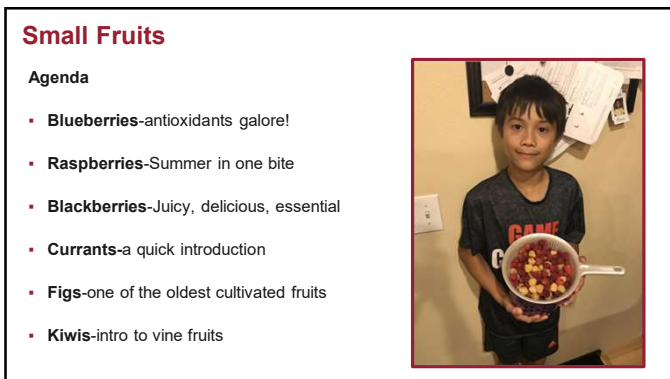


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4


Blueberries-A Native Staple

- Wild blueberries are one of only three berries native to North America.
- 35 species of blueberries and huckleberries are indigenous to North America.
- Native peoples revered these plants which played significant roles in their culture, sociology, economics, and spirituality.
- Dried blueberries were often an ingredient of *pemmican* (*Cree word for rendered fat*). When mixed with pulverized dried fish or meat and melted tallow, and baked by the sun, provided energy, lasted for months, and was easily portable on long journeys.
- Roots of the blueberry plant were boiled for tea by Native Americans.
- <http://naeb.brit.org/>



5

Blueberries



- Deciduous perennial
- Can live over 40 years
- 15 - 20 pounds berries per plant
- Attractive in landscape
 - fall foliage
 - spring flowers

6

Blueberry-Plant Selection



- Northern Highbush best type
- Cultivars differ in characteristics
 - berry size 1/4 - 1 inch
 - flavor (sweetness)
 - ripening time June - Sept
 - bush growth habit up to 9 feet tall & 5 feet wide
 - disease resistance
- 2-year-old or 3-year-old

7

Blueberry-Site

- 6 hours sun per day
- Well-drained, acidic soil
 - soil test
- Avoid areas by trees
- Be aware of microclimates
 - frost pockets
 - S & SW sides of buildings



8

Blueberry-Planting

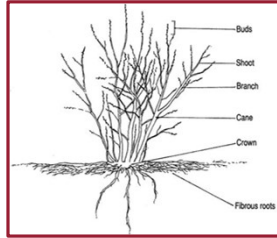
- Workable weed-free soil
 - Jan – Mar
- Same depth as nursery
 - 4 – 8 feet apart
- Hills 12 inches wide
- Raised beds 18 inches tall
- Same depth as nursery in the largest container you can find.
- Container at least 10 gallon
- Be sure to mulch and provide steady water.



9

Blueberry-Mulch

- 3-inch layer, avoiding base of plant
- Arborist wood chips, bark mulch, aged sawdust
- Conserves moisture, protects roots from temperature fluctuations, suppresses weeds
- Add 2 inches each year



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Blueberry- Fertilization



- Evaluate visually
 - if 2 - 4 new shoots per season & green leaves, no need to fertilize
 - excessive fertilizer can damage roots
- Split applications in April, May, & June
 - roots don't take up nutrients earlier
 - follow package directions
 - soil test
- Don't apply to drought - stressed plants or late in season

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Blueberry-Pruning

- When dormant in winter
- Branches damaged, crossing, or less than a pencil in diameter
- 4th year canes near base
- Can prune up to 20%
- 6 – 12 canes on mature bush



12

Blueberry-Diseases

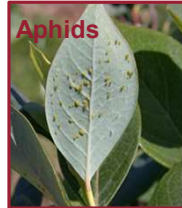


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Spotted Wing Drosophila and Aphids



-Bury into fruits



-Feed in colonies on leaves & new shoots

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Blueberry- Harvesting

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



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Raspberries-Many Uses

- Indigenous peoples of North America likely the first cultivators.
- Fresh berries were picked straight from the vine or mashed and mixed into beverages.
- Also added to soups and meat dishes and baked into a variety of cakes.
- The entire raspberry plant was used by American Indians to treat a number of illnesses.
- Raspberry roots, leaves and bark were all used to treat different ailments of the digestive and intestinal tracts.
- Roots were used to treat diarrhea; raspberry leaf tea was used as a diuretic and to calm nausea and vomiting.
- Bark tea was also commonly prescribed to treat dysentery and stomach aches.
- <http://naeb.brit.org/>



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Raspberries




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Raspberries-Types



- Long lived perennial
- Canes biennial
 - 1st year leaves primocanes)
 - 2nd year berries (floricanes)
 - die after fruiting
- New canes develop each year

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

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Plant Selection



- Dormant without bud
 - bare root or container
- Certified, disease-free
- Suckers from old plants may be virus-infected
- All are self-fertile

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Site

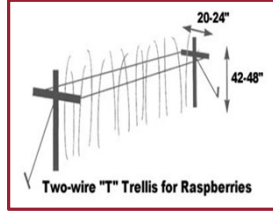
- Full sun (N – S rows good)
- Well-drained, weed-free soil
 - water logged soil leads to root rot
 - raised beds or hilling
- Ideal pH is 6.0 – 6.5
- Avoid frost pocket, wind
- Containers work too



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Raspberry-Trellis

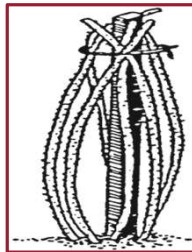
- Keeps canes & fruit off ground
- Reduces wind breakage
- Improves air circulation
- Reduces disease
- Eases weed control



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Raspberry-Staked Hill

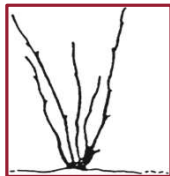
- Single post about 5 feet high
- Tie 5 or 6 of the sturdiest canes to post with twine or wire
- Cut smaller canes to ground level
- Top when canes reach above post



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Raspberry-Freestanding

- Choose 5 - 7 canes
- Head back to keep at 4 ½ feet



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Raspberry-Freestanding



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Raspberry-Watering and Fertilizer

- 1 – 1 ½ inches water per week during active growth
 - avoid overwatering
- Drip irrigate within the row
- Split applications or use slow- release fertilizer



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Raspberry-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

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Raspberry-Pruning

Summer bearing vs. Fall bearing



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Pruning Cuts



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Raspberry-Diseases



Botrytis Fruit Rot

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

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Root rot



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

31

Verticillium wilt



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

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Bushy Dwarf Virus

- Plants are stunted, berries crumbled
- No treatment
 - remove infected plants
- Does not live in soil, so OK to plant new plants in same area
- Buy certified disease - free plants



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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 or use slow release



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Crown Borer



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

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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
- To rinse or not to rinse?

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Blackberry

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Blackberry


- Blackberry is a flavor of fall (mid-July to September) in the Pacific Northwest.
- Blackberries live in the rose family and are close relatives of red raspberries.



38

Blackberry-Cultivation

- Six to eight hours of sunlight.
- Slightly acidic soil with a pH of 6.0 to 6.5.
- Do not plant in low areas where water stands after heavy rains.
- Plant in late February and early March.



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Blackberry-Pruning

- During the dormant season, prune out the dead canes that provided fruit the previous summer. Reduce by one-third to one-half of the length of the branch.
- **First Year:** Little pruning is necessary.
- **Second Year:** After the fruiting season, remove the old canes that are in the process of dying.



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Blackberry Rust (*Phragmidium violaceum*)

- A defoliating disease found on 'Evergreen' blackberries.
- Foliar symptoms include circular purplish leaf spots (1/8 inch) with yellow to tan centers on the upper leaf surface.
- Yellowish-orange pustules may also form on the flower buds, fruit, and canes of infected plants.
- Fungicides are used as a protectant, will not eradicate the disease after it has been established.



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Blackberry-Dry Cell Syndrome

- Individual drupelets become shriveled, dry and hard.
- Some fruits may have small dry, scabby looking lesions on green, red and black drupelets.
- There is no one specific organism that produces this symptom



42

Purple Blotch (Septocyta ruborum)

- All blackberries and hybrid berries are affected by this disease.
- In winter and spring, the lesions turn purple with a red margin.
- Fungicide will not "cure" the problem but may protect new canes.



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Black Vine Weevil (Otiorynchus sulcatus)

- Larvae feed on roots and destroy the bark and cortex of larger roots.
- Plants will soon begin to wilt because they are no longer able to provide moisture for the leaves.
- Adults are nocturnal and feed on foliage, removing large scallops (notching) from the leaves.
- Sprays work better at night.



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Redberry Mite (Acalitus essigi)

- Pest of all blackberries, most damaging to late-maturing cultivars, such as 'Thornless Evergreen'.
- The mite feeds at the core, stem, and base of drupelets. The mite injects a toxin that prevents proper drupelet development.
- Affected drupelets usually remain hard, green, or bright red.
- Preventative dormant sulfur applications



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Blackberry-Harvesting

- Erect blackberries are ripe and at their peak of flavor when they lose their high glossy shine and turn slightly dull.
- Harvesting is best when berries are juiciest, during the late morning hours



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Currant/Gooseberries



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Currants-Lesser-Known Facts

- Currants are grown on about 78 acres in Washington State, almost all of which are located in southeastern Washington.
- Red currants have been shown to have considerable health benefits, including high vitamin C and potassium content.



<https://www.javenderandlovage.com/2016/06/moelleux-aux-groseilles-redcurrant-cake.html>

48

Currant/Gooseberry-Cultivation

- Both grow well in medium to heavy soils.
- Currants have high nitrogen requirements.
- Plant in sun or partial shade.
- They bloom early, avoid frost prone areas.
- Plants will bear fruit at two years but won't bear full crops until their 3rd or 4th year.



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Currants/Gooseberries-Pruning



- Currants and gooseberries are grown as free-standing bushes or in hedge rows.
- Gooseberries can reach 5 to 7 feet at maturity and have thorny, arching canes.
- Currants are more erect and are thornless.
- If bushes are not pruned yearly, yields suffer.
- Maintain only 6 to 12 canes per plant.

50

Currants/Gooseberries-Pruning

- Remove older wood and encourage new growth on spurs of productive, two- to three-year-old wood.



Thinning-out cuts promote branching



Heading-back cuts promote development of new wood on 2 to 3 year-old wood

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A Cause for Concern

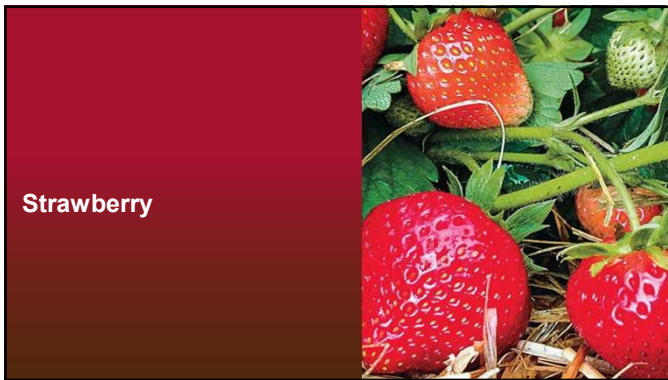
Question:

- Is it safe to plant currants and gooseberries in home gardens?

Answer:

- Early in the 1900's, white pine blister rust (*Cronartium ribicola*) became a serious disease problem in the United States. White pine blister rust requires both a currant or gooseberry (*Ribes* species) and white pine to complete its life cycle. The disease causes little harm to currants and gooseberries but is often deadly to white pines. (Black currants are very susceptible to white pine blister rust. Gooseberries and red and white currants are somewhat resistant.)

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Strawberry

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Strawberries-Plant Selection



- **June-bearing:** produce 1 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>

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Site and Planting

- 6 hours sun, well-drained, weed-free soil
- 8 – 12 inch raised bed or hilling
- Avoid frost pockets
- June-bearing: 12 - 24 inches apart in Sept
- Ever-bearing: 8 - 12 inches apart in March
- Can be closer in containers

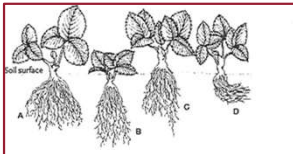


Figure 6. Proper planting depth (A) and improper depths (B, C, D). In B, the crown is too deep; in C, the crown is too high; and in D, the roots are bent and remain near the surface.

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Water and Mulch

- Bark mulch, aged sawdust, straw, black plastic
- Keeps berries clean, limits weeds, conserves soil moisture
- Avoid covering the crown
- Place drip line irrigation underneath mulch
- Water 1- 1 ½ inches per week during active growth
- Soil in containers dries out more quickly



Mulching strawberries
Photo: Noursefarms.com

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Fertilization

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



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Renovation of June-bearing

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



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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 and leaves; leaves slime trail



59

Diseases

Powdery Mildew



Botrytis Mold



60

Verticillium Wilt



61

Figs



62

About Figs

- A tree of mediterranean origin in the mulberry family (Moraceae).
 - Spanish explorers brought fig trees to Florida in 1575.
 - Brought to California by missionaries in 1769.
 - Grown in PNW since the late 1800s.
- Figs are inside-out flowers called **syconium**.
- Wood is flexible and grows quickly (often more than 3 feet per year).
- Can grow 10-30' without pruning.
- Shallow roots – easy to propagate.
- Cut branches produce latex which irritates skin.



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Fig Selection

4 Types of Figs

- Common Fig
- Caprifig
- Smyrna
- San Pedro

Recommended cultivars for PNW

- Desert King
- Brown Turkey
- Vashon Violet/Brunswick
- Italian Honey/Lattarula
- Negronne/Violette de Bordeaux
- Neveralla
- Petite Negri
- Olympian



Image sources: RainTree Nursery

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Site

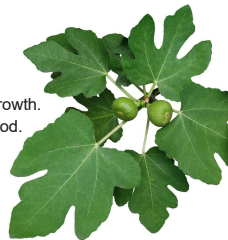
- Okay down to 10°F. May need winter protection.
- Needs a warm spot in full sun.
- Can do well in a container.
- Fairly drought tolerant, but needs regular watering.



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Fruiting and Pruning

- Figs grow on growth from last ~9 months.
- Figs produce two rounds of figs
 - Prima crop – main crop produced on this year’s growth.
 - Breba crop – figs produced on previous year’s wood.
- Very easy to prune; very easy to renovate.
- General guidance:
 - In April, prune about a 1/3 of branches.
 - Goal is to increase sunlight into inner canopy.
 - Use heading cuts to promote branches closer to the ground (easier to reach).
 - Keep last year’s new branches – that’s where it will fruit.



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Problems and Solutions

Cold Damage

- In winter snaps (temperatures below 10°F), cover tree or wrap sensitive tips.
- Bring potted plants in doors or give them shelter.
- Avoid pruning while frost is still likely.

Birds

- Use netting.

Skin Irritation

- Use gloves to prevent contact with latex.

Botrytis

- Prevalent airborne fungus – causes branch to die. Must be pruned out to prevent spread.
- Vector for entry is prima crop after frost – remove unripe crop from branches in winter.



Botrytis

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Harvest and Propagation

- Best picked fully ripe from the tree – should be able to just lift fig up to break free.
- It's too soon if latex oozes from the stem – they're not ripe.
- Breba crop ready in PNW in July.
- Main crop usually doesn't have enough time before first frost.
- Keeps only for a few days.

Easily started from cuttings!

- Take a 1/2" cutting that's about a foot long, bury it 8" deep.
- Keep soil moist.
- By next season, the fig tree will take root.



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Kiwi



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Kiwi Selection

Three types

- Fuzzy (Actinidia delisiosa)
 - Hayward – most commonly available cultivar found in stores
 - Blake – a "self fertile" cultivar, though benefits from cross polication
- Hardy (Actinidia arguta)
 - Anansasaya – most popular hardy. Russian name means "pineapplelike."
 - Issai – from Japan, less vigorous. Smaller fruit.
- Arctic (Actinidia kolomikta)
 - Krupnopladnaya - means "large fruit" in Russian.
 - Pautske – most vigorous of arctic varieties.



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Kiwi Types



Image sources: Raintree Nursery

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Physiology

Dioecious

- Male & Female flowers on separate plants- 'Issai'self-fruitful (?)

Flowering

- Flower late-after mason bees-may need hand pollinating
- Fruits on current years shoots from previous year's canes

Harvest

- Fuzzy kiwis ripen in fall and can be stored over winter, others late summer/fall



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Culture

Sun

- Sun, except hardy kiwis fruit in part shade
- Arctic kiwis prefers some shade

Growth

- Vigorous growers, especially fuzzy kiwis
- Must have sturdy structure to grow on
- Usually trained as a 'cordon'

Watering

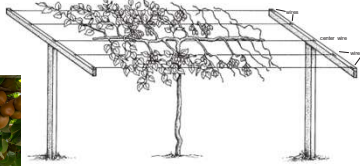
- Must have good soil drainage
- Prefer regular watering during growing season



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Training

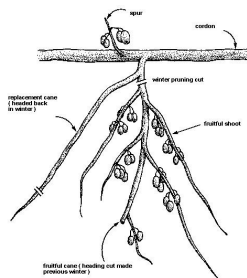
- Kiwis are a vine fruit – grow them the same way as grapes
- Use a trellis or a fence to support growth



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Pruning

- Kiwis are most effective when cordon trained
- Kiwis fruit on this year's growth
- Prune back to the cordon each winter leaving a few spurs and canes for coming year



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Master Gardener Resources

Ask a Master Gardener

Send a messages with questions and photos to: ask-a-mastergardener@live.com

Or use the online form at <https://extension.wsu.edu/king/ask-a-master-gardener>

Become a Master Gardener

For information on King County Master Gardener training, visit <https://extension.wsu.edu/king/gardening/become-a-master-gardener>

Applications for the 2025 class will open in September 2024

This institution is an equal opportunity provider. Please report violations through your local Extension office.

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Thank you!



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Master Gardener Foundation of King County
<http://www.mgfk.org>

- Fundraising for these programs

More information about growing groceries:
<https://kingcounty.mastergardenerfoundation.org/education/gg/>

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