

Cherry Pest Control Recommendations

Use only one material except where a combination is indicated. Follow label precautions when tank-mixing oils, fungicides, and insecticides. Materials are not listed in order of preference. Copper-based products alone have not worked well under conditions favorable for bacterial canker development.

Dormant and Delayed Dormant (Stages 0-1—before buds open and before eggs hatch)

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Scale insects, mite eggs, aphids, eggs and larvae of certain leafrollers, peach twig borer, and bud moth		
<i>Note:</i> When using a WP formulation with oil, fill sprayer tank one-third full with water, turn on agitator, slowly add the WP, fill tank one-half full with more water, add oil. Keep agitator running, finish filling. Thorough coverage is essential. Dilute sprays recommended during this stage. Liquid formulations mix best with oil and water.		
horticultural mineral oil (HMO) + an insecticide registered for these pests, such as:		
Centaur 70WDG	34.5-46 oz	14-day PHI.
diazinon 50WP	4 lb	Do not exceed 1 dormant application per season.
Esteem 35WP	4-5 oz	Do not exceed 2 applications per year. 14-day PHI.
Lorsban 4E	4 pt	4-day reentry.
Supracide 2E	3-12 pt	Supracide may be used without oil for San Jose scale control. 2- to 14-day reentry.
Shothole borer (See footnote 4, page 10)		
<i>Note:</i> Make first application in late February or March when overwintering adults first emerge. Spot treat infestations within orchard. Apply to infested trunk and limbs until runoff.		
endosulfan 50WP	—	See footnote 4, page 10.
Lorsban 4E as above	4 pt	Do not use Lorsban on sweet cherries after budbreak. Use only on sour cherries. 4-day reentry.

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Popcorn Stage (Stages 2-5—blossom buds white just before opening)

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot blossom blight (see footnote 3, page 10)		
Abound	12-15.5 fl oz	See footnote 6, page 10. 4-hour reentry. 0-day PHI.
Adament 50WG	4-8 oz	Group 3 + 11 fungicide (Elite + Gem). 5-day reentry. 1-day PHI.
Bravo Weather Stik	3-4.1 pt	Do not apply later than shuck split. 12-hour reentry.
Bumper 41.8EC	4 fl oz	24-hour reentry. 0-day PHI.
Cabrio EG	9.5 oz	12-hour reentry. 0-day PHI.
Captan 80WDG	1.9-2.5 lb	24-hour reentry.
CaptEvote 68WDG	3.75 lb	(Captan + Elevate.) Do not apply more than 2 consecutive applications. 24-hour reentry. 0-day PHI.
Elevate 50WDG	1-1.5 lb	12-hour reentry. 0-day PHI.
Elite 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Indar 2F	6 fl oz	12-hour reentry. 0-day PHI.
Orius 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Pristine	10.5-14.5 oz	(Cabrio + Endura.) 12-hour reentry. See footnote 6, page 10. 0-day PHI.
Procure	10-16 fl oz	12-hour reentry. 1-day PHI.
Quash	2.5-4 oz	12-hour reentry. 14-day PHI.
Quilt Xcel	14 fl oz	Abound + Tilt. 12-hour reentry. See footnote 6, page 10. 0-day PHI.
Rally 40WSP	2.5-6 oz	24-hour reentry.
Rovral 4F	1-2 pt	Do not make more than 2 applications per season. Do not use past shuck split. See footnote 3, page 10. 24-hour reentry.
Tilt	4 fl oz	12-hour reentry. 0-day PHI.
Topsin 4.5FL	20-30 oz	Tank mix with another fungicide. 2-day reentry. 1-day PHI.
Ziram 76DF	5-6 lb	Do not apply after first cover. 48-hour reentry. 30-day PHI.

Aphids, bud moth, leafrollers

Note: Aphids usually are of concern only on young trees. If undesirable on mature trees, a spray 2 weeks after shuck fall is effective.

Actara	3-4 oz	14-day PHI.
Altacor	3-4 oz	For leafroller control. 7-day PHI.
diazinon 50WP	4 lb	Only 1 application per season. Allow 5 days before introducing bees.
endosulfan 50WP	4 lb	Limited to 2 applications per season. Allow 1-3 days before introducing bees.

Syneta beetle (see footnote 5, page 10)

Note: A local problem in certain Valley orchards. Adults may emerge and require control between early popcorn and petal fall. Place a beating tray or sheet under limbs and shake or tap branches to find beetles. Most damage is seen on pinhead size and smaller cherries. Insecticides should be applied no later than shuckfall if this prebloom application is not made.

azinphos methyl (Guthion Solupak)	1.5 lb	Wait at least 5 days before introducing bees. 15-day PHI.
endosulfan 50WP	4 lb	Do not use more than 6 lb/A per year nor make more than 2 applications per year. Wait at least 1-3 days before introducing bees. 21-day PHI.
Imidan 70WP	1.3 lb	Imidan is the material of choice. Early popcorn is the time to treat if weather allows. A water-soluble bag formulation (70WSP) also is available. OR 24c for sweet cherries. Federal label for tart cherries. Wait at least 5 days before introducing bees. 7-day PHI.

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Full Bloom (Stages 6-7)

Brown rot blossom blight (see footnote 3, page 10)

See materials listed for Popcorn Stage, page 3.

Petal Fall (75% petal fall)

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot blossom blight (see footnote 3, page 10)		
See materials listed for Popcorn Stage.		
Leaf spot (see footnote 2, page 10)		
Adament 50WG	4-8 oz	Group 3 + 11 fungicide (Elite + Gem). 24-hour reentry. 1-day PHI.
Bravo Weather Stik	3-4.1 pt	Do not apply after shuck split. 12-hour reentry.
Captan 80WDG	1.9-2.5 lb	24-hour reentry.
Echo 720	3-4.1 pt	12-hour reentry.
Elite 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Gem 500SC	1.9-3.8 oz	12-hour reentry. 1-day PHI.
Indar 2F	6 fl oz	12-hour reentry. 0-day PHI.
Orius 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Pristine	10.5-14.5 oz	12-hour reentry. See footnote 6, page 10. 0-day PHI.
Procure	10-16 fl oz	12-hour reentry. 7-day PHI.
Quilt Xcel	14 fl oz	Abound + Tilt. 12-hour reentry. See footnote 6, page 10. 0-day PHI.
Rally 40WSP	2.5-6 oz	Has some curative (kickback) activity. 7-day PHI.
Rubigan 1EC	6-12 oz	Do not apply more than 48 oz/A per season. 0-day PHI.
Syllit FL	1-3 pt	48-hour reentry.
Tilt	4 fl oz	12-hour reentry. 0-day PHI.
Ziram 76DF	7 lb	30-day PHI.

Aphids, bud moth, leafrollers

Note: If this petal fall spray is used, spray only after bloom and after bees have been removed from orchard.

diazinon 50WP	4 lb	Limited to 1 application per season. 21-day PHI.
endosulfan 50WP	4 lb	Do not exceed 6 lb/A per year. Do not apply more than twice per year. Use if not sprayed prebloom and syneta beetle is a problem. 21-day PHI.
Success 2L	4.8 oz	Not effective on aphids. 7-day PHI.

Syneta beetle

Note: See materials listed for Popcorn Stage, page 3.

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Shuck Split

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Leaf spot		
Adament 50WG	4-8 oz	Group 3 + 11 fungicide (Elite + Gem). 5-day reentry. 1-day PHI.
Bravo Weather Stik	3-4.1 pt	Do not apply after shuck split. 12-hour reentry.
Captan 80WDG	1.9-2.5 lb	24-hour reentry.
Echo 720	3-4.1 pt	12-hour reentry.
Elite 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Gem 500SC	1.9-3.8 oz	12-hour reentry. 1-day PHI.
Indar 2F	6 fl oz	12-hour reentry. 0-day PHI.
Orius 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Pristine	10.5-14.5 oz	12-hour reentry. See footnote 6, page 10. 0-day PHI.
Procure	10-16 fl oz	12-hour reentry. 1-day PHI.
Quilt Xcel	14 fl oz	Abound + Tilt. 12-hour reentry. See footnote 6, page 10. 0-day PHI.
Rally 40WSP	2.5-6 oz	Has some curative (kickback) activity. 7-day PHI.
Rubigan 1EC	6-12 oz	Do not apply more than 48 oz/A per season.
Syllit FL	1.5-3 pt	48-hour reentry. Use with another fungicide. 1-day PHI.
Tilt	4 fl oz	12-hour reentry. 0-day PHI.
Ziram 76DF	5-6 lb	48-hour reentry. 30-day PHI.

Shothole (Coryneum blight)

Note: See footnote 7, page 10.

Captan 80WDG	1.9-2.5 lb	24-hour reentry.
Echo 720	3-4.1 pt	12-hour reentry.
Ziram 76DF	5-6 lb	48-hour reentry. 30-day PHI.

Powdery mildew

Note: Can be a problem in some years in western Oregon. Materials used for brown rot and/or leaf spot can be effective on this disease as well.

Two Weeks after Shuck Fall

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Leaf spot		
See materials listed at Shuck Split.		
Aphids		
Note: Aphids are of concern primarily in young orchards. Use this spray if the popcorn spray was not made and aphids are increasing.		
Actara	3-4 oz	14-day PHI.
diazinon 50WP	2-4 lb	Limited to 1 application per season. 21-day PHI.
endosulfan 50WP	4 lb	Do not exceed 6 lb/A per year. Do not apply more than twice per year. 21-day PHI.

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Late Spring and Summer

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot on fruit		
<i>Note:</i> Apply materials prior to harvest before wet weather is expected. Pay close attention to preharvest spray restrictions.		
Abound	12-15.5 fl oz	See footnote 6, page 10. 4-hour reentry. 0-day PHI.
Adament 50WG	4-8 oz	Group 3 + 11 fungicide (Elite + Gem). 5-day reentry. 1-day PHI.
Bumper 41.8EC	4 fl oz	24-hour reentry. 0-day PHI.
Cabrio EG	9.5 oz	12-hour reentry. 0-day PHI.
Captan 50WP	3-4 lb	4-day reentry.
CaptEvote 68WDG	3.75 lb	(Captan + Elevate.) Do not apply more than 2 consecutive applications. 24-hour reentry. 0-day PHI.
Elevate 50WDG	1-1.5 lb	12-hour reentry. 0 day PHI.
Elite 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Indar 2F	6 fl oz	12-hour reentry. 0-day PHI.
Orius 45DF	4-8 oz	12-hour reentry. 0-day PHI.
Procure	10-16 fl oz	12-hour reentry. 1-day PHI.
Quash	2.5-4.0 oz	12-hour reentry. 14-day PHI.
Quilt Xcel	14 fl oz	Abound + Tilt. 12-hour reentry. See footnote 6, page 10. 0-day PHI.
sulfur, wettable (92%)	5-10 lb	Phytotoxic when temperatures over 85°F. 24-hour reentry.
Tilt	4 fl oz	12-hour reentry. 0-day PHI.
Topsin 4.5FL	20-30 fl oz	Tank-mix with another fungicide. See footnote 3, page 10. 2-day reentry. 1-day PHI.
Bacterial canker, cherry witches' broom		
none	—	Prune out cankers and dead limbs during dry weather.

Late Spring and Summer continues on next page

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CONTINUED—Late Spring and Summer

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Cherry fruit fly		
<i>Note:</i> First emergence can be in early May or as late as mid-June depending on location, elevation, weather, slope, and population pressure of an orchard. Growers should obtain emergence dates and base spray timing on local emergence information. SOUTH VALLEY: Douglas or Lane Co. Ext. offices. MID-VALLEY: Lane Co. Extension. NORTH VALLEY: Yamhill Co. Extension. Many other insecticides are registered for cherry fruit fly control including azinphos-methyl (Guthion) and Asana.		
Actara	4.5-5.5 oz	7-day PHI.
Asana	4.8-14.5 fl oz	May aggravate spider mite problems. 14-day PHI.
Assail 70WP	2.3-3.4 oz	7-day PHI.
Assail 30SG	5.3-8 oz	7-day PHI.
Delegate WG	4.5-7 oz	Apply no less than 1 week apart, maximum 4 times per season. 7-day PHI.
diazinon 50WP	4 lb	WPs may leave residues visible at harvest.
dimethoate 267	3-4 pt	21-day PHI.
dimethoate 400 or dimethoate 4E	2 pt 2 pt	Do not mix dimethoate with Syllit. Thorough coverage is important. Phytotoxicity can occur and varies from marginal leaf burn to defoliation. USE ONLY ONCE PER SEASON. 21-day PHI.
Entrust	1.25-2.5 oz	Organic formulation of spinosad. 14-day PHI.
Imidan	2.33-2.5 lb	South cherries only. 7-day PHI.
malathion	see labels	Many formulations are available: WP, ULV, and EC. WPs may leave residues visible at harvest. Fyfanon ULV is produced by Cheminova. 1- to 3-day PHI.
Provado 1.6F	4-8 oz	7-day PHI.
Sevin XLR Plus or Sevin 80WSP	2-3 qt 3 lb	3-day PHI.
spinosad bait (GF-120 NF)	20 oz	Apply every 7 days by air or all-terrain vehicle. Apply 0.8-1 gal/A with a D2 nozzle (without a core) attached to an ATV, at 6-7 mph.
Success 2L	4-8 oz	7-day PHI.
Voliam Flexi	6-7 oz	14-day PHI.
See also spotted wing <i>Drosophila</i> on the next page.		

Late Spring and Summer continues on next page

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CONTINUED—Late Spring and Summer

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Spotted wing Drosophila		
<i>Note:</i> Begin monitoring just before fruit starts to change to its ripening color. See footnote 8, page 10. Insecticides recommended for management of spotted wing Drosophila are based on preliminary information and may change after additional research is conducted.		
Delegate WG	4.5-7 oz	Apply no less than 1 week apart, maximum 4 times per season. 7-day PHI.
diazinon 50WP	4 lb	WPs may leave residues visible at harvest. 21-day PHI.
dimethoate 267	3-4 pt	Do not mix dimethoate with Syllit. Thorough coverage is important. Phytotoxicity can occur and varies from marginal leaf burn to defoliation. USE ONLY ONCE PER SEASON. 21-day PHI.
dimethoate 400 or	2 pt	
dimethoate 4E	2 pt	
malathion	see labels	Many formulations are available: WP, ULV, and EC. WPs may leave residues visible at harvest. Pyranon ULV is produced by Cheminova. 1- to 3-day PHI.
Entrust	1.25-2.5 oz	Organic formulation of spinosad. 14-day PHI.
Provado 1.6F	4-8 oz	7-day PHI.
Sevin XLR Plus or	2-3 qt	3-day PHI.
Sevin 80WSP	3 lb	
Success 2L	4-8 oz	7-day PHI.
Shothole borer (see footnote 4, page 10)		
<i>Note:</i> Spot-treat as needed. See Delayed Dormant Stage		
endosulfan 50WP	1.5 lb/100 gal water	Do not exceed 6 lb/A per year or 2 times per year. 21-day PHI.
Pear slugs		
<i>Note:</i> Usually controlled with insecticides applied for control of other pests. Pear slugs should be controlled on young trees during “establishment years.”		
Fruit cracking		
hydrated lime	20-25 lb	Thorough coverage of fruit is essential. Will reduce, not eliminate, cracking.

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Postharvest

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
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Shothole borer (see footnote 4, page 10)

endosulfan 50WP	1.5 lb/100 gal water (4-5 lb/acre)	See late spring and summer use. Emergence of this third generation will be in September or October.
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Spider mites

Note: Spider mites seldom are a problem on cherries in the Willamette Valley except on young trees.

Acramite 50WS	0.75-1 lb	Use only once per season. 3-day PHI.
Apollo 50SC	4-8 oz	Do not use more than once per season. 21-day PHI.
Envidor 2SC	16-18 oz	7-day PHI.
Omite 30W	6 lb	Postharvest use only.
Onager 1EC	24 oz	Postharvest use only.
Savey DF	3-6 oz	Does not control rust mites. 28-day PHI.
Vendex 50WP	1.5-2 lb	14-day PHI if used preharvest.

Increased fruit set

Solubor or Borosol	5-8 lb 2-4 qt	Late September or early October use with 60 gal or more of water. Don't mix boron sprays with pesticides. The elevated pH of the boron spray solution weakens many insecticides. Use this rate for foliar application.
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Dormant Season (October and January—Stage 0)

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
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Shothole

Note: Use of copper may **increase** bacterial canker in some orchards. If you use these products, apply the first spray in October before the fall rains and again in early January. Do not graze sheep in orchards sprayed with coppers. Toxic amounts of copper can build up in orchard soils after decades of use.

bordeaux 12-12-100	See footnote 1, page 10.	—
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Footnotes

1. Bacteria resistant to copper products have been detected in many Willamette Valley crops. Some growers report control of bacterial canker by the application of bordeaux 12-12-100 in October and January; others report little or no control. Some research trials have shown that copper products can significantly **increase** this disease. If you choose to use copper-based products, thoroughly spray the trunks and lower scaffolds as well as the upper branches. Bordeaux 12-12-100 means 12 pounds of copper sulfate plus 12 pounds of hydrated lime in 100 gallons of water. In any bordeaux formula, the ingredients always are listed in the same order—copper sulfate, hydrated lime, then gallons of water.
2. Young trees not being sprayed for brown rot may need an application of fungicide during bloom for adequate control of cherry leaf spot. This is more of a problem in high rainfall areas.
3. Fungal pathogens have shown resistance to several fungicides when one is used exclusively. Alternate or tank-mix with fungicides with different modes of action. Fungicides from different groups have different modes of action. Some products may already be a mix of two different fungicides. One or two applications during bloom may adequately control brown rot when products with systemic (translaminar) activity are used.
4. Shothole borer can have three generations in Valley orchards. Look for new adults and/or sawdust pushed from emergence holes in late winter, June/July, and again in Sept/Oct. It prefers young and/or stressed trees. Control is difficult and consists of spot-treating infested trunks and limbs with a dilute spray when adults are emerging and reinvading. Thiodan (Endosulfan), although not labeled for this pest, has given some control. It, however, has a 21-day PHI and should not be used within 3 weeks of harvest. Mix as a dilute spray at the rate of 1-1.5 lb 50WP per 100 gal water.
5. Syneta beetle is a small, pale leaf- and fruit-feeding beetle that causes fruit scarring shortly after pollination through the time cherries are pinhead size. It is a localized problem in the Valley and within orchard blocks. Adults begin emerging and feeding in orchards before bloom or as late as early fruit set. First emergence has been as early as April 6 or as late as early May depending upon elevation and slope of individual blocks. Beetles may be present for 4-6 weeks in an orchard. Best time for control is PREBLOOM (popcorn) if beetles are present. Imidan (OR-24c) is the favored insecticide. Guthion (azinphos-methyl) also will give good control at this time *if* beetles are present. However, do not introduce bees for 5 days post spray of either insecticide because of possible residues and associated bee kills. Propulsan 50WP (OR-24c) also will control Syneta and is not quite as hazardous to pollinators; but at the rate suggested for use, 3 days should pass prior to introducing bees. **DO NOT APPLY THESE INSECTICIDES TO TREES IN BLOOM!** Both ground emergence cages and “tap trays” for pear psylla monitoring are used to determine presence of Syneta.
6. Alternate group 11 fungicides with a fungicide that has a different mode of action. Do not use more than 2 sequential applications. Sprayers used for Abound should **not be used on apples** such as Gala, Cox’s Orange Pippin, and McIntosh. Even a small amount of drift can severely impact these apple trees.
7. Good information on the control of shothole in sweet cherry is lacking. Much of our information is derived for the same disease on peaches or almonds. Other materials also may be effective. Applications past shuck split may be needed in years when heavy spring rains continue past bloom.
8. Monitor for spotted wing Drosophila (SWD) with clear, quart sized plastic deli cups with lids. Drill or puncture about 10 $\frac{3}{16}$ -inch holes near the rim of the cup for fly entry. Bait traps with pure apple cider vinegar plus a drop of unscented liquid soap. Hang the trap in a shady, cool location within the tree canopy. Just before fruit starts to change to its ripening color, place as many traps as you will be able to maintain. Check traps weekly. Various kinds of flies will be captured in this non-specific trap so learn to identify SWD and have positive catches confirmed by your local Extension office. Treatment thresholds have not been established, but preventive measures should be taken when the first SWD is captured and fruit starts to ripen. Monitoring guidelines are based on the data currently available and designed for ease of grower adoption and use. During the 2010 growing season, SWD were captured in mid-May in the Mid-Columbia area and earlier west of the Cascades. Watch the SWD website for regional detections of SWD at <http://swd.hort.oregonstate.edu/>

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Table 1. Effectiveness of Fungicides for Control of Cherry Diseases*

Fungicide	Fungicide group #	Properties**	Brown rot (blossom blight)	Brown rot (fruit rot)	Cherry leaf spot	Powdery mildew	Shothole
Abound	11	B, F, Ls, P	Good	Good	Good	Excellent***	Fair-good
Adament	3 + 11	B-N, C, F, Ls, P	??	??	Excellent	Excellent	??
Botran	14	F, P	Fair	Fair	??	Not effective	??
Bravo	M5	B, F, P	Good-fair	Not registered	Excellent	Not effective	Good
Bumper/Orbit/Tilt	3	B-N, C, F, Ls, P	Excellent	Excellent	??	Fair-good***	Slight
Cabrio	11	B, F, Ls, P	Good	Good	Fair-good	Excellent***	??
Captan	M4	B, F, P	Good	Good	Good	Not effective	Good-excellent
CaptEstate	M4 + 17	B, F, P	Good	Good	Good	Not effective	Good
Copper-based products	M1	B, Bact, F, P	Slight	Not registered	Good	Slight	Good
Echo 720	M5	B, F, P	Good-fair	Not registered	Excellent	Not effective	Good
Elevate	17	F, N, P	Good-excellent	Good-excellent	??	Not effective	??
Elite	3	B-N, C, F, Ls, P	Good-excellent	Good-excellent	Good	Fair-good***	??
Gem	11	B, F, Ls, P	Good	Fair-good	??	Excellent***	??
Indar	3	B-N, C, F, Ls, P	Excellent***	Excellent***	Good-excellent	Slight**	??
HMO	Not classified	E, F, I, P	??	??	??	Good-excellent	??
Kaligreem	Not classified	E, B-N	??	??	??	Poor	??
Orius	3	B-N, C, F, Ls, P	Good-excellent	Good-excellent	Good	Excellent***	??
Pristine	7 + 11	B-N, F, Ls, P	Good	Good	Good	Excellent**	??
Procure	3	B-N, C, F, Ls, P	Good	??	Fair	Good***	??
Quash	3	B-N, C, F, Ls, P	Good-excellent	Good	??	Good***	??
Quilt Xcel	11 + 3	B-N, C, F, Ls, P	Excellent	Excellent	??	Excellent***	Fair-good
Quintec	13	N, F, P	None	None	None	Excellent	None
Rally	3	B-N, C, F, Ls, P	Good-fair	Good-fair	Excellent	Fair-good***	Slight
Rovral	2	B-N, F, Ls, P	Good**	Not registered	Slight	Not effective	Fair-good
Rubigan	3	B-N, C, F, Ls, P	Not registered	Good	Excellent	Good-fair	??
Sulfur	M2	F, L, P, V	??	Fair	Fair	Good	Not effective
Syllit	M7	F, F, P	??	Slight	Good	Not effective	??
Topsin	1	B, C, F, Ls	Good**	Good***	??	Good***	Not effective
Ziram	M3	B, F, P	Slight	Slight	Fair	Not effective	Good-excellent

*These ratings are relative rankings based on labeled application rates, good spray coverage, and proper spray timing. Actual levels of disease control will be influenced by these factors in addition to cultivar susceptibility, disease pressure, and weather conditions.

**Properties: E = Eradicant; F = Fungicidal; Fv = Fungivorous; I = Insecticidal; Ls = Locally systemic; N = Narrow spectrum of activity; P = Protectant; V = Vapor active; ?? = Unknown.

***Resistance pathogens will lower the effectiveness of these fungicides.

Follow the “Rules” for fungicide stewardship:

Rotate or mix fungicides of different chemical groups.

Use labeled rates.

Limit total number of applications.

Educate yourself about fungicide activity, mode of action, and class—as well as resistance management practices.

Start a fungicide program with multisite mode of action materials.

For more information about fungicides registered for use on cherries and their specific modes of action, consult the following OSU Extension publication: *How to Reduce the Risk of Pesticide Resistance in Cherry Pests in Oregon*, EM 8951.

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Table 2. Registered Herbicides for Orchard Crops in Oregon

For a more complete guide to orchard crop weed management, please refer to the *PNW Weed Management Handbook*, available in hard copy or online (<http://extension.oregonstate.edu/catalog/>). For access to herbicide labels, visit the CDMS Agro-chemical database (<http://www.cdms.net/LabelsMsds/LMDefault.aspx>) or Greenbook (<http://www.greenbook.net/>).

Site preparation		
Material	Uses	Rate
glyphosate (numerous product names)	—	Read label carefully for crops listed and geographic location.
New plantings (newly planted trees less than 1 year old), nonbearing		
Material	Uses	Rate
napropamide (Devrinol)	All except chestnuts	5 lb ai/A (50 lb/A Devrinol 20-6)
oryzalin (Surflan)	—	2-6 lb ai/A (2-6 qt/A Surflan AS)
pendimethalin (Prowl H20, 3.3)	All fruits and nuts	1.9-6 lb ai/A (2-6.3 qt/A) depending on desired weed control and crop
flumioxazin (Chateau SW and WDG)	Pome, stone, and nut trees	0.188-0.38 lb ai/A Chateau WDG. Slight differences in rates and uses in SW and WDG labels. Refer to label for organic matter, soil types, and rates for various broad leaf weeds.
isoxaben (Gallery or Gallery T & V)	Nonbearing crop only, except chestnuts	0.7-1 lb ai/A (0.66-1.33 lb/A product)
trifluralin (Treflan 4EC)	Newly established, nonbearing and bearing, except pears, chestnuts, and hazelnuts	0.5-1 lb ai/A (1-2 pt/A Treflan 4EC)
isoxaben + trifluralin (Snapshot 2.5TG)	Nonbearing crop only, except chestnuts	5 lb ai/A (200 lb/A Snapshot 2.5TG)
trifluralin + isoxaben + oxyfluorfen (Showcase)	Nonbearing crops only, including apricots, cherries, nectarines, peaches, plums, and prunes, excluding apples, pears, hazelnuts, walnuts, and chestnuts	2.5-5 lb ai/A (100-200 lb/A Showcase)
pronamide (Kerb)	—	1-4 lb ai/A (2-8 lb/A). Rate depends on species present and soil texture.
fluazifop (Fusilade DX)	Apples, pears, hazelnuts, and walnuts	0.25-0.375 lb ai/A (16-24 oz/A Fusilade DZ). Refer to specific grassy weeds on label.
sethoxydim (Poast)	Except prunes and plums	0.28-0.47 lb ai/A (1.5-2.5 pt/A product)
clathrom (Envoy, Prismo Select)	Nonbearing trees only	0.06-0.125 lb ai/A (6-8 oz/A Select)
paraquat (Gramoxone Inteon, Firestorm)	—	0.625-1 lb cation/A (2.5-4 pt/A Gramoxone; 1.7-2.7 pt/A Firestorm)
glyphosate (numerous product names)	—	Read label carefully for crops listed and geographic location.
glyphosate (numerous product names)	—	Wiper: 33% solution
glufosinate ammonium (Rely)	Apples, hazelnuts, and walnuts	0.75-1.5 lb ai/A (3-6 qt/A Rely)
oxyfluorfen (Goal 2XL)	—	1.25-2 lb ai/A (5-8 pt/A Goal 2XL)

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Established plantings/Applications that persist in the soil

Material	Uses	Rate
pendimethalin (Prowl H2O)	—	Prowl H2O: 1.9-6 lb ai/A (2-6.3 qt/A), depending on desired length of weed control and crop.
flumioxazin (Chateau SW and WDG)	Pome, stone, and nut trees	0.188-0.38 lb ai/A Chateau WDG. Slight differences in rates and uses in SW and WDG labels. Refer to label for organic matter, soil types, and rates for various broadleaf weeds.
dichlobenil (Casoron)	Apples, pears, cherries, and hazelnuts	4-6 lb ai/A (100-150 lb/A Casoron)
diuron (Karmex DF and others)	Apples, pears, peaches, hazelnuts, and walnuts only	See label for crop-specific application rates.
simazine (Princep Caliber 90 is a Special Local Needs label (OR-080038) for sweet cherries only). Tart cherries have a federal label for Princep 4L, Caliber 90, and other simazine herbicides in Oregon.	Except chestnuts, apricots, prunes, and nectarines	See product labels for rates.
terbacil (Sinbar 80)	Bearing apples and peaches only; labeled for nonbearing apricot, pear, apple, cherry, peach, and plum	0.4-0.8 lb ai/A (0.5-1 lb/A), newly established; 1-4 lb/A Sinbar, bearing, depending on soil type.
norflurazon (Solicam)	Except chestnuts	1.97-7.8 lb ai/A (2.5-10 lb/A Solicam)
napropamide (Devrinol)	Except chestnuts	5 lb ai/A (50 lb/A Devrinol 10G)
oryzalin (Surflan AS)	Except apples, cherries, nectarines, peaches, prunes, and walnuts	0.5 lb ai/A (2-6 qt/A Surflan)
pronamide (Kerb)	Except hazelnuts and walnuts	1-4 lb ai/A (2-8 lb/A Kerb 50W)
trifluralin (Treflan 4EC)	Stone fruit and walnuts	0.5-1 lb ai/A (1-2 pt/A Treflan 4EC)
oxyfluorfen (Goal 2XL)	—	1.25-2 lb ai/A (5-8 pt/A Goal 2XL)

THIS PUBLICATION IS OUT OF DATE.
 For most current information:
<http://extension.oregonstate.edu/catalog>

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Established plantings/Postemergence contact and translocated herbicides

Material	Uses	Rate
paraquat (Gramoxone Max, Firestorm)	—	0.625-1 lb cation/A (2.5-4 pt/A Gramoxone; 1.7-2.7 pt/A Firestorm)
oxyfluorfen (Goal 2XL)	—	1.25-2 lb ai/A (5-8 pt/A Goal 2XL)
pyraflufen (Venue)	—	0.7-4 fl oz product/A (0.001-0.006 lb ai/A)
saflufenacil (Treevix)	Pome fruits and walnuts	1 oz/A (0.045 lb ai/A)
glyphosate (numerous product names)	—	Spray: read label carefully for crops listed and geographic location.
glyphosate (numerous product names)	—	Wiper: 23% solution
glufosinate ammonium (Rely)	Apples, hazelnuts, and walnuts	1.75-1.5 lb ai/A (3-6 qt/A Rely)
2,4-D amine (Saber, Weed-Rhap A4D, Dri-Clean Herbicide)	—	0.95-1.4 lb ae/A (2-3 pt/A Saber)
clopyralid (Stinger)	Stone fruits only	0.12-0.25 lb ae/A (0.75-0.63 pt/A Stinger)
rimsulfuron (Matrix FNV)	All fruit and nut crops	0.063 lb ai/A (4 oz/A Matrix FNV per year)
halosulfuron (Sanda)	Hazelnuts and walnuts	0.032-0.062 lb ai/A (0.66-1.33 oz/A)
fluzafop (Fusilade DX)	Bearing stone fruit	0.25-0.37 lb ai/A (16-24 oz/A Fusilade DX) Refer to specific grassy weeds listed on label.
sethoxydim (Poast)	Except prunes and plums	0.28-0.47 lb ai/A (1.5-2.5 pt/A Poast)

Grass suppression in row middles (chemical moving)

Material	Uses	Rate
glyphosate (numerous product names)	—	Read label carefully for crops listed and geographic location.
sethoxydim (Poast)	—	0.09 lb ai/A (0.5 pt/A Poast)

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OSU Internet Resources for Plant Protection

Information regarding plant protection is available from several sources at OSU. The following listings are excellent examples:

- OSU Integrated Plant Protection Center. Online weather data and degree day information for insect pests and diseases (<http://uspest.org/wea/>)
 - Eastern filbert blight help page—all the information you need for this disease (<http://oregonstate.edu/dept/botany/epp/EFB/>)
 - Codling moth development information (<http://ippc2.orst.edu/cgi-bin/ddmodel.pl?clm>)
 - Apple scab infection season information (<http://ippc2.orst.edu/cgi-bin/ddmodel.pl?spp=asc>)
 - Pear scab infection season information (<http://ippc2.orst.edu/cgi-bin/ddmodel.pl?spp=asp>)
 - Pear scab infection period information for the Hood River Valley (<http://ippc2.orst.edu/hr/>)
 - Fire blight risk information (<http://ippc2.orst.edu/cgi-bin/ddmodel.pl?fbl>)
- Directions for the use of each model are available at each site.
- OSU Botany and Plant Pathology Department. Site of “Online Guide to Plant Disease Control.” Disease symptom descriptions, pictures of disease symptoms, and other information helpful in plant protection (<http://plant.disease.ippc.orst.edu/>)
 - Pacific Northwest Insect Management Handbook (<http://uspest.org/pnw/insects>)
 - Pacific Northwest Weed Management Handbook (<http://extension.oregonstate.edu/catalog>)

Basic Elements of Safe Pesticide Use

- Always read the label with care. This is the first step in selecting the right material for the job. Never rely on your memory. Before opening the container, pay strict attention to warnings and cautions printed on the label.
- Keep all pesticide and spray materials out of the reach of children, pets, and irresponsible persons. Storage outside of the home, away from food and feed, and under lock and key is the safest method.
- Store only in the original container and keep tightly closed.
- NEVER smoke, eat, or drink while applying pesticides.
- Avoid inhalation or direct contact. Always wear protective clothing and safety devices as recommended on the label.
- Avoid spills. If spills occur, take immediate action to remove contaminated clothing and wash thoroughly.
- After each application, bathe and change to clean clothing. Wash clothing after each use. Always use fresh clothing when starting new application.
- Avoid contamination of fish ponds and water supplies. Cover feed and water containers when treating around livestock or pet areas.
- Keep separate equipment for use with hormone-type herbicides to avoid accidental injury to susceptible plants. Also avoid applications under wind conditions that could create drift to nontarget areas.
- Rinse empty containers three times before disposing of them. Add the rinse to the spray tank and dispose of containers according to local regulations to avoid hazard to humans, animals, and the environment.
- Follow label directions for mixing and application to keep residues within the limits prescribed by law.
- Plan ahead. Discuss with your physician the materials you will be using during the season so that he or she can be prepared to provide the appropriate treatment in case of accidental exposure. If symptoms of illness occur, call the physician or get the patient to a hospital immediately. Always provide the medical personnel with as much information as possible.
- Be cautious when you apply pesticides. Know your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.

Oregon Poison Center

The Oregon Health & Science University
3181 S.W. Sam Jackson Park Road, Room CB 550
Portland, OR 97239
Phone: 1-800-222-1022

If a person has collapsed or is not breathing, dial 911.

Prepared by Jeff Olsen, Extension horticulturist, Yamhill County; Jay W. Pscheidt, Extension plant pathologist; and Ed Peachey, assistant professor of weed science, Department of Horticulture, all of Oregon State University. The information in this pest management guide is valid for 2011. Trade-name products and services are mentioned as illustrations only. This does not mean that the Oregon State University Extension Service either endorses these products and services or intends to discriminate against products and services not mentioned. Due to constantly changing laws and regulations, the Oregon State University Extension Service can assume no liability for the suggested use of chemicals contained in this guide. Pesticides should be applied according to the label directions on the pesticide container.

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