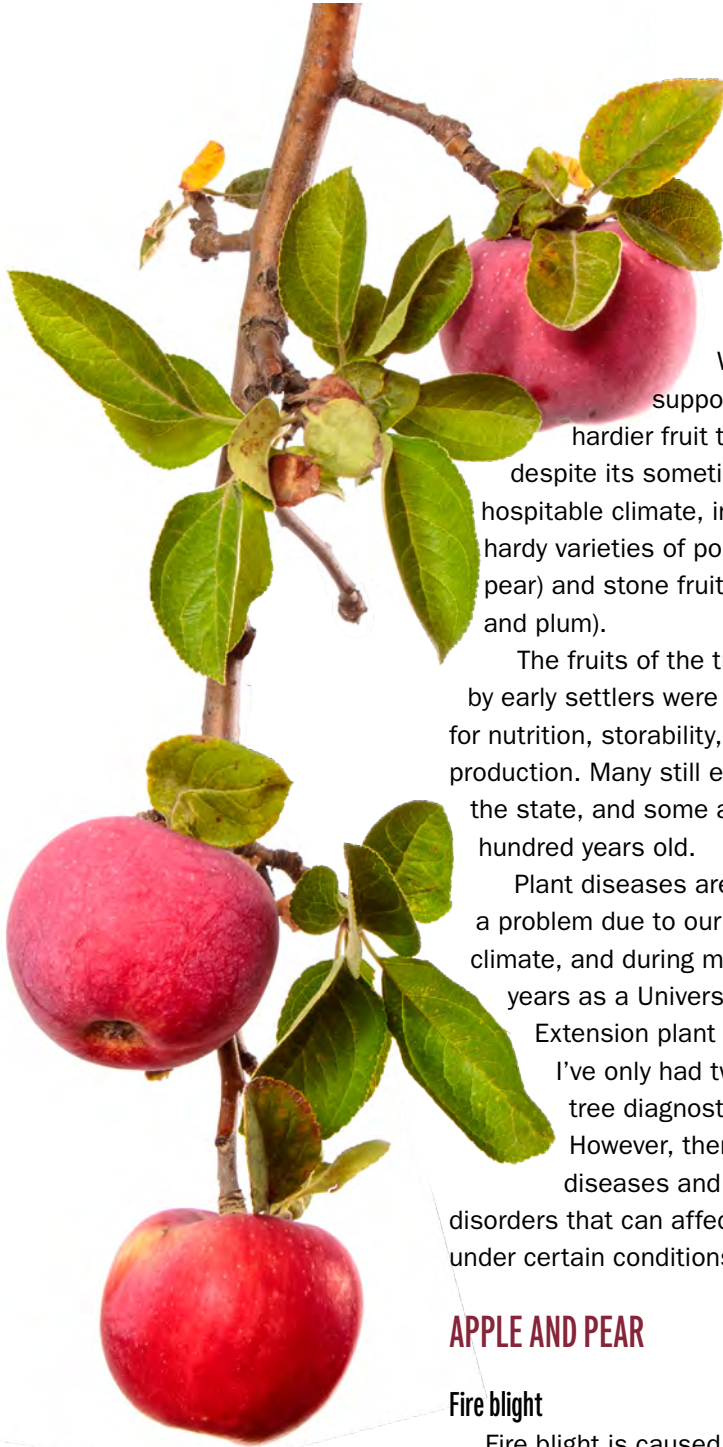


Preventing, pesky fruit



Wyoming can support some of the hardier fruit tree species despite its sometimes less than hospitable climate, including cold hardy varieties of pome (apple and pear) and stone fruits (sour cherry and plum).

The fruits of the trees planted by early settlers were very important for nutrition, storability, and alcohol production. Many still exist throughout the state, and some are well over a hundred years old.

Plant diseases are not normally a problem due to our state's dry climate, and during my six-plus years as a University of Wyoming Extension plant pathologist, I've only had two fruit tree diagnostic samples.

However, there are some diseases and environmental disorders that can affect our trees under certain conditions.

APPLE AND PEAR

Fire blight

Fire blight is caused by the bacterium *Erwinia amylovora* and can be a problem under warm, wet conditions during flowering. This bacterium infects many species in the rose family, which includes most fruit species in Wyoming, and is especially a problem in apple, pear, quince,

and crabapple. Various strains are somewhat host-specific.

Symptoms include a scorched, blackened appearance of leaves, blossoms, and new terminal shoots. Affected young tissue will curl exhibiting a "shepherds crook" symptom. Under warm, humid conditions there are small amber droplets of bacterial ooze on affected tissue and overwintering cankers. Disease favors new growth and is spread by wind, rain, and insects.

Management mostly is preventative. Avoid over-fertilization, which promotes susceptible succulent tissue. During the dormant season, remove infected twigs and branches to prevent the bacterium from overwintering and spreading to the main trunk. Diseased fruits should also be removed and disposed of. Pruning cuts on disease branches should be made 8 to 12 inches below the obvious infection. If pruning must be done during the growing season, sterilize the pruning blade between cuts with a 10 percent bleach solution or a commercial disinfectant. For new plantings, if fire blight is a consistent limiting factor in your area, consider a resistant variety if regionally adapted.

Apple and pear scab

Apple and pear scab are caused by different but closely related fungal diseases that have similar symptoms and management guidelines. Both

solving those tree diseases



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diseases cause foliar spotting of leaves and scabbing of the fruit. The pathogen overwinters on diseased leaves on the ground. During periods of rain or sprinkler irrigation in the spring, spores are released to infect leaves, blossoms, or developing fruit. Disease can continue to spread until conditions become too dry. Typically, these diseases are only a problem during cool, wet springs (55 to 75 degrees F with +9 hours of leaf wetness for initial infection). To manage, remove and dispose of infected leaves after they have fallen. Avoid prolonged wetting of foliage if using sprinklers. Chemical control is only necessary under extremely wet conditions and typically not warranted in Wyoming.

Apple and pear are also susceptible to various fungal rust diseases caused by *Gymnosporangium* species. These diseases can include cedar apple rust (apple) or cedar-hawthorne (apple and pear). These pathogens are unique in that they require an alternate host, *Juniperus* species (cedar), to complete the life cycle. Disease symptoms on apple/pear are prominent yellow-orange foliar lesions. As the disease develops, on the underside of the leaf these lesions will develop noticeable orange-yellow protuberances (fungal fruiting body). Spores produced by these lesions only infect the juniper, which produces orange to brown gelatinous galls

($\frac{1}{4}$ - to 1-inch diameter) known as cedar “apples” the following spring. These in turn produce spores that infect apple/pear. The diseases are considered mostly cosmetic, and control is typically not warranted. Remove the cedar apples from nearby junipers before they release spores in the spring to reduce apple and pear infection.

Powdery mildew

Powdery mildew of apple and pear is caused by the fungus *Podosphaera leucotricha*. This disease can reduce tree vigor, flower bud production, and fruit quality. The fungus overwinters in dormant terminal bud tissue causing systemic infections on new shoots in the spring. These infected buds produce stunted growth and twisted leaves with a silver-grey covering of infectious spores. Infected buds are also more susceptible to winter kill when winter temperatures dip below -18 degrees F.

Secondary disease spread is possible affecting leaves and fruit under conditions of high humidity. Unlike most fungal diseases, leaf wetness is inhibitory to powdery mildew spore germination, but germination does require high humidity. Diseased leaves will twist and can be covered in a whitish-grey, powdery mold-like growth. Fruits will develop russetting in affected areas. To manage, remove infected

buds during the dormant season. Infected buds may be a little smaller and with whitened terminal buds. Use proper pruning to avoid crowded canopies effectively increasing air movement and lowered humidity within the canopy. For sites with perennial powdery mildew problems, investigate resistant cultivars that may be adapted to your area. Fungicide applications during fruit development may protect fruit from russetting, but disease pressure in Wyoming rarely would warrant this.

Environmental disorders of apple and pear include bitter pit and cork spot caused by nutrient calcium imbalances. Bitter pit and cork spot, which is more common in apple than in pear, is characterized by external and internal dark spots that develop in the fruit late in the season or in storage. Manage by avoiding excess fertility, which results in excessive tree vigor (because shoots then compete with fruit for calcium).

SOUR CHERRY AND PLUM (*PRUNUS*)

Cherry leaf spot

Diseases of sour cherry include cherry leaf spot caused by the fungus *Coccomyces hiemalis*. Symptoms include small red-purple spots on the leaves that turn brown and may



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coalesce (merge) over larger areas of the leaf. The tree or shrub will shed affected leaves with increased lesion numbers. Disease overwinters in infected leaves on the ground, and disease development is promoted by warm temperatures and humid conditions. Manage by removing and disposing the infected leaves from the previous season. Cherry leaf spot can be managed with foliar fungicides if applied at early stages of disease.

Black knot

Black knot is another fungal disease caused by *Apiosporina morbosa* that can infect cherry and plum. Symptoms include unique elongated swellings (galls or knots) on the newer shoots of the tree and occasionally on trunks. Knots can reach up to 12 inches long, initially olive green in color with a corky texture, then turning black and becoming hard and brittle. These galls release spores in the spring when wet. Leaves and shoots affected with knots of susceptible trees can wilt and die. Less susceptible trees can tolerate the galls. Manage by pruning out the galls during the winter with cuts at least 4 inches below the gall. Infected material should be burned, buried, or disposed of.

Brown rot

Brown rot (*Monilinia* species) is a potentially serious fungal disease of

Prunus species. Disease can affect blossoms, twigs, and fruit. Symptoms include blossoms that brown, die, and remain attached to the tree, which contrasts with freeze injury in which blossoms fall to ground. The pathogen will infect small twigs resulting in the formation of small twig cankers that often have drops of sticky ooze. Infected, developing fruit will initially have small, firm, brown spots that grow to encompass large portions of the fruit. Infected fruit will dry up and remain attached to the tree. Under periods of high humidity, masses of tan-to-grey spores are apparent on fruit and stem cankers. Disease initiates in the spring as spores from previously infected stem cankers and shriveled fruit on the ground or tree infect blossoms under wet, cool conditions (45 to 70 degrees F) with three to six hours of leaf wetness. Reduced leaf wetness is required with warmer temperatures. Secondary spore production and spread occurs from cankers and infected fruit causing disease to spread the entire summer under proper conditions. Proper sanitation is required for management. Remove infected and overripe fruit and dispose. Prune out diseased twig cankers. Avoid damaging fruit at harvest since the fungus requires injury to infect, thereby reducing post-harvest infections. Fungicide can be used when warranted, applied to protect blossoms and developing fruit.

Powdery mildew

Powdery mildew can also affect *Prunus* fruits reducing tree vigor, flower bud production, and fruit

quality much like powdery mildew on apple/pear. The powdery mildew fungus that affects cherry and plum is *Podosphaera clandestine*. Powdery mildews are very diverse as a group with many different host-specific strains. A powdery mildew affecting a sour cherry/plum will not infect apple/pear tree and vice versa. Disease development, symptoms, and management are similar to powdery mildew on apple/pear.

ENVIRONMENTAL ISSUES

Wyoming's environmental conditions are probably more important than the above diseases to limiting fruit production. These include short growing seasons, desiccating winter winds, extreme temperatures, and early and late frosts. It's not uncommon for little to no fruit being produced in certain years, or trees can fail to become established. When planting new fruit trees, select proper sites and use regionally adapted varieties that will not only survive our conditions but produce fruit. Consult with your local extension educator or respected local nursery for varieties that will work for your location (apple and pear trees can survive and thrive in Wyoming, <https://bit.ly/wyo-apple-pear>).

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William Stump is the lone University of Wyoming Extension plant pathologist standing between your apple and pear trees and a host of diseases ready to raise havoc. He can be reached at (307) 766-2062 or at wstump@uwyo.edu.