistent cropping
  – Position the fruiting zone
  – Manage diseases

Production Practices

• Pruning mature blueberry plants
  – remove 20% of the oldest canes each year (usually 1-2 canes)
  – Remove weak growth at the base of the plant
  – Thin out the interior of the bush
  – Thin flower buds if needed

Production Practices

• Mulching
  – Benefits
    • Moderate soil temperature
    • Moderate soil water
    • Weed control
    • Organic matter
  – Organic mulches used
  – Mixtures of coarse and fine particles
  – Replenish regularly

Production Practices

• Bird Management
  – Scare tactics
  – Netting

Production Practices

• Blueberry diseases
  – Stem blight
  – Phomopsis stem canker
  – Anthracnose
  – Phytophthora root rot
  – Other diseases

Production Practices

• Disease management
  – Plant on raised ridges or berms
  – Prune out diseased tissue – remember sanitation
  – Fungicide programs
Conclusion

• Growing blueberries in our region is a challenge!
• Select an suitable site
• Proper cultivar selection is critical
• Cultural practices are important
  – Water management
  – Fertility management
  – Soil pH management
  – Mulching

Strawberries

• Advantages:
  – Strong Demand for Crop
  – Younger Bearing Age
  – Reduced Pest Management

Strawberry

• June-Bearing
  – Matted Row
  – Annual Plasticulture
• Everbearing
• Day-Neutral

Strawberry

• Disadvantages:
  – Plants and Fruit are susceptible to environmental issues
  – Plantings are short lived
  – Weed management
  – Vertebrate pest management

Defining Classifications

• June Bearing strawberries produce one flush of flowers/fruit. Fruit is typically available for 2-3 weeks, ranging from late May-late June.
• Everbearing strawberries actually produce a good sized crop in the spring and a small crop in the fall
• Day-Neutral strawberries can produce flower buds and fruit can be harvested every 6 weeks or so. But, since they do not flower when temps are above 85, they operate much like Everbearing cultivars
More on Classifications

- All strawberries should be planted in spring, as soon as soil can be worked.
- June Bearing varieties will produce a crop in about 13 months. There are many varieties to choose from. All flowers should be removed in year 1.
- Day-Neutral and Everbearing varieties should have all flowers removed until the 4th of July of the planting year. Expect a small crop in the fall of year 1. Look for Ogallala and Ozark Beauty (Everbearing) and Tribute and Tristar (Day-Neutral).

Site Selection

- Full Sun
- Good surface and internal drainage
- 5% Organic Matter

Productivity

- Expect ~1 Qt./plant (plus it’s daughter plants)
- Matted Row systems should provide optimum production for 3 seasons
  - Important to purchase new plants
  - Don’t dig up from a friend’s patch

Planting

- Traditional bed design
  - Planted on level ground
  - Rows 48 inches apart
  - Plants spaced 30-36” apart
  - Fruiting bed is wide – up to 24 inches

Year 1 Maintenance

- Cultivate, Cultivate, Cultivate
  - The first 6 weeks are the most important
  - Good for weed removal and loosening up soil for runners to root easily
- Remove all blossoms
  - End this practice beginning in July for Everbearing and Day-Neutral cultivars
- Train runners into row
- Irrigate (1”/Week)
- Apply mulch in fall after a few days in the 20s
Spring Care

• Determine when to remove mulch by monitoring leaf color as days warm up
  – When you begin to see yellowing, rake the mulch into the row middles, but leave a scattered layer on the plants.
  – If a frost is expected, replace the mulch onto the plants.
  – Always protect plants from frost (even when flowering), just remember to remove the mulch during the day.
• Harvest daily when berries begin to ripen

Renovating the Bed

• After harvest, renovate the bed by following these steps:
  – Remove weeds from row middles
  – Mow old tops off of the plants (set the mower blade to remove foliage without hitting the crown)
  – Rototill each established row to a row of plants
  – Fertilize
  – Irrigate

Brambles

• Blackberries:
  – Upright Blackberries
  – Semi-Erect Blackberries
  – Primocane Blackberries
• Raspberries:
  – Black Raspberries
  – Primocane Red and Yellow Raspberries
  – Floricane Red Raspberries

• Advantages:
  – Strong Market Demand
  – Younger Bearing Age
  – Reduced Disease Management
Brambles

• Disadvantages:
  – Plants and Crops are vulnerable to environmental issues
  – Plantings are short-lived
  – Perishable fruit

Introduction

• What is a bramble?
• Raspberry vs blackberry
• Primocane vs florican

Recommended Primocane Raspberry Cultivars

• Red Primocane Raspberries
  – Caroline
  – Heritage
  – Josephine
  – Polana
  – Autumn Bliss
  – Autumn Britten
• Yellow Primocane Raspberries
  – Anne
  – Kiwigold

Recommended Floricane Red Raspberry Cultivars

• Prelude
• Lauren
• Revielle
• Nova
• Canby
• Titan
• Harvest: late May to July

Recommended Floricane Black Raspberry Cultivars

• Bristol, Jewel
  – Harvest:
    • Bristol – 6/9-6/30
    • Jewel – 6/13-6/30
  – Avg berry size: 1.5-2.0 g/berry
  – Yield: 1500-1700 lbs/acre

Primocane Black Raspberries?

• "Explorer" primocane black raspberry
Recommended Erect Blackberry Cultivars

- Thorny
  - Choctaw
  - Shawnee
  - Chickasaw
  - Kiowa

Recommended Erect Blackberry Cultivars

- Thornless
  - Arapaho
  - Natchez
  - Ouachita
  - Apache
  - Navaho

Prime-Jim, Prime-Jan (thorny)

- University of Arkansas: 2004
- Harvest
  - Floricane – late June
  - Primocane – late July
- Avg Berry Size
  - Floricane – 5 g
  - Primocane – 3-10 g
- Yield:
  - Floricane yield comparable to Apache
  - Primocane yield disappointing in MO

Recommended Semi-erect Blackberry Cultivars

- Triple Crown
- Chester
- Loch Ness

Site Selection

- Full sun
- Well drained soil
- pH: 5.5-6.5
- Elevated site
- Previous uses of the site
- Marketing considerations

Site Preparation

- Eliminate perennial weeds
- Modify soil pH and fertility
  - pH: 5.5-6.5
  - K: 300 lbs/acre
  - P: 50 lbs/acre
- Organic matter addition, cover crops
Site Preparation

- Berming

Planting

- Types of nursery stock
  - Conventional rooted suckers
  - Tissue culture plug plants
  - Nursery matured tissue culture plants
  - Root cuttings

Planting

- Row Spacing: 8-12 feet
- Plant spacing: 2-6 feet
- Plant in early spring

Training and Pruning

- Pruning –
  - Primocane raspberries - dormant removal of canes in early spring (manage for the primocane crop only)
  - Floricane brambles
    - Tip primocanes (blackberries, black raspberries)
    - Remove spent floricanes
    - Dormant season pruning

Training and Pruning

Separation of floricanes and primocanes

Bramble Problems

- Environmental Damage
- Anthracnose
- Stink Bug Injury
Other Problems

- Cold damage to floricanes
- Frost damage to blossoms

Harvest

- Season:
  - Primocane raspberry: late July – October
  - Floricane brambles: June – late August
- Harvest early in the day
- Harvest frequently – every second day

Thank You

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