



Sweet Cherry Programs

Major Diseases

Bacterial canker or gummosis

Bacterial canker or gummosis (*Pseudomonas syringae*) is a serious disease of cherry in the Pacific Northwest. It is particularly damaging to young trees and can result in replanting issues if un-managed. Spread of the pathogen is favored by cool, moist weather. Optimum timing for control of bacterial gummosis is in late winter before trees break of dormancy and spring frost, and wet weather occur. In the fall, apply most materials before autumn rains or after October 1.

Brown rot

Brown rot is a serious disease of stone fruit when wet conditions occur in the orchard. The disease is caused by the fungus *Monilinia fructicola* although other species (i.e. *M. laxa* and *M. fructigena*) have been reported in other regions. There are both floral and fruit phases of the disease. Brown rot is explosive and highly favored by rain events during bloom (blossom infection) and immediately prior to harvest (fruit infection). Many fungicide materials are effective on both brown rot and powdery mildew. Use the products list on the bloom table for brown rot, as they are effective, and mildew sprays are not recommended at this stage of tree growth. Neither iprodione nor fenbuconazole are first-rate powdery mildew materials. Always follow fungicide resistance management guidelines. Current resistance management guidelines are available at <https://www.frac.info>

Cherry Powdery Mildew

Powdery mildew, caused by the fungus *Podosphaera cerasi*, is one of the most serious disease of cherries in the Pacific Northwest. The fungus attacks both foliage and (less commonly) fruit. Most cultivars are susceptible to the disease but it is particularly severe on the cultivar 'Sweetheart'. Management of the foliar phase is important because spores that infect fruit are produced on infected leaves. The fungus survives winter as chasmothecia (the sexual fruiting body); epidemics are initiated in spring when moisture results in ascospore release from the overwintering propagules. Ascospore release requires free moisture at 50F or greater. Ascospores serve as primary inoculum and give rise to powdery mildew colonies that continually produce millions of asexual spores (conidia). Conidia serve to spread and intensify the

epidemic on both foliage and fruit. The disease is favored by moderate temperatures and high humidity, particularly during the two weeks before harvest. Management of powdery mildew in sweet cherries involves intensive and expensive fungicide application programs. Resistance to Group 3 (DMI) and Group 11 (QoI) fungicides has been documented in the cherry powdery mildew pathosystem. Resistance to Group 7 (SDHI) fungicides has been documented but is of quite limited distribution. Current resistance management guidelines are available at <https://www.frac.info>

Coryneum blight (shothole)

Coryneum blight or shothole, caused by *Wilsonomyces carpophilus*, is a fungal disease of minor importance in the Pacific Northwest. The fungus overwinters in twig cankers. Spores are produced on canker surfaces during early spring rains (or over-the-canopy irrigation) and are splashed to foliage and fruit where they germinate, infect, and cause small lesions. The lesions are small and circular. Necrotic lesion centers may drop giving heavily infected leaves a "shothole" appearance. The disease is managed using fungicide programs early in the growing season.

Major Insects

Leafrollers (Pandemis, Obliquebanded)

Pre-bloom applications of pesticides can be effective and will also conserve natural enemies for leafroller and biological control agents of other pests, such as aphids. If treatments for leafrollers were applied at pink and/or bloom, sampling to determine the density of surviving leafrollers should be completed prior to deciding to apply additional controls at this timing. Most products listed act primarily as stomach poisons versus direct contact to residues, therefore, complete coverage is very important to achieve maximal control. Repeating an application of any product should be based on the leafroller population surviving previous treatments. Use the leafroller models on the WSU Decision Aid System (<https://decisionaid.systems>) for the optimum timing. Additional Details about Leafrollers (Pandemis, Obliquebanded)

Shothole borer

Good sanitation (removing large wood prunings, dead limbs, and woodpiles from the orchard) is the most effective management tactic. Insecticides are only effective against adults. Beetles begin flying in late April and are active through May. The second generation flight begins in late July or early August. Yellow sticky traps placed on orchard borders will detect adult beetle activity. Spraying the border trees (rows) with high water volumes will protect the remainder of the orchard in many situations where external sources are the primary problem. Additional Details about Shothole borer

Spotted-wing drosophila

Spotted-wing drosophila (SWD) is one of the newer invasive species from Asia, first detected in the continental US in 2008, and achieving pest status in eastern Washington in 2010. Among the tree fruits, only cherries are considered to be vulnerable to attack preharvest, although like any drosophilid, SWD will use injured or rotting fruit of any type to complete development. SWD can be controlled by several groups of insecticides, and rotation among MOAs is important for resistance management. Monitoring tools are available, and should be used to gain a general idea of pest pressure in a given year. Experience since 2010 indicates that cold winters, especially those with sudden and extreme cold snaps, will decimate overwintering populations, and result in low pressure the following growing season, with little need for spray coverage. Conversely, mild winters and early springs have preceded extremely high pest pressure, necessitating a full season spray program. Additional Details about Spotted-wing drosophila

Twospotted spider mite

Twospotted spider mite (TSM) is the most common spider mite pest of pear, although it has a very broad host range and will also feed on other tree fruits. Unlike apple, some pear cultivars (especially Anjou) have a very low threshold for mite damage, and controls must be applied at lower populations. Like all spider mites, TSM is an induced pest that will be controlled by natural enemies (especially predatory mites) if no disruptive sprays are applied. TSM can also feed on a number of broadleaf weeds, and reservoirs of both pest and predator can build up on the orchard floor. Mowing and herbicide applications beneath the tree may have unintended consequences for population in the tree canopy. Additional Details about Twospotted spider mite

Western cherry fruit fly

Western cherry fruit fly is the key direct pest of cherries, and quarantine regulations create a zero tolerance for this pest. Adult flies lay eggs in the fruit, and the larvae feed and develop inside the fruit until they are ready to pupate. A baited yellow sticky trap can be used for monitoring adult emergence of the single generation per year, and a degree-day model is available. Females have a 7-10 day pre-oviposition period, so sprays (either canopy or bait sprays) can start about a week after first fly detection or when the model predicts emergence. Fly emergence continues after harvest, so post-harvest clean up sprays will help prevent future problems, especially if unharvested fruit remains in the orchard. Many of the materials that kill western cherry fruit fly are also effective on spotted-wing drosophila; the neonicotinyls are a notable exception. Additional Details about Western cherry fruit fly

Spray Schedule

Dormant

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|------------------------------|--|---------------|------|-----|-----|------|-------|
| Bacterial canker or gummosis | fixed copper Champ WG | 8 lb | 24 h | 0 d | M1 | NR | |
| | copper hydroxide Kocide 3000 | See Label | 48 h | 0 d | M1 | NR | |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

Delayed dormant

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---------------------------------|---|---------------|------|-------------|-----|------|----------------------|
| Black cherry aphid | petroleum oil- dormant petroleum oil- dormant | 1-1.5 % v/v | 12 h | none listed | | NR | Organic |
| Cutworms | indoxacarb Avaunt | 6 oz | 12 h | 14 d | 22 | 4 | |
| European red mite | clofentezine Apollo 4SC | 4-8 fl oz | 12 h | 21 d | 10A | NR | |
| | petroleum oil- dormant petroleum oil- dormant | 1-1.5 % v/v | 12 h | none listed | | 2 | Organic |
| | hexythiazox Savey 50DF | 4-6 oz | 12 h | 28 d | 10A | 2-4 | |
| Grape mealybug | diazinon Diazinon 50W | 4 lb | 4 d | 21 d | 1B | 3 | |
| San Jose scale & Lecanium scale | petroleum oil- dormant petroleum oil- dormant | 6 gal | 12 h | none listed | | NR | Organic |
| Twospotted spider mite | fenbutatin oxide Vendex 50WP | 1-2 lb | 48 h | 14 d | 12B | NR | |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

Prebloom

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|----------------------------|--|------------------------|------|------|-------|------|--|
| Coryneum blight (shothole) | azoxystrobin Abound | 11-15 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on label. Do not apply more than 2.88 quarts product per acre per season. |
| | trifloxystrobin Flint Extra | 3-3.8 fl oz | 12 h | 1 d | 11 | NR | |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | copper hydroxide Kocide 3000 | See Label | 48 h | 0 d | M1 | NR | |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | ziram + copper hydroxide Ziram Granuflo 76WDG + Kocide 3000 | See Label See Label | 48 h | 30 d | M3 | NR | |
| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
| Black cherry aphid | diazinon Diazinon 50W | 4 lb | 4 d | 21 d | 1B | NR | |
| Cutworms | indoxacarb Avaunt | 6 oz | 12 h | 14 d | 22 | 4 | |
| Leafrollers (Pandemis) | Bacillus thuringiensis subsp. kurstaki DiPel DF | See label | 4 h | 0 d | 11B2 | 3 | Bts are stomach poisons so complete coverage is very important for control. Two or three applications are usually required. Apply when forecasts predict a warm weather pattern for 3 or more days. This spray timing is too early to control obliquebanded leafroller. Organic |
| | spinosad Entrust SC | 4-8 fl oz | 4 h | 7 d | 5 | NR | Organic |
| | | | | | | | |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------|----------------------------|---------------|-----|-----|-----|------|-------|
| | spinosad Success | 4-8 fl oz | 4 h | 7 d | 5 | NR | |

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Bloom

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------------------|--|-----------------|------|------|-------|------|---|
| Brown rot | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | triflumizole Procure 480SC | 10-16 fl oz | 12 h | 1 d | 3 | NR | Do not apply more than 96 fl oz of Procure 480SC per acre per season. |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | metconazole Quash | 2.5-3.5 oz | 12 h | 14 d | 3 | NR | |
| | myclobutanil Rally 40WSP | 5 oz | 24 h | 0 d | 3 | NR | Place into solution before adding oil. Make a second application at petal fall if disease-conducive weather occurs. |
| Cherry Powdery Mildew | azoxystrobin Abound | 11-15 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on label. Do not apply more than 2.88 quarts product per acre per season. |
| | pyraclostrobin Cabrio | 9.5 oz | 12 h | 0 d | 11 | NR | Resistance to Group 11 (QoI) fungicides has been documented in the cherry powdery mildew pathosystem. |
| | trifloxystrobin Flint Extra | 2.5-3.8 fl oz | 12 h | 1 d | 11 | NR | |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | difenoconazole Inspire | 7 fl oz | 12 h | 0 d | 3 | NR | |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---|---|---------------|------|------|-------|------|--|
| Apple Scab | potassium bicarbonate Kaligreen | See Label | 4 h | 1 d | NC | NR | Organic |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | fluxapyroxad + pyraclostrobin Merivon | 4-6.7 fl oz | 12 h | 0 d | 7, 11 | NR | |
| | polyoxin D zinc salt OSO 5%SC | 13 fl oz | 4 h | 3 d | 19 | NR | Apply every 7-10 days. Organic |
| | polyoxin D zinc salt Ph-D | 6.2 oz | 4 h | 0 d | 19 | NR | Apply every 7-10 days. |
| | triflumizole Procure 480SC | 8-16 fl oz | 12 h | 1 d | 3 | NR | Do not apply more than 96 fl oz of Procure 480SC per acre per season. |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | metconazole Quash | 3.5-4 oz | 12 h | 14 d | 3 | NR | |
| | quinoxifen Quintec | 7 fl oz | 12 h | 7 d | 13 | NR | |
| | myclobutanil Rally 40WSP | 5 oz | 24 h | 0 d | 3 | NR | Place into solution before adding oil. Make a second application at petal fall if disease-conducive weather occurs. |
| | flutriafol Topguard | 6-8 fl oz | 12 h | 7 d | 3 | NR | |
| | petroleum oil, summer petroleum oil, summer | 1-2 % v/v | 4 h | 0 d | | 4 | Do not apply to oil-sensitive varieties. Do not spray wet foliage. Do not spray when freezing temperatures are anticipated within 48 hours of an oil application, above 90°F (32°C) or when plants are under heat or moisture stress. Do not apply between pit hardening and harvest. Organic |
| | metrafenone Vivando | 15.4 fl oz | 12 h | 7 d | U8 | NR | Max 2 applications per year (30.8 fl oz). Do not apply with petroleum oils. Do not exceed 2 sequential applications. |
| Notes: Resistance to Group 11 and 3 compounds has been detected in every WA production area. However, resistance was detected in slightly greater than 50% of orchards sampled but not in every orchard. In rare cases isolates were resistant to both Groups 3 and 11. There is also some evidence of spatial variability in the distribution of resistant isolates in specific orchards. | | | | | | | |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|----------------------------|---|-----------------|------|-----|-------|------|---|
| Coryneum blight (shothole) | azoxystrobin Abound | 11-15 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on label. Do not apply more than 2.88 quarts product per acre per season. |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |

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Petal fall

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------|--|-----------------|------|-----|-------|------|---|
| Brown rot | azoxystrobin Abound | 12-15.5 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on the label. |
| | pyraclostrobin Cabrio | 9.5 oz | 12 h | 0 d | 11 | NR | |
| | captan Captan 50WP | 4 lb | 24 h | 0 d | M4 | NR | Do not apply Captan if oil will be used at any time for mildew control. |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------------------|--|---------------|------|-------------|-------|------|---|
| | triflumizole Procure 480SC | 10-16 fl oz | 12 h | 1 d | 3 | NR | Do not apply more than 96 fl. oz. per acre per season. |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | metconazole Quash | 2.5-3.5 oz | 12 h | 14 d | 3 | NR | |
| | myclobutanil Rally 40WSP | 5 oz | 24 h | 0 d | 3 | NR | |
| Cherry Powdery Mildew | azoxystrobin Abound | 11-15 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on the label. |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | sulfur sulfur | 20 lb | 24 h | none listed | M2 | NR | Organic |
| | difenoconazole Inspire | See Label | 12 h | 0 d | 3 | NR | |
| | potassium bicarbonate Kaligreen | See Label | 4 h | 1 d | NC | NR | Organic |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | fluxapyroxad + pyraclostrobin Merivon | 4-6.7 fl oz | 12 h | 0 d | 7, 11 | NR | |
| | polyoxin D zinc salt OSO 5%SC | 13 fl oz | 4 h | 3 d | 19 | NR | Apply every 7-10 days. Organic |
| | polyoxin D zinc salt Ph-D | 6.2 oz | 4 h | 0 d | 19 | NR | Apply every 7-10 days. |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | triflumizole Procure 480SC | 8-16 fl oz | 12 h | 1 d | 3 | NR | Do not apply more than 96 fl. oz. per acre per season. |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---------------------------------------|---|-----------------|------|------|------|------|--|
| | metconazole Quash | 4 oz | 12 h | 14 d | 3 | NR | |
| | quinoxifen Quintec | 7 fl oz | 12 h | 7 d | 13 | NR | |
| | flutriafol Topguard | 6-8 fl oz | 12 h | 7 d | 3 | NR | |
| | petroleum oil, summer petroleum oil, summer | 1-2 % v/v | 4 h | 0 d | | 4 | Do not apply to oil-sensitive varieties. Do not spray wet foliage. Do not spray when freezing temperatures are anticipated within 48 hours of an oil application, above 90°F (32°C) or when plants are under heat or moisture stress. Do not apply between pit hardening and harvest. Organic |
| | metrafenone Vivando | 15.4 fl oz | 12 h | 7 d | U8 | NR | Do not exceed 2 applications per year (30.8 fl oz.). Do not apply with petroleum oils. Do not exceed 2 sequential applications. |
| Coryneum blight (shothole) | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
| Fruittree leafroller | chlorantraniliprole Altacor | 4.5 oz | 4 h | 10 d | 28 | NR | |
| | spinetoram Delegate WG | 4.5-7 oz | 4 h | 7 d | 5 | NR | |
| Grape mealybug | imidacloprid Admire Pro | 1.4-2.8 fl oz | 12 h | 7 d | 4A | 3 | |
| | acetamiprid Assail 70WP | 3.4 oz | 12 h | 7 d | 4A | 3 | |
| | buprofezin Centaur WDG | 34.5 oz | 12 h | 14 d | 16 | 3 | |
| Leafrollers (Pandemis, Obliquebanded) | chlorantraniliprole Altacor | 4.5 oz | 4 h | 10 d | 28 | 4 | |
| | spinetoram Delegate WG | 4.5-7 oz | 4 h | 7 d | 5 | 4 | |
| | Bacillus thuringiensis subsp. kurstaki DiPel DF | See Label | 4 h | 0 d | 11B2 | 3 | Apply when warm weather is predicted for 3 or more days. Two or three applications per pest generation may be required to achieve adequate control. Organic |
| | | | | | | | |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------|---------------------------------------|---------------|-----|-----|-----|------|--|
| | spinosad Entrust SC | 4-8 fl oz | 4 h | 7 d | 5 | NR | Organic |
| | methoxyfenozide Intrepid 2F | 8-16 fl oz | 4 h | 7 d | 18A | 3 | Some leafroller populations have developed resistance to Intrepid and its use could result in reduced levels of control. |
| | spinosad Success | 4-8 fl oz | 4 h | 7 d | 5 | 3-4 | Some leafroller populations have developed resistance to spinosad products and repeated use of these products during the growing season could result in reduced levels of control. |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

Shuck fall

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------|--|-----------------|------|-----|-------|------|---|
| Brown rot | azoxystrobin Abound | 12-15.5 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on the label. |
| | pyraclostrobin Cabrio | 9.5 oz | 12 h | 0 d | 11 | NR | |
| | captan Captan 50WP | 4 lb | 24 h | 0 d | M4 | NR | Do not use Captan if using oil for mildew control. |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | triflumizole Procure 480SC | 10-16 fl oz | 12 h | 1 d | 3 | NR | Do not apply more than 96 fl. oz. of PROCURE 480SC per acre per season. |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------------------|--|------------------|------|-------------|-------|------|--|
| | metconazole Quash | 2.5-3.5 oz | 12 h | 14 d | 3 | NR | |
| | myclobutanil Rally 40WSP | 5 oz | 24 h | 0 d | 3 | NR | Place into solution before adding oil. |
| Cherry Powdery Mildew | azoxystrobin Abound | 11-15.5 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on label. |
| | pyraclostrobin Cabrio | 9.5 oz | 12 h | 0 d | 11 | NR | Resistance to Group 11 (QoI) fungicides has been documented in the cherry powdery mildew pathosystem. |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | flutianil Gatten Fungicide | See Label | 12 h | 3 d | U13 | NR | Maximum Application Rate: 8.0 fl oz product/A (0.0264 lb ai/A). DO NOT apply more than 4 applications per year. DO NOT exceed a maximum of 0.1056 lbs ai per acre per year. DO NOT apply within 3 days of harvest. |
| | sulfur sulfur | 20 lb | 24 h | none listed | M2 | NR | Organic |
| | difenoconazole Inspire | 7 fl oz | 12 h | 0 d | 3 | NR | |
| | potassium bicarbonate Kaligreen | See Label | 4 h | 1 d | NC | NR | Organic |
| | fluopyram Luna Privilege | 4.0 - 6.84 fl oz | 12 h | 0 d | 7 | NR | |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | pydiflumetofen Miravis | 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | polyoxin D zinc salt OSO 5%SC | 13 fl oz | 4 h | 3 d | 19 | NR | Apply every 7-10 days. Organic |
| | polyoxin D zinc salt Ph-D | 6.2 oz | 4 h | 0 d | 19 | NR | Apply every 7–10 days. |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | triflumizole Procure 480SC | 16 fl oz | 12 h | 1 d | 3 | NR | |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---|---|-----------------|------|------|-------|------|--|
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | metconazole Quash | 3.5-4 oz | 12 h | 14 d | 3 | NR | |
| | quinoxifen Quintec | 7 fl oz | 12 h | 7 d | 13 | NR | |
| | myclobutanil Rally 40WSP | 5 oz | 24 h | 0 d | 3 | NR | Place into solution before adding oil. |
| | cyflufenamid Torino | 4-8 fl oz | 4 h | 6 d | U6 | 4 | Do not make more than two (2) applications per year. Do not apply more than once every seven (7) days. Do not exceed a total of 0.106 lbs. active ingredient (16.0 oz. of product) per acre per calendar year. Do not apply within six (6) days of harvest; (PHI = 6 days) |
| | petroleum oil, summer petroleum oil, summer | 1-2 % v/v | 4 h | 0 d | | 4 | Do not apply to oil-sensitive varieties. Do not spray wet foliage. Do not spray when freezing temperatures are anticipated within 48 hours of an oil application, above 90°F (32°C) or when plants are under heat or moisture stress. Do not apply between pit hardening and harvest. Organic |
| Notes: Resistance to Group 11 and 3 compounds has been detected in every WA production area. However, resistance was detected in slightly greater than 50% of orchards sampled but not in every orchard. In rare cases isolates were resistant to both Groups 3 and 11. There is also some evidence of spatial variability in the distribution of resistant isolates in specific orchards. | | | | | | | |
| Coryneum blight (shothole) | azoxystrobin Abound | 11-15 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on label. Do not apply more than 2.88 quarts product per acre per season. |
| | captan Captan 50WP | 4 lb | 24 h | 0 d | M4 | NR | Do not use Captan if using oil for mildew control. |
| | fluxapyroxad + pyraclostrobin Merivon | 4-6.7 fl oz | 12 h | 0 d | 7, 11 | NR | |
| | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---------------------------------------|---|---------------|------|------|------|------|--|
| Black cherry aphid | imidacloprid Admire Pro | 1.4-2.8 fl oz | 12 h | 7 d | 4A | NR | |
| | acetamiprid Assail 70WP | 2.3 oz | 12 h | 7 d | 4A | NR | |
| Leafrollers (Pandemis, Obliquebanded) | chlorantraniliprole Altacor | 3-4.5 oz | 4 h | 10 d | 28 | 4 | |
| | spinetoram Delegate WG | 4.5-7 oz | 4 h | 7 d | 5 | 4 | |
| | Bacillus thuringiensis subsp. kurstaki DiPel DF | See Label | 4 h | 0 d | 11B2 | 3 | Two or three applications are usually required. Apply when forecasts predict a warm weather pattern for 3 or more days. Organic |
| | spinosad Entrust SC | 4-8 fl oz | 4 h | 7 d | 5 | NR | Organic |
| | pyriproxyfen Esteem 35WP | 4-5 oz | 12 h | 14 d | 7C | 4 | Time pyriproxyfen to coincide with the presence of the last larval stage but before pupae are present. |
| | methoxyfenozide Intrepid 2F | 8-16 fl oz | 4 h | 7 d | 18A | 3 | |
| | spinosad Success | 4-8 fl oz | 4 h | 7 d | 5 | 3-4 | Some leafroller populations have developed resistance to spinosad products and repeated use of these products during the growing season could result in reduced levels of control. |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

Late spring and summer

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------|---------------------------------|---------------|------|-------------|-----|------|--|
| Brown rot | captan Captan 50WP | 4 lb | 24 h | 0 d | M4 | NR | |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | sulfur sulfur | See Label | 24 h | none listed | M2 | NR | See label—Potential Fruit and Leaf Injury Organic |
| | | | | | | | |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------------------|--|---------------------|------|-------------|-------|------|--|
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | metconazole Quash | 2.5-3.5 oz | 12 h | 14 d | 3 | NR | |
| Cherry Powdery Mildew | azoxystrobin Abound | 11-15 fl oz | 4 h | 0 d | 11 | NR | Abound is extremely phytotoxic to certain apple varieties. See Application Directions, Resistance Management, and Attention information on label. |
| | pyraclostrobin Cabrio | 9.5 oz | 12 h | 0 d | 11 | NR | Resistance to Group 11 (QoI) fungicides has been documented in the cherry powdery mildew pathosystem. |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | flutianil Gatten Fungicide | See Label | 12 h | 3 d | U13 | NR | Maximum Application Rate: 8.0 fl oz product/A (0.0264 lb ai/A). DO NOT apply more than 4 applications per year. DO NOT exceed a maximum of 0.1056 lbs ai per acre per year. DO NOT apply within 3 days of harvest. |
| | sulfur sulfur | 20 lb | 24 h | none listed | M2 | NR | Organic |
| | sulfur sulfur | See Label | 24 h | none listed | M2 | NR | See label—Potential Fruit and Leaf Injury Organic |
| | difenoconazole Inspire | See Label | 12 h | 0 d | 3 | NR | |
| | potassium bicarbonate Kaligreen | See Label | 4 h | 1 d | NC | NR | Organic |
| | fluopyram Luna Privilege | 4.0 - 6.84 fl oz | 12 h | 0 d | 7 | NR | |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | fluxapyroxad + pyraclostrobin Merivon | 4-6.7 fl oz | 12 h | 0 d | 7, 11 | NR | |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---|---|-----------------|------|------|-------|---|--|
| | pydiflumetofen Miravis | 3.4 - 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | polyoxin D zinc salt OSO 5%SC | 13 fl oz | 4 h | 3 d | 19 | NR | Apply every 7–10 days. Organic |
| | polyoxin D zinc salt Ph-D | 6.2 oz | 4 h | 0 d | 19 | NR | Apply every 7–10 days. |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | triflumizole Procure 480SC | 16 fl oz | 12 h | 1 d | 3 | NR | |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | metconazole Quash | 3.5-4 oz | 12 h | 14 d | 3 | NR | |
| | quinoxifen Quintec | 7 fl oz | 12 h | 7 d | 13 | NR | |
| | myclobutanil Rally 40WSP | 5 oz | 24 h | 0 d | 3 | NR | Place into solution before adding oil. |
| | cyflufenamid Torino | 4-8 fl oz | 4 h | 6 d | U6 | 4 | Do not make more than two (2) applications per year. Do not apply more than once every seven (7) days. Do not exceed a total of 0.106 lbs. active ingredient (16.0 oz. of product) per acre per calendar year. Do not apply within six (6) days of harvest; (PHI = 6 days) |
| | petroleum oil, summer petroleum oil, summer | 1-2 % v/v | 4 h | 0 d | | 4 | Do not apply to oil-sensitive varieties. Do not spray wet foliage. Do not spray when freezing temperatures are anticipated within 48 hours of an oil application, above 90°F (32°C) or when plants are under heat or moisture stress. Do not apply between pit hardening and harvest. Organic |
| metrafenone Vivando | 15.4 fl oz | 12 h | 7 d | U8 | NR | Max 2 applications per year (30.8 fl oz.). Do not apply with petroleum oils. Do not exceed 2 sequential applications. | |
| Notes: Resistance to Group 11 and 3 compounds has been detected in every WA production area. However, resistance was detected in slightly greater than 50% of orchards sampled but not in every orchard. In rare cases isolates were resistant to both Groups 3 and 11. There is also some evidence of spatial variability in the distribution of resistant isolates in specific orchards. | | | | | | | |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---------------------------------------|---|---------------|-------------|-------------|------|------|--|
| Cherry rust mite | fenbutatin oxide Vendex 50WP | 1-2 lb | 48 h | 14 d | 12B | NR | |
| Grape mealybug | imidacloprid Admire Pro | 1.4-2.8 fl oz | 12 h | 7 d | 4A | 3 | |
| | acetamiprid Assail 70WP | 3.4 oz | 12 h | 7 d | 4A | 3 | |
| | buprofezin Centaur WDG | 34.5 oz | 12 h | 14 d | 16 | 3 | |
| | diazinon Diazinon 50W | 4 lb | 4 d | 21 d | 1B | 3 | |
| Leafrollers (Pandemis, Obliquebanded) | chlorantraniliprole Altacor | 3-4.5 oz | 4 h | 10 d | 28 | 4 | |
| | spinetoram Delegate WG | 4.5-7 oz | 4 h | 7 d | 5 | 4 | |
| | Bacillus thuringiensis subsp. kurstaki DiPel DF | See Label | 4 h | 0 d | 11B2 | 3 | Two or three applications are usually required to achieve acceptable control of high populations. Organic |
| | spinosad Entrust SC | 4-8 fl oz | 4 h | 7 d | 5 | NR | Organic |
| | pyriproxyfen Esteem 35WP | 4-5 oz | 12 h | 14 d | 7C | 4 | |
| | methoxyfenozide Intrepid 2F | 8-16 fl oz | 4 h | 7 d | 18A | 3 | Some leafroller populations have developed resistance to Intrepid and its use could result in reduced levels of control. |
| | spinosad Success | 4-8 fl oz | 4 h | 7 d | 5 | 3-4 | Some leafroller populations have developed resistance to spinosad products and repeated use of these products during the growing season could result in reduced levels of control. |
| Peachtree Borer | Peach Tree Borer pheromone Isomate-P | See Label | none listed | none listed | | NR | |
| Pear slug | chlorantraniliprole Altacor | 4.5 oz | 4 h | 10 d | 28 | NR | |
| | spinetoram Delegate WG | 4.6 oz | 4 h | 7 d | 5 | NR | |
| | spinosad Success | 4 fl oz | 4 h | 7 d | 5 | NR | Some leafroller populations have developed resistance to spinosad products and repeated use of these products during the growing season could result in reduced levels of control. |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|---------------------------------|--|---------------|------|------|-----|------|---|
| | lambda-cyhalothrin Warrior II | 1.5 fl oz | 24 h | 14 d | 3 | NR | Pyrethroids are broadly toxic to predatory mites, and repeated use of such products may cause mite flare-ups. |
| San Jose scale & Lecanium scale | buprofezin Centaur WDG | 34.5 oz | 12 h | 14 d | 16 | 4 | Oil at delayed dormant is critical to the success of San Jose scale management. |
| | pyriproxyfen Esteem 35WP | 4-5 oz | 12 h | 14 d | 7C | 4 | Time pyriproxyfen to coincide with the presence of the last larvae stage but before pupae appear. Timing for leafrollers should also provide control of scale. |
| Shothole borer | esfenvalerate Asana XL | 14.5 fl oz | 12 h | 14 d | 3A | 4 | Sanitation is the most effective management for shothole borer. |
| Spider mites | bifenazate Acramite 50WS | 1 lb | 12 h | 3 d | un | 4 | |
| | spirodiclofen Envidor 2SC | 18 fl oz | 12 h | 7 d | 23 | 3-4 | |
| | hexythiazox Onager | 12-24 fl oz | 12 h | 7 d | 10A | NR | |
| | fenbutatin oxide Vendex 50WP | 1-2 lb | 48 h | 14 d | 12B | NR | Apply sprays in early May. |
| | etoxazole Zeal Miticide1 72WSP | 3 oz | 12 h | 7 d | 10B | 3-4 | |
| Spotted-wing drosophila | spinetoram Delegate WG | 7 oz | 4 h | 7 d | 5 | NR | |
| | spinosad Entrust SC | 8 fl oz | 4 h | 7 d | 5 | NR | There is a Washington 24(c) label for Entrust that allows a shorter preharvest interval, but has more restrictions on rates and timing. See label. Organic |
| | malathion Malathion ULV | 16 fl oz | 12 h | 1 d | 1B | NR | Apply malathion ULV by air only (ULV is NOT mixed with any water) (see text--Aerial Application). Activity against spotted-wing drosophila is only a few days. |
| | spinosad Success | 8 fl oz | 4 h | 7 d | 5 | NR | |
| | lambda-cyhalothrin Warrior II | 2.56 fl oz | 24 h | 14 d | 3 | NR | Pyrethroids are broadly toxic to predatory mites, and repeated use of such products may cause mite flare-ups. |
| Western cherry fruit fly | imidacloprid Admire Pro | 1.4-2.1 fl oz | 12 h | 7 d | 4A | NR | |
| | acetamiprid Assail 70WP | 2.3-3.4 fl oz | 12 h | 7 d | 4A | NR | |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------|---|---------------|------|-----|-----|------|---|
| | spinetoram Delegate WG | 4-4.5 oz | 4 h | 7 d | 5 | NR | |
| | spinosad Entrust SC | 4.8-6 fl oz | 4 h | 7 d | 5 | NR | Organic |
| | spinosad GF-120 NF Naturalyte | 20 fl oz | 4 h | 0 d | 5 | NR | This is a spinosad formulation registered specifically for management of Tephritid fruit flies. This product has not proven sufficiently effective for the control of spotted wing drosophila. Monitor carefully for SWD if you use this bait. Apply to alternate rows with special auxiliary applicator; dilute with no more than 3 quarts of water per acre. Re-apply after rain. For application method, see label. Organic |
| | malathion Malathion ULV | 16 fl oz | 12 h | 1 d | 1B | NR | Apply malathion ULV by air only (ULV is NOT mixed with any water) (see text--Aerial Application). Activity against spotted-wing drosophila is only a few days. |
| | carbaryl Sevin XLR Plus | 4 pt | 12 h | 3 d | 1A | NR | WARNING: Multiple applications of carbaryl may cause mite problems. |
| | spinosad Success | 4-6 fl oz | 4 h | 7 d | 5 | NR | |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

Preharvest and harvest

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------|--|---------------|------|-----|-------|------|-------|
| Brown rot | pyraclostrobin Cabrio | 9.5 oz | 12 h | 0 d | 11 | NR | |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|-----------------------|---|------------------|------|------|-------|------|---|
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |
| | metconazole Quash | 2.5-3.5 oz | 12 h | 14 d | 3 | NR | |
| | Notes: See label—Potential Fruit and Leaf Injury | | | | | | |
| Cherry Powdery Mildew | azoxystrobin Abound | 11-15 fl oz | 4 h | 0 d | 11 | NR | Azoxystrobin is extremely toxic to certain apple varieties. See label for further information. |
| | pyraclostrobin Cabrio | 9.5 oz | 12 h | 0 d | 11 | NR | Resistance to Group 11 (QoI) fungicides has been documented in the cherry powdery mildew pathosystem. |
| | penthiopyrad Fontelis | 14-20 fl oz | 12 h | 0 d | 7 | NR | |
| | difenoconazole Inspire | See Label | 12 h | 0 d | 3 | NR | |
| | potassium bicarbonate Kaligreen | See Label | 4 h | 1 d | NC | NR | Organic |
| | fluopyram Luna Privilege | 4.0 - 6.84 fl oz | 12 h | 0 d | 7 | NR | |
| | fluopyram + trifloxystrobin Luna Sensation | 5-5.6 fl oz | 12 h | 1 d | 7, 11 | NR | |
| | fluxapyroxad + pyraclostrobin Merivon | 4-6.7 fl oz | 12 h | 0 d | 7, 11 | NR | |
| | pydiflumetofen Miravis | 5.1 fl oz | 12 h | 0 d | 7 | NR | |
| | polyoxin D zinc salt OSO 5%SC | 13 fl oz | 4 h | 3 d | 19 | NR | Apply every 7–10 days. Organic |
| | polyoxin D zinc salt Ph-D | 6.2 oz | 4 h | 0 d | 19 | NR | Apply every 7–10 days. |
| | pyraclostrobin + boscalid Pristine | 10.5-14.5 oz | 12 h | 0 d | 11,7 | NR | |
| | triflumizole Procure 480SC | 16 fl oz | 12 h | 1 d | 3 | NR | |
| | azoxystrobin + difenoconazole Quadris Top | 12-14 fl oz | 12 h | 0 d | 11, 3 | NR | The azoxystrobin component of Quadris Top is extremely toxic to certain apple varieties. See label for further information. |

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------------------------|---|---------------|------|------|-----|------|---|
| | metconazole Quash | 3.5-4 oz | 12 h | 14 d | 3 | NR | |
| | quinoxifen Quintec | 7 fl oz | 12 h | 7 d | 13 | NR | |
| | myclobutanil Rally 40WSP | 5 oz | 24 h | 0 d | 3 | NR | Place into solution before adding oil. See remarks in shuck fall section. |
| | metrafenone Vivando | 15.4 fl oz | 12 h | 7 d | U8 | NR | Max 2 applications per year (30.8 fl oz.). Do not apply with petroleum oils. Do not exceed 2 sequential applications. |
| | Notes: Resistance to Group 11 and 3 compounds has been detected in every WA production area. However, resistance was detected in slightly greater than 50% of orchards sampled but not in every orchard. In rare cases isolates were resistant to both Groups 3 and 11. There is also some evidence of spatial variability in the distribution of resistant isolates in specific orchards. | | | | | | |
| | Notes: See label—Potential Fruit and Leaf Injury | | | | | | |
| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
| Spotted-wing drosophila | spinetoram Delegate WG | 7 oz | 4 h | 7 d | 5 | NR | |
| | spinosad Entrust SC | 8 fl oz | 4 h | 7 d | 5 | NR | There is a Washington 24(c) label for Entrust that allows a shorter preharvest interval but has more restrictions on rate and timing. See label. Organic |
| | malathion Malathion ULV | 16 fl oz | 12 h | 1 d | 1B | NR | Apply malathion by air only, ULV, not mixed with water. See text—Aerial Application. Activity against spotted-wing drosophila is only a few days. |
| | spinosad Success | 8 fl oz | 4 h | 7 d | 5 | NR | |
| | lambda-cyhalothrin Warrior II | 2.56 fl oz | 24 h | 14 d | 3 | NR | Pyrethroids are broadly toxic to predatory mites, and repeated use of such products may cause mite flare-ups. |
| Western cherry fruit fly | imidacloprid Admire Pro | 1.4-2.8 fl oz | 12 h | 7 d | 4A | NR | |
| | spinetoram Delegate WG | 4-4.5 oz | 4 h | 7 d | 5 | NR | |
| | spinosad Entrust SC | 4-6 fl oz | 4 h | 7 d | 5 | NR | Organic |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------|---|---------------|------|-----|-----|------|--|
| | spinosad GF-120 NF Naturalyte | 20 fl oz | 4 h | 0 d | 5 | NR | This is a spinosad formulation registered specifically for management of Tephritid fruit flies. This product has not proven sufficiently effective for the control of spotted wing drosophila. Monitor carefully for SWD if you use this bait. Apply to alternate rows with special auxiliary applicator; dilute with no more than 3 quarts of water per acre. Re-apply after rain. Organic |
| | malathion Malathion ULV | 16 fl oz | 12 h | 1 d | 1B | NR | Apply malathion by air only, ULV, not mixed with water. See text—Aerial Application. |
| | carbaryl Sevin XLR Plus | 4 pt | 12 h | 3 d | 1A | NR | WARNING: Multiple applications of carbaryl may cause mite problems. |
| | spinosad Success | 4-6 fl oz | 4 h | 7 d | 5 | NR | |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

Postharvest

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------------------|-----------------------------------|---------------|------|------|-----|------|---|
| Leafhoppers cherry | thiamethoxam Actara | 2.75 oz | 12 h | 14 d | 4A | 2-4 | Actara at 2.75 oz/100gal resulted in 100% mortality of <i>C. reductus</i> leafhoppers 24 hours after treatment 2020 WA trial [Nottingham, 2020]. Actara maintains good control past 24 hours after treatments at 60-80% mortality [Nottingham 2021]. Actara had more than 80% control in 10 CA trials, above 50% in 2 CA trials and 30-50% in 1 CA trial [Van Steenwyk 1988, 1989, 1990, 2002, 2003] Generally thought to be good on nymphs and poor on adults. |
| | imidacloprid Admire Pro | 2.8 fl oz | 12 h | 7 d | 4A | 1-4 | Admire Pro has had mixed success in lab bioassays on <i>C. reductus</i> , from 73-100% mortality in direct sprays to 15% by residues [Nottingham 2020-2022]. Provado rated as high efficacy on White apple leafhopper in WA trials. Provado provided 8%, 20%, 34%, 69%, 30%, 34%, 51% and 73% control in eight California trials [Van Steenwyk 1988, 2000, 2001]. Many generics now available. E.g. Macho, Asada, Midash Forte. |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------|---|---------------|-------------|-------------|---------------|------|---|
| | abamectin Agri-Mek SC | See Label | 12 h | 21 d | 6 | 2-4 | Generally thought to be good on nymphs and poor on adults. Rated excellent control White apple leafhopper nymphs West Virginia [Hogmire 1999]. 50% control nymphs and adults New York [Reisig 1995]. |
| | esfenvalerate Asana XL | 2-5.8 fl oz | 12 h | 14 d | 3A | 3-4 | Asana resulted in 98-100% mortality of C. reductus leafhoppers 24 hours after treatment in 2 WA trials [Nottingham 2020, Nottingham 2022]. Asana's efficacy drops to around 50% within 24 hours of treatment [Nottingham 2021]. Asana had 80-90% control in 8 CA trials and 50-79% in 1 CA trial [Van Steenwyk 1987, 1989, 1990, 2002]. |
| | acetamiprid Assail 70WP | 1.7 oz | 12 h | 7 d | 4A | 1-2 | Assail had 20, 25, 40 and 52% control in four California trials [Van Steenwyk 2002]. Generally higher efficacy on younger instar nymphs. |
| | indoxacarb Avaunt | 6 oz | 12 h | 14 d | 22 | 3-4 | Rated good to high efficacy on White apple leafhopper in WA. |
| | azadirachtin Aza-Direct | 1-2 pt | 4 h | 0 d | un | 1-3 | Aza-direct at 32oz provided 62%, 78% control of white apple leafhopper and 63%, 25% of potato leaf hopper in apples [Wise 2002]. Azadirect 32oz provided 64% of control for potato leafhopper nymphs [Harding 2019]. Organic |
| | Azadirachtin, Pyrethrin Azera | 56 fl oz | 12 h | 0 d | | 3 | Azera (premix of pyrethrins 1.4% and azadirachtin 1.2%) achieved 100% mortality of C. reductus 24 hours after treatment in 2020 WA trial [Nottingham 2020-2021]. Residual control is unknown. Azera 40oz provided 64% of control for potato leafhopper nymphs [Harding 2020]. Organic |
| | tolfenpyrad Bexar | 21 fl oz | 12 h | 14 d | 21A | NR | Additional testing is needed, but an initial lab bioassay showed 65% mortality of C. reductus [Nottingham 2020-2021]. |
| | diatomaceous earth Celite 610 | 50 lb | none listed | none listed | particle film | 3-4 | Celite reduced leafhoppers from colonizing leaves compared to 1% oil by 50% and to untreated checks by 85% in 4 experiments [Nottingham 2021]. Organic |
| | cinnamon oil Cinnerate | 32 fl oz | none listed | 0 d | unknown | 3 | 67 % mortality of C. reductus in 2020 WA trial [Nottingham 2020]. |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------|---|---------------|--|-----|-----|------|--|
| | fenpropathrin Danitol 2.4EC | 18 fl oz | 24 h | 3 d | 3 | 2-4 | It is generally recommended that no more than 2 Danitol 2.4 EC apps per season. Danitol had 68-94% control in four California trials at 0.2 and 0.4 lb AI/a [Steenwyk 1993]. |
| | spinosad Entrust SC | 8 fl oz | 4 h | 7 d | 5 | 1-2 | 32% control of C. reductus in 2020 WA trial [Nottingham 2020]. Organic |
| | malathion Malathion 5EC | 2.8 pt | 12 h apricot/cherry/pear 24 h peach/nectarine | 3 d | 1B | NR | Additional testing is needed, but an initial lab bioassay showed 100% mortality of C. reductus [Nottingham 2020-2021]. |
| | azadirachtin Neemix 4.5%L | 16 fl oz | 4 h | 0 d | un | 1-3 | Neemix was not different than the check for controlling of C. reductus [Nottingham 2021]. Neemix at 3.5 and 7 fl oz provided little control compared to the check (Sevin) for white apple leafhoppers for first or second generations [Beers 1995]. Neemix 4.5 at 8 oz provided 67% control potato leafhopper adults 7 days after treatment [Patton 2002]. Organic |
| | spinosad Success | 2-2.7 fl oz | 4 h | 7 d | 5 | 3 | Rated as good efficacy on White apple leafhopper in WA. |
| | kaolin clay Surround WP | 25-50 lb | 4 h | 0 d | | 3-4 | Kaolin confuses insects where they don't recognize the plants to feed. Two initial post-harvest applications, followed by monthly reapplication of Surround at 50 lb/A reduced leafhopper numbers 20-80% in traps in 2020 WA study [Northfield 2020]. Kaolin reduced leafhoppers from colonizing leaves compared to 1% oil by 50% and to untreated checks by 85% [Nottingham 2021]. Kaolin reduced disease transmission of Pierces disease by glassy winged sharpshooters better than conventional products in one trial [25]. 100% control of white apple leafhoppers [Wise 2002]. Surround + Trilogy 49% control potato leafhopper adults 7 days after treatment [Patton 2002]. Organic |
| | sulfoxaflor Transform | 2.75 oz | 24 h | 7 d | 4C | 3-4 | Laboratory bioassays show 85-95% mortality of C. reductus [Nottingham 2021]. |
| | petroleum oil, summer petroleum oil, summer | 2 gal | 4 h | 0 d | | 3 | Oil at 1% reduced leafhoppers in choice tests by 75% [Nottingham 2021] Oil at 2% reduced White apple leafhopper oviposition resulting in fewer nymphs [Fernandez 2001]. Organic |

| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|--------|----------------------------------|---------------|------|------|-----|------|---|
| | lambda-cyhalothrin Warrior II | 2.56 fl oz | 24 h | 14 d | 3 | NR | 95% control potato leafhoppers [Laub 2003]. For potato leafhoppers Warrior II CS at 1.9 fl oz had number 40% lower than untreated control (not sig.) [Kuhar 2009] |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

Fall

| Disease | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
|------------------------------|---------------------------------|---------------|------|-----|-----|------|--|
| Bacterial canker or gummosis | fixed copper Champ WG | See Label | 24 h | 0 d | M1 | NR | |
| | copper hydroxide Kocide 3000 | See Label | 48 h | 0 d | M1 | NR | |
| Insect | Chemical | Rate per Acre | REI | PHI | MOA | Eff. | Notes |
| Leafhoppers cherry | carbaryl carbaryl | 3 qt | 12 h | 3 d | 1A | 2-4 | Can cause leaf-drop in Canadian varieties. Use fall only. Sevin had 50-90% in 5 CA. [Van Steenwyk 1988]. |

Efficacy numbers denote the relative efficacy of a pesticide against a given pest on a 1 to 4 scale with 1 being low and 4 high efficacy. This information is based primarily on research conducted with WSU researchers in Washington.

?>