

Pear

2019 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!**

Also:

1. Make sure any tank-mixes of pesticides are compatible. For example, the elevated pH of some boron spray solutions weakens many insecticides. Boron also is not compatible with water-soluble packets.
2. Use adjuvants and spreader stickers with caution.

Important information

Be aware of worker protection standards. All new pesticide labels will provide orchard reentry intervals and personal protection equipment information.

Stages

Dormant Season (Stage 0)
 Delayed Dormant (Stages 1–2)
 Tight Cluster Bud or Prepink (Stage 3)
 Pink or Preblossom (Stages 4–6)

Not shown

Calyx; First Cover Spray; Second Cover Spray; Third Cover Spray; Preharvest; Postharvest

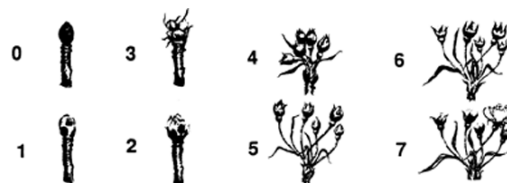


Illustration courtesy of Washington State University Extension.

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.

Pear 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 (Stage 0)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Pear psylla (adults and eggs), scale			
<i>Note:</i> Apply just prior to egg deposition. Thorough coverage is important.			
horticultural mineral oil (HMO)	oil	4–6 gal	The oil spray alone repels adult psylla and inhibits egg laying.
HMO + one of the following:		4–6 gal	The oil + pyrethroids kills adult psylla. Use pyrethroids judiciously to avoid development of resistance in psylla.
Asana XL	esfenvalerate	7.3–12.8 oz (dilute rate)	Group 3 insecticide. Restricted use. Do not apply more than 0.2 lb ai/A per season. See label for concentrate rate. 12-hour reentry.
Danitol 2.4 EC	fenpropathrin	16–21.33 oz	Group 3 insecticide. Restricted use. Minimum of 75 gal water. Do not apply more than 42.66 oz/A per season. No more than 2 applications per season for resistance management recommended. 12-hour reentry.
Permethrin 3.2 EC	permethrin	8–16 oz	Group 3 insecticide. Restricted use. Dormant, delayed dormant, and pre-bloom use only. Multiple formulations available. 12-hour reentry.
Surround WP	kaolin clay	25–50 lbs/A	OMRI listed for organic use. Apply in 200 gal water at the beginning of pear psylla egg laying. Maintain coverage until bloom with additional applications to prevent egg laying.
Warrior II EC	lambda-cyhalothrin	1.3–2.5 oz	Group 3 insecticide. Restricted use. Apply as needed determined by scouting. 24-hour reentry.

Pear rust mite, pear leaf blister mite

Note: Apply before bud swell if pear rust mite has been a problem in previous years.

horticultural mineral oil (HMO) + one of the following:	oil	4–6 gal	HMO + sulfur provides some suppression of pear psylla.
flowable sulfur (6 lb ai/gal)	calcium polysulfide 29%	2 gal	—
lime sulfur	calcium polysulfide 29%	10 gal	—
wettable sulfur (80%)	sulfur	16–20 lb	—

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.

Delayed Dormant (Stages 1 and 2—apply when buds are swelling but before bud scales drop to minimize injury)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Pear rust mite, pear leaf blister mite			
<i>Note: Apply before bud swell if pear rust mite has been a problem in previous years.</i>			
horticultural mineral oil (HMO) + one of the following:	oil	4–6 gal	Some HMOs are OMRI approved for organic use.
flowable sulfur (6 lb ai/gal)	calcium polysulfide 29%	2 gal	Some products OMRI approved for organic use.
lime sulfur	calcium polysulfide 29%	10 gal	Some products OMRI approved for organic use.
wettable sulfur (80%)	sulfur	16–20 lb	Some products OMRI approved for organic use.
Pear psylla adults, European red mite, San Jose scale, European fruit scale, lygus bug			
Centaur 70 WDG	buprofezin	34.5–46 oz	Group 16 insecticide (IGR). No more than 2 applications per season. Possible phytotoxicity on Asian pear. Do not tank mix with oil. 12-hour reentry.
horticultural mineral oil (HMO) + one of the following:	oil	4–6 gal	If scale is a problem, increase gallonage to 500 gpa. Calibrate to discharge two-thirds of volume out of top one-third of sprayer. Use pyrethroids (group 3 insecticides) judiciously to avoid development of resistance in psylla.
Asana XL	esfenvalerate	7.3–12.8 oz (dilute rate)	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. See label for concentrate rate. 12-hour reentry.
Danitol 2.4 EC	fenpropathrin	16–21 oz	Group 3 insecticide. Restricted use. Minimum of 75 gal water. Do not apply more than 42.66 oz/A per season. No more than 2 applications recommended per season for resistance management. 12-hour reentry.
Diazinon 50W	diazinon	0.5–1 lb	Group 1B insecticide. Restricted use. Limited to 1 application in the dormant season and 1 foliar cover spray. Enclosed cab required. IMPORTANT: In some areas, Diazinon no longer gives adequate control of pear psylla. 4-day reentry.
Esteem 35WP	pyriproxyfen	4–5 oz	Group 7C (IGR). Limited to 2 applications per season. Does not kill adult psylla, targets eggs and immature (molting) stages. Apply just prior to anticipated egg laying.
flowable sulfur (6 lb ai/gal)	sulfur	2 gal	—
lime sulfur	calcium polysulfide 29%	10 gal	—

Delayed Dormant (Stages 1 and 2—apply when buds are swelling but before bud scales drop to minimize injury) 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—Delayed Dormant (Stages 1 and 2—apply when buds are swelling but before bud scales drop to minimize injury)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Pear psylla adults, European red mite, San Jose scale, European fruit scale, lygus bug (continued)			
Lorsban 4E	chlorpyrifos	1.5–4 pt/A	Group 1B insecticide. Limited to one application during dormant season. 4-day reentry.
Permethrin 3.2 EC	permethrin	8–16 oz	Group 3 insecticide. Restricted use. Dormant, delayed dormant, and pre-bloom use only. Multiple formulations available. 12-hour reentry.
Warrior II EC	lambda-cyhalothrin	1.3–2.5 oz	Group 3 insecticide. Restricted use. Apply as needed, determined by scouting. 24-hour reentry.
Pseudomonas (see footnote 6, page 16) and fire blight (holdover cankers)			
Badge X2	copper oxychloride + copper hydroxide	5.25–14 lb	48-hour reentry.
Copper-Count-N	copper ammonium complex	8–12 qt	48-hour reentry.
Cuprofix Ultra	copper sulfate	7.5–10 lb	48-hour reentry.
Kocide 3000	copper hydroxide	5.5–7 lb	Copper may not be compatible with other spray materials. Do not attempt to mix it with other fungicides or insecticides. 48-hour reentry.
ManKocide	copper hydroxide + mancozeb	12–16 lb	48-hour reentry.
Nu-Cop 50DF	copper hydroxide	12–16 lb	48-hour reentry.
Tight Cluster Bud (after scales drop) or Prepink (Stage 3)			
Scab (see footnote 9, page 16)			
Aprovia	benzovindiflupyr	5.5–7 fl oz	Mix with another fungicide and adjuvant. 12-hour reentry. 30-day PHI.
Flint 50WG	trifloxystrobin	2–2.5 oz	Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 14-day PHI.
Inspire Super	difenoconazole + cyprodinil	12 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 14-day PHI.
Lime Sulfur Ultra	calcium polysulfide	0.75–1.25 gal/100 gal water	See footnote 5, page 16.
Luna Sensation	fluopyram + trifloxystrobin	4–5.8 fl oz	Group 7 + 11 fungicide. Do not use with HMOs. 12-hour reentry. 14-day PHI.
Mancozeb	mancozeb	3 or 6 lb	Do not use the 6 lb/A rate beyond bloom. 24-hour reentry.
Merivon	fluxapyroxad + pyraclostrobin	4–5.5 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 0-day PHI.
Procure and generics	triflumizole	8–16 fl oz	12-hour reentry. 14-day PHI.
Sovran	kresoxim-methyl	4–6.4 oz	See footnote 8, page 16. Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 30-day PHI.

Tight Cluster Bud (after scales drop) or Prepink (Stage 3) 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—Tight Cluster Bud (after scales drop) or Prepink (Stage 3)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Scab (see footnote 9, page 16)(continued)			
Syllit FL	dodine	3 pt	Mix with another fungicide. See footnote 1, page 16. 48-hour reentry. 7-day PHI.
Topguard	flutriafol	13 fl oz	Mix with another fungicide. 12-hour reentry. 14-day PHI.
Ziram 76DF	ziram	6 lb	48-hour reentry. 14-day PHI.
Rust mite			
Envidor 2SC	spirodiclofen	16–18 oz	Group 23 miticide. 12-hour reentry. 7-day PHI.
Fujimite 5EC	fenpyroximate	2 pt	Group 21A miticide. Do not rotate with Nexter. 12-hour reentry. 14-day PHI.
Nexter 75W SB	pyridaben	6.6–10.67 oz	Group 21A miticide. Do not rotate with Fujimite. 12-hour reentry. 7-day PHI.
Pear psylla			
<i>Note: All of the products listed below are detrimental to predatory mites with this timing; avoid psylla controls at this time if possible.</i>			
Asana XL	esfenvalerate	7.3–12.8 oz (dilute rate)	Group 3 insecticide. Restricted use. Do not apply past the white bud/prebloom stage. Do not apply more than 0.2 lb ai/A per season. See label for concentrate rate. 12-hour reentry.
Danitol 2.4 EC	fenpropathrin	16–21 oz	Group 3 insecticide. Restricted use. Minimum of 75 gal water. Do not apply more than 42.66 oz/A per season. No more than 2 applications per season for resistance management recommended. 12-hour reentry.
Permethrin 3.2 EC	permethrin	8–16 oz	Group 3 insecticide. Restricted use. Dormant, delayed dormant and pre-bloom use only. Multiple formulations available. 12-hour reentry.
Warrior II EC	lambda-cyhalothrin	1.3–2.5 oz	Group 3 insecticide. Restricted use. Apply as needed determined by scouting. 24-hour reentry.

Pink or Preblossom (Stages 4–6—just before blossoms open)

Pest or disease/ Material	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Codling moth (mating disruption)		
<i>Note: Many hand-applied pheromone dispenser products are available, and all of them can work, provided codling moth populations are moderate to low. Consider utilizing well-timed insecticide applications to bring populations of codling moth to a level that will allow mating disruption to work effectively. Aerosol pheromone dispensers (puffers) can also be used at the rate of 1–2 unit/acre, but hand-applied border treatments may still be necessary. Check label recommendations. Do not use mating disruption on orchards less than 10 acres in size.</i>		
Checkmate CM-XL	200 ties	—
Isomate-C+	400 ties	—
Isomate-CTT	200 ties	—
No mate CM	200–400 ties	—

Pink or Preblossom (Stages 4–6—just before blossoms open) continues on next page

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CONTINUED—Pink or Preblossom (Stages 4–6—just before blossoms open)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Scab (see footnote 9, page 16)			
Aprovia	benzovindiflupyr	5.5–7 fl oz	Mix with another fungicide and adjuvant. 12-hour reentry. 30-day PHI.
Flint 50WG	trifloxystrobin	2–2.5 oz	Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 14-day PHI.
Inspire Super	difenoconazole + cyprodinil	12 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 14-day PHI.
Lime Sulfur Ultra	calcium polysulfide	2 qt/100 gal water	See footnote 5, page 16.
Luna Sensation	fluopyram + trifloxystrobin	4–5.8 fl oz	Group 7 + 11 fungicide. Do not use with HMOs. 12-hour reentry. 14-day PHI.
Mancozeb	mancozeb	3 or 6 lb	Do not use the 6 lb/A rate beyond bloom. 24-hour reentry.
Merivon	fluxapyroxad + pyraclostrobin	4–5.5 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	14.5–18.5 oz	Do not make more than 2 consecutive applications or with an HMO. 12-hour reentry. 0-day PHI.
Procure and generics	triflumizole	8–16 fl oz	12-hour reentry. 14-day PHI.
Sovran	kresoxim-methyl	3.2–6.4 oz	See footnote 8, page 16. Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 30-day PHI.
Syllit FL	dodine	3 pt	Mix with another fungicide. See footnote 1, page 16. 48-hour reentry. 7-day PHI.
Topguard	flutriafol	13 fl oz	Mix with another fungicide. 12-hour reentry. 14-day PHI.
Ziram 76DF	ziram	6 lb	48-hour reentry. 14-day PHI.
Powdery mildew (see footnote 9, page 16)			
Aprovia	benzovindiflupyr	5.5–7 fl oz	Mix with an adjuvant. Group 7 fungicide. 12-hour reentry. 30-day PHI.
Flint 50WG	trifloxystrobin	2–2.5 oz	Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 14-day PHI.
Fontelis	penthiopyrad	16–20 fl oz	Do not use with thinning agents. 12-hour reentry. 28-day PHI.
HMO such as JMS Stylet oil	horticultural mineral oils	1–2 gal/100 gal water	Do not use within 10 days of a sulfur application.
Inspire Super	difenoconazole + cyprodinil	12 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 14-day PHI.
Lime Sulfur Ultra	calcium polysulfide	2 qt/100 gal water	See footnote 5, page 16.
Luna Sensation	fluopyram + trifloxystrobin	4–5.8 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 14-day PHI.
Sulfur (DF)	micronated sulfur	10–20 lb	24-hour reentry.
Merivon	fluxapyroxad + pyraclostrobin	4–5.5 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 0-day PHI.
Oso SC	polyoxin D	3.75–13 fl oz	4-hour reentry. 0-day PHI.

Pink or Preblossom (Stages 4–6—just before blossoms open) continues on next page

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CONTINUED—Pink or Preblossom (Stages 4–6—just before blossoms open)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Powdery mildew (see footnote 9, page 16)(continued)			
Ph-D	polyoxin D	6.2 oz	4-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	14.5–18.5 oz	Do not make more than 2 consecutive applications or with an HMO. 12-hour reentry. 0-day PHI.
Procure and generics	triflumizole	8–16 fl oz	12-hour reentry. 14-day PHI.
Sovran	kresoxim-methyl	4–6.4 oz	See footnote 8, page 16. Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 30-day PHI.
Topguard	flutriafol	8–12 fl oz	12-hour reentry. 14-day PHI.
Torino	cyflufenamid	6.8 oz	4-hour reentry. 14-day PHI.
Unicorn DF	tebuconazole + sulfur	2–3 lb	Group 3 fungicide + sulfur. 5-day reentry. 75-day PHI.
Pseudomonas and fire blight			
Previsto	copper hydroxide	2–4 qt	May help with fire blight control. Do not tank mix with any other product. Do not use on Anjou, Comice, or Forelle pears to avoid severe russetting. M1 fungicide. 48-hr reentry.
streptomycin 21.2%	streptomycin	28.8 oz	Do not overuse; bacterial populations can quickly develop resistance to this antibiotic. 12-hour reentry. 30-day PHI.
Pear psylla			
<i>Note: Some of the following pesticides are toxic to bees and fish. Do not apply if bees are active in the crop. Materials listed below are detrimental to predatory mites with this timing; avoid psylla controls at this time, if possible. Carefully read the labels for precautions.</i>			
Asana XL	esfenvalerate	9.6–19.2 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. See label for concentrate rate. 12-hour reentry.
Assail 70WP	acetamiprid	1.1–3.4 oz	Group 4A insecticide. No more than 4 applications per season. 12-hour reentry.
Centaur WDG	buprofezin	34.5–46 oz	Group 16 insecticide (IGR). No more than 2 applications per season. Possible phytotoxicity on Asian pear. Do not tank mix with oil. 12-hour reentry.
FujiMite 5EC	fenpyroximate	2 pt	Group 21A miticide. Do not rotate with Nexter. 12-hour reentry.
Nexter 75WSB	pyridaben	6.6–10.67 oz	Group 21A miticide. Do not rotate with Fujimite. 12-hour reentry.
Penncozeb 75DF	mancozeb	8 lb	Group M3 fungicide. Begin applications at early bloom. Do not apply after bloom. Note 24 (c) SLN valid until Dec. 31, 2020. 24-hour reentry. 77-day PHI.
Permethrin 3.2 EC	permethrin	8–16 oz	Group 3 insecticide. Restricted use. Dormant, delayed dormant and pre-bloom use only. Multiple formulations available. 12-hour reentry.

Pink or Preblossom (Stages 4–6—just before blossoms open) continues on next page

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CONTINUED—Pink or Preblossom (Stages 4–6—just before blossoms open)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Pear psylla (continued)			
Proaxis	gamma-cyhalothrin	2.56–5.12 oz	Group 3 insecticide. Restricted use. For psylla suppression only. 24-hour reentry.
Proclaim 5SG	emamectin benzoate	3.2–4.8 oz	Group 6 insecticide. Restricted use. For psylla suppression only. 48-hour reentry.
Rimon 0.83EC	novaluron	20–32 oz	Group 15 insecticide. No more than 2 applications per season. Do not apply after turndown. 12-hour reentry.
Sivanto 200SL	flupyradifurone	10.5–14 oz	Group 4D insecticide. Maximum of 28 oz/A per year. 12-hour reentry.

Calyx (when three-quarters of the petals have fallen, before calyx or central fruit cluster closes)

Scab and powdery mildew

See materials listed for Pink or Preblossom Stage.

Bull's eye rot

Ziram 76DF	ziram	6 lb	48-hour reentry. 14-day PHI.
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First Cover Spray (about 15 days after petals fall)

Scab (see footnote 9, page 16)

Aprovia	benzovindiflupyr	5.5–7 fl oz	Mix with another fungicide and adjuvant. 12-hour reentry. 30-day PHI.
Flint 50WG	trifloxystrobin	2–2.5 oz	Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 14-day PHI.
Inspire Super	difenoconazole + cyprodinil	12 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 14-day PHI.
Lime Sulfur Ultra	calcium polysulfide	2 qt/100 gal water	See footnote 5, page 16.
Luna Sensation	fluopyram + trifloxystrobin	4–5.8 fl oz	Group 7 + 11 fungicide. Do not use with HMOs. 12-hour reentry. 14-day PHI.
Mancozeb	mancozeb	3 lb	24-hour reentry. 77-day PHI.
Merivon	fluxapyroxad + pyraclostrobin	4–5.5 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	14.5–18.5 oz	No more than 2 consecutive applications. Do not use with an HMO. 12-hour reentry. 0-day PHI.
Procure and generics	triflumizole	8–16 fl oz	12-hour reentry. 14-day PHI.
Sovran	kresoxim-methyl	3.2–6.4 oz	See footnote 8, page 16. Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 30-day PHI.
Syllit FL	dodine	3 pt	Mix with another fungicide. See footnote 1, page 16. 48-hour reentry. 7-day PHI.
Topguard	flutriafol	13 fl oz	Mix with another fungicide. 12-hour reentry. 14-day PHI.
Ziram 76DF	ziram	6 lb	48-hour reentry. 14-day PHI.

First Cover Spray (about 15 days after petals 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—First Cover Spray (about 15 days after petals fall)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Powdery mildew (only if needed—see footnote 9, page 16)			
Apruvia	benzovindiflupyr	5.5–7 fl oz	Mix with an adjuvant. 12-hour reentry. 30-day PHI.
Flint 50WG	trifloxystrobin	2–2.5 oz	Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 14-day PHI.
Fontelis	penthiopyrad	16–20 fl oz	Do not use with thinning agents. 12-hour reentry. 28-day PHI.
HMO such as JMS Stylet oil	horticultural mineral oils	1–2 gal/100 gal water	Do not use within 10 days of a sulfur application.
Inspire Super	difenoconazole + cyprodinil	12 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 14-day PHI.
Lime Sulfur Ultra	calcium polysulfide	2 qt/100 gal water	See footnote 5, page 16.
Luna Sensation	fluopyram + trifloxystrobin	4–5.8 fl oz	Group 7 + 11 fungicide. Do not use with HMOs. 12-hour reentry. 14-day PHI.
Merivon	fluxapyroxad + pyraclostrobin	4–5.5 fl oz	Group 7 + 11 fungicide. 12-hour reentry. 0-day PHI.
Sulfur (DF)	micronated sulfur	10–20 lb	24-hour reentry.
Oso SC	polyoxin D	3.75–13 fl oz	4-hour reentry. 0-day PHI.
Ph-D	polyoxin D	6.2 oz	4-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	14.5–18.5 oz	Do not make more than two consecutive applications or with an HMO. 12-hour reentry. 0-day PHI.
Procure	triflumizole	8–16 fl oz	12-hour reentry. 14-day PHI.
Sovran	kresoxim-methyl	4–6.4 oz	See footnote 8, page 16. Rotate with other fungicides. Do not make more than 2 consecutive applications. 12-hour reentry. 30-day PHI.
Topguard	flutriafol	8–12 fl oz	12-hour reentry. 14-day PHI.
Torino	cyflufenamid	6.8 oz	4-hour reentry. 14-day PHI.
Unicorn DF	tebuconazole + sulfur	2–3 lb	Group 3 fungicide + sulfur. 5-day reentry. 75-day PHI.
Pear psylla (only if a problem)			
Admire Pro	imidacloprid	7 oz	Group 4A insecticide. Can be applied as soil application through chemigation system, rates and restrictions differ for this application, see label. Generic labels available. 12-hour reentry. 7-day PHI.
Agri-Mek SC, Epi-mek 0.15EC	abamectin	16–20 oz	Group 6 insecticide. Restricted use. Must be used with adjuvant such as horticultural spray oil to avoid illegal residues. Use up to second cover (late June). Effectiveness of Agri-Mek diminishes in late season. Alternate with other available insecticides for summer control of pear psylla as a resistance management strategy. 12-hour reentry. 28-day PHI.
Assail 70WP	acetamiprid	1.7–3.4 oz	Group 4A insecticide. No more than 4 applications per season. 12-hour reentry. 7-day PHI.

First Cover Spray (about 15 days after 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—First Cover Spray (about 15 days after petals fall)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Pear psylla (only if a problem) (continued)			
Closer SC	sulfloxaflo	5.75 oz	Group 4C insecticide. Suppression of psylla only. Avoid drift to blooming crops. No more than 2 consecutive applications. 12-hour reentry.
FujiMite 5EC	fenpyroximate	2 pt	Group 21A miticide. Do not rotate with Nexter. 12-hour reentry. 14-day PHI.
Nexter 75W SB	pyridaben	6.6–10.67 oz	Group 21A miticide. Do not rotate with Fujimite. 12-hour reentry. 7-day PHI.
Codling moth (see footnote 2, page 16)			
Altacor	chlorantraniliprole	2.5–4 oz	Group 28 insecticide. Apply prior to egg hatch for 10–17 days of protection. Do not use an adjuvant with Altacor. 4-hour reentry. 5-day PHI.
Assail 70WP	acetamiprid	1.7–3.4 oz	Group 4A insecticide. No more than 4 applications per season. Combine with horticultural oil for increased efficacy on codling moth. 12-hour reentry. 7-day PHI.
Avaunt 30WDG	indoxacarb	5–6 oz	Group 22 insecticide. For use against low codling moth populations. 12-hour reentry. 28-day PHI.
Danitol 2.4EC	fenpropathrin	16–21.3 oz	Group 3 insecticide/miticide. Restricted use. Apply at 250 degree days after biofix. 24-hour reentry. 14-day PHI.
Delegate	spinetoram	6–7 oz	Group 5 insecticide. Begin applications just prior to egg hatch, approx. 220–250 days after biofix. No more than 4 applications per year. 7-day PHI.
Diazinon 50WP	diazinon	1 lb	Group 1B insecticide. Restricted use. Limited to 1 foliar application per season. Enclosed cab required. 4-day reentry. 21-day PHI.
Entrust SC	spinosad	6–10 oz	Group 5 insecticide. OMRI listed for organic use. Targets larval stages. No more than 4 applications or 29 oz per year. 4-hour reentry. 7-day PHI.
Esteem 35WP	pyriproxyfen	4–5 oz	Group 7 insecticide (IGR). Apply approximately 14–21 days after petal fall or at peak moth flight. 12-hour reentry. 45-day PHI.
Exirel 0.83SE	cyantraniliprole	10–17 oz	Group 28 insecticide. Apply prior to egg hatch for 10–14 days of control. No more than 3 applications of Group 28 insecticides per year. 12-hour reentry. 3-day PHI.
Granulosis virus	virus	See label	Group 11 insecticide. OMRI listed for organic use. Codling moth granulosis virus, multiple formulations available. Use non-chlorinated water with pH near 7. Make 2 applications per codling moth generation. 4-hour reentry. 0-day PHI.
Imidan 70WP	phosmet	2.125–5.75 lb	Group 1B insecticide. A water-soluble bag formulation is also available. 7-day reentry. 7-day PHI.

First Cover Spray (about 15 days after 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—First Cover Spray (about 15 days after petals fall)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Codling moth (see footnote 2, page 16) (continued)			
Intrepid 2F	methoxyfenozide	16 oz	Group 18 insecticide (IGR). Apply at or just prior to egg hatch. Suppression of codling moth only, appropriate for low infestations. 4-hour reentry. 14-day PHI.
Proclaim 5SG	emamectin benzoate	3.2–4.8 oz	Group 6 insecticide. Restricted use. For codling moth, provides suppression only. Apply immediately after hatch. 12-hour reentry. 14-day PHI.
Rimon 0.83EC	novaluron	30–32 oz	Group 15 insecticide (IGR). Apply at the onset of egg hatch to target small larvae. This occurs at approximately 50–75 degree days for the first generation and 1,000 degree days for the second generation. 12-hour reentry. 14-day PHI.
Pear psylla, aphids			
Closer SC	sulfloxaflo	5.75 oz	Group 4C insecticide. Suppression of psylla only (higher rate). Avoid drift to blooming crops. No more than 2 consecutive applications. 12-hour reentry.
Ultor	spirotetramat	8–14 oz	Group 23 insecticide. Surfactant required. Also labeled for codling moth suppression. Do not apply before petal fall. 1-day reentry. 7-day PHI.
Rust mites only			
Agri-mek SC, Epi-mek 0.15EC	abamectin	0.5–1 oz / 2.5–5 oz (dilute)	Group 6 miticide. Must be used with adjuvant such as horticultural spray oil (not dormant oil) to avoid illegal residues. Use up to second cover (late June), effectiveness of abamectin products diminishes in late season. Alternate with other available insecticides for summer control of pear psylla as a resistance management strategy. No more than 2 applications of any foliar applied abamectin product per season. 12-hour reentry. 28-day PHI.
Envidor 2SC	spirodiclofen	16–18 oz	Group 23 miticide. 12-hour reentry. 7-day PHI.
FujiMite 5EC	fenpyroximate	2 pt	Group 21A miticide. Do not rotate with Nexter. 12-hour reentry. 14-day PHI.
Nexter 75W SB	pyridaben	6.6–10.67 oz	Group 21A miticide. Do not rotate with Fujimite. 12-hour reentry. 7-day PHI.
Vendex 50WP	fenbutatin-oxide	1–2 lbs	Group 12B miticide. Restricted use. No more than 2 applications per season. 48-hour reentry. 14-day PHI.

Second Cover Spray (15 or more days after first cover spray)**Scab and powdery mildew**

See materials listed for First Cover Stage.

Second Cover Spray (15 or more days after first cover spray) 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—Second Cover Spray (15 or more days after first cover spray)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Pear psylla			
Assail 70WP	acetamiprid	1.7–3.4 oz	Group 4A insecticide. Will provide suppression of San Jose scale at 3.4 oz/A. No more than 4 applications per season. 12-hour reentry. 7-day PHI.
Centaur WDG	buprofezin	34.5–46 oz	Group 16 insecticide (IGR). No more than 2 applications per season. Possible phytotoxicity on Asian pear. Do not tank mix with oil. 12-hour reentry. 14-day PHI.
Ultor	spirotetramat	8–14 oz	Group 23 insecticide. Surfactant required. Also labeled for codling moth suppression. Do not apply before petal fall. 1-day reentry. 7-day PHI.
Pear psylla and scale			
Centaur WDG	buprofezin	34.5–46 oz	Group 16 insecticide (IGR). No more than 2 applications per season. Possible phytotoxicity on Asian pear. Do not tank mix with oil. 12-hour reentry. 14-day PHI.
Closer SC	sulfloxaflor	5.75 oz	Group 4C insecticide. Suppression of psylla and scale only. Avoid drift to blooming crops. No more than 2 consecutive applications. 12-hour reentry.
Ultor	spirotetramat	8–14 oz	Group 23 insecticide. Surfactant required. Also labeled for codling moth suppression. Do not apply before petal fall. 1-day reentry. 7-day PHI.
Codling moth (see footnote 2, page 16)			
Altacor	chlorantraniliprole	3–4.5 oz	Group 28 insecticide. Do not use an adjuvant with Altacor. 4-hour reentry. 5-day PHI.
Assail 70WP	acetamiprid	3.4 oz	Group 4A insecticide. No more than 4 applications per season. Combine with horticultural oil for increased efficacy on codling moth. 12-hour reentry. 7-day PHI.
Diazinon 50WP	diazinon	1 lb	Group 1B insecticide. Restricted use. Limited to 1 application in the dormant season and 1 foliar cover spray. Enclosed cab required. See footnote 3, page 16. 4-day reentry. 21-day PHI.
Exirel 0.83SE	cyantraniliprole	10–17 oz	Group 28 insecticide. No more than 3 applications of Group 28 insecticides per year. 12-hour reentry. 3-day PHI.
Granulosis virus	virus	1-6 oz	OMRI listed for organic use. Multiple brand names and formulations including CYD=X. Make a minimum of 2 applications during egg hatch and early larval stage, beginning approximately 250 degree days after biofix. 4-hour-reentry. 0-day PHI.
Imidan 70WP	phosmet	2.125– 5.75 lb	Group 1B insecticide. A water-soluble bag formulation is also available. 7-day reentry. 7-day PHI.

Second Cover Spray (15 or more days after first cover spray) 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—Second Cover Spray (15 or more days after first cover spray)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Scale, aphids			
Diazinon 50W	diazinon	0.5–1 lb	Group 1B insecticide. Limited to 1 application in the dormant season and 1 foliar cover spray. Enclosed cab required. See footnote 3, page 16. 4-day reentry. 21-day PHI.
Ultror	spirotetramat	8–14 oz	Group 23 insecticide. Surfactant required. Also labeled for codling moth suppression. Do not apply before petal fall. 1-day reentry. 7-day PHI.
Spider mites			
Acramite 50WS	bifenazate	0.75–1 lb	Unclassified mode of action. 12-hour reentry. 7-day PHI.
Agri-mek SC, Epi-mek 0.15 EC	abamectin	0.5–1 oz / 2.5–5 oz (dilute)	Group 6 miticide. Must be used with adjuvant such as horticultural spray oil (not dormant oil) to avoid illegal residues. Use up to second cover (late June), effectiveness of abamectin products diminishes in late season. Alternate with other available insecticides for summer control of pear psylla as a resistance management strategy. No more than 2 applications of any foliar applied abamectin product per season. 12-hour reentry. 28-day PHI.
Apollo 50SC	clofentezine	4–8 oz	Group 10A miticide. Do not use any combination of Apollo and Savey in the same growing season. 21-day PHI.
Envidor 2SC	spirodiclofen	16–18 oz	Group 23 miticide. 12-hour reentry. 7-day PHI.
FujiMite 5EC	fenpyroximate	2 pt	Group 21A miticide. Do not rotate with Nexter. 12-hour reentry. 14-day PHI.
Kanemite 15SC	acequinocyl	21–31 oz	Group 20B miticide. No aerial applications. No more than 2 applications per year. Targets spider mites. 12-hour reentry. 14-day PHI.
Nealta	cyflumetofen	13.7 oz	Group 25 miticide. Do not make successive applications without rotating action groups. 12-hour reentry. 7-day PHI.
Nexter 75W SB	pyridaben	6.6– 10.67 oz	Group 21A miticide. Do not rotate with Fujimite. 12-hour reentry. 7-day PHI.
Savey 50DF	hexythiazox	4–6 oz	Group 10A miticide. One application per season. Do not use any combination of Apollo and Savey in the same growing season. 12-hour reentry. 28-day PHI.
Vendex 50WP	fenbutatin-oxide	1–2 lb	Group 12B miticide. Restricted use. No more than 2 applications per season. 48-hour reentry. 14-day PHI.
Zeal 72WSP	etoxazole	2–3 oz	Group 10B miticide. No more than 1 application per year. 12-hour reentry. 28-day PHI.

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.

Third Cover Spray (usually about last week of July or first week in August)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Codling moth (see footnote 2, page 16)			
Altacor	chlorantraniliprole	3–4.5 oz	Group 28 insecticide. 4-hour reentry. 5-day PHI.
Diazinon 50W	diazinon	1 lb	Group 1B insecticide. Restricted use. Limited to 1 application in the dormant season and 1 foliar cover spray. Enclosed cab required. See footnote 3, page 16. 4-day reentry. 21-day PHI.
Exirel 0.83SE	cyantraniliprole	10–17 oz	Group 28 insecticide. No more than 3 applications of Group 28 insecticides per year. 12-hour reentry. 3-day PHI.
Imidan 70WP	phosmet	2.125– 5.75 lb	Group 1B insecticide. A water-soluble bag formulation is also available. 7-day reentry. 7-day PHI.
Pear psylla, codling moth, scale, aphids			
Diazinon 50WP	diazinon	1 lb	Group 1B insecticide. Restricted use. Limited to 1 application in the dormant season and 1 foliar cover spray. Enclosed cab required. See footnote 3, page 16. 4-day reentry. IMPORTANT: In some areas, Diazinon no longer gives adequate control of pear psylla. <i>Note:</i> Projected harvest date given 21-day PHI.
Spider mites			
Acramite 50WS	bifenazate	0.75–1 lb	Unclassified mode of action. 12-hour reentry. 7-day PHI.
Agri-mek SC, Epi-mek 0.15 EC	abamectin	0.5–1 oz / 2.5–5 oz (dilute)	Group 6 miticide. Must be used with adjuvant such as horticultural spray oil (not dormant oil) to avoid illegal residues. Use up to second cover (late June), effectiveness of abamectin products diminishes in late season. Alternate with other available insecticides for summer control of pear psylla as a resistance management strategy. No more than 2 applications of any foliar applied abamectin product per season. 12-hour reentry. <i>Note:</i> Projected harvest date given 28-day PHI.
Apollo 50SC	clofentezine	4–8 oz	Group 10A miticide. Do not use any combination of Apollo and Savey in the same growing season. <i>Note:</i> Projected harvest date given 21-day PHI.
FujiMite 5EC	fenpyroximate	2 pt	Group 21A miticide. Do not rotate with Nexter. 12-hour reentry. 14-day PHI.
Nealta	cyflumetofen	13.7 oz	Group 25 miticide. Do not make successive applications without rotating action groups. 12-hour reentry. 7-day PHI.
Savey 50DF	hexythiazox	4–6 oz	Group 10A miticide. One application per season. Do not use any combination of Apollo and Savey in the same growing season. 12-hour reentry. <i>Note:</i> Projected harvest date given 28-day PHI.

Third Cover Spray (usually about last of July or first week in August) 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—Third Cover Spray (usually about last of July or first week in August)

Pest or disease/ Material	Active ingredient (AI)	Amount of product per acre	Comments/Reentry interval/Preharvest interval (PHI)
Spider mites (continued)			
Vendex 50WP	fenbutatin-oxide	1–2 lbs	Group 12B miticide. Restricted use. No more than 2 applications per season. 48-hour reentry. 14-day PHI.
Zeal 72WSP	etoxazole	2–3 oz	Group 10B miticide. No more than 1 application per year. 12-hour reentry. <i>Note:</i> Projected harvest date given 28-day PHI.

Preharvest**Storage rots, such as Bull's eye rot**

Merivon	fluxapyroxad + pyraclostrobin	4–5.5 fl oz	Do not use with EC or oil-based products. Group 7 + 11 fungicide. 12-hour reentry. 0-day PHI.
Ph-D	polyoxin D	6.2 oz	4-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	14.5–18.5 oz	Do not use if used for powdery mildew or scab during the growing season. 12-hour reentry. 0-day PHI.
Ziram 76DF	ziram	6 lb	48-hour reentry. 14-day PHI.

Postharvest (in fall after all fruit is harvested)**Pear leaf blister mite, pear rust mite**

lime sulfur solution +	calcium polysulfide 29%	4 gal/100 gal water	Use this rate postharvest through September. Lime sulfur also helps control psylla and mites. Some products OMRI approved for organic use.
horticultural mineral oil (HMO)	oil	0.75 gal/100 gal water	Some products OMRI approved for organic use.
Sulforix	calcium polysulfide	Follow label directions	Some products OMRI approved for organic use.

Pear leaf blister mite, pear rust mite, scale, aphid and mite eggs, pear psylla

lime sulfur solution (Ca polysulfide 29%) +	calcium polysulfide 29%	3–5 gal/100 gal water	Use this rate postharvest in late fall when temperatures cool (mid-October through November). Some products OMRI approved for organic use.
superior oil	oil	1.5–2 gal/100 gal water	—

Anthracnose*Note:* Apply before fall rains.

Bordeaux 8-8-100	copper sulfate + hydrated lime	—	—
Copper-Count-N	copper ammonium complex	8–12 qt	48-hour reentry.
Cuprofix Ultra 40 Disperss	copper sulfate	7.5–10 lb	48-hour reentry.
Kocide 3000	copper hydroxide	5.25–7 lb	48-hour reentry.
ManKocide	copper hydroxide + mancozeb	12–16 lb	48-hour reentry.
Nu-Cop 50DF	copper hydroxide	12–16 lb	48-hour reentry.
Ziram 76DF	ziram	6 lb	48-hour reentry. 14-day PHI.

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

1. Syllit is not compatible with lime and should not be combined with oils or oil emulsions. Alternate with other products to delay development of resistant fungi.
2. Notice of first emergence of codling moth sometimes is sent out by OSU Extension agents to growers and/or newspapers. Pheromone traps are available to monitor emergence and activity in individual orchards.
3. Diazinon is compatible with Ziram and wettable sulfur.
4. Although Topsin is registered for use for control of scab, powdery mildew, and storage rots, it is not recommended for use in orchards. The use of Topsin in orchards will increase the possibility that tolerant (resistant) strains of fungi will develop and increase losses in orchards and packing houses where Mertect 340F or Decco Salt #19 are used. Topsin also is toxic to earthworms, which help decompose scab-infected leaves.
5. Do not use lime sulfur on Anjou and Comice pears after the dormant application as it interferes with fruit set. It should be recognized that although lime sulfur and other sulfur materials are relatively low in cost, they are not without limitations. The use of sulfurs may result in phytotoxicity when temperatures exceed 90°F following application.
6. Pseudomonas injury may resemble fire blight. Although fire blight generally is not a problem in the Willamette Valley, it has been observed in some years. Do not use copper-based products on Anjou, Comice, or Forelle pears past delayed dormant stage. The use of copper-based products at this time has also been associated with a lower population of apple scab isolates resistant to fungicides in Pennsylvania. It may have utility for the same use on pears in Oregon.
7. Integrated pest management principles are being used successfully in Pacific Northwest orchards to manage insects, mites, diseases, and other pests. These research-based techniques provide effective monitoring methods and management practices for sustained and economical control of pests while minimizing damage to beneficial organisms. Improved health and minimal environmental impact are benefits often cited in IPM-managed orchards using reduced pesticide programs.

The comprehensive reference, *Orchard Pest Management: A Resource Book for the Pacific Northwest*, 1993, edited by Beers, Brunner, Willet, and Warner, was produced by research and Extension personnel from the tri-state region. It serves as OSU's guide to effective IPM principles for managing insect and mite pests in the state. We recommend its use in conjunction with the numerous regional OSU Extension Service Orchard Pest Management Guides produced and/or distributed in the different tree fruit districts of the state. It addresses key elements of IPM for controlling pests, including prevention, monitoring, indicating "action levels" or pest densities at which time to apply controls, and effective alternative strategies based on current knowledge. Although designed for the commercial orchard, many principles and control considerations apply to non-commercial trees.

8. Sovran drift may injure sweet cherry cultivars such as 'Van'. Please be extra careful when spraying near cherry orchards.
9. Do not exceed two applications per season of Group 11 fungicides such as Sovran, Flint, Pristine, etc.

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. Spotts model for estimating pear scab infection periods

Average temperature (°F) during leaf wetness	Minimum hours of leaf wetness required for infection
45	25
46	22
48	19
50	17
52	15
54	13
55	12
57	12
59	11
61	11
63	10
64	10
66	10
68	10
70	10
72	10
73	10
75	10

In the fall, examine all leaves on 10 shoots on each of 10 trees scattered throughout the orchard. If you find fewer than six leaves with scab, the overall risk from scab is low enough to skip the first fungicide spray at pink stage.

The end of the ascospore infection period occurs after the first rain following the accumulation of 1,620 degree days (32°F base) starting at delayed dormant stage.

Table 2. Effectiveness of fungicides and bactericides for pear disease management

Fungicide or bactericide	Fungicide group #	Pear scab	Powdery mildew	Bull's eye rot	Storage rots	Fire blight
Actigard	21	None	None	None	None	Suppression
Aprovia	7	Good**	Good**	None	None	None
Blight Ban	Not classified	??	??	??	??	Poor–Fair
Bloomtime Biological	Not classified	None	None	None	None	Poor–Good
Copper-based products	M1	??	Fair??	Poor	??	Fair
Flint	11	Good–Excellent**	Excellent**	Fair	??	None
Focus	3	Good**	Excellent**	??	??	None
Fontelis	7	Good**	Good**	??	??	None
Horticultural mineral oils	Not classified	??	Good	??	??	None
Kasumin	24	None	None	None	None	Good**
Lime sulfur	M2	Good	Fair	??	??	None
Mancozeb products	M3	Good	None	Poor	??	None
Oso	17	??	Good	??	??	None
Oxytetracycline	41	None	None	None	None	Fair–Good**
Ph-D	17	??	Good	??	??	None
Procure and generics	3	Good**	Excellent**	??	??	None
Scala	9	Fair–Good	None	??	??	None
Serenade Opti	44	??	Fair	??	??	Fair–Good
Sovran	11	Good**	Excellent**	??	??	None
Streptomycin	25	None	None	None	None	Poor–Excellent**
Sulfur	M2	Fair	Good	??	??	None
Syllit	U12	Good**	None	??	??	None
Topguard	3	Good**	Good–Excellent	??	??	None
Topsin ¹	1	Fair–Good**	Good**	Excellent	Good	None
Torino	U6	??	Good–Excellent	??	??	None
Ziram	M3	Fair	None	Fair	Fair–Good	None
Combination products						
Inspire Super	3 + 9	Good	Good	??	??	None
Luna Sensation	7 + 11	Good to Excellent**	Excellent**	??	Possible	None
ManKocide	M3 + M1	Excellent	None	Poor	??	Fair
Merivon	7 + 11	Excellent**	Excellent**	??	Fair–Good	None
Pristine	7 + 11	Good–Excellent**	Excellent**	Good	Fair–Good	None
Unicorn	3 + M2	Good	Good	??	??	None

¹ See footnote 4, page 16.

*These ratings are relative rankings based on full 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. Possible ratings for disease control include none, poor, fair, good, or excellent.

**Resistant pathogens will lower the effectiveness of this fungicide.

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.

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 3. Quick reference guide to herbicides labeled for use in pears

Active ingredient [WSSA number ¹] (trade name)	Rate pounds ai/a (product)	Max seasonal per acre per year (product)	Reapply (Month)	Minimal Age (Month)	Replant (Month)	PHI (day)
Soil-active herbicides (pre-emergence)						
dichlobenil [20] (Casoron CS)	1.96–3.92 lb ai (1.4–2.8 gal)	3.92 lb ai 2.8 Gal	12	12	12	30
diuron [7] ² (Diuron 4L)	1.6–3.2 lb ai (1.6–3.2 quarts)	3.2 lb ai (3.2 quarts)	3	12	24	
indaziflam [29] (Alion)	0.04–0.08 lb ai (3.5–6.5 fl oz)	0.09–0.13 lb ai (7.0–10.3 fl oz)	3	12	12	14
isoxaben [21] (Trellis SC)	0.5–1 lb ai (16–31 fl oz)	1.0 lb ai (31 fl oz)		0	0	365
norflurazon [12] (Solicam DF)	1.95–3.93 lb ai (2.5–5 lb)	3.93 lb ai (5 lb)	0	18	18	60
oryzalin [3] (Surflan)	2–6 lb ai (2–6 qt)	12 lb ai (12 qt)	2.5	0	0	N/A
pendimethalin [3] (Prowl H ₂ O)	1.9–4 lb ai (2–4.2 qt)	4 lb ai (4.2 qt)	1	0	12	60
pronamide [3] (Kerb SC)	1–4 lb ai (2.5 – 9.5 pt)	4 lb ai (9.5 pt)	12	12	0	N/A
simazine [5] (Princep 4L)	2–4 lb ai (2 to 4 qt)	4 lb ai (4 qt)	12	12	12	14
trifluralin [3] (Treflan 4L)	0.5–1 lb ai (1–2 pints)	1 lb ai (2 pints)	N/A	0	0	60
trifluralin + isoxaben [3+21] (Snapshot 2.5 TG)	2.5 to 5 lb ai (100–200 lb)	15 lb ai (600 lb)	2	0	0	365
Pre- and post-emergence herbicides						
Flazasulfuron [2] (Mission)	0.03–0.04 lb ai (2.14–2.85 oz)	0.09 lb ai (5.7 oz)	3	36	12	130
flumioxazin [14] (Chateau SW)	0.18–0.38 lb ai (6–12 oz)	0.76 lb ai (24 oz)	1	12	18	60
halosulfuron [2] (Sanda)	0.03–0.06 lb ai (0.6–1.3 oz)	0.13 lb ai (2.6 oz)	1.5	12	9	1
oxyfluorfen [14] (Goal 2XL)	1.25–2 lb ai (1–4 pt)	2 lb ai (4 pt)		0	30	60
oxyfluorfen + penoxsulam [14 + 2] (Pindar GT)	1.47 + 0.03 lb ai (1.5–3 pints)	2.2 + 0.04 lb ai (4.5 pt)		48	30	60
rimsulfuron [2] (Matrix)	0.03 to 0.06 lb ai (2–4 oz)	0.06 lb ai (4 oz)	1	12	12	21
mesotrione [27] (Broadworks)	0.09–0.18 lb ai (3–6 fl oz)	0.36 lb ai (12 fl oz)	5	12	18	30
Post-emergence herbicides ²						
2,4-D [4] (Saber)	0.95–1.4 lb ai (2–3 pt)	1.9 lb ai (4 pt)	2.5	12	1	60
carfentrazone [14] (Aim EC)	0.01–0.03 lb ai (1 -2 fl oz)	0.079 lb ai (7.9 fl oz)	0.5	0	0	3

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.

Table 3. Quick reference guide to herbicides labeled for use in pears (cont'd)

Active ingredient [WSSA number ¹] (trade name)	Rate pounds ai/a (product)	Max seasonal per acre per year (product)	Reapply (Month)	Minimal Age (Month)	Replant (Month)	PHI (day)
Post-emergence herbicides ² (continued)						
clethodim [1] (Select max)	0.07–0.12 lb ai (9–16 fl oz)	0.64 lb ai (64 fl oz)	0.5	0	0	14
diquat [22] (Reglone)	0.37–0.56 lb ai (1.5–2 pt)	0.56 lb ai (2 pt)	0.5	12	0	365
fluazifop [1] (Fusilade DX)	0.25–0.375 lb ai (16–24 fl oz)	1.125 (72 fl oz)	0.5	0	0	365
glufosinate [10] (Rely 280)	0.88–1.5 lb ai (48 to 82 fl oz)	4.5 lb ai (246 fl oz)	0.5	0	6	14
glyphosate [9] (Roundup Powermax)	0.38–3.69 lb ae (11–105 fl oz)	7.87 lb ae (224 fl oz)	0.5	0	0	3
paraquat [22] (Gramoxone SL)	0.625–1 lb ai (2.5–5 pt)	4 lb ai (20 pt)	0.5	0	0	1
pelargonic acid (Scythe)	3–10 % v/v	N/A	N/A	N/A	N/A	1
pyraflufen [14] (Venue)	0.002–0.005 lb ai (2–4 fl oz)	0.0085 lb ai (6.8 fl oz)	1	12	0	0
Saflufenacil [14] (Treevix)	0.04 lb ai (1 oz)	0.13 lb ai (3 oz)	0.7	1	1	7
Saflufenacil [14] (Treevix)	0.19–0.47 lb ai (1.5–2.5 pt)	1.88 lb ai (10 pt)	0.5	0	0	30
sethoxydim [1] (Poast)	0.19–0.47 lb ai (1.5–2.5 pt)	1.88 lb ai (10 pt)	0.5	0	0	30
Green sucker control						
2,4-D [4] (Saber)	0.71–0.95 lb ai (1.5–2 pt)	1.9 lb ai (4 pt)	1	12	1	45
carfentrazone [14] (AIM EC)	0.03 lb ai (2 fl oz)	0.079 lb ai (7.9 fl oz)	0.5	0	0	3
glufosinate [10] (Rely 280)	1.0 lb ai (56 fl oz)	4.5 lb ai (246 fl oz)	0.5	0	6	14
paraquat [22] (Gramoxone SL)	0.625–1 lb ai (2.5–5 pt)	4 lb ai (20 pt)	0.5	0	0	1
pelargonic acid (Scythe)	5–7 % v/v	N/A	N/A	N/A	N/A	1
pyraflufen [14] (Venue)	0.002–0.005 lb ai (2–4 fl oz)	0.0085 lb ai (6.8 fl oz)	1	12	0	0

¹ WSSA number—Weed Science Society of America herbicide site of action group number. Trade names listed are not a recommendation but are listed to facilitate interpretation of the table. Always consult and follow the label recommendations.

² The use of trunk guards is recommended until the bark is well developed (2 to 3 years).

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 onernet 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/>)
- Codling moth development information (<http://ippc2.orst.edu/cgi-bin/ddmodel.pl?clm>)
- Pear scab infection season information (<http://ippc2.orst.edu/cgi-bin/ddmodel.pl?spp=asp>)
- Pear scab infection period information for the Hood River Valley (<http://ippc2.orst.edu/hr/>)
- Fire blight risk information (<http://ippc2.orst.edu/cgi-bin/ddmodel.pl?fbl>)
Directions for the use of each model are available at each site.
- 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.

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.

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 (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 nontarget 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.

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