



Marymoor Community Garden Association

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- Blueberries
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- Blackberries
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BLUEBERRIES

- Deciduous perennial, needs acidic soil.
- Can live for decades
- Self-fertile
- Abundant fruits, depends on variety
- Attractive in landscape
 -fall foliage
 - -spring flowers



PLANT SELECTION

- Northern Highbush best type
- Cultivars differ in characteristics
- berry size
- -flavor
- -ripening time
- -habit
- -disease resistance
- Buy the largest plant you can afford





NORTHERN HIGHBUSH BLUEBERRIES

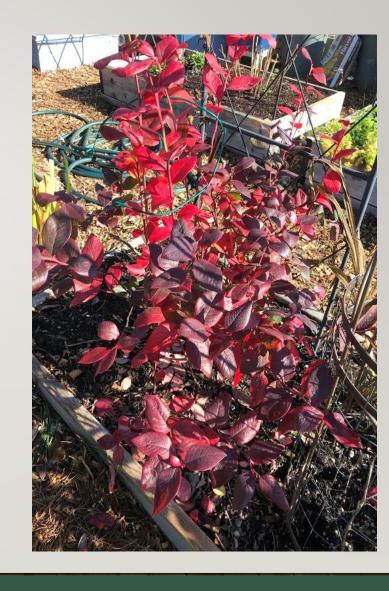
Cultivar	Origin	Harvest period ¹	Fruit and plant characteristics	Fruit Flavor	Mummy berry (MB) disease resistance (Ehlenfeldt et al. 2010).
Earliblue	1952 USDA- Rutgers University release	Early	First to ripen, large fruit size. High yields but not consistent (Fuqua et al. 2005). Ensure good fruit set by avoiding frost pockets on this early bloomer. Avoid planting on poorly drained soils. Early maturity helps avoid Spotted wing drosophila infestations (Demchak 2014).	Good to excellent (Strik et al. 2014)	Susceptible to both the primary and secondary stage of MB.
Spartan	1977 Rutgers University release	Early	Very large fruit, light blue. Moderate yield. Upright bush; productive. Prefers light soils with high organic matter (Gauther and Kaiser 2013). Blooms late. Needs pollinizer.	Excellent	Moderate resistance to both stages of MB (Pavlis 2000).
Duke	1987 USDA release	Early	Large fruit size. Moderate to high yield. Short harvest season. Vigorous, stocky plant. Considered the standard for early season cultivars (Fuqua et al. 2005).	Fair flavor; improves with refrigeration	Unknown resistance to the primary phase; moderate resistance to secondary stage of MB.
Draper	2004 Michigan State University release	Early	Very large fruit; stores well. High yielding, but shorter harvest season. Vigorous, upright plant. Stores longer in cold storage than other cultivars (Hancock 2004).	Excellent	Susceptible to both stages of MB.
Olympia	1930 private breeder release	Mid	Medium size fruit. Low to medium yield (Strik et al. 2014).	Excellent	Good resistance to both stages of MB.
Bluecrop	1952 USDA- Rutgers University release	Mid	Large to very large size; light blue fruit. Most widely planted cultivar in the world (Langstroth and Hanson 2012). Very productive; vigorous bushes bear fruit over a 1-month harvest season.	Good; tart if picked early	Susceptible to the initial phase of MB, but resistant to the secondary stage (Gauther and Kaiser 2013).
Liberty	2003 Michigan State University release	Mid-Late	Firm, light blue. Moderate to large fruit size. Stores well under refrigeration (Weber 2012a). Vigorous, upright habit. Rated as very high in antioxidants (Pavlis 2003, Hancock 2003).	Excellent	Resistant to the primary stage of MB; unknown resistance to the secondary stage.
Darrow	1965 USDA- Rutgers University release	Late	Very large fruit size. High yields (Fuqua et al. 2005). Vigorous, upright bush.	Excellent	Resistant to the initial stage of MB; intermediate resistance to the secondary stage.
Chandler	1994 USDA	Late	Very large fruit size. Very long ripening period (6 weeks, Pavlis 1998). Moderate vigor and high yield. Best in the milder regions of Washington state.	Good	Intermediate resistance to the primary stage of MB; susceptible to the secondary stage.

¹ The earliest ripening cultivars ripen in late June in southwest Washington, and mid-July in the northwest portion of the state. The latest ripening cultivars ripen in early to mid-August in the southwest portion of the state and late August-early September in the northwest portion of the state. Ripening tends to be earlier in eastern Washington.

SITE

- Sun, Sun, Sun 6+ hours a day
- Well-drained, acidic soil
 -soil test
- Avoid trees

Avoid concrete beds





PLANTING

- Workable weed-free soil-Jan Mar
- Same depth as nursery
 - -4 8 feet apart
- Hills, raised beds 18 inches

 Container at least 10gallon



MULCH

- 3-inch layer, avoiding base
- Arborist wood chips, pine needles

 Conserves moisture, protects roots from temperature fluctuations, limits weeds

Add 2 inches each year



Irrigation

- I- 2 inches per week
 from May Aug
- Factor rainfall into schedule
- Avoid overhead watering

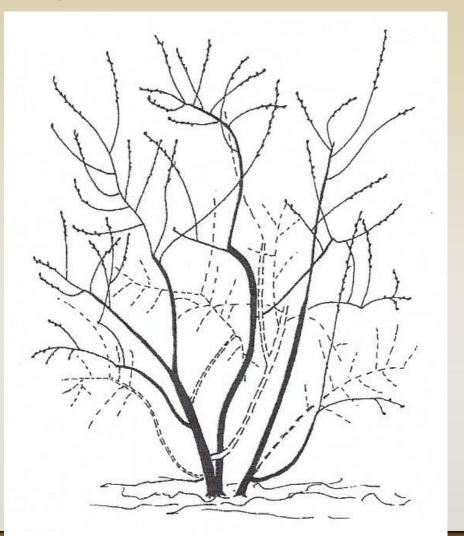


Fertilization

- Evaluate visually
 - -use soil test
 - -excessive fertilizer can damage roots
- Split applications in April, May, & June
 - -roots don't take up nutrients earlier
 - -follow package directions
- Never apply to drought stressed plants or late in season

Pruning

- When dormant in winter
- Branches damaged or crossing
- Less than pencil in diameter
- 4th year canes near base
- Can prune up to 20%



BIRDS



- Most devices don't scare birds away
- Netting is best

 -place directly on plants or
 frame
 -secure to ground
- Need time for berries to ripen







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DISEASES-MUMMY BERRY





DISEASES - MUMMY BERRY





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APHIDS





- Feed in colonies on leaves& new shoots
- Spread blueberry scorch& shock
- Avoid excess fertilizer
- Spray off with water
- Use OMRI insecticide

Harvesting

- Ripen over 2 5-week period
- Pick when blue with dusting of gray
- Gently roll between thumb & forefinger





STRAWBERRIES



- Fit in small spaces
- Grow well in containers
- Perennials
- I 2 pounds fruit per
 plant and varies with
 cultivar



Plant Selection

- June-Bearing: produce I heavy crop in short period
 -begin blossoming in late April
- Ever-Bearing: produce berries over a 4–5-month period when temperatures are 40 90° F
- Many varieties: differ in berry size, flavor, firmness, color, yield, growth habit, pest resistance

https://catalog.extension.oregonstate.edu/pnw565



June-Bearing Strawberries

Cultivar	Origin	Harvest period ¹	Fruit and plant characteristics	Fruit Flavor	Resistance to root rot and virus susceptibility
Honeoye	1979 Cornell University	Very early	Good appearance and glossy red color. Firm texture. Low to medium yields and poor shelf life (Hokanson and Finn 2000). Best grown on lighter soils. May become tart on heavier sites.	Fair	Highly prone to root rot; virus susceptibility unknown.
Sweet Sunrise	2014 Oregon State University	Very early	A new high yielding cultivar with medium to large fruit size. Plants are very vigorous (Finn et al. 2014a).	Excellent	Unknown resistance to root rot; good virus resistance.
Hood	1965 Oregon State University	Early	Attractive, bright fruit of average size. Excellent for preserves. Medium yield. Plants are short lived (Barritt 1973).	Excellent	Prone to root rot; highly susceptible to viruses.
Shuksan	1970 Washington State University	Mid-season	Large fruit size with bright and attractive berries. Best cultivar for freezing. Plants have good winter hardiness (Barritt 1971).	Excellent	Resistant to both root rot and viruses.
Puget Reliance	1995 Washington State University	Mid-season	Bright glossy fruit that are large- sized. High yields and good plant vigor (Moore, Sjulin, and Shanks 1995).	Good	Resistant to both root rot and viruses.
Rainier	1972 Washington State University	Late	A sibling of "Shuksan." Large fruit size. Produces few runners. Fruit can lack firmness and be soft.	Good	Good resistance to root rot and viruses.
Puget Crimson	2011 Washington State University	Very late	Large fruit size with medium- firmness. Vigorous plant growth (Moore et al. 2011).	Excellent	Moderate resistance to viruses.

¹ In the southwest part of the state, the earliest cultivars ripen in late May, while the later season cultivars ripen in the last half of June and into July.

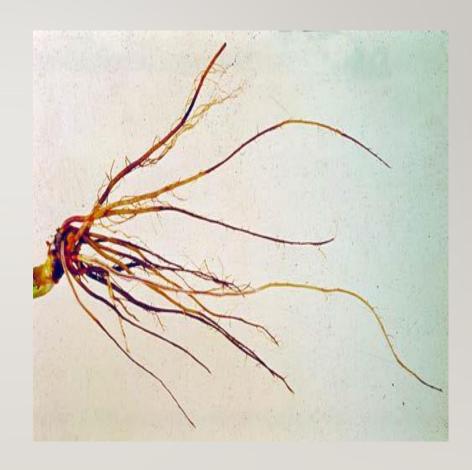
Ever-bearing Strawberries

Cultivar	Origin	Harvest period ¹	Fruit and plant characteristics	Fruit Flavor	Resistance to root rot and virus susceptibility
Albion	2004 University of California	June -October	The most widely grown California day-neutral cultivar. Firm fruit with better flavor than "Aromas," but lower yield than "Aromas" (Shaw 2006). Plants lack durability in northern zones (Finn et al. 2014b).	Good	Good resistance to root rot; susceptible to viruses.
Tristar	1981 USDA Beltsville Maryland	June -October	Small to medium sized fruit with good internal and external color and fruit firmness. Yield is low. Sister cultivar of "Tribute." Larger fruit size than "Tribute" (Weber 2012c).	Excellent	Fair to good resistance to both root rot and viruses.
Seascape	1991 University of California	June -October	Good yield and plant vigor, though fruit size is smaller and flavor is less preferred when compared to "Albion" (Bringhurst and Voth 1991).	Good	Lacks resistance to root rot; good resistance to viruses (Finn, Strik, and Moore 2014).
Aromas	1998 University of California	June -October	A late season cultivar with high yield capacity, good plant growth, and durability. Larger fruit size than "Seascape" (Shaw 1998).	Fair to good (Hoashi-Erhardt and Walters 2014)	Excellent resistance to viruses (UC Davis 2015).

¹ Day-neutral cultivars beginning bearing in early June, followed by small crops on a regular basis until frost, unless summer temperatures exceed 90°F.

Site

- 6 hours sun
- Well-drained, weed-free soil
- 8 12 inch raised bed or hilling
- Avoid frost pockets



PLANTING

- June-bearing: 12 24 inches apart in Sept.
- Ever-bearing: 8 12
 inches apart in March
- Can be closer in containers

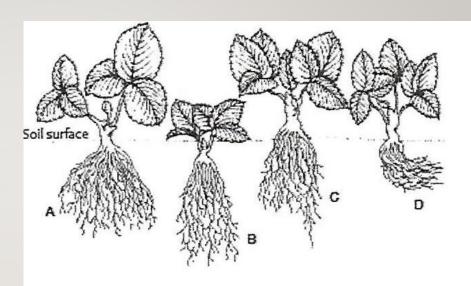
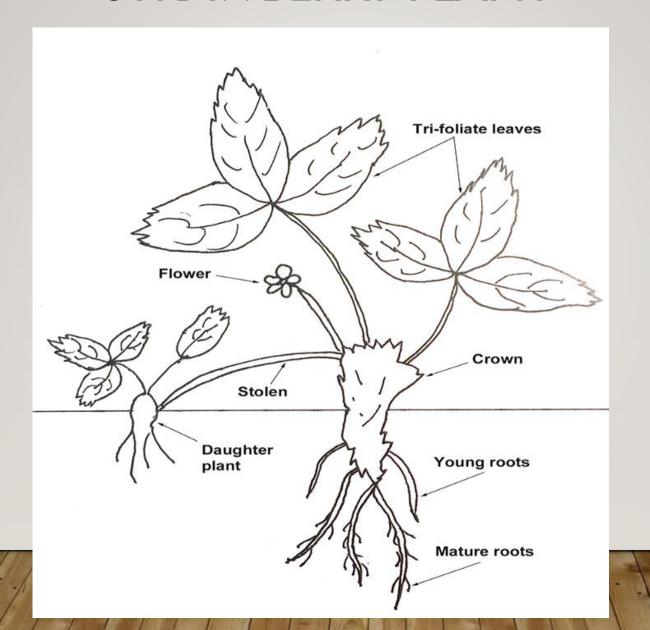


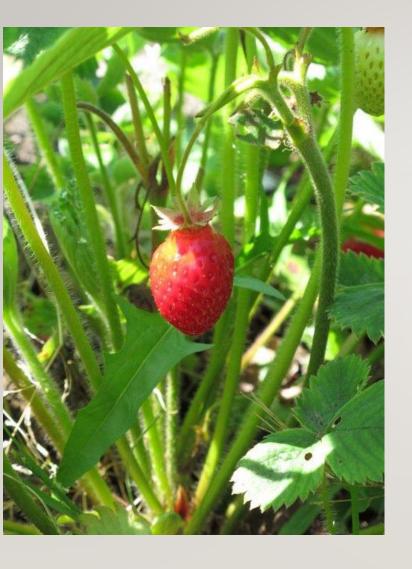
Figure 6. Proper planting depth (A) and improper depths (B, C, D). In B, the crown is too deep; in C, the crown is too high; and in D, the roots are bent and remain near the surface.

STRAWBERRY PLANT



Mulch

- Bark mulch, aged sawdust, straw, black plastic
- Keeps berries clean, limits weeds, conserves soil moisture
- Avoid covering crown
- Drip line irrigation underneath mulch



Water

- Water I- I ½ inches per week
 from June mid Sept
- Drip irrigation keeps water off leaves & berries
- Soil in containers dries out more quickly

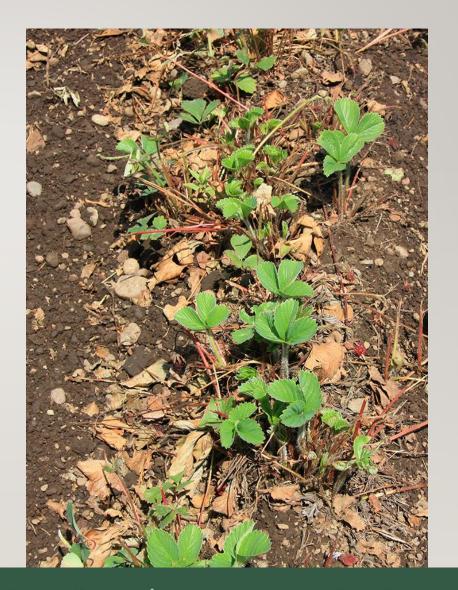
Fertilization

- June-bearing: in late summer at renovation
- Ever-bearing: 3 4 times during growing season
- If lush greens but few berries, reduce fertilizer



RENOVATION OF JUNE-BEARING

- Runners propagate new plants every year
- Thin after fruiting finished
- Fertilize avoiding the crown
- Water





Pest Management

- Birds peck holes just before you want to pick them
- Mylar tape least expensive
- Netting makes harvest difficult
- Slugs leave holes in berries
 & leaves & leave slime trail





Diseases

Powdery Mildew Botry Mold





VERTICILLIUM WILT



WSU Resources

http://gardening.wsu.edu

http://pubs.extension.wsu.edu

http://extension.wsu.edu/king/gardening

http://pep.wsu.edu/hortsense

http://soiltesting@kingcd.org

https://puyallup.wsu.edu/soils/video_soiltexture

All photos from wsu.edu

RASPBERRIES AND BLACKBERRIES







RASPBERRIES



- Perennial roots & crowns-can live up to 40 years
- Canes biennial
- I st year leaves primocanes)
- -2nd year berries (floricanes)
- -die after fruiting
- New canes develop each year



TYPES

 Summer-bearing & fallbearing

- Cultivars differ
 - -fruit quality, flavor & appearance
 - -fruiting season
 - growing needs
 - -pest & disease resistance





SUMMER BEARING

- Most common
- 6 12 feet by end of summer
- 2nd year begin flowering early
- May & fruiting mid June
- 4 6-week season

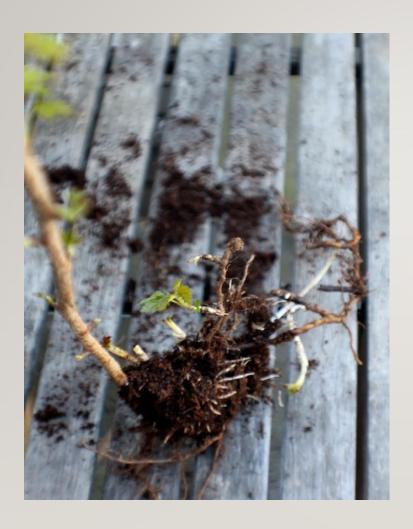


FALL BEARING

3 – 6 feet by end of summer

- Single cane bears 2 crops per year
- On tips of canes late Aug Oct
- -lower on canes next July
- For I crop cut to ground each winter
- Total yield from 2 crops about same
 - as summer bearing





PLANT SELECTION

- Dormant without bud
- -bare root or container
- Certified, disease-free
- All are self-fertile

SUMMER BEARING RASPBERRIES

Cultivar	Origin	Harvest period ¹	Fruit and plant characteristics	Fruit Flavor	Disease resistance to root rot and raspberry viruses
Chemainus	2006 Agriculture Canada	Early	Medium-sized fruit. Medium yield. Considered a replacement for "Meeker" in terms of yield (Kempler 2006).	Excellent (Finn and Strik 2014)	Prone to root rot, though less than "Meeker"; prone to viruses (Martin et al. 2013).
Meeker	1967 WSU Puyallup	Mid	Medium fruit size and firmness. Medium to high yield. Most widely grown cultivar in the Northwest (Steury 2012).	Excellent (Moore, Daubeny 1993)	Prone to root rot and susceptible to viruses.
Tulameen	1991 Ag Canada	Mid-late	Very large fruit size; firm and attractive berries. Extended harvest season. Widely grown for the fresh market (Daubeny 1991).	Excellent	Very prone to root rot and susceptible to viruses.
Cascade Delight	2004 WSU Puyallup	Late	Very large fruit size (exceeds "Tulameen"). Very firm berries with attractive, glossy appearance (Moore 2004)	Excellent	Tolerant to root rot and susceptible to viruses.

¹ The earliest-ripening cultivars ripen in late June in southwest Washington, and early July in the northwest portion of the state.



FALL BEARING RASPBERRIES

Cultivar	Origin	Harvest period ¹	Fruit and plant characteristics	Fruit Flavor	Disease resistance to root rot and virus susceptibility
Autumn Bliss	1984 Great Britain	Very early	Larger than "Heritage." Medium yield. Ripens 10–14 days earlier than "Heritage." Fair firmness (Keep 1989).	Good	Resistant to root rot, but susceptible to viruses.
Fall Gold	1967 New Hampshire	Early	Yellow fruited. Soft fruit. Medium yield (NCGR 2015b).	Mild, sweet flavored fruit	Tolerant to root rot, but susceptible to viruses.
Summit	1989 Oregon State University	Early	Equal in size and firmness to "Heritage." Difficult to pick under hot conditions. Medium to high yield (NCGR 2015a).	Good	Resistant to root rot, but susceptible to viruses.
Anne	1996 Rutgers University	Early	Large, yellow fruit. Medium-to- high yield. Soft fruit (Swartz et al. 1998a).	Excellent	Highly prone to root rot, and susceptible to viruses.
Caroline	1998 Rutgers University	Early	Large red fruit with moderate firmness. Ripens 1–3 weeks prior to "Heritage" (Swartz et al. 1998b).	Good	Good resistance to root rot; virus susceptible.
Polka	1981 Poland	Mid	Medium to large fruit. Soft (Weber 2012b).	Excellent	Resists root rot and viruses.
Heritage	1969 New York	Late	Large, dark fruit. Winter hardy to -30°F. Medium yield (NCGR 2015c). Late ripening can limit yield.	Bland	Prone to root rot; virus resistant (Finn and Strik 2014).
Vintage	2013 USDA/ Oregon State University	Very late	Large, bright fruit. High yield. Overall fruit characteristics considered better than "Heritage," as they are 30% larger (Finn et al. 2013).	Excellent	Susceptible to root rot. Susceptibility to viruses has yet to be determined.

¹ In the southwest part of the state the earliest cultivars ripen in early August, while the latter season cultivars ripen in the last half of August into September.



Marymoor Community Garden Association

SITE



- Full sun (N S rows good)
- Well-drained, weed-free soil
 - -water logged soil leads to root rot
 - -raised beds or hilling
- Ideal pH is 6.0 6.5
- Avoid frost pocket, wind

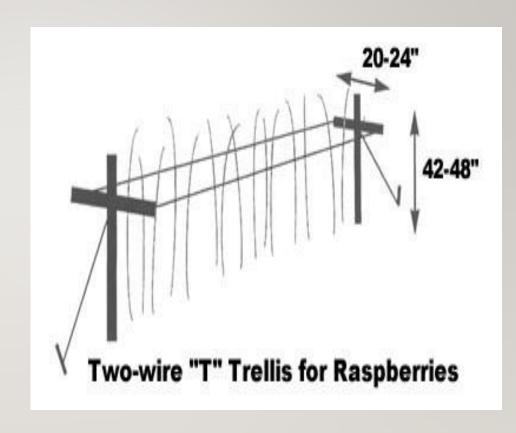


Planting

- Early spring
- Set highest point where roots attach to crown I- 2 inches below ground
- Cover with soil & water well
- Apply 3 inches mulch
- Spacing depends on type & training system

TRELLIS

- Keeps canes & fruit off ground
- Reduces wind breakage
- Improves air circulation
- Reduces disease
- Eases weed control



WATERING

- I I ½ inches water per week to ensure top I2 - I8 inches of soil is moist-avoid overwatering
- Early June September
 - reduce water after first frost
- Drip irrigate within the row





FERTILIZER

- Base on plant's growth rate and soil test
 - •8 9 feet growth with healthy green leaves
 - •-primocane growth 4 6 feet

 Split applications or use slowrelease fertilizer

PRUNING

Summer bearing

- Remove old floricanes when fully dormant
- Keep 10 12 healthy canes & secure to top trellis wire
- Cut off to 6 inches above top wire

Fall bearing

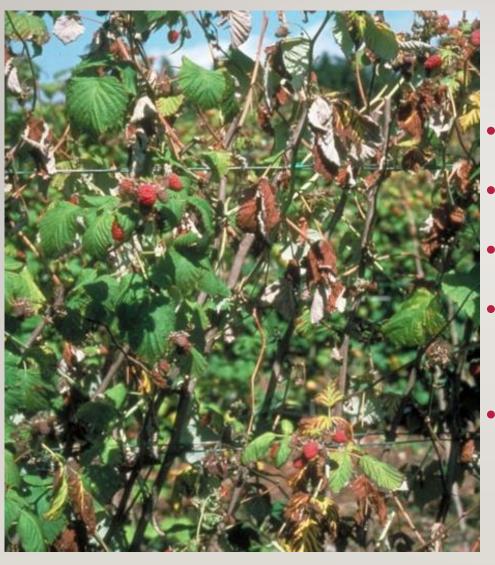
- Remove top half of cane after harvest
- Leave lower half to produce crop following summer
- For single crop, cut to ground after fall harvest

DISEASES



Botrytis Fruit Rot

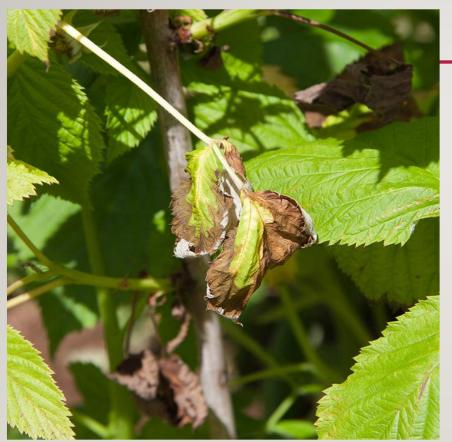
- Fungus which attacks ripening fruit
- Plant in sunny location
- Avoid overhead irrigation
- Proper pruning & training
- Registered fungicide



ROOT ROT

- Fungus spreads in wet soil
- Persists in soil for years
- Proper site selection
- Hilling, raised bed, drip irrigation
- Plant resistant varieties

ROOT ROT









VERTICILLIUM WILT

- Contracted from soil
- Spread by aphids, pruning tools, nematodes
- No treatment
- Buy certified plants
- Crop rotation

INSECTS

Spotted Wing Drosophila

- Ripening fruit attracts adult flies
- Remove fruit on the ground
- Same control measures as other berries

- Aphids
- Remove plant debris during winter
- Limit fertilizer



CROWN BORER

- Eggs on leaves
- Larvae tunnel in base of canes
- Canes droop & break off
- Remove infected canes
- Carefully timed insecticide before bloom



HARVEST

- Pick dry fruit in peak of color
- do not ripen further in storage
- wet fruit deteriorates quickly
- When picked, ripe fruit detaches easily from the receptacle
 -yields hollow-cored berry
- Harvest season 4 6 weeks
 depending on cultivar

BLACKBERRIES



- Similar to raspberries
- Perennial
- Extensive root system
- Flowers & fruit larger than raspberry
- Productive for 8 12 years
- 4 55 pounds fruit per plant
 depending on cultivar

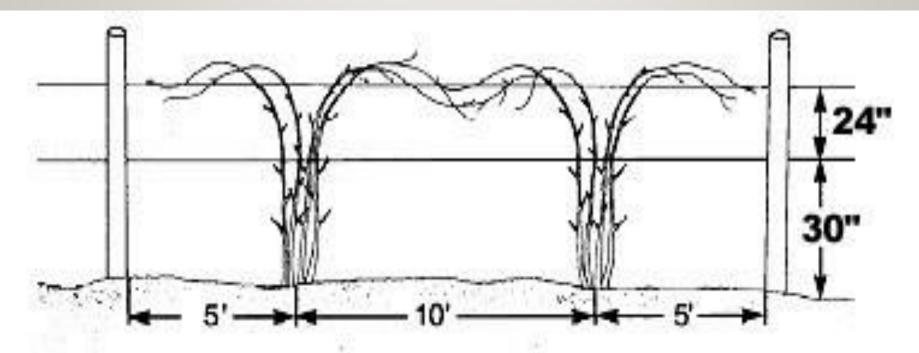


BLACKBERRIES

Cultivar	Origin	Harvest period ¹	Fruit and plant characteristics	Fruit Flavor	Resistance to root rot, and virus susceptibility
Siskiyou	1999 USDA/ Oregon State University	Early	Trailing type. Thorny canes are more vigorous than "Marion." Yields slightly less than "Marion." Fruit size is greater than "Marion" (Finn 1999).	Excellent	Resists root rot; excellent virus resistance.
Obsidian	2005 USDA/ Oregon State University	Early	Trailing type. Thorny canes are vigorous. Similar to "Marion." High yielding cultivar with large attractive fruit (Finn 2005a).	Excellent	Resists root rot; excellent virus resistance.
Marion	1957 Oregon State University	Mid	Trailing type. Very thorny and vigorous canes. Medium sized fruit. Second most widely raised blackberry in the Northwest (Finn et al. 2014b)	Excellent (Waldo 1957)	Resists root rot; susceptible to viruses (Martin 2013).
Black Diamond	2005 USDA/ Oregon State University	Mid	Trailing type. Thornless and vigorous canes. Berries are attractive and firmer than "Marion."	Good (Finn et al. 2005b)	Resists root rot; excellent virus resistance.
Columbia Star	2014 USDA/ Oregon State University	Mid	Trailing type. Thornless and vigorous canes. Higher yielding than "Marion" or "Black Diamond" (Finn et al. 2014d). Firm fruit.	Excellent	Resists root rot; excellent virus resistance.
Triple Crown	1996 USDA/ Rutgers University	Late	Semi-erect type. Thornless canes (Galletta et al. 1998). Fruit has large seeds.	Excellent	Resists root rot; no major virus issues.
Chester Thornless	1998 USDA/ Rutgers University	Late	Semi-erect type. Thornless canes. Medium size fruit. Sunburn prone (Galletta et al. 1998).	Fair	Resists root rot; no major virus issues.
Prime-Ark 45	2009 University of Arkansas	Very late	Primocane fruiting, erect type. Very large fruit size. Fruit is black and glossy, but seedy. Short harvest season in mid-September.	Fair (Clark and Perkins-Veazie 2011)	Resists root rot; no major virus issues.

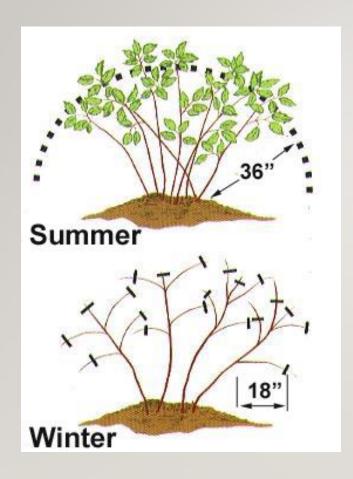
¹ Trailing type blackberry cultivars begin bearing late June in southwest Washington, with harvest extending for approximately 3 weeks. Semierect types begin fruiting in mid-August and may produce to the first frost. Erect type cultivars begin ripening in early September.

2 -WIRETRELLIS



Two-wire Trailing Blackberry Trellis

PRUNING



- Cut floricanes on all 3 types at ground level in Oct.
- Remove suckers that develop between rows & hills
- Prune erect type when canes are 3 feet

DISEASES



Leaf and cane spot

- Fungus causes leaf spots-canes develop cankers
- Remove spent fruiting canes promptly

•Fruit rot

- Less severe than raspberries
- Site & plant selection
- Good air circulation



WSU Resources

http://gardening.wsu.edu

http://pubs.extension.wsu.edu

http://extension.wsu.edu/king/gardening

http://pep.wsu.edu/hortsense

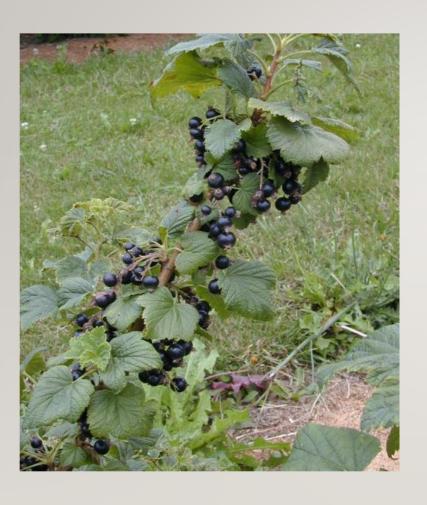
http://soiltesting@kingcd.org

https://puyallup.wsu.edu/soils/video_soiltexture

All photos from wsu.edu



CURRANTS



- Easy to grow
- Fast growing deciduous shrub
- Red, white & black
 -White is albino form of red with less acidity
- Black leaves have scent
- 3 10 pounds per bush depending on cultivar



PLANTING

- Part shade
- -leaves burn & plants collapse in hot sun
- Tolerate varying soil conditions
- Well drained soil with pH 6.5
- Space 2 ½ 4 feet apart for good air circulation

WATER & FERTILIZATION

Drip irrigation I – 3 inches per week

 Keep watered until fruit is harvested
 -will wither if not enough water



PRUNING

- Annual pruning in winter
 - -keep to about 2 ½ feet high
- Keep 9 to 12 canes of 1, 2, & 3-year-old canes
- Do not prune after spring growth
- Plants can be trained to decorative forms

DISEASES & PESTS



- Anthracnose
- Powdery mildew
- Aphids
- Currant borer
- Botrytis
- Host for white pine blister rust
- Birds



HARVEST



Ripen over a 2-week period

- Sweeten the longer they stay on the bush
- If leave on bush too long, birds will eat them
- Pick red currants by the stem with strand of fruit

CURRANTS & GOOSEBERRIES

Table 9. Currants and gooseberries.

Cultivar	Origin	Harvest	Fruit and plant characteristics	Disease resistance
Red currants				
Jonkheer van Tets	1941 Holland	June	An early season red currant with good flavor and large fruit size. Fruits may split with wet weather (Bratsch and Williams 2009).	Susceptible to PM ¹ ; resistant to WPBR ² .
Perfection	1887 New York	June	An older cultivar gaining renewed interest (Tepe and Hoover 2015).	Fair resistance to PM.
Red Lake	1933 University of Minnesota	July	Good fruit flavor and moderate plant vigor. Widely available in the trade. Highly susceptible to spring frost in northern latitudes.	Fair resistance to PM; susceptible to WPBR.
Rovada	1980 The Netherlands	July	Considered one of the best red cultivars (Barney 2013). Bears abundantly. The most common commercial cultivar in Europe (Pluta and Hummer 1995) as it produces large fruits and strigs.	Resistant to PM; susceptible to WPBR.
White currants				
White Imperial	1890 New York	July	European cultivar which produces well with long strigs. Wide spreading bush. Fruit low in acids.	Resistant to PM; susceptible to WPBR.
Primus	1977 Slovakia	July	Vigorous upright bush which bears yellow-white fruiting strigs (Carroll et al 2014). Touted as the sweetest of the white currants.	Susceptible to PM.
Blanka	1977 Slovakia	July	High yielding cultivar with very long strigs. Blooms later in the spring, thus avoiding spring frosts.	Resistant to PM; unknown for WPBR.
Black currants				
Ben Sarek	1983 Scotland	July	A popular Scottish black currant with a compact spreading habit. Fruit have tough skin. Tight fruit clusters make hand picking berries difficult.	Resistant to PM and WPBR.
Consort	1950 Canada	July	An early, blister rust resistant cultivar. Fruit quality rates as fair (Barney 2013). Related "Consort" and "Crusader" cultivars are also resistant to WPBR.	Highly resistant to both PM and WPBR.
Ben Lomand	1975 Scotland	July	Compact bush. Very large fruit size. One of the most widely grown English home garden cultivar. The standard European cultivar for processing.	Resistant to PM; susceptible to WPBR.
Titania	1984 Sweden	July	Tall bushes (over 6'). Very large fruit size, but fruit are highly acidic and lack flavor. Initially reported to be WPBR resistant; now found to be susceptible (Ferguson and Crawford 2014).	Highly resistant to PM; susceptible to WPBR.
Gooseberries				
Hinnonmaki Red	Finland	July	Red fruit with tart, sweet flavor. Can be eaten fresh. Medium sized fruit (Pomper 2012).	Resistant to PM and WPBP.
Invicta	1981 East Malling, England	July	European cultivar with large, green fruit with fair flavor. Very large thorns.	Resistant to PM, some resistance to WPBR.
Jeanne	2006 USDA Corvallis	August	Dark red gooseberry with high fruit quality. Better resistance to sawfly defoliation (Hummer and Reed 2008).	Resistant to PM and WPBR.

¹ PM: Powdery mildew (Podosphaera mors-uvae)

² WPBR: white pine blister rust (Cronartium ribicola)



RESOURCES

- http://gardening.wsu.edu
- http://pubs.extension.wsu.edu
- http://extension.wsu.edu/king/gardening
- http://pep.wsu.edu/hortsense
- http://soiltesting@kingcd.org
- all photos from WSU.edu and Gia Parsons