**Blueberries for the Home Garden**

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**Free Resources**

http://extension.oregonstate.edu/catalog/

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**What do plants need?**

- Full sun
- Acid soil (pH 4.5 to 5.5)
- Good organic matter in soil
- Good drainage

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**Site - Full sun is important**

Blueberry plants with only a few hours of sun do not grow well

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**Symptoms of soil pH being too high**

“lime induced iron deficiency”

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**Blueberry plants are well-suited to containers**
Blueberry plants are well-suited to containers

Relatively shallow root system

Plant growing in a 5 gallon container

Site – Think about pH

Before Planting:
- Test soil – 6 months prior to planting (previous fall typically) Test for soil pH and nutrient levels
- In the fall, incorporate any materials needed to achieve target pH of about 5.5 prior to planting
- In spring, incorporate Douglas fir bark mulch or sawdust (~ 4 inches deep tilled in)
- Form or build raised beds, if possible

Publication:
“Blueberry Cultivars for the Pacific Northwest”

http://extension.oregonstate.edu/catalog/

Various cultivars are grown to extend the fruited season from late June to early Sept. in northern highbush and Aug.- Oct. in rabbiteye

Ripening dates in Western Oregon

Bernadine Strik, Professor, Oregon State University
<table>
<thead>
<tr>
<th>Northern Highbush – all areas</th>
<th>Highbush – Willamette Valley and coast only</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cultivars</strong></td>
<td><strong>Cultivars</strong></td>
</tr>
<tr>
<td>Spartan</td>
<td>Legacy</td>
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<tr>
<td>Chandler</td>
<td>Spartan</td>
</tr>
<tr>
<td>Mini Blues</td>
<td>Mini Blues</td>
</tr>
<tr>
<td>Bluecrop</td>
<td>Bluecrop</td>
</tr>
<tr>
<td>Liberty</td>
<td>Liberty</td>
</tr>
<tr>
<td>Darrow</td>
<td>Darrow</td>
</tr>
<tr>
<td><strong>Cultivars</strong></td>
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</tr>
<tr>
<td>Rabbiteye – Willamette Valley only</td>
<td>Half-high – All regions</td>
</tr>
<tr>
<td>Powder Blue</td>
<td>Many cultivars</td>
</tr>
<tr>
<td>Ochlockonee</td>
<td>Very cold hardy</td>
</tr>
<tr>
<td>Pink Lemonade</td>
<td>Compact growth habit (1 to 4 ft tall)</td>
</tr>
<tr>
<td></td>
<td>Don’t need much pruning</td>
</tr>
<tr>
<td></td>
<td>Nice ornamentals</td>
</tr>
<tr>
<td></td>
<td>Yields range from 1 to 7 lb/bush</td>
</tr>
</tbody>
</table>

**Nursery plants**

**Planting – rough up roots, if needed:**
Planting – set at same depth as nursery pot:

Planting – “Don’ts”
- Do NOT leave fruit buds on at planting
- Do NOT leave too much fruit on young plants (in second year)
Producing fruit in the first and second growing season (if plants are not vigorous enough) reduces plant growth

Pruning to limit fruiting on young plants
- Be able to identify flower buds
- On most nursery plants, remove the flower buds

Pruning at planting – prior to first growing season

Pruning a new plant for no fruit (Pruning at bloom)

Pruning at planting (preceding first season)
Pruning "larger" sized nursery plants

- Prune plants to shape & remove MOST of fruit buds or flowers

![New "larger" plant: before pruning](Image)

Chandler

![After pruning](Image)

New whip from basal bud

Vigorous growth from pruned wood

Pruning impact on growth

- New whip from basal bud
- Vigorous growth from pruned wood

Plant growth, first year

- Promote good growth:
  - Irrigate well
  - Remove weeds
  - Fertilize well

End of Year 1

During Year 2

End of Year 2

During Year 3

End of Year 3

During Year 4

Wood age

- Whips from plant base
- Pruned bush showing complement of old and new canes
- Two-year-old cane with nice laterals for next season’s crop

For good fruit production need a “balanced plant” with good pruning and fertilization for fruit production & growth
Too many buds left previous winter (too much fruit; too little growth)

What 1-year-old wood (laterals) are most productive?

Better lateral to keep
Pruners pointing to poor lateral. Should be removed

Selecting best wood – Lateral thinning

“Twiggy” growth
- 1-year-old short, “twiggy” laterals at red arrows. These will not produce good fruit quality
- How old is this cane?
- Why was growth so poor this past year on this 3-year-old cane?
- Too many laterals were left when pruning last winter

‘Duke’ going into fourth growing season (year 4)

After pruning crew done, but needs a bit more pruning

‘Duke’ going into fourth growing season (year 4)

Too many laterals on this lower section of the cane and in upper mid-left
'Duke' going into fourth growing season (year 4)

Laterals that are too short left in this section. One cut would remove this

With some additional pruning, bush is better shifted toward encouraging more vegetative growth

Renovation of poorly maintained/pruned bushes

Cut to above crown height in winter

Partial crop year later

Blueberry plants are well-suited to containers

Plant growing in a 5 gallon container

Growing in raised beds or containers:
- An appropriate potting medium ("soil") in container or bed
- A well-sized container (16 inch diam. x 12 inch deep – 12 gallons or larger) or 2 ft-deep raised bed
- Ensure good downward drainage below raised bed so it doesn’t behave like a "bath tub"
- Locate in a sunny location
- Good irrigation/watering
- Good fertilization
- Good pruning/training

Potting media:
- Blueberries require a pH of 4.5 to 5.5
- Potting soil/compost not ideal for berries
  - Poor drainage (and porosity)
  - Not long-lived in a container
  - May not be at correct pH for ideal growth (e.g. yard compost and manure have pH 7 – 8)
- Ideal mix has bark, peat, and perlite – proportions vary to get ideal pH and drainage for berry crop being grown
Potting media:

- 50% bark
- 40% peat moss
- 10% perlite (pumice)

Blueberry:

- 50% bark
- 40% peat moss
- 10% perlite (pumice)

Irrigation:

- Monitor pots carefully to avoid under- or over-irrigating
- Just irrigate to the point of water draining out bottoms
- Pot must dry out some between waterings
- Use hand or drip systems

http://www.dripworks.com/product/Q_MRS/sprayers

Irrigation:

- ‘Spartan’ blueberry sensitive to over-watering

May 2 - symptoms

Irrigation was every other day at 3 quarts/pot

‘Spartan’ blueberry response after reducing irrigation frequency

Irrigation:

- Irrigation was reduced to 4 days per week (despite growth) at 3 quarts/pot

July 27 – plant recovered

Fertilization – what types of fertilizers are best?

- Blueberry plants only take up the ammonium form of nitrogen (N) – NH₄
- Use inorganic fertilizers with the NH₄ type of N – ammonium sulfate (21-0-0) or urea (46-0-0)
- Many organic fertilizer options – they differ in N content
  - Fish (e.g. 4-1-1); feather meal (e.g. 13-0-0); blood meal (e.g. 13-0-0); soybean or cotton seed meal (e.g. 7-1-2); coffee grounds (e.g. 2-6-0)
  - Bone meal (e.g. 0-12-0) note no N
- Composts when used as a light mulch
  - Do not use fresh manures; use composted manures
  - Yard debris compost has a high pH (7-8) but is good nutrient source (e.g. 1-24-6) & good source of organic matter
Fertilization

- Rate of nitrogen (N) fertilizer to apply increases with plant age and whether a fresh sawdust mulch has been added
- Fertilizer needs to be divided throughout spring period for best growth
- For inorganic fertilizer products:
  
  **Start at early bloom**
  
  **Finish in June/July**

Fertilization – With fresh sawdust in the row

| Product to apply FOR SEASON (with fresh sawdust applied in the CURRENT season) |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Rate of total N per plant per season | Ammonium sulfate (21-0-0) | Fish (4-1-1) | Diluted fish solution (15-0) |
| (oz/plant) | (ounces/plant) | (lb/plant) | (cups/plant) | (lb/plant) |
| 1 (planting year) | 0.7 | 3.5 | 1.1 | 1.8 |
| 2 | 1.0 | 6.9 | 1.6 | 2.6 | 0.5 | 0.9 |
| 3 | 1.3 | 5.6 | 1.8 | 2.9 | 0.6 | 1.0 |
| 4 | 1.2 | 5.9 | 2.0 | 3.1 | 0.6 | 1.1 |
| 5 | 1.4 | 6.6 | 2.2 | 3.5 | 0.7 | 1.2 |
| 6 | 1.5 | 7.3 | 2.4 | 3.9 | 0.7 | 1.4 |
| 7 | 1.5 | 8.7 | 2.5 | 4.6 | 0.9 | 1.6 |
| 8+ | 1.7 | 9.4 | 2.7 | 4.9 | 1.0 | 1.8 |

1. Distribute all fertilizer over as much of the root area as possible (circular area from crown to drip line edge)
2. Divide feather, soy, and cotton seed meal products into two applications (half in late March and the other half in mid May)
3. Divide fish & water solution into 7 equal applications starting at bloom (about the first week of April through the end of June – every 2 weeks)
4. Note: one gallon of fish weighs about 10 pounds

Fertilization: Many sources of fertilizer work

**Conventional:**
- Slow release over 4 months (goal to fertilize once)
- Water-soluble, immediately available (fertilize frequently)

**Organic:**
- Label gives %N in product; no directions on how much to apply for berries on this product label
- Calculate based on N recommendation in berry publications

- For example: First year blueberry plant requires 0.4 ounces of ammonium N (total)
- Total amount of product to apply = (total N recommended ÷ % N-$NH_4$ in product)
- 0.4 ounces ÷ 0.082 = 5 oz. product

Fertilization:

- 0.4 ounces ÷ 0.082 = 5 oz. product
- Approximately equal to ½ cup
- 4 month release so apply all at once and work into soil a bit
- Water in
Fertilization:
Calculating amount of fertilizer to apply – look at the label!
- I apply 1 Tbsp product/1 gallon water and use 3 cups of this per plant. This is 0.08 oz. product/application. I do this weekly (need about 21 applications to get N needed).

24% N (most NH₄-N)

Harvest
- Fruit will increase in size by ~20% after they first turn blue
- Pick fruit about every 5 days
- Fruit stores well in the fridge

Expect 10 to 20 lb fruit/bush on mature highbush blueberry plants, depending on the cultivar

Common Problems in the Home Garden
pH Problems
“lime induced iron deficiency”

Reducing Soil pH AFTER planting:
In existing plantings where soil pH is too high:
- Apply 3 ounces of elemental sulfur (S) per plant
- Check pH one year later and if more is needed, apply no more than 3 oz/plant again
Do this in autumn as the S needs to react with water to acidify the soil and this takes time

Symptoms of soil pH being too high

Weeds
- Blueberry plants cannot compete with weeds
- Remove by hand pulling or use mulches well

Weeds
- Mulches must be maintained to be effective
**Bacterial Blight**  
(*Pseudomonas syringae*)
- Very common
- Controls not effective
- Cultivars differ in sensitivity
- Prune out affected shoots in late winter

**Mummy berry**  
(*Monilinia vaccini-corymbosi*)
- Cultivars differ in sensitivity
- Find and remove/burn mummies

**Botrytis (gray mold)**  
(*Botrytis cinerea*)
- Usually affects clusters
- Green fruit botrytis occurs sometimes
- Prune well to an open canopy
- Avoid overhead irrigation

**Anthracnose ripe rot**  
(*Colletotrichum acutatum* sexual: *Glomerella acutata*)

**Alternaria fruit rot**  
(*Alternaria tenuissima*)
- Prune well to an open canopy
- Avoid overhead irrigation

**Blueberry Shock Virus**
- Pollen borne
- Flowers blight
- Infected plants do not repeat cycle every year
- Plants appear to recover & reach full yield

**Blueberry Shock Virus**
- Plant in "shock" year with no fruit; has good growth
- Leaf symptoms on shock infected plant in year 2
Spotted Wing Drosophila – SWD
(Drosophila suzukii)
Presence of small white flies

www.spottedwing.com

Birds
- Birds will peck or take whole fruit
- Plots can be netted
- Scare devices have limited usefulness

Voles (also known as field mice)
- Populations fluctuate
- Will eat roots on plants & have been shown to damage young plants
- They “love” living under weed mat
- Open up weed mat in winter to encourage predation

Native Blueberries (also called “huckleberries”)
Vaccinium parvifolium
V. ovatum
“Evergreen huckleberry”
Can be grown as a hedge

Vaccinium ovatum

Native Blueberries (also called “huckleberries”)
Vaccinium membranaceum (big huckleberry)
V. scoparium (grouseberry)
V. cespitosum (dwarf huckleberry)
V. occidentale (western bog blueberry)

All native to NE Oregon
The End