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PEST MANAGEMENT GUIDE FOR PEACHES

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This guide lists recommendations for insect, mite and disease control in peach orchards. The chemicals, formulations and application rates listed here are based on label directions, research and orchard experience.

Pest management depends on producers and their knowledge of the orchard and its characteristics. Producers must weigh several factors: cultivar, tree size, tree density, canopy characteristics, pest complex and pest history. Consider all these factors when choosing which chemicals to apply and at what rates. Other variables include the amount of water used per acre, and the method of application.

Trade name products are mentioned as examples only. Occasionally, manufacturers register different formulations of a product that contain a different concentration of active ingredient. This does not mean that OSU Extension either endorses these products or intends to discriminate against products not mentioned. Consult product labels to 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.

Producers ask two common questions about the chemical control of insects and diseases:

- “How much chemical do I use per acre?”
- “What is the least amount of water I need per acre to apply in my concentrate sprayer?”

The schedule below suggests an amount of formulated product to use per acre, and not the amount of active ingredient. This amount is based on a “typical” orchard of middle age and average tree density, with moderate pest pressure. Less product may be needed in 1- to 4-year-old orchards. Conversely, more chemical (within label limits) may be required for large, mature trees experiencing heavy pressure from multiple pests.

Many insecticide labels today list the minimum amount of water needed per acre in concentrate sprays



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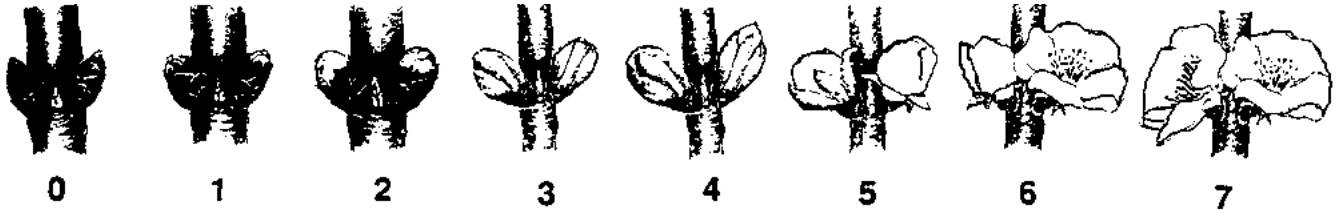
Peaches at harvest time.

of insecticides. Labels also tell users how to calculate the amount of chemical needed per acre in a concentrate sprayer. **CHECK THE LABEL BEFORE SPRAYING!** Some label directions indicate dilute applications only. Also:

- Make sure any tank-mixes of pesticides are compatible. For example, the elevated pH of some boron spray solutions weakens many insecticides. Water hardness above 250-350 ppm can also negatively affect pesticide efficacy, particularly for certain herbicides.
- Use adjuvants and spreader stickers with caution.
- In this guide, mode of action (MoA) for insecticides is based on the Insecticide Resistance Action Committee (IRAC) classification (irac-online.org). Fungicide mode of action is based on the Fungicide Resistance Action Committee (FRAC) classification (www.frac.info). Herbicide site of action is based on the Herbicide Resistance Action Committee (HRAC) classification (hracglobal.com).

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- Premix products may have reduced rates of active ingredients, and may contribute to development of resistance.
- Be aware of regulations governing the application of pesticides outlined in the EPA Worker Protection Standard, particularly the Application Exclusion Zone, which is enforced by Oregon Occupational Safety and Health. All pesticide labels provide orchard re-entry intervals and personal protection equipment information.
- Apply pesticides judiciously and promote good relationships with neighbors.



Stages

Dormant and delayed dormant (Stages 0, 1, and 2)
 Prebloom (Stage 3)
 Popcorn (Stages 4–5)
 Full bloom (Stage 7)

Not shown

Petal fall, shuck split to shuck fall, summer, preharvest, postharvest

Peach 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.

STAGES 0–2: Dormant and delayed dormant *Just before buds open and before eggs hatch*

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval
Cytospora canker	None		Remove and destroy dead cankered limbs.
Peach leaf curl and shothole Note: Apply first leaf curl spray when 50% of the leaves have fallen and again at delayed dormant in late February before floral buds begin to open. An additional spray may be needed during the dormant season for shothole control depending on material selected. The addition of a spreader sticker will increase the effectiveness of some leaf curl sprays. Even curl-resistant cultivars need protection during the first few years. East of the Cascades, in southern Oregon, and in low-rainfall areas, a delayed dormant application alone should be effective.			
Bordeaux 12-12-100	copper sulfate + hydrated lime	—	—
Bravo Weather Stik	chlorothalonil	3–4 pt	Group M5 fungicide. Effective if used all dormant season long. Do not add a spreader sticker. 12-hour reentry.
Rex Lime Sulfur Solution	calcium polysulfide	6-12 gal/100 gal water	A very effective product for leaf curl only. 48-hour reentry.
Cuprofix or other copper-based products	copper sulfate	5–10 lb	Effective only on shothole if used during the dormant season. Group M1 fungicide. 48-hour reentry. Many other copper-based products are labeled, such as C-O-C-S, Copper-Count-N, and Nordox.
Echo 720	chlorothalonil	3–4 pt	Group M5 fungicide. Effective if used all dormant season long. Do not add a spreader sticker. 12-hour reentry.
Ferbam Granuflo	ferbam	4.5 lb	Group M3 fungicide. 24-hour reentry.
Nu-Cop 50DF or other copper-based products	cupric hydroxide	8–16 lb	Group M1 fungicide. Effective only on shothole if used during the dormant season. 48-hour reentry. Many other copper products are labeled, such as Champion, CuPro and Kocide.

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Trade-name products and services are mentioned as illustrations only. This does not mean that the Oregon State University Extension Service either endorses these products and services or intends to discriminate against products and services not mentioned.

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STAGES 0–2: Dormant and delayed dormant *Just before buds open and before eggs hatch*

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Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval
Syllit FL	dodine	3 pt	Group U12 fungicide. 48-hour reentry.
Lime Sulfur Ultra	calcium polysulfide	2-3 gal/100 gal water	A very effective product for leaf curl only. 48-hour reentry.
Ziram 76DF	ziram	6–8 lb	Group M3 fungicide. A very effective product for both leaf curl and shothole. 48-hour reentry.
Scale, mite, and aphid eggs, peach twig borer			
Dormant horticultural oil (superior) or horticultural mineral oil (HMO) + one of the following:		4–6 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.
Altacor 35 WDG	chlorantraniliprole	3–4.5 oz	Group 28 insecticide. Use high rate for dormant and lower for delayed dormant. 4-hour reentry. 10-day PHI.
Assail 30 SG	acetemiprid	2.5–5.3	Group 4A insecticide. Targets aphids and peach twig borer at this timing. 12-hour reentry. 7-day PHI.
Entrust SC	spinosad	4–8 oz	Group 5 insecticide. OMRI listed for organic use. No more than 4 applications or 29 oz per year. Targets peach twig borer at this timing. 4-hour reentry. 7-day PHI.
Centaur WDG	buprofezin	34.5 oz	Group 16 insecticide. San Jose scale in black cap stage. 12-hour reentry. 14-day PHI.
Esteem 35WP	pyriproxyfen	4–8 oz	Group 7C insecticide. Improves efficacy of oil treatments for scale. Limited to 3 applications per season. 12-hour reentry. 14-day PHI.
Exirel 0.83SE	cyantraniliprole	10–20.5 oz	Group 28 insecticide. No more than 0.4 lb ai/A per season. Use high rate for dormant and lower for delayed dormant. 12-hour reentry. 3-day PHI.
Success 2L	spinosad	4–8 gal	Group 5 insecticide. Targets peach twig borer, low efficacy for piercing/sucking insects. Entrust is the OMRI formulation approved for organic use. Apply when overwintering larvae become active. 4-hour reentry. 7-day PHI.

STAGE 3: Prebloom (prepink) *Brown buds turn white just before opening*

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval
Shothole borer Note: This pest has two to three generations in the Willamette Valley; the first flight can precede bloom. Make first application in late February or March when overwintering adults first emerge. Spot treat infestations within orchard. Apply to infested trunk and limbs until runoff. Once beetles are in trees they cannot be controlled with insecticides.			
Azera	azadirachtin + pyrethrins	1-2 pt	Group 3A insecticide. OMRI listed for organic agriculture. Avoid contact with blooming crops, weeds or cover crops. 12-hour reentry. 0-day PHI.
PyGanic EC	pyrethrins	1 pt- 2qt	Group 3A insecticide. OMRI listed for organic agriculture. Adjust pH of spray mixture to 5.5-7.0. Avoid contact with blooming crops, weeds or cover crops. 12-hour reentry. 0-day PHI.

STAGES 4–5: Popcorn *Just before petals begin to open*

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval
Peach twig borer, leafrollers, aphids, eyespotted bud moth Note: This is the most satisfactory time to apply green peach aphid-twig borer combination sprays. Avoid pyrethroids (group 3) at this timing as they may flare spider mites. Monitor peach twig borer with pheromone traps.			
Peach twig borer, leafrollers, bud moth			
Altacor	chlorantraniliprole	3–4.5 oz	Group 28 insecticide. Apply at maximum moth flight. 4-hour reentry. 10-day PHI.
<i>Bacillus thuringiensis</i> <i>kurstaki</i> (Btk)	bacterium	See label.	Group 11B2 insecticide. Generic. OMRI listed for organic use. Apply when temperatures exceed 60°F. Complete coverage and 2 to 3 sprays usually are required for satisfactory control. Follow the label rates for individual products. 0-day PHI.

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Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval
Delegate WG	spinetoram	4.5–7 oz	Group 5 insecticide. Apply no less than 1 week apart, maximum 4 times per season. 4-hour reentry. 7-day PHI.
Entrust SC	spinosad	4–8 oz	Group 5 insecticide. OMRI listed for organic use. No more than 4 applications or 29 oz per year. Targets peach twig borer at this timing. 4-hour reentry. 7-day PHI.
Exirel 0.83SE	cyantraniliprole	10–20.5 oz	Group 28 insecticide. Apply at maximum moth flight. No more than 0.4 lb ai/A per season. 12-hour reentry. 3-day PHI.
Intrepid 2F	methoxyfenozide	8–16 oz	Group 18 insecticide. For peach twig borer, apply at start of egg hatch. Reapply after 14 days. No more than 64 oz per season. 4-hour reentry. 7-day PHI.
Nexter	pyridaben	10.67 oz	Group 21A miticide. Activity against aphids. Do not exceed 2 applications per year. Applications must be 30 days apart. Aerial application not allowed. 7-day PHI.
Thrips (see footnote 4, page 12)			
Brown rot blossom blight (see footnote 3, 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 pt	Avoid use when honey bees are active due to larval toxicity. Group M5 fungicide. Do not apply after shuck split. 12-hour reentry.
Captan 80WDG	captan	2.5–5 lb	Avoid use when honey bees are active due to larval toxicity. Group M4 fungicide. 24-hour reentry. 0-day PHI.
Cevya	mefentrifluconazole	3-5 fl oz	Group 3 fungicide. 12-hr reentry. 0-day PHI.
Elevate 50WDG	fenhexamid	1–1.5 lb	Group 17 fungicide. 12-hour reentry. 0-day PHI.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Add a surfactant. 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 Sensation	fluopyram + trifloxystrobin	5-7.6 fl oz	See footnote 5, page 12. 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 Dispers or others	sulfur (80%)	10-20 lb	Group M2 fungicides. Do not use within 2 weeks of an oil spray. 24-hr reentry.
Miravis	pydiflumetofen	5.1 fl oz	Group 7 fungicide. 12-hr reentry. 0-day PHI
Miravis Duo	Pydiflumetofen + difenconazole	13.6 fl oz	Group 3 + 7 fungicide. 12-hr reentry. 0-day PHI
Orius 20 AQ	tebuconazole	8.6–17.2 oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quadris	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. See footnote 5, page 12. 4-hour reentry. 0-day PHI.
Quash	metconazole	2.5–4 oz	Group 3 fungicide. 12-hour reentry. 14-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Rhyme	flutriafol	7 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Rovral or generics	iprodione	1.5–2 pt	Do not mix with insecticides due to honey bee adult and/or larval toxicity. Group 2 fungicide. See footnote 3, page 12. Do not apply after petal fall. 24-hour reentry.
Scala SC	pyrimethanil	9–18 fl oz	Group 9 fungicide. Do not apply more than 3 applications alone. 2-day PHI.
Tesaris	fluxapyroxad	3.5-5.6 fl oz	Group 7 fungicide. Do not use with EC or oil-based products. 12-hour reentry. 0-day PHI.
Thiram Granuflo	thiram	3.5 lb	Group M3 fungicide. 24-hour reentry. 7-day PHI.
Tilt or generics	propiconazole	4 fl oz	Do not mix with insecticides due to bee toxicity. Group 3 fungicide. 12-hour reentry. 0-day PHI.

STAGES 4–5: Popcorn *Just before petals begin to open*

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval
TopGuard SC	flutriafol	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 5, page 12. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Topsin 4.5FL	thiophanate-methyl	20–30 oz	Group 1 fungicide. Tank-mix with another fungicide. 2-day reentry. 1-day PHI.

STAGE 7: Full bloom

Brown rot blossom blight (see materials listed for Popcorn stage)

PETAL FALL *75% petal fall*

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval
Peach twig borer, leafrollers, oriental fruit moth, aphids			
Note: Make Petal Fall spray if Popcorn spray missed or if orchard was heavily infested the previous season.			
Assail 30SG	acetamiprid	2.5–8.0 oz	Group 4A insecticide. Use with horticultural oil is recommended. Do not use until after petal fall. 12-hour reentry. 7-day PHI.
Diazinon 50W	diazinon	1 lb/100 gal water	Group 1B insecticide. Restricted use. One dormant and one in-season application only. 4-day reentry. 21-day PHI.
Delegate WG	spinetoram	4.5–7 oz	Group 5 insecticide. Maximum of 4 applications per season. 4-hour reentry. 1-day PHI.
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.
Peach twig borer, leafrollers, bud moth			
Altacor 35	chlorantraniliprole	3–4.5 oz	Group 28 insecticide. Use high rate for dormant and lower for delayed dormant. 4-hour reentry.
<i>Bacillus thuringiensis</i> <i>kurstaki</i> (Btk)	bacterium	See label.	Group 11B2 insecticide. Generic. OMRI listed for organic use. Apply when temperatures exceed 60°F. Bt products are stomach poisons. Apply with sticker. Complete coverage and 2 to 3 sprays usually are required for satisfactory control. 4-hour reentry. 0-day PHI.
Delegate WG	spinetoram	4.5–7 oz	Group 5 insecticide. Maximum of 4 applications per season. 4-hour reentry. 1-day PHI.
Entrust SC	spinosad	4–8 oz	Group 5 insecticide. OMRI listed for organic use. No more than 4 applications or 29 oz per year. Targets peach twig borer at this timing. 4-hour reentry. 7-day PHI.
Exirel 0.83SE	cyantraniliprole	10–20.5 oz	Group 28 insecticide. Apply at maximum moth flight. No more than 0.4 lb ai/A per season. 12-hour reentry. 3-day PHI.
Success 2L	spinosad	4–8 oz	Group 5 insecticide. Entrust is the OMRI formulation approved for organic use. 4-hour reentry. 1-day PHI.

Stink bugs, including brown marmorated stink bug

Note: BMSB is an increasing problem in Oregon, and peaches are a preferred host for this pest. Early season feeding on fruit causes catfacing and other defects. Gummosis is a common symptom of fruit feeding. Populations tend to increase in the late season as harvest approaches, but BMSB also feed on vegetative growth early in the season and may build up in the orchard. Eggs and nymphs are found from May to September. Damage can be more intensive along orchard borders and border sprays have proven effective. Group 3 and Group 1 materials are most effective against stink bugs, but loss of biological control and secondary pest problems may result. See: *Brown Marmorated Stink Bug*, EM 9054, <https://catalog.extension.oregonstate.edu>, and the PNW Insect Management Handbook, <https://pnwhandbooks.org/insect>.

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Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval
Admire Pro	imidacloprid	1.2–2.4 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.
Ambush 25W	permethrin	12.8–25.6 oz	Group 3A insecticide. Restricted use. Do not graze treated orchards. Extremely toxic to fish and aquatic habitat. Do not apply more than 1.6 lb ai/A per season. 24-hour reentry. 14-day PHI.
Baythroid XL	beta-cyfluthrin	2–2.4 oz	Group 3 insecticide. Restricted use. 12-hour reentry. 14-day PHI.
Belay	clothianidin	6 oz	Group 4A insecticide. No more than 0.2 lb AI per year. 12-hour reentry. 21-day PHI.
Danitol	fenpropathrin	10.6–21.3 oz	Group 3 insecticide. Restricted use. No more than 2 applications recommended, no more than 0.8 lb AI allowed per season. 24-hour reentry. 3-day PHI.
Declare	gamma-cyhalothrin	1.02–2.05 oz	Group 3A insecticide. Restricted use. No more than 0.08 lb AI per year. 24-hour reentry. 14-day PHI.
Endigo ZC	lambda-cyhalothrin + thiamethoxam	5–6 oz	Group 3A + group 4A insecticide. Restricted use. Premix product, see label as both AIs have cumulative limits/season. 24-hour reentry. 14-day PHI.
Leverage 360	beta-cyfluthrin + imidacloprid	2.8 oz	Group 3A + 4A insecticide. Restricted use. Premix product, see label as both AIs have cumulative limits/season. 12-hour reentry. 14-day PHI.
Mustang Max	zeta-cypermethrin	3.2–4 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.
Proaxis	gamma-cyhalothrin	2.56–5.12 oz	Group 3A insecticide. Restricted use. No more than 0.08 lb AI per year. 24-hour reentry. 14-day PHI.
Surround WP	kaolin clay	25-50 lb	Group UNM insecticide. Particle film deters stink bugs. OMRI approved for organic use. 4-hour reentry. 0-day PHI.
Tombstone	cyfluthrin	2–2.4 oz	Group 3A insecticide. Restricted use. Maximum of 2.8 oz per season. 12-hour reentry. 14-day PHI.
Transform WG	sulfoxaflor	2.0-2.25 oz	Group 4C insecticide. Effective against stink bugs, aphids, and gives suppression of thrips and San Jose scale. Use higher rate for heavy infestations. 12-hour-reentry. 7-day PHI.

Green peach aphid (Note: Do not use group 4 insecticides prior to petal fall to protect pollinators.)

Actara	thiamethoxam	3–4 oz	Group 4A insecticide. No more than 11 oz/ac per season. See label; higher rates can provide some stink bug control. 12-hour reentry. 14-day PHI.
Assail 70WP	acetamiprid	1–2.3 oz	Group 4A insecticide. No more than 4 applications per season and do not apply more frequently than every 10 days. Activity against stink bugs. 12-hour reentry. 7-day PHI.
Admire Pro	imidacloprid	1.4–2.8 oz	Group 4A insecticide. No more than 8.4 oz per year. 7-day minimum interval between treatments. Activity against stink bugs. 12-hour reentry. 0-day PHI.
Beleaf	flonicamid	2.0-2.8 oz	Group 29 insecticide. Begin application with increasing population using high rate when populations already high. No more than 8.4 oz per year. 12-hour-reentry. 14-day PHI.
Transform WG	sulfoxaflor	0.75-1.5 oz	Group 4C insecticide. Aphid control, suppression of thrips and San Jose scale. Use higher rate for heavy infestations. Activity against stink bugs. 12-hour-reentry. 7-day PHI.
Ultor	spirotetramat	8-14 oz	Group 23 insecticide. See supplemental label. Aphid and scale control, Suppression of spider mite, select scale. 24-hour reentry. 7-day PHI.

Thrips (see footnote 4, page 12)

Brown rot blossom blight (for high rainfall areas)
See materials listed for Popcorn Stage.

SHUCK SPLIT TO SHUCK FALL

Continued from page 6

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval
Shothole			
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 pt	Group M5 fungicide. Do not apply past shuck split. 12-hour reentry.
Captan 80WDG	captan	5 lb	Group M4 fungicide. 24-hour reentry.
Cevya	mefentrifluconazole	3–5 fl oz	Group 3 fungicide. 12-hr reentry. 0-day PHI.
Echo 720	chlorothalonil	3–4 pt	Group M5 fungicide. Do not apply past shuck split. 12-hour reentry.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Flint Extra	trifloxystrobin	3–3.8 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.
Miravis	pydiflumetofen	3.4-5.1 fl oz	Group 7 fungicide. 4-hr reentry. 0-day PHI
Miravis Duo	Pydiflumetofen + difenconazole	13.6 fl oz	Group 3 + 7 fungicide. 12-hr 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	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. 4-hour reentry. 0-day PHI.
QuadrisTop	azoxystrobin + difenoconazole	12–14 fl oz	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.
Rhyme	azoxystrobin	7 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Syllit FL	dodine	3 pt	Group U12 fungicide. Do not apply after petal fall. 48-hour reentry.
Tesaris	fluxapyroxad	3.5-5.6 fl oz	Group 7 fungicide. Do not use with EC or oil-based products. 12-hour reentry. 0-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 5, page 12. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Ziram 76DF	ziram	6 lb	Group M3 fungicide. 48-hour reentry. 30-day PHI.
Powdery mildew			
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.
Cevya	mefentrifluconazole	5 fl oz	Group 3 fungicide. 12-hr reentry. 0-day PHI.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Flint Extra	trifloxystrobin	2.5–3.8 oz	Group 11 fungicide. 12-hour reentry. 1-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Inspire Super	difenoconazole + cyprodinil	16–20 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 2-day PHI.
Sulfur DF	sulfur	10–30 lb	Micronated sulfur, several brands. Group M2 fungicide. 24-hour reentry.
Luna Sensation	fluopyram + trifloxystrobin	5–7.6 fl oz	Group 7+11 fungicide. See footnote 5, page 12. 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.
Miravis	pydiflumetofen	3.4-5.1 fl oz	Group 7 fungicide. 4-hr reentry. 0-day PHI
Miravis Duo	pydiflumetofen + difenconazole	13.6 fl oz	Group 3 + 7 fungicide. 12-hr reentry. 0-day PHI
Oso SC	polyoxin D zinc salt	6.5–13 fl oz	Group 19 fungicide. 4-hour reentry. 0-day PHI.
Ph-D WDG	polyoxin D zinc salt	6.2 oz	Group 19 fungicide. 4-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. Do not use with an HMO. See footnote 5, page 12. 12-hour reentry. 0-day PHI.

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SHUCK SPLIT TO SHUCK FALL

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval
Quadris	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. 4-hour reentry. 0-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quash	metconazole	3.5–4 oz	Group 3 fungicide. 12-hour reentry. 14-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quintec	quinoxifen	7 fl oz	Group 13 fungicide. 12-hour reentry. See footnote 7, page 12. 7-day PHI.
Rally 40WSP	myclobutanil	2.5–6 oz	Group 3 fungicide. 24-hour reentry. 0-day PHI.
Rhyme	azoxystrobin	7 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Sulfur DF	sulfur	10–30 lb	Micronated sulfur, several brands. Group M2 fungicide. 24-hour reentry.
Tesaris	fluxapyroxad	3.5-5.6 fl oz	Group 7 fungicide. Do not use with EC or oil-based products. 12-hour reentry. 0-day PHI.
Tilt and generics	propiconazole	4 fl oz	Group 3 fungicide. 12- to 24-hour reentry.
TopGuard SC	azoxystrobin	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 5, page 12. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Vivando	metrafenone	15.4 fl oz	Group U8 fungicide. Do not use with horticultural oils. 12-hour reentry. 7-day PHI.

SUMMER

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval (PHI)
Powdery mildew (if found before pit hardening; see footnote 6, 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.
Cevya	mefentrifluconazole	5 fl oz	Group 3 fungicide. 12-hr reentry. 0-day PHI.
Flint Extra	trifloxystrobin	2.5–3.8 oz	Group 11 fungicide. 12-hour reentry. 1-day PHI.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Inspire Super	difenoconazole + cyprodinil	16–20 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 2-day PHI.
JMS Stylet oil	horticultural mineral oil	1–2 gal/100 gal water	Need good coverage when trees are dry. 4-hour reentry. OMRI listed for organic use.
Luna Sensation	fluopyram + trifloxystrobin	5-7.6 fl oz	Group 7+11 fungicide. See footnote 5, page 12. 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.
Miravis	pydiflumetofen	5.1 fl oz	Group 7 fungicide. 4-hr reentry. 0-day PHI
Miravis Duo	pydiflumetofen + difenconazole	13.6 fl oz	Group 3 + 7 fungicide. 12-hr reentry. 0-day PHI
Oso SC	polyoxin D	6.5–13 fl oz	Group 19 fungicide. 4-hour reentry. 0-day PHI.
Ph-D WDG	polyoxin D	6.2 oz	Group 19 fungicide. 4-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. Do not use with an HMO. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quadris	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. 4-hour reentry. 0-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quash	metconazole	3.5–4 oz	12-hour reentry. 14-day PHI.

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Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval (PHI)
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quintec	quinoxifen	7 fl oz	Group 13 fungicide. 12-hour reentry. See footnote 7, page 12. 7-day PHI.
Rally 40WSP	myclobutanil	2.5–6 oz	Group 3 fungicide. 24-hour reentry. 0-day PHI.
Rhyme	azoxystrobin	7 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Sulfur DF	sulfur	10–30 lb	Micronated sulfur, several brands. Group M2 fungicide. 24-hour reentry.
Tesaris	fluxapyroxad	3.5-5.6 fl oz	Group 7 fungicide. Do not use with EC or oil-based products. 12-hour reentry. 0-day PHI.
Tilt and generics	propiconazole	4 oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
TopGuard SC	flutriafol	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 5, page 12. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.
Vivando	metrafenone	15.4 fl oz	Group U8 fungicide. Do not use with horticultural oils. 12-hour reentry. 7-day PHI.
Cucumber beetle			
Sevin XLR Plus	Carbaryl	2–3 qt	Group 1A insecticide. No more than 15 qt per season. May flare secondary pests. 12-hour reentry. 14-day PHI.
Shothole borer Note: Emergence in March to September, with three generations per year.			
Azera	azadirachtin + pyrethrins	1-2 pt	Group 3A insecticide. OMRI listed for organic agriculture. Avoid contact with blooming crops, weeds or cover crops. 12-hour reentry. 0-day PHI.
PyGanic EC	pyrethrins	1 pt-2qt	Group 3A insecticide. OMRI listed for organic agriculture. Adjust pH of spray mixture to 5.5-7.0. Avoid contact with blooming crops, weeds or cover crops. 12-hour reentry. 0-day PHI.
Spider mites			
M-Pede	potassium salts of fatty acids	1–2% solution	Unclassified action group. OMRI listed for organic use. Not recommended on yellow-skin nectarines. 12-hour reentry. 0-day PHI.
Spider mites, peach silver mite			
Acramite 50WS	bifenazate	0.75–1 lb	Unclassified action group. 12-hour reentry. 3-day PHI.
Apollo 50SC	clofentezine	2–8 fl oz	Make only one application. Active against mite eggs only, can be combined with an adulticide. Do not make aerial applications. 12-hour reentry. 21-day PHI.
Envidor	spirodiclofen	16–18 oz	Group 23 miticide. Make only one application. Do not make aerial applications. 12-hour reentry. 7-day PHI.
Nexter	pyridaben	5.2– 10.67 oz	Group 21 miticide. Do not make aerial applications. 12-hour reentry. 7-day PHI.
Savey 50DF	hexythiazox	3–6 fl oz	Group 10 miticide. Will not control adults. Apply only once per season. 12-hour reentry. 28-day PHI.
Ultor	spirotetramat	8-14 oz	Group 23 insecticide. See supplemental label. Aphid and scale control, Suppression of spider mite, select scale. 24-hour reentry. 7-day PHI.
Vendex 50WP	fenbutatin-oxide	1–2 lb	Group 12B miticide. Restricted use. Do not use more than twice per season or more than 1.5 lb ai/A per year. Apply when mites appear. 48-hour reentry. 14-day PHI.
Peach twig borer, oriental fruit moth Note: Apply twig borer and fruit moth sprays in early June or time sprays with pheromone traps. Apply cover spray about 14 days after pheromone traps average two moths per trap for first adult generation (May–June) or five moths per trap for second adult generation (July–August).			
Spotted wing drosophila Note: SWD is no longer regarded as an important pest of peaches and nectarines. However, split or damaged fruit are attacked, so peaches can serve as a reservoir for SWD populations, which may then move to other susceptible crops. It may therefore be prudent to begin monitoring as fruit begins to ripen, and potentially to treat if preferred hosts such as cherries or small fruits are also present.			
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.
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 4 times per season. 4-hour reentry. 1-day PHI.

SUMMER

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval (PHI)
Diazinon 50W	diazinon	1 lb/100 gal water	Group 1B insecticide. Restricted use. One dormant and one in-season application only. 4-day reentry. 21-day PHI.
Entrust SC	spinosad	4–8 oz	Group 5 insecticide. OMRI listed for organic use. No more than 4 applications or 29 oz per year. 4-hour reentry. 1-day PHI.
Exirel	cyantranilprole	13.5–20.5 oz	Group 28 insecticide. 12-hour reentry. 3-day PHI.
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.
Malathion	malathion	See labels.	Group 1B insecticide. Many formulations are available: WP, ULV, and EC. WPs may leave residues visible at harvest. Fyfanon ULV is produced by Cheminova. 24-hour reentry. 7-day PHI.
Mustang Max	zeta-cypermethrin	3.2–4 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	Group 1A insecticide. No more than 15 qt per season. 12-hour reentry. 14-day PHI.
Success	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. No more than 0.2 ai per year. 24-hour reentry. 14-day PHI.
Earwigs			
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.
San Jose scale, Lecanium scale crawlers (mid-June to early July)			
Assail 30SG	acetamiprid	5.3–8.0 oz	Group 4A insecticide. Use with horticultural oil is recommended. 12-hour reentry. 7-day PHI.
Centaur WDG	buprofezin	34.5 oz	Group 16 insecticide. Target crawler emergence. 12-hour reentry. 7-day PHI.
Diazinon 50W	diazinon	1 lb/100 gal water	Group 1B insecticide. Restricted use. One dormant and one in-season application only. This spray is effective only on the crawler stages of scales. 4-day reentry. 21-day PHI.
Esteem 35WP	pyriproxyfen	4–8 oz	Group 7C insecticide. Limited to 3 applications per season. 12-hour reentry. 4-day PHI.
Transform WG	sulfoxaflor	2.75 oz	Group 4C insecticide. Suppression of San Jose scale only. 12-hour-reentry. 7-day PHI.
Ultor	spirotetramat	8-14 oz	Group 23 insecticide. See supplemental label. San Jose scale control, Suppression of lecanium scale. 24-hour reentry. 7-day PHI.
Peachtree borer			
Note: Timing usually is first or second week in July, and again 3 weeks later in August. If pheromone traps are used, place in orchard in June. Position traps about 2–3 feet from ground surface. Make first application 2 weeks after first consistent trap catches. Pounce and Ambush (all group 3A, restricted use) also are registered for peach tree borers. Preharvest intervals are 14 days.			
Asana XL	esfenvalerate	4.8–14.5 oz	Group 3A insecticide. Restricted use. Thoroughly cover trunk and scaffold branches. No more than 0.375 lb ai per season. 12-hour reentry. 14-day PHI.

PREHARVEST

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval (PHI)
Brown rot fruit rot (if rain is forecast)			
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.
Captac 4L	captan	4 qt	Group M4 fungicide. 24-hour reentry. 0-day PHI.
Fontelis	penthiopyrad	14–20 fl oz	Group 7 fungicide. 12-hour reentry. 0-day PHI.
Indar 2F	fenbuconazole	6 fl oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Inspire Super	difenoconazole + cyprodinil	16–20 fl oz	Group 3 + 9 fungicide. 12-hour reentry. 2-day PHI.

Luna Sensation	fluopyram + trifloxystrobin	5–7.6 fl oz	Group 7+11 fungicide. See footnote 5, page 12. 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.
Miravis	pydiflumetofen	3.4-5.1 fl oz	Group 7 fungicide. 4-hr reentry. 0-day PHI
Miravis Duo	Pydiflumetofen + difenconazole	13.6 fl oz	Group 3 + 7 fungicide. 12-hr reentry. 0-day PHI
Orius 20 AQ	tebuconazole	8.6–17.2 oz	Group 3 fungicide. 12-hour reentry. 0-day PHI.
Pristine	pyraclostrobin + boscalid	10.5–14.5 oz	Group 7 + 11 fungicide. Do not use with an HMO. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quadris	azoxystrobin	12–15.5 fl oz	Group 11 fungicide. 4-hour reentry. 0-day PHI.
Quadris Top	azoxystrobin + difenoconazole	12–14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 12-hour reentry. 0-day PHI.
Quash	metconazole	2.5–4 oz	Group 3 fungicide. 12-hour reentry. 14-day PHI.
Quilt Xcel	azoxystrobin + propiconazole	14 fl oz	Group 3 + 11 fungicide. See footnote 5, page 12. 24-hour reentry. 0-day PHI.
Rhyme	azoxystrobin	7 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
Scala SC	pyrimethanil	9–18 fl oz	Group 9 fungicide. Do not apply more than 3 applications alone. 2-day PHI.
Tesaris	fluxapyroxad	3.5-5.6 fl oz	Group 7 fungicide. Do not use with EC or oil-based products. 12-hour reentry. 0-day PHI.
Tilt and generics	propiconazole	4 fl oz	Group 3 fungicide. 12-24-hour reentry. 0-day PHI.
TopGuard SC	flutriafol	14 fl oz	Group 3 fungicide. 12-hour reentry. 7-day PHI.
TopGuard EQ	azoxystrobin + flutriafol	6–8 fl oz	See footnote 5, page 12. Do not use with silicone surfactants. Group 3 + 11 fungicide. 12-hr reentry. 7-day PHI.

POSTHARVEST: September–October

Pest or disease/ material	Active ingredient	Application rate/acre	Comments/re-entry interval/preharvest interval (PHI)
Cytospora canker Paint trunks with whitewash to help prevent winter injury.			
Peach leaf curl and shothole Note: Apply first leaf curl spray when 50% of the leaves have fallen and again at delayed dormant in late February before floral buds begin to open. An additional spray may be needed during the dormant season for shothole control depending on material selected. The addition of a spreader sticker will increase the effectiveness of some of these leaf curl sprays. Even curl-resistant cultivars need protection during the first few years.			
bordeaux 12-12-100	copper sulfate + hydrated lime	—	—
Bravo Weather Stik	chlorothalonil	3–4 pt	Group M5 fungicide. Effective if used all dormant season long. Do not add a spreader sticker. 12-hour reentry.
Rex Lime Sulfur Solution	calcium polysulfide	6–12 gal/100 gal water	Is a very effective product for leaf curl only. 48-hour reentry.
Cuprofix or other copper-based products	copper sulfate	5–10 lb	Effective only on shothole if used during the dormant season. Group M1 fungicide. 48-hour reentry. Many other copper products are labeled, such as C-O-C-S, Copper-Count-N, and Nordox.
Echo 720	chlorothalonil	3–4 pt	Group M5 fungicide. Effective if used all dormant season long. Do not add a spreader sticker. 12-hour reentry.
Ferbam Granuflo	ferbam	4.5 lb	Group M3 fungicide. 24 hour reentry.
Nu-Cop 50DF or other copper-based products	cupric hydroxide	8–16 lb	Effective only on shothole if used during the dormant season. Group M1 fungicide. 48-hour reentry. Many other copper products are labeled, such as Champion, CuPro and Kocide.
Syllit FL	dodine	3 pt	Group U12 fungicide. 48-hour reentry.
Lime Sulfur Ultra	calcium polysulfide	2–3 gal/100 gal water	A very effective product for leaf curl only. 48-hour reentry.

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Ziram 76DF	ziram	6-8 lb	A very effective product for both leaf curl and shothole. Group M3 fungicide. 48-hour reentry.
Shothole borer (third generation)			
Azera	azadirachtin + pyrethrins	1-2 pt	Group 3A insecticide. OMRI listed for organic agriculture. Avoid contact with blooming crops, weeds or cover crops. 12-hour reentry. 0-day PHI.
PyGanic EC	pyrethrins	1 pt- 2qt	Group 3A insecticide. OMRI listed for organic agriculture. Adjust pH of spray mixture to 5.5-7.0. Avoid contact with blooming crops, weeds or cover crops. 12-hour reentry. 0-day PHI.

FOOTNOTES

1. Bordeaux mixture may be combined with horticultural mineral oil for both peach leaf curl and Lecanium scale control. No sticker is needed with this combination.
2. Bordeaux 12-12-100 means 12 pounds of copper sulfate plus 12 pounds of hydrated lime in 100 gallons of water. In any bordeaux formula, the ingredients always are listed in the same order — copper sulfate, hydrated lime, then gallons of water.
3. Fungal pathogens have shown resistance to many fungicides when one is used exclusively. Alternate or tank-mix fungicides with different modes of action. Fungicides from different FRAC groups have different modes of action. Some products may already contain two different fungicides.
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 thrip 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. Prebloom and petal fall sprays of spinosyn materials (Entrust, Success or Delegate) should be applied in the evening after bee activity.

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

5. Do not use group 11 fungicides for more than two consecutive applications before switching to another fungicide in a different family or FRAC group with a different mode of action. Sprayers used for Abound or Topguard EQ should not be used on apples such as Gala, Cox’s Orange Pippin and McIntosh.
6. Powdery mildew may be a problem in some years. Nearby roses are an alternate host for this fungus. Scout for first occurrence. Chemical control is not needed after pit hardening. A similar disease called rusty spot comes from local apple trees with powdery mildew.
7. A surfactant is not required when using Quintec alone, but a nonionic surfactant is preferred if needed for tank-mixes.

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.

Effectiveness of fungicides and bactericides for control of peach disease management

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

Fungicide	Fungicide group	Brown rot (blossom blight)	Brown rot (fruit rot)	Peach leaf curl	Powdery mildew	Shothole
Abound	11	(Fair to) Good**	(Fair to) Good**	??	Good-Excellent**	Fair-Good
Botran	14	Fair	Fair	Slight	Not effective	??
Bravo	M5	Fair-Good	Not registered	Good	Not registered	Good
Captan	M4	Good	Fair-Good	Slight	Not effective	Fair-Good
Cevya	3	??	??	??	Good-Excellent**	??
Copper-based products	M1	Slight	Not registered	Fair-Good	Slight	Good
Echo	M5	Fair-Good	Not registered	Good	Not registered	Good
Elevate	17	Good-Excellent	Good-Excellent	??	Not effective	??
Ferbam	M3	Fair	Not registered	Good	Not registered	Good
Fontelis	7	Good-Excellent**	Good-Excellent**	??	Good-Excellent**	Good
Gem	11	Good**	Fair-Good**	??	Good-Excellent**	??
Indar	3	Excellent**	Excellent**	Fair	Good**	??
JMS Stylet oil	Not classified	??	??	??	Good	??
Lime sulfur	M2	Not recommended	Not recommended	Excellent	Not recommended	Slight
Miravis	7	Good-Excellent**	Good-Excellent**	??	Good-Excellent**	Good
Orius	3	Good	Good	Fair	Good**	??
Oso	19	??	??	??	?? (Fair-Good)	??
PhD	19	??	??	??	?? (Fair-Good)	??
Quash	3	Good-Excellent**	Good-Excellent**	??	Good**	??
Quintec	13	None	None	None	Excellent**	None
Rally	3	Good**	Good**	??	Good**	Slight
Rovral	2	Good**	Not registered	Slight	Not effective	Fair-Good
Scala	9	Good	Good	??	None	??
Sulfur	M2	Fair	Fair (good)	Slight	Good	Not effective
Syllit	M7	??	Not registered	??	Not registered	??
Thiram	M3	Good	Good	Good	Not effective	??
Tilt and generics	3	Good-Excellent**	Good-Excellent**	Slight	Good-Excellent**	Slight
TopGuard	3	Good**	Good**	??	Good-Excellent**	??
Topsin	1	Good**	Good**	Not effective	Good**	Not effective
Vanguard	9	Good**	Not registered	??	Not effective	Fair
Vivando	U8	Not effective	Not effective	??	Fair to Good	Not effective
Ziram	M3	Fair	Not registered	Excellent	Not effective	Good-Excellent
Combination products						
Inspire Super	3 + 9	Good	Good	??	Good**	??
Luna Sensation	7+11	Good-Excellent**	Good-Excellent**	??	Excellent**	??
Merivon	7 + 11	Good	Good	??	Excellent	??
Miravis Duo	3 + 7	Good-Excellent**	Good-Excellent**	??	Good-Excellent**	Good
Pristine	7 + 11	Good	Good	??	Good-Excellent**	??
QuadrisTop	3+11	??	??	??	Excellent**	??
Quilt Xcel	3 + 11	Good-Excellent	Good-Excellent	Slight	Excellent**	Fair-Good
Unicorn	3 + M2	Fair-Good	Fair-Good	Fair	Excellent	??

?? = no information available. **Resistant pathogens will lower the effectiveness of this fungicide.

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*: <https://catalog.extension.oregonstate.edu/weed>

Ingredient common name (herbicide mode of action) and product name example	Nuts			Pome fruit		Stone fruit						Rate
	Chestnut	Hazelnuts	Walnut	Apple	Pear	Apricot	Cherry	Nectarine	Peach	Plums	Prunes	
Applications that are soil active												
dichlobenil (20) Casoron												4 to 6 lb ai/a (100 to 150 lb/a Casoron); apply in cold, wet weather.
diuron (7) Karmex												1.6 to 3.2 lb ai/a (2 to 4 lb/a Karmex 80DF)
Fluridone (12) Brake ON!												Rate 0.19 to 0.40 lb ai/A (21 to 43 fl oz/A Brake on!).
isoxaben (21) Trellis SC				NB	NB	NB	NB	NB	NB	NB	NB	0.5 to 1 lb ai/a
indaziflam (29) Alion												(0.66 to 1.33 lb/a product)
mesotrione (27) Callisto, Broadworks												0.046 to 0.085 lb ai/a
napropamide (3) Devrinol												(3.5 to 6.5 oz/a product) depending on soil texture.
norflurazon (12) Solicam												0.093 to 0.187 lb ai/a
oryzalin (3) Surflan												(3 to 6 fl oz/a product)
pendimethalin(3) Prowl H2O												4 lb ai/a (8 lb/a)
pronamide (3) Kerb		NB										1.95 to 3.98 lb ai/a
simazine (5) Princep												(2.5 to 5 lb/a Solicam)
sulfentrazone (14) Zeus XC/Sulfentrazone 4SC												2 to 6 lb ai/a
terbacil (5) Sinbar WDG						NB	NB					(2 to 6 quarts/a Surflan)
trifluralin (3) Treflan 4L/EC												Prowl H2O: 1.9 to 6 lb ai/a
trifluralin (3)+ isoxaben (21)+ oxyfluorfen (14) Showcase	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	(2 to 6.3 quarts/a) depending on desired length of control and crop.
Applications that are soil and foliar active												
clopyralid (4) Stinger		NB										Pome Fruit: 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)
flazasulfuron (2) Mission												See product label for rates. Princep Caliber 90 is a Special Local Needs label (OR-080038) for sweet cherries only.
flumioxazin (14) Chateau SW												0.125 to 0.375 lb ai/a
oxyfluorfen (14) generic												1.25 to 2 lb ai/a (5 to 8 pints/a Goal 2XL)

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Ingredient common name (herbicide mode of action) and product name example	Nuts			Pome fruit		Stone fruit						Rate
	Chestnut	Hazelnuts	Walnut	Apple	Pear	Apricot	Cherry	Nectarine	Peach	Plums	Prunes	
oxyfluorfen (14) + penoxsulam (2) Pindar GT												1.47 lb ai/a oxyfluorfen + 0.015 lbs ai/a penoxsulam (1.5 to 3 pints/a)
Quinclorac (4) Quinstar 4L		NB										0.375 lb ai/A (12.6 fl oz/A Quinstar 4L)
rimsulfuron (2) Matrix												0.063 lb ai/a (4 oz/a Matrix FNV per year)
Postemergence contact and translocated herbicides												
2,4-D (4) Saber												Green sucker control in hazelnuts: 0.7 to 0.95 lb ai/a (1.5 to 2 pints/a Saber)
ammonium nonanoate Axxe												6% to 15% v/v OMRI certified
caprylic acid + capric acid Suppress												6% to 9% v/v . OMRI listed.
carfentrazone (14) Aim EC												Green sucker control in hazelnuts: 0.031 lb ai/a (2 fl oz/a Aim EC)
clethodim (1)		NB	NB	NB	NB	NB	NB		NB	NB	NB	0.06 to 0.125 lb ai/a (6 to 8 oz/a Select Max)
diquat (22) Reglone		NB	NB	NB	NB	NB	NB	NB	NB	NB	NB	0.375 to 0.5 lb ai/a (1.5 to 2 pints/a)
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) generic												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.
saflufenacil (14) Treevix												0.045 lb ai/a (1 oz/a)
sethoxydim (1) Poast										NB	NB	Grass suppression in row middles: 0.28 to 0.47 lb ai/a (1.5 to 2.5 pints/a product)

OSU resources for plant protection

Information on plant protection is available from several sources at Oregon State University:

- OSU Integrated Plant Protection Center. Online weather data and degree day information for insect pests and diseases uspest.org/wea/
- Pacific Northwest Plant Disease Management Handbook, pnwhandbooks.org/plantdisease
- Pacific Northwest Insect Management Handbook, pnwhandbooks.org/insect
- Pacific Northwest Weed Management Handbook, 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 they can be used safely if you follow recommended precautions. Follow all label requirements, and strongly consider any recommendations for additional personal protective clothing and equipment. In addition to reading and following the label, other major factors in the safe and effective use of pesticides are the pesticide applicator's qualifications, common sense and positive attitude. Always take all safety precautions when using pesticides.

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

Pesticide safety checklist

- Use pesticides only when necessary and as part of an Integrated Pest Management program.
- Always read the label and follow the instructions.
- Do not allow children to play around sprayers or mixing, storage, and disposal areas.

- Wear appropriate protective clothing and equipment.
- Never eat, drink, or smoke while handling pesticides.
- Avoid drift into non-target areas and pesticide runoff into streams, rivers, lakes, irrigation ponds and canals.
- Avoid spilling materials on skin or clothing.
- Have access to clean water, soap, and first aid supplies.
- Keep pesticides in a dry and locked storage area away from food and feed.
- Triple rinse or pressure rinse empty containers and dispose or recycle in accordance with state and local regulations.
- Stay out of recently sprayed areas until the spray has dried, and observe the restricted entry intervals specified on the pesticide label.
- Follow the pre-harvest interval on the pesticide label before harvesting crops or gardens and before allowing livestock to graze fields.

Emergency response for exposure and spills

- For any pesticide exposure emergency, dial 911.
- First aid for exposure is indicated on the pesticide label.
- For information on poison emergency treatment call the National Poison Center at 1-800-222-1222.
- For emergency information related to pesticide spills contact the Oregon Emergency Response System at 1-800-452-0311.

Non-emergency information

- **General pesticide information** — The National Pesticide Information Center provides objective, science-based information about pesticides and pesticide-related topics. Visit npic.orst.edu/index.html or call 1-800-858-7378.
- **Pesticide licensing and regulation** — The Oregon Department of Agriculture regulates most aspects of pesticide use in the State of Oregon. Visit www.oregon.gov/ODA/programs/Pesticides/Pages/AboutPesticides.aspx or call 503-986-4635.
- **Worker protection** — The federal Worker Protection Standard for Agricultural Pesticides protects agricultural workers from pesticide exposure at work. The Oregon Occupational Safety and Health Administration is the state agency responsible for administering the WPS in Oregon. For information on WPS requirements for employers, visit osha.oregon.gov/Pages/topics/worker-protection-standard.aspx or call 1-800-922-2689.
- **Pesticide waste** — The Oregon Department of Environmental Quality regulates the disposal of pesticide waste in the state of Oregon. Visit www.oregon.gov/deq/Hazards-and-Cleanup/hw/Pages/Miscellaneous-Industries.aspx or call 503-229-5263. Most chemical distributors offer plastic pesticide container recycling.