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## Blueberries for the Home Garden

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Oregon State University

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

Strawberry inter-planted

Photos: Neil Bell, OSU

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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

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Blueberry plants are well-suited to containers



Relatively shallow root system

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Blueberry plants are well-suited to containers



Plant growing in a 5 gallon container

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Site – Think about pH



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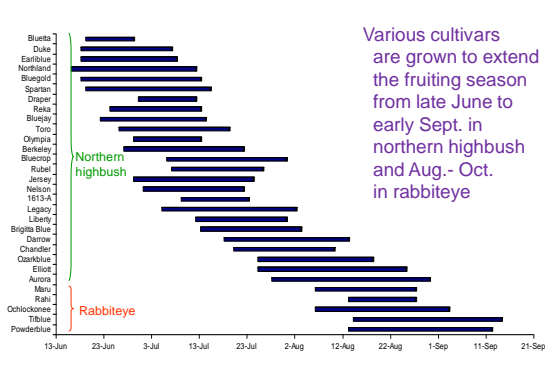
Before Planting:

- 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



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Ripening dates in Western Oregon



Publication:

"Blueberry Cultivars for the Pacific Northwest"



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

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**Cultivars**  
Northern Highbush – all areas

Spartan  
Chandler  
Jersey  
Mini Blues  
Bluecrop  
Liberty  
Darrow

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**Cultivars**  
Highbush – Willamette Valley and coast only

Legacy

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**Cultivars**  
Rabbiteye – Willamette Valley only

Powder Blue  
Ochlockonee  
Pink Lemonade

Pick 2 for cross pollination

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**Cultivars**  
Half-high – All regions

- Many cultivars
- Very cold hardy
- Compact growth habit (1 to 4 ft tall)
- Don't need much pruning
- Nice ornamentals
- Yields range from 1 to 7 lb/bush

North Country

Pick 2 for cross pollination

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**Nursery plants**

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**Planting –rough up roots, if needed:**

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Planting – set at same depth as nursery pot:



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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



Plant allowed to produce fruit in first year; also poor plant “form”



“Bluecrop”. Left: Plant allowed to produce fruit in year 1 and 2; Right: plant pruned to produce no fruit in year 1 and 2

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Pruning to limit fruiting on young plants



- Be able to identify flower buds
- On most nursery plants, remove the flower buds

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Pruning at planting – prior to first growing season



Before pruning



After pruning

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



Before pruning



After pruning

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Pruning at planting (preceding first season)



Before




After


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### Pruning "larger" sized nursery plants


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



New "larger" plant: before pruning



After pruning

Chandler 

### Pruning – impact on growth



New whip from basal bud



Vigorous growth from pruned wood



### Plant growth, first year

Plant with good growth in planting year



Planting year – drip irrigation lines


**Promote good growth:**

- Irrigate well
- Remove weeds
- Fertilize well

Plants in second year - irrigation



Mature plants with weed mat – drip irrigation underneath





### Wood age



Whips from plant base

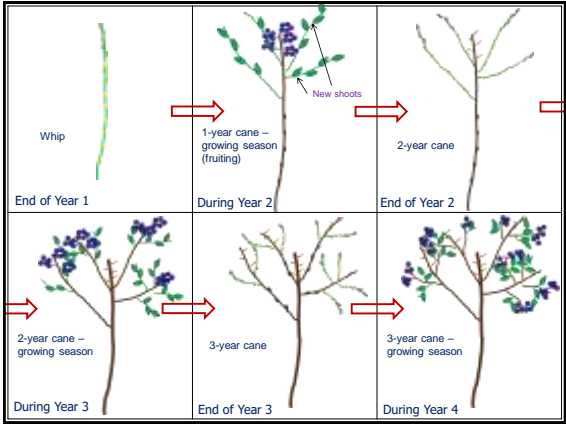


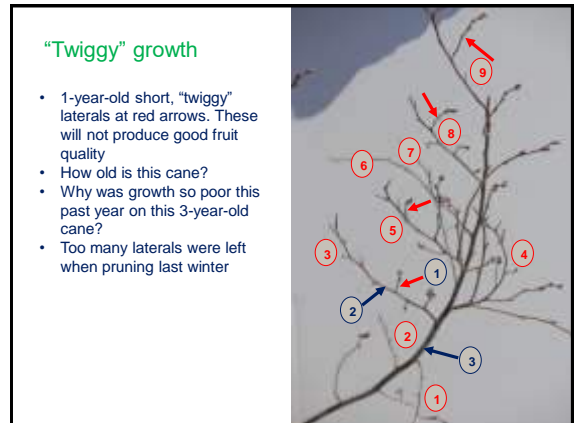
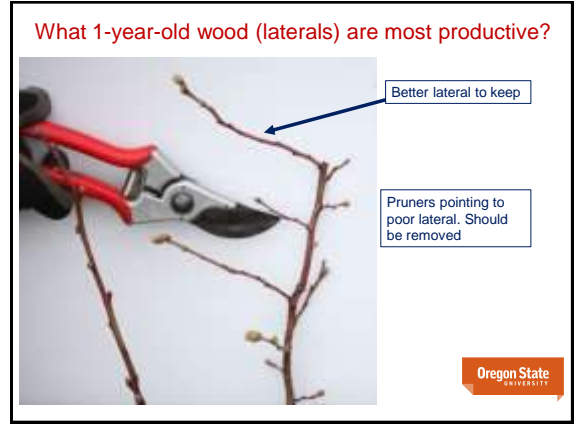
Pruned bush showing complement of old and new canes



Two-year-old cane with nice laterals for next season's crop







'Duke' going into fourth growing season (year 4)



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



'Duke' going into fourth growing season (year 4)



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



Renovation of poorly maintained/pruned bushes



Poor growth


Cut to above crown height in winter

New whips grow


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




Neil Bell, OSU



Potting media:




Blueberry:

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

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Irrigation:

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




[http://www.dripworks.com/product/Q\\_MRS/sprayers](http://www.dripworks.com/product/Q_MRS/sprayers)

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Irrigation:

'Spartan' blueberry sensitive to over-watering




May 2 - symptoms

Irrigation was every other day at 3 quarts/pot

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Irrigation:

'Spartan' blueberry response after reducing irrigation frequency



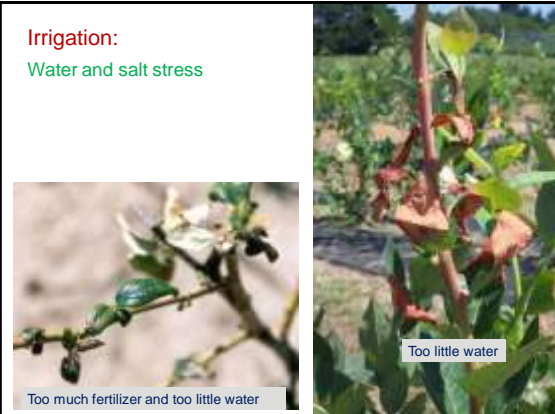
Irrigation was reduced to 4 days per week (despite growth) at 3 quarts/pot

July 27 – plant recovered

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Irrigation:

Water and salt stress



Too little water

Too much fertilizer and too little water

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Fertilization – what types of fertilizers are best?

- Blueberry plants only take up the ammonium form of nitrogen (N) –  $\text{NH}_4^+$
- Use inorganic fertilizers with the  $\text{NH}_4$  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. 2-0-0)
  - 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



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## 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



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## Fertilization – With fresh sawdust in the row

Product to apply PER SEASON (with fresh sawdust applied in the CURRENT season)

Planting age	Product to apply PER 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 (1:10; fish:water)	Feather meal (13-0-0)	Soybean meal (7-1-2) (cottonseed meal is similar)
	(oz./plant)	(ounces/plant)	(lb/plant)	(cups/plant)	(lb/plant)	(lb/plant)
1 (planting year)	0.7	3.5	1.1	1.8	0.4	0.7
2	1.0	4.9	1.6	2.6	0.5	0.9
3	1.2	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	1.8	8.7	2.9	4.6	0.9	1.6
8+	2.1	9.8	3.2	5.1	1.0	1.8

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

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## Fertilization:

Many sources of fertilizer work



Conventional:

Slow release over 4 months (goal to fertilize once)



Organic:



Water-soluble, immediately available (fertilize frequently)



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## Fertilization:

Calculating amount of fertilizer to apply – look at the label!



14% N (8.2% NH<sub>4</sub>-N)



24% N (most NH<sub>4</sub>-N)

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## Fertilization:

- 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<sub>4</sub> in product)

- 0.4 ounces ÷ 0.082 = 5 oz. product



14% N (8.2% NH<sub>4</sub>-N)

8.2% NH<sub>4</sub>-N = 8.2/100 = 0.082

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## Fertilization:

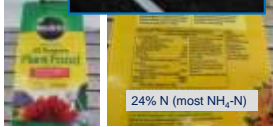
- 0.4 ounces ÷ 0.082 = 5 oz. product
- Approximately equal to ½ cup
- 4 month release so apply all at once and work into soil a bit
- Water in



### 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).



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### 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

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### Common Problems in the Home Garden pH Problems



"lime induced iron deficiency"



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### 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

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### Weeds

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



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### Weeds

- Mulches must be maintained to be effective



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### Bacterial Blight

(*Pseudomonas syringae*)



- Very common
- Controls not effective
- Cultivars differ in sensitivity
- Prune out affected shoots in late winter

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### Mummy berry

(*Monilinia vaccinii-corymbosi*)

- Cultivars differ in sensitivity
- Find and remove/burn mummies



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### 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

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### 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 larvae

www.spottedwing.com

**Birds**

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

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**Voles (also known as field mice)**

Courtesy: WSU

- 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 depredation

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**Native Blueberries**  
(also called "huckleberries")

*Vaccinium parvifolium*

*V. ovatum*  
"Evergreen huckleberry"  
Can be grown as a hedge

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*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

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