

Cherry

2019 Pest Management Guide for the Willamette Valley

EM 8329 • Revised May 2019

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The chemicals, formulations, and rates listed for insect, mite, and disease control are among the best recommendations based on label directions, research, and orchard use experience. Only a thorough knowledge of the orchard, its cultivar, tree size and density, canopy characteristics, pest complex, and past pest problems will enable you to correctly select chemicals, rates, amount of **water** used per acre, and method of application for optimum pest control. Occasionally, different formulations of a product or like formulations containing a different amount of active ingredient also are registered and effective for use on the pests listed. These products also may be used; we do not intend to discriminate against them. You may wish to consult their labels and determine whether their use confers advantages over the products listed in this guide.

Always refer to the pesticide label for use instructions. It is the legal document regarding use patterns. Two questions frequently are asked about the chemical control of insects and diseases: “How much chemical do I use per acre?” and “What is the least amount of water I need per acre to apply in my concentrate sprayer?” Notice that the schedule below suggests an amount of formulated product (not active ingredient) to use per acre. This amount is based on a “typical” middle age and density orchard with moderate pest pressure. Common sense indicates that less material may be needed than that given for 1- to 4-year-old orchards. Conversely, more chemical (within label limits) may be required for

large, mature trees experiencing heavy pest pressure from multiple pests.

Many insecticide labels today indicate the minimum amount of water needed per acre to apply concentrate sprays of insecticides, as well as how to calculate the amount of chemical needed per acre in a concentrate sprayer. **CHECK THE LABEL BEFORE SPRAYING!** Some label directions indicate dilute applications only, such as the dimethoate labels for cherry fruit fly control.

Also:

1. Make sure any tank-mixes of pesticides are compatible. For example, the elevated pH of some boron spray solutions weakens many insecticides.
2. Use adjuvants and spreader stickers with caution.

Important information

1. Be aware of worker protection standards. All new pesticide labels will provide orchard reentry intervals and personal protection equipment information.
2. Diazinon is now classified as a restricted-use pesticide due to bird toxicity. Maximum per-acre application rates have been reduced to 4 lb 50W, and the preharvest interval extended to 21 days.

Stages

Dormant Season (Stage 0)
Dormant and Delayed Dormant (Stages 0–1)
Popcorn Stage (Stages 2–5)
Full Bloom (Stages 6–7)

Not shown

Petal Fall; Shuck Split; Two Weeks after Shuck Fall; Late Spring and Summer; Postharvest

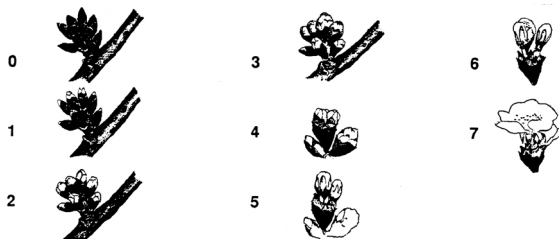


Illustration courtesy of Washington State University Extension.

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.

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	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval
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	buprofezin	34.5–46 oz	Group 16 insecticide (IGR). No more than 2 applications per season. Do not tank mix with oil. 12-hour reentry.
Cobalt	chlorpyrifos + lambda-cyhalothrin	4–6.25 oz	Group 1B + group 3 insecticide. Restricted use. Premix product. See label, as both AIs have cumulative limits/season. Cold/dry conditions may cause phytotoxicity. Avoid contact with sweet cherry foliage. 4-day reentry.
Diazinon 50WP	diazinon	4 lb	Group 1B insecticide. Restricted use. Limited to one dormant and one cover spray per season. Closed cab required. 24-hour reentry.
Esteem 35WP	pyriproxyfen	4–5 oz	Group 7C insecticide. Limited to 3 applications per season. Targets eggs and immature (molting) stages of leafrollers. 12-hour reentry.
Exirel 0.83SE	cyantraniliprole	10–20.5 oz	Group 28 insecticide. No more than 0.4 lb ai/A per season. Targets leafroller and peach twig borer at this timing. Use the high rate for dormant and the low rate for delayed dormant. 12-hour reentry.
Lorsban Advanced	chlorpyrifos	1.5–4 pt	Group 1B insecticide. Restricted use. Limited to one application during dormant season, foliage contact could cause leaf drop. 4-day reentry.
Supracide 2E	methidathion	1–2 or 3–12 pt	Group 1B insecticide. Supracide may be used without oil for San Jose scale control. Do not apply when blossoms are open. Avoid residues by limiting to one application per season. 3-day reentry.

Shothole borer (see footnote 4, page 13)

Note: 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. Once beetles are in trees, insecticides have limited efficacy.

Lorsban Advanced	chlorpyrifos	3 pt	Group 1B insecticide. Do not use Lorsban on sweet cherries after budbreak. For growing season applications (tart cherries only), target infested and neighboring tree trunks and small limbs. 4-day reentry.
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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.

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

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval
Brown rot blossom blight (see footnote 2, page 13)			
Abound	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. See footnote 6, page 13. Do not use with silicone-based surfactants. 4-hour reentry. 0-day PHI.
Bravo Weather Stik	chlorothalonil	3–4.1 pt	Group M5 fungicide. Do not apply later than shuck split. 12-hour reentry.
Cabrio EG	pyraclostrobin	9.5 oz	Group 11 fungicide. 12-hour reentry. 0-day PHI.
Captan 80WDG	captan	1.9–2.5 lb	Group M4 fungicide. 24-hour reentry. 0-day PHI.
CaptEvate 68WDG	captan + fenhexamid	3.75 lb	Group M4 + Group 17 (Captan + Elevate) 24-hour reentry. 0-day PHI.
Elevate 50WDG	fenhexamid	1–1.5 lb	Group 17 fungicide. 12-hour reentry. 0-day PHI.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Inspire	difenoconazole	7 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Luna Sensation	fluopyram + trifloxystrobin	5–7.6 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 1-day PHI.
Merivon	fluxapyroxad + pyraclostrobin	4–6.7 fl oz	Group 7 + 11 fungicide. Do not use with EC or oil-based products. Only nonionic surfactants can be used within 14 days of harvest. 12-hour reentry. 0-day PHI.
Orius 20 AQ	tebuconazole	8.6–17.2 oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. 12-hour reentry. See footnote 6, page 13. 0-day PHI.
Procure and generics	triflumizole	10–16 fl oz	Group 3 fungicide. 12-hour reentry. 1-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	Group 3 + 11 fungicide. 12-hour reentry. 0-day PHI.
Quash	metconazole	2.5–4 oz	Group 3 fungicide. 12-hour reentry. 14-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. 12-hour reentry. See footnote 6, page 13. 0-day PHI.
Rally 40WSP	myclobutanil	2.5–6 oz	Group 3 fungicide. 24-hour reentry. 0-day PHI.
Rovral 4F or generics	iprodione	1–2 pt	Group 2 fungicide. Do not make more than 2 applications per season. Do not use past shuck split. See footnote 3, page 13. 24-hour reentry.
Tilt and generics	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard	flutriafol	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 6, page 13. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Topsin 4.5FL	thiophanate-methyl	20–30 oz	Group 1 fungicide. Tank-mix with another fungicide. 2-day reentry. 1-day PHI.
Ziram 76DF	ziram	5–6 lb	Group M3 fungicide. Do not apply after first cover. 48-hour reentry. 30-day PHI.

Popcorn Stage (Stages 2–5—blossom buds white just before opening) continues on next page

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.

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

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Aphids, bud moth, leafrollers, thrips			
<i>Note:</i> Aphids usually are of concern only on young trees. On mature trees, a spray 2 weeks after shuck fall is effective.			
Actara	thiamethoxam	2–2.75 oz	Group 4A insecticide. Aphids, thrips, and leafrollers at this timing. No more than 11 oz/A per season (of this and/or any other thiamethoxam product). 12-hour reentry.
Altacor 35 WDG	chlorantraniliprole	2–4 oz	Group 28 insecticide. Leafroller only. 4-hour reentry.
<i>Bacillus thuringiensis</i> (B.t.)	bacterium	See label.	Group 11B2 insecticide. Generic. OMRI listed. Can provide excellent, targeted control of leafrollers. Apply when temperatures exceed 60°F. Repeat application 2–3 times. 4-hour reentry.
Delegate 25WG	spinetoram	4.5–7 oz	Group 5 insecticide. Leafroller and thrips only at this timing. 4-hour reentry.
Diazinon 50WP	diazinon	4 lb	Group 1B insecticide. Restricted use. Limited to one dormant and one cover spray per season. Closed cab required. Allow 5 days before introducing bees. 24-hour reentry.
Entrust 2SC	spinosad	1.25–2.5 oz	Group 5 insecticide. OMRI listed for organic use. No more than 4 applications or 29 oz per year. Leafroller and thrips only at this timing. Targets larval stages. <i>Note:</i> Entrust 80WP is an alternative formulation. 4-hour reentry.
Intrepid 2F	methoxyfenozide	8–16 oz	Group 18 insecticide (IGR). Leafroller only. 4-hour reentry.
Success 2L	spinosad	4–8 oz	Group 5 insecticide. Leafroller and thrips only. 4-hour reentry.

Syneta beetle (see footnote 5, page 13)

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 shuck fall if this prebloom application is not made.

Entrust SC	spinosad	4–8 oz	Group 5 insecticide. OMRI listed. No more than 4 applications or 29 oz per year. 4-hour reentry.
Imidan 70WP	phosmet	1.3 lb	Group 1B insecticide. Restricted use. Early popcorn is the time to treat if weather allows. Tart cherries only. Wait at least 5 days before introducing bees. If not spraying pre-bloom, spray at petal fall but before shuck fall— after bees are removed. 3-day reentry.
Success	spinosad	4–8 oz	Group 5 insecticide. No more than 4 applications or 29 oz per year. 4-hour reentry.

Full Bloom (Stages 6–7)

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot blossom blight (see footnote 2, page 13)			
See materials listed for Popcorn Stage.			

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.

Petal Fall (75% petal fall)

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot blossom blight (see footnote 3, page 13)			
See materials listed for Popcorn Stage.			
Leaf spot (see footnote 2, page 13)			
Bravo Weather Stik	chlorothalonil	3–4.1 pt	Group M5 fungicide. Do not apply after shuck split. 12-hour reentry.
Captan 80WDG	captan	1.9–2.5 lb	Group M4 fungicide. 24-hour reentry.
Echo 720	chlorothalonil	3–4.1 pt	Group M5 fungicide. 12-hour reentry.
Gem 500SC	trifloxystrobin	1.9–3.8 oz	Group 11 fungicide. 12-hour reentry. 1-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Luna Sensation	fluopyram + trifloxystrobin	5–7.6 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 1-day PHI.
Merivon	fluxapyroxad + pyraclostrobin	4–6.7 fl oz	Group 7 + 11 fungicide. Do not use with EC or oil-based products. Only nonionic surfactants can be used within 14 days of harvest. 12-hour reentry. 0-day PHI.
Orius 20 AQ	tebuconazole	8.6–17.2 oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. 12-hour reentry. See footnote 6, page 13. 0-day PHI.
Procure and generics	triflumizole	10–16 fl oz	Group 3 fungicide. 12-hour reentry. 1-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. 12-hour reentry. See footnote 6, page 13. 0-day PHI.
Rally 40WSP	myclobutanil	2.5–6 oz	Group 3 fungicide. 24-hour reentry. 7-day PHI.
Syllit FL	dodine	1–3 pt	Group U12 fungicide. 48-hour reentry. 7-day PHI.
Tilt and generics	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard	flutriafol	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 6, page 13. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Ziram 76DF	ziram	6 lb	Group M3 fungicide. 48-hour reentry. 30-day PHI.

Petal Fall (75% petal fall) continues on next page

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.

CONTINUED—Petal Fall (75% petal fall)

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Aphids, bud moth, leafrollers			
<i>Note:</i> If this petal fall spray is used, spray only after bloom and after bees have been removed from orchard.			
Actara	thiamethoxam	2–2.75 oz	Group 4A insecticide. Targets aphids at this timing. No more than 11 oz/A per season (of this and/or any other thiamethoxam product). 12-hour reentry.
Altacor 35 WDG	chlorantraniliprole	2–4 oz	Group 28 insecticide. Targets leafroller with this timing. 4-hour reentry.
Assail 70WP	acetemiprid	1.1–2.3 oz	Group 4A insecticide. Targets aphids with this timing. 12-hour reentry. Note that SG formulation also available and rates differ. 7-day PHI.
<i>Bacillus thuringiensis</i> (B.t.)	bacterium	See label.	Group 11B2 insecticide. Generic. OMRI listed. Can provide excellent control of leafrollers. Apply when temperatures exceed 60°F. Repeat application 2–3 times. 4-hour reentry.
Delegate 25WG	spinetoram	4.5–7 oz	Group 5 insecticide. Targets leafroller with this timing. 4-hour reentry.
Entrust 2SC	spinosad	1.25–2.5 oz	Group 5 insecticide. OMRI listed. No more than 4 applications or 29 oz per year. Targets leafroller with this timing. Note Entrust 80WP is an alternative formulation. 4-hour reentry.
Imidacloprid 2F	imidacloprid	3.2–6.4 oz	Group 4A insecticide. Generic, several product names. Targets aphids with this timing. Do not apply when bees are active. 12-hour reentry.
Intrepid 2F	methoxyfenozide	8–16 oz	Group 18 insecticide (IGR). Targets leafroller with this timing. 4-hour reentry.
Success 2L	spinosad	4–8 oz	Group 5 insecticide. Targets leafroller with this timing. 4-hour reentry.

Syneta beetle

See materials listed for Popcorn Stage.

Shuck Split

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Leaf spot			
Bravo Weather Stik	chlorothalonil	3–4.1 pt	Group M5 fungicide. Do not apply after shuck split. 12-hour reentry.
Captan 80WDG	captan	1.9–2.5 lb	Group M4 fungicide. 24-hour reentry.
Echo 720	chlorothalonil	3–4.1 pt	Group M5 fungicide 12-hour reentry.
Gem 500SC	trifloxystrobin	1.9–3.8 oz	Group 11 fungicide. 12-hour reentry. 1-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Luna Sensation	fluopyram + trifloxystrobin	5–7.6 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 1-day PHI.

Shuck Split continues on next page

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CONTINUED—Shuck Split

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Leaf spot (continued)			
Merivon	fluxapyroxad + pyraclostrobin	4–6.7 fl oz	Group 7 + 11 fungicide. Do not use with EC or oil-based products. Only nonionic surfactants can be used within 14 days of harvest. 12-hour reentry. 0-day PHI.
Orius 20 AQ	tebuconazole	8.6–17.2 oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. 12-hour reentry. See footnote 6, page 13. 0-day PHI.
Procure and generics	triflumizole	10–16 fl oz	Group 3 fungicide. 12-hour reentry. 1-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. 12-hour reentry. See footnote 6, page 13. 0-day PHI.
Rally 40WSP	myclobutanil	2.5–6 oz	Group 3 fungicide. 24-hour reentry. 0-day PHI.
Syllit FL	dodine	1–3 pt	Group U12 fungicide. 48-hour reentry. 7-day PHI.
Tilt and generics	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard	flutriafol	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 6, page 13. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Ziram 76DF	ziram	6 lb	Group M3 fungicide. 48-hour reentry. 30-day PHI.

Shothole (Coryneum blight) (see footnote 7, page 13)

Captan 80WDG	captan	1.9–2.5 lb	Group M4 fungicide. 24-hour reentry.
Echo 720	chlorothalonil	3–4.1 pt	Group M5 fungicide. 12-hour reentry.
Fontelis	penhiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Ziram 76DF	ziram	6 lb	Group M3 fungicide. 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	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Leaf spot			
See materials listed for Shuck Split.			
Aphids			
<i>Note:</i> Aphids are of concern primarily in young orchards. Use this spray if the popcorn spray was not made and aphids are increasing.			
Actara	thiamethoxam	2–2.75 oz	Group 4A insecticide. No more than 11 oz/A per season (of this and/or any other thiamethoxam product). 12-hour reentry.
Diazinon 50WP	diazinon	4 lb	Group 1B insecticide. Restricted use. Limited to one dormant and one cover spray per season. Closed cab required. 24-hour reentry.

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.

Late Spring and Summer

Pest or disease/ Material	Active ingredient (AI)	Application rate/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	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. See footnote 6, page 13. Do not use with silicone-based surfactants. 4-hour reentry. 0-day PHI.
Cabrio EG	pyraclostrobin	9.5 oz	Group 11 fungicide. 12-hour reentry. 0-day PHI.
Captan 80 WDG	captan	2–2.5 lb	Group M4 fungicide. 24-hour reentry. 0-day PHI.
CaptEstate 68WDG	captan + fenhexamid	3.75 lb	Group M4 + Group 17. (Captan + Elevate) 24-hour reentry. 0-day PHI.
Elevate 50WDG	fenhexamid	1–1.5 lb	Group 17 fungicide. 12-hour reentry. 0-day PHI.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Inspire	difenoconazole	7 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Luna Sensation	fluopyram + trifloxystrobin	5–7.6 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 1-day PHI.
Merivon	fluxapyroxad + pyraclostrobin	4–6.7 fl oz	Group 7 + 11 fungicide. Do not use with EC or oil-based products. Only nonionic surfactants can be used within 14 days of harvest. 12-hour reentry. 0-day PHI.
Orius 20 AQ	tebuconazole	8.6–17.2 oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Procure and generics	triflumizole	10–16 fl oz	Group 3 fungicide. 12-hour reentry. 1-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	Group 3 + 11 fungicide. 12-hr reentry. 0-day PHI.
Quash	metconazole	2.5–4.0 oz	Group 3 fungicide. 12-hour reentry. 14-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. 12-hour reentry. See footnote 6, page 13. 0-day PHI.
Sulfur, wettable (92%)	inorganic sulfur	5–10 lb	Group M fungicide. Phytotoxic when temperatures over 85°F. 24-hour reentry.
Tilt and generics	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard	flutriafol	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 6, page 13. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Topsin 4.5FL	thiophanate-methyl	20–30 fl oz	Group 1 fungicide. Tank-mix with another fungicide. See footnote 3, page 13. 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	Active ingredient (AI)	Application rate/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 or the phenology model (available from uspest.org).			
Actara	thiamethoxam	4.5–5.5 oz	Group 4A insecticide. No more than 11 oz/A per season (of this and/or any other thiamethoxam product). 12-hour reentry. 7-day PHI.
Asana XL	esfenvalerate	4.8–14.5 fl oz	Group 3 insecticide. Restricted use. Do not apply past the white bud/prebloom stage. Do not apply more than 0.2 lb a.i./A per season. May aggravate spider mite problems. See label for concentrate rate. 12-hour reentry. 14-day PHI.
Assail 70WP	acetemiprid	2.3–3.4 oz	Group 4A insecticide. No more than 4 applications per season. Note that SG formulation also available and rates differ. 12-hour reentry. 7-day PHI.
Delegate WG	spinetoram	4.5 oz	Group 5 insecticide. Avoid repeated applications targeting cherry fruit fly. Apply no less than 1 week apart, maximum 4 times per season. 7-day PHI.
Diazinon 50WP	diazinon	4 lb	Group 1B insecticide. Restricted use. Limited to one dormant and one cover spray per season. Closed cab required. WPs may leave residues visible at harvest. 24-hour reentry. 21-day PHI.
Dimethoate 4E/400EC	dimethoate	2.66 pt	Group 1B insecticide. Restricted use. Apply once at 7 days following cherry fruit fly emergence. Do not mix dimethoate with Syllit. Phytotoxicity can occur and varies from marginal leaf burn to defoliation. Thorough coverage is important. Use only once per season. 10- to 14-day reentry. 21-day PHI.
Entrust 2SC	spinosad	1.25–2.5 oz	Group 5 insecticide. OMRI listed for organic use. No more than 4 applications or 29 oz per year. Note Entrust 80WP is an alternative formulation. 4-hour reentry. 7-day PHI.
Exirel 0.83SE	cyantraniliprole	10–17 oz	Group 28 insecticide. No more than 0.4 lb ai/A per season. Targets leafroller and peach twig borer at this timing. Use the high rate for dormant and the low rate for delayed dormant. 12-hour reentry.
GF-120 NF	spinosad + bait compounds	10–20 oz	Group 5 insecticide. OMRI listed. Attracticide bait spray. Does not control spotted wing drosophila. Begin applications when flies emerge or 2–3 weeks before ripening. Apply to inner canopy and underside of leaves using coarse nozzles. Repeat applications on 7- to 14-day intervals. 4-hour reentry. 0-day PHI.
Imidacloprid 2F	imidacloprid	4.8–6.4 oz	Group 4 insecticide. Generic; several product names. 12-hour reentry. 7-day PHI.

Late Spring and Summer continues on next page

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.

CONTINUED—Late Spring and Summer

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Cherry fruit fly (continued)			
Imidan	imidan	2.125 lb	Group 1B insecticide. Restricted use. Tart cherries only. 3-day reentry, or 14-day reentry for general public as in “U-pick”. 14-day PHI.
Malathion	malathion	See labels.	Group 1B insecticide. Many formulations and product names are available: WP, ULV, and EC. WPs may leave residues visible at harvest. ULV formulation is not a standalone product for SWD; do not use sequential sprays of ULV formulation. Repeated applications can cause secondary pest problems (mites and leafminers). Cross-resistance with other Group 1B materials and carbaryl (Sevin). Potential phytotoxicity. 12-hour reentry. 1- to 3-day PHI.
Sevin 4F	carbaryl	1.5–2 qt	Group 1A insecticide. Restricted use. Note other formulations available. 12-hour reentry. 3-day PHI.
Success 2L	spinosad	4–8 oz	Group 5 insecticide. 4-hour reentry. 7-day PHI.
Voliam Flexi	thiamethoxam + chlorantraniliprole	6–7 oz	Group 4A + 28 insecticide. No more than 14 oz per season. No more than 0.172 lb of thiamethoxam products (i.e., Actara) per season. Do not apply by air. 12-hour reentry. 14-day PHI.
Warrior II	lambda-cyhalothrin	2.6–5.1 oz	Group 3 insecticide. Restricted use. Several product names, also a component in premix formulations. Can cause secondary pest problems at this timing. 1-day reentry. 14-day PHI.
Spotted wing drosophila			
<i>Note:</i> Begin monitoring just before fruit starts to change to its ripening color, or earlier to monitor population levels. See footnote 8, page 13.			
Baythroid XL	beta-cyfluthrin	2.4–2.8 oz	Group 3 insecticide. Restricted use. Rotate with other resistance management groups. 12-hour reentry. 7-day PHI.
Danitol 2.4EC	danitol	10.66–21.33 oz	Group 3 insecticide. Restricted use. Rotate with other resistance management groups. 24-hour reentry. 3-day PHI.
Delegate WG	spinetoram	4.5–7 oz	Group 5 insecticide. Apply no less than 1 week apart, maximum 4 times per season. 4-hour reentry. 7-day PHI.
Diazinon 50WP	diazinon	4 lb	Group 1B insecticide. Restricted use. Limited to one dormant and one cover spray per season. Closed cab required. WPs may leave residues visible at harvest. 24-hour reentry. 21-day PHI.
Dimethoate 4E/400EC	dimethoate	2.66 pt	Group 1B insecticide. Restricted use. Do not mix dimethoate with Syllit. Phytotoxicity can occur and varies from marginal leaf burn to defoliation. Thorough coverage is important. Use only once per season. 10- or 14-day reentry. 21-day PHI.

Late Spring and Summer continues on next page

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.

CONTINUED—Late Spring and Summer

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Spotted wing drosophila (continued)			
Entrust 2SC	spinosad	1.9–2 oz	Group 5 insecticide. OMRI listed for organic use. No more than 4 applications or 29 oz per year. Note Entrust 80WP is an alternative formulation. 4-hour reentry. 7-day PHI.
Exirel 0.83SE	cyantraniliprole	13.5–20.5 oz	Group 28 insecticide. Some risk of fruit marking. No more than 0.4 lb ai/A per season. 12-hour reentry. 3-day PHI.
Malathion	malathion	See labels.	Group 1B insecticide. Many formulations and product names are available: WP, ULV, and EC. WPs may leave residues visible at harvest. ULV formulation is not a standalone product for SWD; do not use sequential sprays of ULV formulation. Repeated applications can cause secondary pest problems (mites and leafminers). Cross-resistance with other Group 1B materials and carbaryl (Sevin). Potential phytotoxicity. 12-hour reentry. 1- to 3-day PHI.
Mustang Maxx 8EC	zeta-cypermethrin	4 oz	Group 3 insecticide. Applications must be 7 days apart. 12-hour reentry. 14-day PHI.
Sevin 4F	carbaryl	2–3 qt 3 lb	Group 1A insecticide. <i>Note:</i> other formulations available. Repeated applications can cause secondary pest problems (mites and leafminers). Cross-resistance with Group 1B materials. Potential phytotoxicity. 12-hour reentry. 3-day PHI.
Success 2L	spinosad	4–8 oz	Group 5 insecticide. 4-hour reentry. 7-day PHI.
Warrior II	lambda-cyhalothrin	1.28–2.56	Group 3A insecticide. Restricted use. Can cause secondary pest problems at this timing. 1-day reentry. 14-day PHI.

Shothole borer (see footnote 4, page 13)

Note: Spot-treat as needed. See Delayed Dormant Stage.

Pear slugs

Note: 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	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Shothole borer (see footnote 4, page 13)			
Spider mites			
<i>Note:</i> Spider mites seldom are a problem on cherries in the Willamette Valley except on young trees.			
Acramite 50WS	bifenazate	0.75–1 lb	Unclassified mode of action. Do not use more than once per season. 12-hour reentry. 3-day PHI.

Postharvest continues on next page

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.

CONTINUED—Postharvest

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Spider mites (continued)			
Apollo 4SC	clofentezine	4–8 oz	Group 10A miticide. Do not use more than once per season. Do not rotate with other group 10A materials in the same season. 12-hour reentry. 21-day PHI.
Envidor 2SC	spirodiclofen	16–18 oz	Group 23 miticide. Targets rust and spider mites. Do not use more than once per season. 12-hour reentry. 7-day PHI.
Horticultural Mineral Oil (HMO)	mineral oil	1–2 gal	Can cause phytotoxicity if applied within 2 weeks of a sulfur application. 4-hour reentry. 0-day PHI.
Nexter 75WSB	pyridaben	5.2–10.6 oz	Group 21A miticide. Ground application only. Two applications per season. 12-hour reentry. 300-day PHI.
Omite 30WS	propargite	5–6 lb	Group 12C miticide. Postharvest use only. Each water soluble bag contains 2.5 lbs. 2-day reentry. No PHI.
Onager 1EC	hethythiazox	24 oz	Group 10A miticide. Postharvest use only. Do not rotate with other group 10A materials in the same season. 12-hour reentry. 28-day PHI.
Savey DF	hethythiazox	3–6 oz	Group 10A miticide. Does not control rust mites. Do not rotate with other group 10A materials in the same season. 12-hour reentry. 28-day PHI.
Zeal 72WSP	etoxazole	2–3 oz	Group 10B insecticide. 12-hour reentry. 7-day PHI.
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.

Dormant Season (October and January—Stage 0)

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Shothole			
<i>Note:</i> 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, below.

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, and limit total number of applications. Bordeaux 12-12-100 means 12 lb of copper sulfate plus 12 lb of hydrated lime in 100 gal of water. In any bordeaux formula, the ingredients always are listed in the same order—copper sulfate, hydrated lime, then gallons of water.

Footnotes continue on next page

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.

Footnotes (continued)

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 or years.
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 FRAC 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 September/October. This pest prefers young and/or stressed trees. Cultural controls include pruning of infested limbs, and severely infested trees should be removed before adult beetles emerge in spring. Maintaining tree vigor and health with a good nutrition program helps trees resist shothole borer. Chemical control is difficult and consists of spot-treating infested trunks and limbs with a delayed dormant dilute Lorsban spray when adults are emerging and reinvading. Do not use Lorsban on sweet cherry foliage.
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 was historically the favored insecticide but can only be used on tart cherries. Do not introduce bees for 5 days post spray of this insecticide because of possible residues and associated bee kills. **DO NOT APPLY IMIDAN TO TREES IN BLOOM!** Spinosad (Entrust/Success) compounds have less risk for pollinators, but avoid spraying when bees are active. 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 two sequential applications. Sprayers used for Abound, QuiltXcel, Quadris Top or TopGuard EQ 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 commercial traps or clear, quart-sized plastic deli cups with lids (or any plastic container). Drill or puncture about 10 3/16-inch holes near the rim of the cup for fly entry. Bait traps with pure (unflavored) apple cider vinegar plus a drop of unscented liquid soap or use commercial lures in bait traps or on sticky cards. Hang the trap in a shady, cool location within the tree canopy. Place traps just before fruit starts to change to its ripening color. Check traps weekly. Various kinds of flies will be captured in this nonspecific trap, so learn to identify SWD. Treatment thresholds have not been established, but preventive measures should be taken when the first SWD is captured and fruit starts to ripen. Chemical controls target adults and can help prevent females from laying eggs in fruit, but have limited effect on larvae feeding within the fruit.

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 OSU Extension publication EM 8951, *How to Reduce the Risk of Pesticide Resistance in Cherry Pests in Oregon*.

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.

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
Bravo	M5	B, F, P	Good–Fair	Not registered	Excellent	Not effective	Good
Cabrio	11	B, F, Ls, P	Good***	Good	Fair–Good	Excellent***	??
Captan	M4	B, F, P	Good	Good	Good	Not effective	Good–Excellent
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	Fair–Good ***	Fair–Good ***	Fair	Not effective	??
Fontelis	7	B, F, P	Good–Excellent***	Good–Excellent***	??	Good***	Good
Gatten	U13	F, N	??	??	?? (Poor)	Good	??
Gem	11	B, F, Ls, P	Good***	Fair–Good***	??	Fair–Good ***	??
Indar	3	B–N, C, F, Ls, P	Good–Excellent***	Good–Excellent***	Good–Excellent	Slight***	??
HMO	Not classified	E, F, I, P	??	??	??	Good–Excellent	??
Kaligreen	Not classified	E, B–N	??	??	??	Poor	??
Orius	3	B–N, C, F, Ls, P	Good–Excellent***	Good–Excellent***	Good***	Fair–Good***	??
Oxidate	Not classified	D	??	??	??	??	None
Procure/Trionic	3	B–N, C, F, Ls, P	Good***	??	Fair***	Good***	??
Quash	3	B–N, C, F, Ls, P	Good–Excellent***	Good***	??	Good***	??
Quintec	13	N, F, P	None	None	None	Good	None
Rally	3	B–N, C, F, Ls, P	Good–Fair***	Good–Fair***	Excellent***	Fair***	Slight
Rovral	2	B–N, F, Ls, P	Good***	Not registered	Slight	Not effective	Fair–Good
Sulfur	M2	F, I, P, V	Fair	Fair	Fair	Good	Not effective
Syllit	M7	B, F, P	??	Slight	Good	Not effective	??
Tebucon	3	B–N, C, F, Ls, P	Fair–Good ***	Fair–Good ***	Good***	Fair–Good***	??
Tilt and generics	3	B–N, C, F, Ls, P	Good–Excellent***	Good–Excellent***	??	Fair***	Slight
TopGuard	3	B–N, C, F, Ls, P	Good***	Good***	Excellent***	Good***	??
Topsin	1	B, C, F, Ls	Fair–Good ***	Fair–Good ***	??	Fair–Good***	Not effective
Vivando	U8	N, F, P	Not effective	Not effective	??	Fair–Good	Not effective
Ziram	M3	B, F, P	Slight	Slight	Fair	Not effective	Good–Excellent
Combination products							
CaptEstate	M4 + 17	B, F, P	Good	Good	Good	Not effective	Good
Luna Experience	3 + 7	B–N, F, Ls, P	Good***	Good***	???	Good***	??
Luna Sensation	7 + 11	B–N, F, Ls, P	Good–Excellent***	Good–Excellent***	Good	Good–Excellent***	??
Merivon	7 + 11	B–N, F, Ls, P	Good–Excellent***	Good–Excellent***	Good	Good***	??
Pristine	7 + 11	B–N, F, Ls, P	Good	Good	Good	Good **	??
Quadris Top	3 + 11	B–N, C, F, Ls, P	??	??	Excellent	Excellent	??
Quilt Xcel	3 + 11	B–N, C, F, Ls, P	Good–Excellent	Good–Excellent	??	Excellent***	Fair–Good
TopGuard EQ	3 + 11	B–N, C, F, Ls, P	Good***	Good***	Excellent***	Good ***	??

*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: B = broad spectrum of activity; Bact = bactericidal; B–N = broad to narrow spectrum of activity; C = curative; D = Disinfectant; E = eradicant; F = fungicidal; Fs = fungistatic; I = insecticidal; Ls = locally systemic; N = narrow spectrum of activity; P = protectant; V = vapor active; ?? = Unknown.

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

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**Table 2. Quick reference guide
to herbicides labeled for use in fruit and nut crops**

- Shaded boxes indicate the herbicide is labeled for use in that crop.
- Nonbearing (NB) indicates the herbicide is labeled only for crops that will not be harvested for 1 year (365-day preharvest interval).
- Herbicides in ***bold, italic*** type are recommended for new plantings.
- For more complete information, please refer to the *PNW Weed Management Handbook*: <http://pnwhandbooks.org/weed/>.

Ingredient common name (herbicide mode of action)	Product name example	Nuts			Pome fruits		Stone fruits						Rates
		Chestnut	Hazelnut	Walnut	Apple	Pear	Apricot	Cherry	Nectarine	Peach	Plum	Prune	
Applications that are soil active (herbicides in italics and bold are recommended for new plantings)													
dichlobenil (20)	Casoron												4 to 6 lb ai/a (100 to 150 lb/a Casoron); apply in cold, wet weather.
diuron (7)	Karmex												1.6 to 3.2 lb ai/a (2 to 4 lb/a Karmex 80DF)
<i>isoxaben</i> (21)	Trellis SC				NB	NB	NB	NB	NB	NB	NB	NB	0.5 to 1 lb ai/a (0.66 to 1.33 lb/a product)
indaziflam (29)	Alion												0.046 to 0.085 lb ai/a (3.5 to 6.5 oz/a product) depending on soil texture.
<i>mesotrione</i> (27)	Broadworks												0.093 to 0.187 lb ai/a (3 to 6 fl oz/a product)
<i>napropamide</i> (3)	Devrinol												4 lb ai/a (8 lb/a)
norflurazon (12)	Solicam												1.95 to 3.98 lb ai/a (2.5 to 5 lb/a Solicam)
<i>oryzalin</i> (3)	Surflan												2 to 6 lb ai/a (2 to 6 quarts/a Surflan)
<i>pendimethalin</i> (3)	Prowl												Prowl H ₂ O: 1.9 to 6 lb ai/a (2 to 6.3 quarts/a) depending on desired length of control and crop.
<i>pronamide</i> (3)	Kerb												1 to 4 lb ai/a (2 to 8 lb/a) depending on species present and soil texture.
simazine (5)	Princep												See product label for rates. Princep Caliber 90 is a Special Local Needs label (OR-080038) for sweet cherries only.
sulfentrazone (14)	Zeus XC/ Petra 4SC												0.125 to 0.375 lb ai/a (4 to 12 oz/a) depending on soil classification; established 3 years.
terbacil (5)	Sinbar WDG						NB	NB					0.4 to 0.8 lb ai/a (0.5 to 1 lb/a), newly established; 2 to 4 lb/a Sinbar, bearing, depending on soil type.
<i>trifluralin</i> (3)	Treflan 4L/EC												0.5 to 1 lb ai/a (1 to 2 pints/a Treflan 4L)
trifluralin (3)+ isoxaben (21)+ oxyfluorfen (14)	Showcase	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	2.5 to 5 lb ai/a (100 to 200 lb/a Showcase)
Applications that are soil and foliar active													
flazasulfuron (2)	Mission												0.033 to 0.045 lb ai/a (2.14 to 2.85 oz/a)
flumioxazin (14)	Chateau SW/ WDG												0.188 to 0.38 lb ai/a (6 to 12 oz/a Chateau WDG). Do not apply within 300 yards nondormant pears.
oxyfluorfen (14)	Goal 2XL												1.25 to 2 lb ai/a (5 to 8 pints/a Goal 2XL)
oxyfluorfen (14) + penoxsulam (2)	Pindar GT												1.47 lb ai/a oxyfluorfen + 0.015 lbs ai/a penoxsulam (1.5 to 3 pints/a)

Table continues on next page

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.

Ingredient common name (herbicide mode of action)	Product name example	Nuts			Pome fruits		Stone fruits						Rates
		Chestnut	Hazelnut	Walnut	Apple	Pear	Apricot	Cherry	Nectarine	Peach	Plum	Prune	
CONTINUED—Applications that are soil and foliar active													
rimulfuron (2)	Matrix												0.063 lb ai/a (4 oz/a Matrix FNV per year)
saflufenacil (14)	Treevix												0.045 lb ai/a (1 oz/a)
Postemergence contact and translocated herbicides													
2,4-D (4)	Saber												Green sucker control in hazelnuts: 0.7 to 0.95 lb ai/a (1.5 to 2 pints/a Saber)
ammonium nonanoate	Axxe												6 to 15% v/v; OMRI certified
ammoniated soap of fatty acids	Final-San-O												14 to 26 fl oz/gal. Apply prior to planting or non-cropped areas.
caprylic acid + capric acid	Suppress												6 to 9% v/v; OMRI listed
carfentrazone (14)	Aim EC												Green sucker control in hazelnuts: 0.031 lb ai/a (2 fl oz/a Aim EC)
clethodim (1)	Select Max		NB	NB	NB	NB	NB	NB		NB	NB	NB	0.06 to 0.125 lb ai/a (6 to 8 oz/a Select Max)
clopyralid (4)	Stinger												Apples: 0.094 to 0.25 lb ae/a (0.25 to 0.66 pints/a Stinger) Others: 0.12 to 0.25 lb ae/a (0.33 to 0.66 pints/a Stinger)
diquat (22)	Reglone		NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	0.375 to 0.5 lb ai/a (1.5 to 2 pints/a)
fluazifop (1)	Fusilade DX		NB	NB	NB	NB							0.25 to 0.375 lb ai/a (16 to 24 oz/a Fusilade DX). Refer to specific grassy weeds listed on label.
glufosinate (10)	Rely 280												0.88 to 1.5 lb ai/a (1.5 to 2.5 quarts/a Rely 280); sucker control: 1.75 quarts/a. Do not make spot spray applications to suckers.
glyphosate (9)	Roundup												General weed control and grass suppression in row middles; read label carefully for crops listed and geographic location.
halosulfuron (2)	Sandea												Pome Fruit: 0.035 to 0.094 lb ai/a (0.75 to 2 oz/a); Nut crops: 0.031 to 0.063 lb ai/a (2/3 to 1 1/3 oz/a)
paraquat (22)	Gramoxone SL 2.0												Green sucker control in hazelnuts: 0.625 to 1 lb cation/a (2.5 to 4 pints/a Gramoxone 2.0 SL; 1.7 to 2.7 pints/a Firestorm)
pyraflufen (14)	Venue												0.001 to 0.005 lb ai/a (0.7 to 4 fl oz/a product). Green sucker control in hazelnuts: 3 to 4 fl oz/a.
sethoxydim (1)	Poast										NB	NB	Grass suppression in row middles: 0.28 to 0.47 lb ai/a (1.5 to 2.5 pints/a product)

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.

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/>)
- Pacific Northwest Plant Disease Management Handbook (<http://pnwhandbooks.org/plantdisease>)
- Pacific Northwest Insect Management Handbook (<http://pnwhandbooks.org/insect>)
- Pacific Northwest Weed Management Handbook (<http://pnwhandbooks.org/weed>)

Using pesticides safely

Always read the label

The single most important approach to pesticide safety is to read the pesticide label before each use and then follow the directions. If still in doubt after reading the label, contact a person qualified to help evaluate the hazard of the chemical and its use. Qualified people include Extension specialists, county educators, pesticide product representatives, and retailers.

Pesticides are toxic and should be handled with care—but can be used safely if you follow recommended precautions. Follow all label requirements, and strongly consider any recommendations for additional personal protective clothing and equipment. In addition to reading and following the label, other major factors in the safe and effective use of pesticides are the pesticide applicator's qualifications, common sense, and positive attitude. Always take all safety precautions when using pesticides.

In case of accidents involving pesticides, see your doctor at once. It will help your doctor to know exactly which pesticide is involved. The label on the container gives this information. Take to the physician the pesticide label or information from the label, such as the product name, registration number of the U.S. Environmental Protection Agency, common name and percentage of active ingredient, and first aid instructions. If the label cannot be removed, take along the pesticide container (if not contaminated), but do not take it into the hospital or doctor's office.

Pesticide safety checklist

- Use pesticides only when necessary and as part of an Integrated Pest Management program.
- Always read the label and follow the instructions.
- Do not allow children to play around sprayers or mixing, storage, and disposal areas.
- Wear appropriate protective clothing and equipment.
- Never eat, drink, or smoke while handling pesticides.
- Avoid drift into non-target areas and pesticide runoff into streams, rivers, lakes, irrigation ponds and canals.
- Avoid spilling materials on skin or clothing.
- Have access to clean water, soap, and first aid supplies.
- Keep pesticides in a dry and locked storage area away from food and feed.
- Triple rinse or pressure rinse empty containers and dispose or recycle in accordance with state and local regulations.
- Stay out of recently sprayed areas until the spray has dried, and observe the restricted entry intervals specified on the pesticide label.
- Follow the pre-harvest interval on the pesticide label before harvesting crops or gardens and before allowing livestock to graze fields.

Oregon Poison Center

Oregon Health & Science University
3181 S.W. Sam Jackson Park Road
Portland, OR 97239
Phone: 1-800-222-1222

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

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Revised May 2019.

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.