

Prune and Plum

2018 Pest Management Guide for the Willamette Valley

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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 LABEL BEFORE SPRAYING!** Some label directions indicate dilute applications only.

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 (WPS). All new pesticide labels will provide orchard reentry intervals and personal protection equipment information.
2. *Orchard Pest Management, a Resource Book for the Pacific Northwest*, 1993 (edited by Beers, Brunner, Willet, and Warner, published by the Good Fruit Grower, Yakima, WA) provides a comprehensive list of the tree fruit insect and mite pests of orchards. Life histories, damage, detection, monitoring, and management of the pests are covered. It is one of our primary sources of information in developing this pest management guide and the most complete reference on orchard use of the principles of integrated pest management. Available online: <http://www.tfrec.wsu.edu/pages/opm/Home>

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.

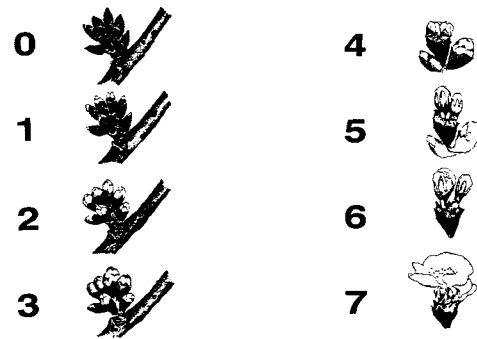
Stages

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

Not shown

Petal Fall; Shuck Fall and 10–14 days later;
 Late Spring and Summer; Postharvest

Illustration courtesy of Washington State University Extension.



Prune and Plum 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.

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/Preharvest interval (PHI)
Lecanium and San Jose scale, aphid eggs, European red mite eggs, peach twig borer			
Centaur WDG	buprofezin	34.5–46 oz	Group 16 insecticide. Good coverage is essential. Targets San Jose scale at white or black cap stage. Do not mix with oil. 12-hour reentry. 14-day PHI.
Horticultural mineral oil (HMO) alone or with one of the following materials registered for these pests:	oil	4 gal	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 (up to 400 GPA). Plum trees are less tolerant of dormant oil sprays than other fruit trees.
Diazinon 50W	diazinon	1 lb	Group 1B insecticide. Restricted use. Avoid drift and runoff to water. Limited to one dormant and one in-season application per year. Avoid use in consecutive years. 4-day reentry. 21-day PHI.
Dimilin 2L	diflubenzuron	12–16 oz	Group 15 insecticide. Restricted use. Avoid contamination of water with runoff or drift. Use with 4–6 gal of narrow range oil. Vegetable oil may be substituted at 1 qt per acre as bloom approaches. Do not apply after petal fall or make more than two applications. 12-hour reentry.
Entrust 2SC	spinosad	6–10 oz	Group 5 insecticide. OMRI listed for organic use. No more than four applications or 29 oz per year. 4-hour reentry.

Dormant and Delayed Dormant (Stages 0–1—before buds open and before eggs hatch) continues on next page

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CONTINUED—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/Preharvest interval (PHI)
Lecanium and San Jose scale, aphid eggs, European red mite eggs, peach twig borer (continued)			
Esteem 35WP	pyriproxyfen	4–5 oz	Group 7C insecticide. Insect growth regulator. Use the higher rate for high pressure. Suppression of peach twig borer. No more than three applications per season. 12-hour reentry. 14-day PHI.
Imidan 70W	phosmet	2.125– 4.25 lb	Group 1B insecticide. 7-day reentry. 14-day PHI.
Lorsban 4E	chlorpyrifos	1.5–4 pt	Group 1B insecticide. Restricted use. Minimum of 100 GPA. Limited to one application during dormant season. 4-day reentry. 14-day PHI.

Popcorn (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)
Leafrollers, bud moth			
Altacor 35WDG	chlorantraniliprole	2.–4.5 oz	Group 28 insecticide. Targets moth larvae at this timing. No more than three applications of Group 28 insecticides per year. 4-hour reentry.
<i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i> (Btk)	bacterium	See label.	OMRI listed for organic use. Multiple formulations. Spray when larvae first detected and temperatures are above 60°F. Apply with a sticker.
Delegate 25 WG	spinetoram	4.5–7 oz	Group 5 insecticide. Peach twig borer activity. 4-hour reentry. 7-day PHI.
Entrust 2SC	spinosad	6–10 oz	Group 5 insecticide. OMRI listed for organic use. No more than four applications or 29 oz per year. 4-hour reentry.
Exirel 0.83SE	cyantraniliprole	10–17 oz	Group 28 insecticide. No more than three applications of Group 28 insecticides per year. 12-hour reentry.
Success 2L	spinosad	4–8 oz	Group 5 insecticide. Entrust is the organic formulation. 4-hour reentry.
Warrior II	lambda-cyhalothrin	1.3–2.5 oz	Group 3A insecticide. Restricted use. 24-hour reentry.

Shothole borer

Note: This pest has 2 or 3 generations per year in the Willamette Valley.

No products are registered for control of this pest.

Aphids (mealy plum, leaf curl plum)

Aza-Direct	azadirachtin	1–2 pt	Botanical insecticide. OMRI listed for organic use. 4-hour reentry. 0-day PHI.
Admire Pro	imidacloprid	1.4–2.8 oz	Group 4A insecticide. Systemic activity, rotate use with other mode of action groups to avoid development of resistance. Soil application allowed but rates, tolerances, and PHI differ. See label. 12-hour reentry. 7-day PHI.

Plum rust mite

Acramite 50WS	bifenazate	0.75–1 lb	Unclassified mode of action. 12-hour reentry. 7-day PHI.
Wettable sulfur	sulfur 80%	10–30 lb	Example product: Kumulus DF. 24-hour reentry.

Popcorn (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 (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)
Lecanium scale			
Esteem 35WP	pyriproxyfen	4–5 oz	Group 7 insecticide (IGR). 12-hour reentry. 14-day PHI.
Peach twig borer			
Altacor	chlorantraniliprole	3–7 oz	Group 28 insecticide. Do not use an adjuvant with Altacor. 4-hour reentry. 5-day PHI.
<i>Bacillus thuringiensis</i> subsp. <i>kurstaki</i> (Btk)	bacterium	See label.	OMRI listed for organic use. Multiple formulations. Apply at 300–350 DD and again at 450–500 DD. Apply with a sticker.
Delegate 25 WG	spinetoram	4.5–7 oz	Group 5 insecticide. Peach twig borer activity. 4-hour reentry. 7-day PHI.
Dimilin 2L	diflubenzuron	12–16 oz	Group 15 insecticide. Restricted use. Avoid contaminating water with runoff or drift. Use with 4–6 gal of narrow range oil. Vegetable oil may be substituted at 1 qt per acre as bloom approaches. Do not apply after petal fall or make more than two applications. 12-hour reentry.
Exirel 0.83SE	cyantraniliprole	10–17 oz	Group 28 insecticide. No more than three applications of Group 28 insecticides per year. 12-hour reentry.
Lygus bug, stink bug			
Voliam Flexi	thiamethoxam + chlorantraniliprole	6–7 oz	Group 4A + group 28 insecticides (premix). Highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply during bloom or when cover crop is blooming. See label for bee caution. Also has activity against aphids and peach twig borer. Do not make aerial applications. 12-hour reentry. 14-day PHI.
Brown rot blossom blight (see footnote 2, page 12)			
Abound	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. See footnote 5, page 12. 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.
Captan 80WDG	captan	2.5–3.75 lb	Group M4 fungicide. 24-hour reentry. 0-day PHI.
Elevate 50WDG	fenhexamid	1–1.5 lb	Group 17 fungicide. Good control of brown rot when used on peaches or cherries. 12-hour reentry. 0-day PHI.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Indar 2F	fenbucanazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Inspire Super	difenoconazole + cyprodinil	16–20 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 2-day PHI.
Luna Privilege	fluopyram	4–6.84 fl oz	Group 7 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.

Popcorn (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 (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)
Brown rot blossom blight (see footnote 2, page 12)(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.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	See footnote 5, page 12. Group 3 + 11 fungicide. 12-hour reentry. 0-day PHI.
Quash	metconazole	2.5–3.5 oz	Group 3 fungicide. 12-hour reentry. 14-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	See footnote 5, page 12. Group 3 + 11 fungicide. 12-hour reentry. 0-day PHI.
Rovral 4F (or generics)	iprodione	1.5–2 pt	Group 2 fungicide. Do not use after petal fall. See footnote 2, page 12. 24-hour reentry.
Scala SC	pyrimethanil	9–18 fl oz	Group 9 fungicide. 12-hour reentry. 2-day PHI.
Tilt (or generics)	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard	azoxystrobin	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Topsin 4.5FL	thiophanate-methyl	20–30 fl oz	Group 1 fungicide. Tank-mix with another fungicide. 2-day reentry. 1-day PHI.
Vanguard 75WG	cyprodinil	5 oz	Group 9 fungicide. Tank-mix with another fungicide. Do not use past bloom. 12-hour reentry.

Full Blossom (Stage 7)

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot blossom blight See materials listed for Popcorn Stage.			
Russet scab			
Rovral 4F (or generics)	iprodione	1.5–2 pt	Group 2 fungicide. Do not use after petal fall. See footnote 2, page 12. 24-hour reentry.
Scala SC	pyrimethanil	9–18 fl oz	Group 9 fungicide. 12-hour reentry. 2-day PHI.
Tilt (or generics)	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.

Petal Fall

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot blossom blight See materials listed for Popcorn Stage.			
Leaf spot			
Abound	azoxystrobin	6–15.5 fl oz	Group 11 fungicide. See footnote 5, page 12. 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 use after shuck split. 12-hour reentry.

Petal Fall continues on next page

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CONTINUED—Petal Fall

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Leaf spot (continued)			
Bumper 41.8EC (or generics)	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry.
Captan 80WDG	captan	2.5–3.75 lb	Group M4 fungicide. 24-hour reentry. 0-day PHI.
Echo 720	chlorothalonil	3–4.1 pt	Group M5 fungicide. Do not use after shuck split. 12-hour reentry.
Gem 500SC	trifloxystrobin	1.9–3.8 oz	Group 11 fungicide. 12-hour reentry. 1-day PHI.
Inspire Super	difenoconazole + cyprodinil	16–20 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 2-day PHI.
Luna Privilege	fluopyram	6.84 fl oz	Group 7 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.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	See footnote 5, page 12. Group 3 + 11 fungicide. 12-hour reentry. 0-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
TopGuard	azoxystrobin	20–30 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Topsin 4.5FL	thiophanate-methyl	12–15 fl oz	Group 1 fungicide. Tank-mix with another fungicide. 2-day reentry. 1-day PHI.
Aphids (mealy plum and leaf curl plum)			
Admire Pro	imidacloprid	1.4–2.8 oz	Group 4A insecticide (many generics). Systemic activity, rotate use with other mode of action groups to avoid development of resistance. Soil application allowed but rates and PHI differ; see label. 12-hour reentry. 7-day PHI.
Diazinon 50W	diazinon	1 lb	Group 1B insecticide. Restricted use. Avoid drift and runoff to water. Limited to one dormant and one in-season application per year. Avoid use in consecutive years. 4-day reentry. 21-day PHI.
Leafrollers, peach twig borer			
See materials listed for Popcorn Stage.			

Petal Fall continues on next page

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CONTINUED—Petal Fall

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Plum rust mite			
Acramite 50WS	bifenazate	0.75–1 lb	Unclassified mode of action. Limited to one application. Do not make aerial applications. 12-hour reentry. 3-day PHI.
Nexter	pyridaben	5.2– 10.67 oz	Group 21 miticide. Do not make aerial applications. Limited to two applications per year. 12-hour reentry. 7-day PHI.
Wettable sulfur	sulfur 80%	10–30 lb	Acceptable for organic use. Do not use within 2 weeks of an oil spray (excepting dormant or delayed dormant applications). 24-hour reentry.
Spider mites			
Acramite 50WS	bifenazate	0.75–1 lb	Unclassified mode of action. Limited to one application. Do not make aerial applications. 12-hour reentry. 3-day PHI.
Savey 50DF	hethythiazox	3–6 oz	Group 10A miticide. Do not use more than once per year. 12-hour reentry. 28-day PHI.
Vendex 50WP	fenbutatin-oxide	1–2 lb	Group 12B miticide. Restricted use. Highly toxic to aquatic organisms. Do not use more than twice per year. 14-day PHI.
Lygus bug, stink bug			
Asana XL	esfenvalerate	4.8–14.5 oz	Group 3 insecticide. Restricted use. 12-hour reentry. 14-day PHI.
Baythroid	beta-cyfluthrin	2.0–2.4 oz	Group 3 insecticide. Restricted use. 12-hour reentry. 7-day PHI.
Mustang Max	zeta-cypermethrin	1.28–4 oz	Group 3A insecticide. Applications must be 7 days apart. No more than 0.125 lb ai per season. 12-hour reentry. 7-day PHI.
San Jose scale			
Movento	spirotetramat	6–9 oz	Group 23 insecticide. Apply immediately after petal fall; two applications may be necessary under high pressure. 24-hour reentry. 7-day PHI.

Shuck Fall and 10–14 days later

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot fruit rot			
See materials listed for Popcorn Stage.			
Leaf spot			
Abound	azoxystrobin	6–15.5 fl oz	Group 11 fungicide. See footnote 5, page 12. Do not use with silicone-based surfactants. 4-hour reentry. 0-day PHI.
Captan 80WDG	captan	2.5–3.75 lb	Group M4 fungicide. 24-hour reentry. 0-day PHI.
Gem 500SC	trifloxystrobin	1.9–3.8 oz	Group 11 fungicide. 12-hour reentry. 1-day PHI.
Inspire Super	difenoconazole + cyprodinil	16–20 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 2-day PHI.

Shuck Fall and 10–14 days later continues on next page

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CONTINUED—Shuck Fall and 10–14 days later

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Leaf spot (continued)			
Luna Privilege	fluopyram	6.84 fl oz	Group 7 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.
Microthiol Disperss	sulfur	10–20 lb	Group M2 fungicide. 24-hour reentry.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	See footnote 5, page 12. Group 3 + 11 fungicide. 12-hour reentry. 0-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Tilt (or generics)	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard	azoxystrobin	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Topsin 4.5FL	thiophanate-methyl	20–30 fl oz	Group 1 fungicide. Tank-mix with another fungicide. 2-day reentry. 1-day PHI.

Late Spring and Summer

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot fruit rot (preharvest)			
Abound	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. See footnote 5, page 12. Do not use with silicone-based surfactants. 4-hour reentry. 0-day PHI.
Captan 80WDG	captan	2.5–3.75 lb	Group M4 fungicide. 24-hour reentry. 0-day PHI.
Elevate 50WDG	fenhexamid	1–1.5 lb	Group 17 fungicide. 12-hour reentry. 0-day PHI.
Indar 2F	fenbucanazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Inspire Super	difenoconazole + cyprodinil	16–20 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 2-day PHI.
Luna Privilege	fluopyram	4–6.84 fl oz	Group 7 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.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. 12-hour reentry. 0-day PHI.
Scala SC	pyrimethanil	9–18 fl oz	Group 9 fungicide. 12-hour reentry. 2-day PHI.

Late Spring and Summer continues on next page

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Late Spring and Summer continues on next page

CONTINUED—Late Spring and Summer

Pest or disease/ Material	Active ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
Brown rot fruit rot (preharvest)(continued)			
Tilt (or generics)	propiconazole	4 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard	azoxystrobin	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Topsin 4.5FL	thiophanate-methyl	20–30 fl oz	Group 9 fungicide. Tank-mix with another fungicide. 2-day reentry. 1-day PHI.
Shothole borer			
No products are registered for control of this pest.			
Aphids (mealy plum and leaf curl plum)			
Admire Pro	imidacloprid	1.4–2.8 oz	Group 4A insecticide. Systemic activity; rotate use with other mode of action groups to avoid development of resistance. Soil application allowed but rates and PHI differ; see label. 12-hour reentry. 7-day PHI.
Diazinon 50W	diazinon	1 lb	Group 1B insecticide. Restricted use. Avoid drift and runoff to water. Limited to one dormant and one in-season application per year. Avoid use in consecutive years. 4-day reentry. 21-day PHI.
Movento	spirotetramat	6–9 oz	Group 23 insecticide. 24-hour reentry. 7-day PHI.
Voliam Flexi	thiamethoxam + chlorantraniliprole	4-7 oz	Group 4A + group 28 insecticides (premix). Highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not make aerial applications. 12-hour reentry. 14-day PHI.
Peach twig borer, leafrollers			
See materials listed for Popcorn Stage.			
Intrepid	methoxyfenozide	8–16 oz	Group 18 insecticide (insect growth regulator). Apply at beginning of egg hatch and reapply under high pressure or fruit growth. 4-hour reentry. 7-day PHI.
Peachtree borer (see footnote 3, page 12)			
Asana XL	esfenvalerate	2–5.8 oz/100 gal water	Group 3 insecticide. Restricted use. Thoroughly apply dilute spray to trunks of trees and scaffold limbs 7–10 days after moths begin flying. 12-hour reentry. 14-day PHI.
Warrior II	lambda-cyhalothrin	1.28–2.56 oz	Group 3 insecticide. Restricted use. 24-hour reentry. 14-day PHI.
Earwigs			
Sevin 4F	carbaryl	2–3 qt	Group 1A insecticide. Apply to trunks and around tree bases about 30 days before harvest. 12-hour reentry. 3-day PHI.
Plum rust mite			
See materials listed for Petal Fall Stage.			

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)
San Jose and lecanium scale			
Centaur WDG	buprofezin	34.5–46 oz	Group 16 insecticide. Good coverage is essential; crawlers should be present. 12-hour reentry. 14-day PHI.
Diazinon 4E	diazinon	4 lb	Group 1B insecticide. Restricted use. Avoid drift and runoff to water. Limited to one dormant and one in-season application per year. Avoid use in consecutive years. Time sprays to coincide with crawler emergence, from late June through September. 4-day reentry. 21-day PHI.
Sevin 4F	carbaryl	2–3 qt	Group 1A insecticide. Apply when crawlers active. 12-hour reentry. 3-day PHI.
Spider mites and European red mite			
Acramite 50WS	bifenazate	0.75–1 lb	Unclassified mode of action. Limited to one application. Do not make aerial applications. 12-hour reentry. 3-day PHI.
Agri-Mek SC, Epi-mek 0.15 EC	abamectin	0.5–4.25 oz	Group 6 insecticide. Restricted use. To avoid illegal residues, a specific adjuvant is needed; see label. 12-hour reentry. 21-day PHI.
Vendex 50WP	fenbutatin-oxide	1–2 lb	Group 12B miticide. Restricted use. Highly toxic to aquatic organisms. Do not use more than twice per year. 48-hour reentry. 14-day PHI.
Spotted wing drosophila			
<i>Note: Begin monitoring just before fruit starts to change to its ripening color.</i>			
Asana XL	esfenvalerate	4.8–14.5 oz	Group 3A insecticide. Restricted use. No more than 0.375 lb ai per season. 12-hour reentry. 14-day PHI.
Baythroid	beta-cyfluthrin	2.4–2.8 oz	Group 3 insecticide. Restricted use. 12-hour reentry. 7-day PHI.
Danitol 2.4EC	fenpropathrin	10–21 oz	Group 3A insecticide. Restricted use. Apply by ground. No more than 2.66 pt per season. Do not apply as a ULV spray. 24-hour reentry. 3-day PHI.
Delegate WG	spinetoram	4.5–7 oz	Group 5 insecticide. Apply sprays no less than 1 week apart, maximum four times per season. 4-hour reentry. 1-day PHI.
Diazinon 50W	diazinon	1 lb	Group 1B insecticide. Restricted use. Avoid drift and runoff to water. Limited to one dormant and one in-season application per year. Avoid use in consecutive years. 4-day reentry. 21-day PHI.
Entrust 2SC	spinosad	6–10 oz	Group 5 insecticide. OMRI listed for organic use. No more than four applications or 29 oz per year. 4-hour reentry. 7-day PHI.
Exirel	cyantraniliprole	13.5– 20.5 oz	Group 28 insecticide. 12-hour reentry. 3-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)
San Jose and lecanium scale			
Imidan 70W	phosmet	2.125– 4.25 lb	Group 1B insecticide. 7-day reentry, but see additional restrictions for thinning and U-pick. 14-day PHI.
Mustang Max	zeta-cypermethrin	1.28–4 oz	Group 3A insecticide. Applications must be 7 days apart. No more than 0.125 lb ai per season. 12-hour reentry. 7-day PHI.
Sevin XLR Plus or Sevin 80WSP	carbaryl	2–3 qt 3 lb	Group 1A insecticide. No more than 15 qt per season. 12-hour reentry. 14-day PHI.
Success 2L	spinosad	4–8 oz	Group 5 insecticide. Entrust is the OMRI formulation approved for organic use. Apply when overwintering larvae become active. 4-hour reentry. 1-day PHI.
Warrior II	lambda-cyhalothrin	1.28–2.56 oz	Group 3A insecticide. Restricted use. No more than 0.2 ai per year. 24-hour reentry. 14-day PHI.

Postharvest

Pest or disease/ Material	Active Ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
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Shothole borer

No products are registered for control of this pest.

Dormant (Stages 0–1—October and January)

Pest or disease/ Material	Active Ingredient (AI)	Application rate/acre	Comments/Reentry interval/Preharvest interval (PHI)
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Dead bud and bacterial canker

Note: Apply the first spray in October before the fall rains and again in early January. Do not graze sheep in orchards sprayed with coppers.

Badge X2	copper oxychloride + copper hydroxide	3.5 to 14 lb	Group M1 fungicide. 48-hour reentry.
bordeaux 12-12-100	copper sulfate +lime	See footnote 1, page 12.	—
C-O-C-S WDG	copper oxychloride + copper sulfate	6–15.5 lb	Group M1 fungicide. 48-hour reentry.
Copper-Count-N	copper ammonium complex	8–12 qt	Group M1 fungicide. 48-hour reentry.
Cuprofix Ultra 40 Disperss	copper sulfate	5–8 lb	Group M1 fungicide. 48-hour reentry.
Kocide 3000	copper hydroxide	3.5–7 lb	Add 1 pt horticultural mineral oil (HMO) per 100 gal water. Group M1 fungicide. 48-hour reentry.
Nu-Cop 50 DF	cupric hydroxide	8–16 lb	Group M1 fungicide. 48-hour reentry.

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Footnotes

1. Bacteria resistant to copper products have been detected in many Willamette Valley crops. Thoroughly spray the trunks and lower scaffolds as well as the upper branches. Bordeaux 12-12-100 means 12 lb copper sulfate plus 12 lb 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. Fungal pathogens have shown resistance to several fungicides when one is used exclusively. Alternate or tank-mix fungicides with different modes of action (FRAC groups). Some products may already contain two different fungicides.
3. First spray usually is made in late June or July. If pheromone traps are used to time sprays, make the application 10 to 14 days after the first moths are caught. A second trunk spray may be required 3 weeks after the first.
4. Surface scarring on stone fruits can be the result of many factors. Certain insects such as thrips deform and bronze flower buds and blossoms. Thrips can scar fruit by feeding on or laying eggs in the fruit. Most significant damage usually occurs during and shortly after pollination.

Lygus and stink bugs also damage stone fruit at this time. Buds are injured, flowers can be sterile, and fruit may be dimpled, distorted, and “pock-marked.”

Damage from the above pests is sporadic and occurs only occasionally in some Valley orchards. Sometimes only portions of orchards or border rows are damaged. Best timing to prevent damage also coincides with pollination periods. Even though some varieties may be wind pollinated, bees can boost yield, often are present, and must be protected.

Be sure fruit scarring to be prevented is the result of insects before applying these sprays.

5. Do not use Group 11 fungicides in more than two consecutive spray applications. Sprayers used for Abound or Topguard EQ should **not be used on apples** such as Gala, Cox’s Orange Pippin, and McIntosh.

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. 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)													
diuron (7)	Karmex												1.6 to 3.2 lb ai/A (2 to 4 lb/A Karmex 80DF)
dichlobenil (20)	Casoron												4 to 6 lb ai/A (100 to 150 lb/A Casoron); apply in cold and wet weather.
<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 weed 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	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		NB										0.5 to 1 lb ai/A (1 to 2 pints/A Treflan 4L)
trifluralin (3)+ <i>isoxaben</i> (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). Slight differences in rates and uses in SW and WDG labels.
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) *Until March 2019

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	
CONTINUED—Applications that are soil and foliar active												
rimsulfuron (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 (volume/volume); OMRI certified
ammoniated soap of fatty acids	Final-San-O											14 to 26 fl oz/gallon. Apply prior to planting or non-cropped areas.
caprylic acid + capric acid	Suppress											6 to 9% v/v (volume/volume); 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	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)
clove oil+ cinnamon oil	Weed Zap											5% v/v/ (volume/volume). OMRI listed.
diquat (22)	Reglone		NB	NB	NB	NB	NB	NB	NB	NB	NB	0.375 to 0.5 lb ai/A (1.5 to 2 pints/A)
fluzifop (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	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; 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 (EPA), 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 (IPM) 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 (REI) specified on the pesticide label.
- Follow the pre-harvest interval (PHI) on the pesticide label before harvesting crops or gardens and before allowing livestock to graze fields.

Oregon Poison Center

The 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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