



APPLE PESTS/DISEASES AND SPRAY SCHEDULE

For help in identifying home orchard problems or for more complete information on specific fruit pests or diseases, contact your county's WSU Extension office.

Pesticide Use

Washington State Law (RCW 15.09.060) states that property owners must control horticultural pests on their property. Help commercial orchards by maintaining good care and pest management practices for your desired fruit trees.

- Do not apply pesticides until a specific insect or disease has been positively identified. Using wrong or unnecessary sprays can be a loss of resources and can pose a hazard to people and the environment.
- Apply pesticide sprays only at the proper time of tree, bud, or pest development. Sprays applied at the wrong time are also ineffective. Vary products during the season and in following seasons to minimize pest resistance.
- Homeowners should not make foliar applications to trees over 10 ft tall. Consult a commercial pesticide applicator for treatment of trees and shrubs over 10 ft. tall.
- Always carefully read and follow label directions of the product you use. The Label is the Law.
- For more information about protecting pollinators: <https://agr.wa.gov/getmedia/6144c435-c1ad-4092-afe3-436bdd627e41/388-tenwaystoprotectbeesfrompesticides.pdf>

Major Insects	Parts affected/management	Major Diseases	Parts affected
Aphids Causes twisted/deformed leaves and stunted shoots. Fruits may be distorted. Produces honeydew, a sweet, sticky material. Natural enemies can be effective on aphids.	Leaves, buds, fruit See spray schedule below	Apple Scab Fungus found in regions with high rainfall. Gray, brown to blackish lesions. Overwinters in fallen leaves	Leaves, fruit See spray schedule below

Apple ermine moth/Tent Caterpillars Adult moth has silver-white wings spotted with black. Larvae are gray, cream-colored, or greenish with dark spots along the sides. Caterpillars later move into the foliage mining out leaf tissues, to feed.	Leaves See spray schedule below	Bitter pit A physiological problem which results from calcium deficiency in the fruit. Depressed spots appear on the fruit surface and the tissue beneath the spot becomes brown.	Fruit <u>No Chemical Management recommended</u> Bitter pit
Apple Maggot <u>Required control in Spokane County</u> Female lays eggs on fruits by puncturing the skin. Cream-colored larvae feeds inside the fruit, creating irregular brown tunnels throughout the fruit.	Fruit See spray schedule below	Burrknot A physiological problem resembling crown gall. Roughened, warty- looking growth is comprised of root tissues. Trees become stunted, girdled, or weakened at the site of the knot.	Branches <u>No Chemical Management recommended</u> Burrknot
Apple-and-thorn skeletonizer Adult is small dark or reddish-brown moth. Caterpillars are yellow-green. Damage includes skeletonized leaves, or leaves that are rolled into a cone and tied with webbing. Damaged leaves are brown and papery and drop prematurely.	Leaves and fruit See spray schedule below	Botrytis/ Gray mold Fungal spores. Overwinters on mummified fruit left on trees and fallen leaves. Decayed area is light to dark brown appearance where fruit is spongy. Diseased tissue does not separate from the healthy tissue. Fluffy white to gray mycelium and grayish spore masses may appear on fruit. May have a “cedar-like” smell. Entire decayed fruit may appear “baked”.	Flowers, fruit <u>No Chemical Management recommended</u> Botrytis Gray mold
Apple Rust Mites Extremely small, wedge-shaped mite, which is tan to amber colored. Feeding makes leaves look off-color, sometimes with a silvery sheen. Leaves roll lengthwise. Feeding shuts down terminal growth.	Leaves See spray schedule below	Bull's Eye Rot (Anthracnose, Perennial Canker) Young cankers appear as small reddish-brown areas and are most easily observed when bark is wet. Cankers elongate reaching a full size from 1-10" long. Cream-colored fungal spores are present. Bark usually splits away around the canker edge.	Fruit, branches See spray schedule below



Brown Marmorated Stink Bugs Young stink bugs, nymphs, are black with a red-and-black striped abdomen. Older nymphs are dark with white bands on body, legs, and antennae. Adults are a little over 1/2" long, with a shield-shaped body. Adult body color is mottled gray and brown, while the legs and antennae have alternating dark and light bands. Abdomen has dark and light bands at the edge of the wings. Sunken areas and deformities on the surface of the fruit are typical symptoms.	Fruit, seeds, and seed pods, but will also feed on stems and leaves See spray schedule below	Crown and collar rot Soilborne fungus typically appearing in early fall. One or more branches may show signs of decline, including discolored (reddish-bronze to purple) foliage, smaller leaves and terminal growth.	Roots, bark <u>No Chemical Management recommended</u> Crown and collar rot
Codling Moth <u>Required control in Spokane County</u> Gray wings of adult codling moths are marked with dark brown bands near wingtips. Fruit appears dirty brown or rotted in the center when cut open. Mature larvae are about 3/4" long, cream-colored to pinkish-white with brown heads.	Fruit See spray schedule below	Crown gall Soilborne bacteria that causes galls. They appear as fleshy, white, enlarged masses on the roots or stems. Older galls are hardened and turn dark brown and woody or corky.	Roots, Stems <u>No Chemical Management recommended</u> Crown gall
Cutworms/Armyworms Fruit damage appears as holes in the fruit surface. Cutworms feed at night. Armyworms feed during the day.	Leaves, bud before blooming, fruit See spray schedule below	Cytospora Canker Fungi initially create cankers that are small but enlarge quickly and may streak up and down the stems. Cankers may girdle twigs, resulting in dieback above the infection site. Leaves on the dead twigs turn color and droop, but often remain attached. Cankers appear as a dark, sunken area of dead bark and wood. Amber gumming is often present.	Twigs and branches <u>No Chemical Management recommended</u> Cytospora canker
Earwigs Insects have pincers at the rear. Damage to leaves appears as of shallow, irregular chewed areas on the surface.	Flowers, shoot tips, leaves, fruit <u>No Chemical Management recommended</u> Earwigs	Fire Blight <u>Required control in Spokane County</u> Twigs and flowers initially appear water-soaked. Cankers can develop on twigs, branches and the base of the tree. (Continued on next page)	Blossoms, twigs, branches, trunk <u>No Chemical Management recommended</u> Fire blight

			Reddish-brown streaking beneath the bark in the cankered area may be observed.	
Fruittree Leafrollers Leaves are rolled and tied in place with webbing, often with frass (excrement) in the webbing. Damaged leaves are often near shoot tips and may be skeletonized or chewed.	Leaves and shoot tip See spray schedule below		Nectria canker (European canker) Young cankers are sunken, dark, and water-soaked in appearance. Older cankers are irregularly elongated and covered with dead bark. White fungal fruiting bodies appear first season. Round, red fruiting bodies produced second season. Fruit may have an eye rot at the blossom end or a rot on the side of the fruit.	Twigs, branches, fruit See spray schedule below
Leafhopper Nymphs are usually less than 1/10" long and white to greenish or yellowish in color. Adults are white and about 1/8" long. Often leaves white to yellow speckling or mottling. Produce honeydew, a sweet, sticky material. Heavy infestations may result in premature leaf drop and small fruit.	Leaves No Chemical Management recommended Leafhopper		Nectria twig blight (Coral spot) Fungus which invades plant tissues through wounds and natural openings in the bark. Cankers are initially small and sunken, gradually girdling the twigs after two or more seasons. The cankered areas produce pinkish or coral-colored fruiting bodies of the fungus.	Twigs, branches, Leaves No Chemical Management recommended Nectria twigblight coral spot
Lecanium scale Shiny brown insects with a turtle-shape. Crawlers are flatter. Produce honeydew. Branches with heavy infestations may be wilted, yellowish, or show other signs of stress. New growth may be stunted.	Branches, twigs See spray schedule below		Phytophthora fruit rot Caused by a soilborne fungus. Can move up into the wood. Firm tan spots develop on infected fruit.	Fruit, twigs No Chemical Management recommended Phytophthora fruit rot
Oystershell scale Looks like a miniature oyster encrusted on a small limb or twig.	Twigs, branches See spray schedule below for San Jose scale		Powdery Mildew Develop a characteristic gray-white powdery growth. Dark brown to black fruiting bodies of the fungus can be seen around midsummer, while the whitish mycelia turn brown at this time.	Twigs, leaves, blossoms, fruit See spray schedule below



C041 – Spray Schedule for Apples

		Infected leaves are curled and distorted.	
San Jose Scale Yellow crawlers. Infestation of wood may cause death of limbs or the entire tree. Fruit develops sunken spots surrounded by reddish areas.	Trunk, limbs, leaves and fruit See spray schedule below	Rusting Corky, roughened, brownish or grayish areas on surface. The type of pattern of the russetting or location may indicate the cause.	Fruit <u>No Chemical Management recommended</u> Fruit Russetting
Shothole Borer Grubs feed by boring between the bark and sapwood, and emerge as adults leaving tiny round "shotholes" in the bark.	Leaves, twigs, bark <u>No Chemical Management recommended</u> Shothole borer	Virus Disease Creamy to yellow mottling, spotting, or vein yellowing visible mainly on the upper surface of leaves. Extremely sensitive varieties may lose leaves.	Bark, Leaves, Fruit <u>No Chemical Management recommended</u> Virus disease
Spider Mites Color of mites range from red, yellow, green to black, depending on species and age. Yellowish to brown speckling on the underside leaves. Mites are usually accompanied by webbing on and between leaves and twigs.	Leaves, Twigs See spray schedule below		
Western Tentiform Leafminer Feed on the green tissues between the leaf surfaces. A narrow, winding trail of mined tissue is left on top of tissue or leave a large damaged spot with an irregular outline. The epidermal layers often become whitish, tan, or brown and may appear papery and dry.	Leaves <u>No Chemical Management recommended</u> Tentiform leafminer		
Spray Schedule			
Growth Stage	Pest/Disease	Non-Chemical and Chemical Control/Management	Notes
	Aphid eggs	Aphids	This is the most important stage and chemical spray to control pests.
	Apple-and-thorn skeletonizer eggs	Apple-and-thorn-skeletonizer	
	Leafroller eggs	Leafroller	

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 <p>Delayed dormant stage: In late winter, just as buds begin to show first green tissue</p>	Lecanium scale	Lecanium scale	<p>Manage pests as they hatch in early spring</p> <p>Spray when daytime temperature is between 45 - 55 F, with no frost forecast overnight. Finish spraying by noon to insure good dry time.</p>
	mites	Spider mites	
	San Jose scale	San Jose scale	
 <p>Pre-pink stage: Before blossom buds show pink color</p>	Aphids	Aphids	<p>Aphids seldom build up to damaging levels in home garden fruit trees. Wash them off with stream of water from the hose, you rarely have to spray.</p>
	Apple scab	Apple scab	
	Powdery mildew	Powdery mildew	
	Apple and thorn skeletonizer	Apple-and-thorn skeletonizer	<p>Do not apply sulfur spray to Delicious varieties at this time as severe fruit drop can occur later.</p> <p>Make sure spray covers top and bottom of leaves</p>
	Apple rust mites	Apple Rust mite Follow homeowner use only	
	Apple scab	Apple scab	
	Armyworms and Cutworms	Cutworms and Armyworms	

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 <p>Pink stage: blossoms show pink color just before flowers open fully</p>	Brown marmorated stink bug	Brown marmorated stink bug	
	Ermine moth/Tent caterpillars	Ermine moth Tent caterpillars	
	Leaf rollers	Leafroller	
	Powdery mildew	Powdery mildew	
 <p>Bloom: When flowers are open</p>	Apple scab	Apple scab	<p>At bloom time and during spring use pesticides for mildew and scab.</p> <p>Apply in the evening after bees have stopped foraging for the day.</p>
	Powdery mildew	Powdery mildew	
 <p>Petal Fall: Just after flower petals fall</p>	Apple Scab	Apple Scab	<p>Critical time for management of insect pest listed in Pink</p> <p>Monitor from bloom through growing season</p>
	Leafroller	Leafrollers	
	Powdery mildew	Powdery mildew	
	San Jose scale Oystershell scale	San Jose scale	

C041 – Spray Schedule for Apples

Late Spring and Early Summer Starting 17-21 days after full bloom	Apple Maggot	Apple maggot	<p>Check your tree for insect-infested fruit from July to harvest.</p> <p>Reapply after brief, heavy rainfall or showers of longer duration then resume regular schedule.</p> <p>Remove infested apples from the tree, seal in black garbage bags. Leave in sun for two weeks to kill worm.</p>
	Bull's Eye Rot	Anthracnose (Bull's-eye rot) Perennial canker (Bull's-eye rot)	
	Codling moth	Codling moth <p>If the apple is not protected, the egg laid by the codling moth will hatch and the worm will enter the apple and be protected from sprays.</p> <p>Remove infested apples from the tree, seal in black garbage bags. Leave in sun for two weeks to kill worm.</p>	<p>Check your tree for insect-infested fruit from late May to harvest.</p> <p>Product reapplications following label directions are necessary throughout late spring and summer.</p>
Before fall rains and during early leaf fall.	Nectria canker		

Adapted from Chelan-Douglas Counties County Extension and Crop Protection for Tree Fruits in Washington

For Pesticide Safety see: <https://tfrec.cahnrs.wsu.edu/admin/pesticide-safety-handling/>

To report unsprayed trees at homes or on abandoned orchards contact: Spokane County Horticultural Pest and Disease Board: email: PestBoard@spokanecounty.org