Disease and Insect Resistant Ornamental Plants

Mary Thurn, Elizabeth Lamb, and Brian Eshenaur
New York State Integrated Pest Management Program, Cornell University

Pyrus

Pear

Pyrus is a large genus of shrubs and trees in the rose family. *Pyrus communis*, the common or European pear, is grown for its edible fruit. *Pyrus calleryana*, or Callery pear, originally imported from China to breed fire blight resistance into *P. communis*, is grown primarily for ornamental use.

The ornamental Callery pear is one of the most widely grown trees in urban, residential and commercial landscapes. It is known for its early spring profusion of showy white flowers, fast growth and tolerance of difficult growing sites. Since the release of 'Bradford' in 1963, many ornamental cultivars have been introduced.

Unfortunately, this species has invasive tendencies throughout most of its range, particularly in Zone 6 and warmer. When multiple cultivars are planted in the same area, cross-pollination can result in the production of fruit and seeds which can be distributed by birds resulting in stands of 'wild' hybrid Callery pear (19). See *The Rise and Fall of the Ornamental Callery Pear Tree* for a detailed history and current status of the Callery pear.

Like other rosaceous plants, pears are susceptible to a number of diseases including fire blight, scab, rust, and leaf spot. This review includes information on edible and ornamental pears.

DISEASES

Fire Blight is a common bacterial disease of rosaceous plants caused by the bacterium *Erwinia amylovora*. *Pyrus communis* is susceptible, and fire blight is the most serious disease affecting fruiting pears in most production regions of the northern hemisphere (13).

Named for the scorched appearance of affected leaves, blossoms and twigs, fire blight can cause severe damage and tree death in landscapes, nurseries and orchards. Fire blight is favored by warm, humid spring weather. Insects and rain can spread the bacteria. Cultural practices that prolong succulent growth such as excess fertilization and heavy pruning can increase disease incidence and severity.

FIRE BLIGHT				
Species/Hybrids	Cultivar	Reference		
		Resistant	Intermediate	Susceptible
Pyrus betulifolia	Dancer	3		
Pyrus calleryana		20, 44		
Pyrus calleryana	Aristocrat			20, 24, 25, 27, 43
	Autumn Blaze			20, 25, 27
	Bradford	21, 25, 40	3, 20, 25, 27	
	Capital	2, 24	27	20
	Chanticleer® (=Cleveland Select)	3, 20, 24, 42, 43	27	
	Earlyred		27	
	Fauriei*			27
	Javelin	31		
	Redspire	42		20, 27
	Whitehouse	1	27	43
Pyrus canescens		42		
Pyrus canescens	Louisa Link	42		
Pyrus communis				20
Pyrus communis	Abate Fetel (=Abbé Fétel)			43, 45
	Aida	23		
	Alexandrine Douillard			45
	Alexander Lucas	45		
	Anjou			43
	Aurora			43, 45
	Ayers	45	43	
	Bartlett (=Williams)			43, 45
	Beech Hill		42	
	Beurre d'Amanlis		45	
	Beurre d'Anjou			45
	Beurre Bosc			45
	Buerre Clairgeau			43, 45
	Beurre Diel		43, 45	
	Beurre Durondeau			45
	Beurre Giffard	45		
	Beurre Hardenpont		45	
	Beurre Hardy			43, 45
	Blake's Pride	10, 23, 43		
	Blanquilla			45
	Bonne Louise d'Avranches		45	
	Boheme	23		

FIRE BLIGHT				
Species/Hybrids	Cultivar	Reference		
		Resistant	Intermediate	Susceptible
Pyrus communis	Bunte Juli			45
	Butirra Precoce Morettini		45	
	California			43, 45
	Cascade			43, 45
	Charneu		45	
	Clapp's Favorite			43, 45
	Clara Frijs		45	
	Comtesse de Paris			45
	Concorde			45
	Conference		45	43
	Corina	23		
	Coscia			45
	Cure			45
	Dawn		43, 45	
	Devoe			43, 45
	Douglas	43	45	
	Doyenne du Comice			43, 45
	Duchesse d'Angouleme		43, 45	
	Earlibrite			45
	Eldorado			45
	Euras	23		
	Flemish Beauty			43, 45
	Forelle			43, 45
	Garber		43, 45	
	General Leclerc			45
	Getica	23		
	Gorham			43, 45
	Grand Champion			43, 45
	Harrow Delight	23, 43, 45		
	Harrow Sweet	22, 23, 45		
	Harvest Queen		45	
	Haydeea	23		
	Herzogin Elsa			45
	Highland			43, 45
	Honeysweet	43, 45		
	Jules Guyot			45
	Kaiser Alexander		45	
	Kieffer		43, 45	
	Kristally			45

FIRE BLIGHT				
Species/Hybrids	Cultivar	Reference		
		Resistant	Intermediate	Susceptible
Pyrus communis	Laxton's Superb			43, 45
	Lincoln		43, 45	
	Luscious		43, 45	
	Magness	23, 43, 45		
	Maxine	43, 45		
	Monica	23		
	Monterrey	43, 45		
	Moonglow	23, 43, 45		
	Packham's Triumph			43, 45
	Passe Crassane			22, 43, 45
	Pierre Corneille		45	
	Potomac	9, 23, 43, 45		
	Precoce de Trevoux		43	45
	Rogue Red		43, 45	
	Seckel	43	45	
	Shenandoah		12	
	Sierra			43, 45
	Spartlet		43, 45	
	Starkrimson			45
	Triomphe de Vienne			43, 45
	Tyson	43, 45		
	Warren	43, 45		
	Winter Cole			43, 45
	Winter Nelis			43, 45
	Worden Seckel		43, 45	
Pyrus regelii		3	42	
Pyrus salicifolia				21
Pyrus salicifolia	Pendula		42	
Pyrus ussuriensis		20, 44		
Pyrus ussuriensis	Prairie Gem	3		
Pyrus x	AC Harrow Gold	29		
	Chastity™ ('NCPX2' P.A.F.)	30		
	Dixie		43	
	Gem		14	
	NY 10262	43		
	NY 10353	43		
	NY 10355	43		
	Sunrise	13		

*=*P. fauriei* and *P. calleryana* var. *fauriei*, US National Plant Germplasm System

Pear Leaf Spot, caused by the fungus *Fabraea maculata*, occurs in most areas of the world where pears are grown under warm, humid conditions. The disease can cause early defoliation and disfigured fruit–most major cultivars of *P. communis* are susceptible (11).

PEAR LEAF SPOT				
Species/Hybrids	Cultivar	Reference		
		Resistant	Intermediate	Susceptible
Pyrus calleryana		8		
Pyrus calleryana	Whitehouse			20
Pyrus communis	Bartlett (=Williams)		11	
	Beurre Fouqueray		11	
	Maxine		11	
	Moonglow		11	
Pyrus pyrifolia	Imamura Aki		8, 11	
	Japan Golden Russet		8, 11	
Pyrus x	Gem			14
	Sunrise			13

Pear Trellis Rust is a new disease affecting edible and ornamental pear species. Caused by *Gymnosporangium sabinae* this fungus produces orange spots which in the fall develop into raised, wart-like galls on the underside of pear leaves. The severity of the disease varies from year to year based on spring weather conditions. Wet weather during pear leaf development will result in more severe disease and can lead to significant defoliation. Work is underway to characterize potential resistance in ornamental pear cultivars.

Scab is a common fungal disease on many plants in the rose family. In the Western Hemisphere and Europe, pear scab is caused by the pathogen *Venturia pyrina*. Host plants include most cultivars of P. communis, and it is an economically significant disease in commercial orchards worldwide (41). In the Pacific Northwest, cultivars 'Bartlett Red Sensation' and 'Forelle' are particularly susceptible (36). Symptoms include lesions on leaves, flowers and fruit.

PEAR SCAB		
Species/Hybrids	Cultivar	Reference
		Resistant
*Pyrus amygdaliformis**		40
*Pyrus calleryana**		40
*Pyrus pyrifolia**		40
Pyrus communis	Abate Fetel (=Abbé Fétel)	32, 41
	David®	23
	Delice d'Avril	23
	Delta®	23
	D'Aout Amer	23
	Elektra®	23
	Gerburg®	23
	Hermann®	23

PEAR SCAB		
Species/Hybrids	Cultivar	Reference
		Resistant
Pyrus communis	Hortensia®	23
	Isolda®	23
	Madame Favre	23
	Monica®	23
	Muscat	23
	Navara	23, 41
	Uta®	23
	Wilder	23
	Winter Nelis	23
*Pyrus ussuriensis**		40
*hybrids between these species & *P. communis*		40

INSECTS

Pear Psyllids, *Cacopsylla pyricola* in North America and *C. pyri* in Europe, are serious pests of *P. communis* in commercial pear orchards and may be found wherever the crop is grown (15, 32, 35). Ornamental pear species do not appear to be susceptible to this insect (18). Psyllids feed on leaf sap and secrete honeydew, a sticky liquid that attracts certain fungi resulting in sooty mold infections on leaf and fruit surfaces.

PEAR PSYLLA				
Species	Cultivar	Reference		
		Resistant	Intermediate	Susceptible
Pyrus betulaefolia		15		
Pyrus bretschneideri	W6	38		
Pyrus calleryana	Bradford	16, 17, 46		
Pyrus communis	Bartlett (=Williams)			4, 5, 7, 15, 16, 17, 37, 39
	Batjarka	4, 6, 43		
	Corina	23		
	D'Août Lamer		39	
	Doyennée de Comice			15
	Doyenné de Poitiers		39	
	Erabasma	7, 43		
	Général de Leclerc			15
	Getica	23		
	Haydeea	23		
	Honeysweet	38		
	Ina-Estival	23		
	Jeribasma	5, 43		

PEAR PSYLLA				
Species	Cultivar	Reference		
		Resistant	Intermediate	Susceptible
Pyrus communis	Junsko Zlato			5
	Kajzerka	4, 43		
	Karamanka	5		
	Karamanlika	7, 43		
	Katman	7, 39, 43		
	Krupan Burnusus	7, 43	37	
	Lida			5
	Lucele	4, 43		
	Mednik	7, 37, 43		
	Monica	23		
	Monterrey			16
	Moonglow			15
	Nadejda			5
	Obican Vodenac	7		37
	Oranzhevaja			5
	Orlovskaya			5
	Smokvarka	7, 43		
	Seckel			16
	Sierra	38		
	Spina Carpi	39, 43		
	Topka	7, 43		
	Tudor	23		
	Vodenjac	5, 43		
	Zelinka	6, 7, 37, 43		
	Fauriei*	46		
Pyrus pyrifolia		15		
Pyrus pyrifolia	Hosui	15		
Pyrus ussuriensis		15, 28		
Pyrus ussuriensis	Harbin	38		
	Swanni	38		
Pyrus x	BP6	39		
	BP81	39		
	Erabasma	7, 43		
	Gem			14
	Golden Spice	38		
	Gutui	39		
	NY 10262	43		
	NY 10352	7, 16	17, 37	

PEAR PSYLLA				
Species	Cultivar	Reference		
		Resistant	Intermediate	Susceptible
Pyrus x	NY 10353	5, 43		
	NY 10355	16, 39, 43		
	P20R5A70	39		
	Philip	38		
	SEL80-79-69		39	
	Smokvarka	7, 43		
	Sunrise			13
	Swanni	38		
	Tait-Dropmore	38		

*=*P. fauriei* and *P. calleryana* var. *fauriei*, US National Plant Germplasm System

Japanese Beetle, *Popillia japonica*, is a foliage feeder of many landscape plants. Resistance is reported for *P. calleryana* 'Bradford' and *P. communis* (26, 33).

Asian Longhorned Beetle, *Anoplophora glabripennis*, is a wood-boring beetle native to Asia. First discovered in the US in 1996 in Brooklyn, NY, it has since been found in four other states and Canada and is currently a federally quarantined pest. Efforts are being made to eliminate Asian longhorned beetle infestations. Larval feeding underneath the bark interferes with transport of water and nutrients, eventually killing the tree.

Maple and poplar are preferred, but many hardwood trees are potential hosts. Resistance is reported for *P. calleryana* (34).

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OTHER RESOURCES

"Missouri Botanical Garden." missouribotanicalgarden.org

"Woody Plants Database." *Urban Horticulture Institute*, Cornell University, woodyplants.cals.cornell.edu/plant/search

New York State Integrated Pest Management Program

Cornell Cooperative Extension

Produced by the New York State Integrated Pest Management Program, which is funded through Cornell University, Cornell Cooperative Extension, the New York State Department of Agriculture and Markets, the New York State Department of Environmental Conservation, and USDA-NIFA. Design by Karen English, New York State IPM Program. Cornell Cooperative Extension provides equal program and employment opportunities. Posted 5/2019. Search for this title at the NYSIPM Publications collection: ecommons.cornell.edu/handle/1813/41246