



Disease and Insect Resistant Ornamental Plants

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ACER

Maple

Acer is a genus of about 120 species of maple trees and shrubs. Offering a wide range of choices for size, growth habit, leaf shape and brilliant fall color, maples are frequently found in residential and commercial landscapes, as well as parks and other public places.

Many species, including the popular Japanese maple (*A. palmatum*) are native to Asia. However, some of the most commonly grown—red maple (*A. rubrum*), silver maple (*A. saccharinum*) and sugar maple (*A. saccharum*)—are native to North America.



DISEASES

Anthracnose is a common fungal disease of shade trees. Prevalent following cool, wet spring weather, it is usually an aesthetic issue on maple and will not cause lasting problems. Symptoms vary by host and pathogen, but generally appear as irregularly-shaped lesions on leaves. Anthracnose caused by *Discula campestris* affects *A. saccharum* and occasionally *A. rubrum* (17). Researchers at Auburn University in Alabama report several resistant and susceptible cultivars of sugar maple.

Anthracnose			
Species	Cultivar	Reference	
		Resistant	Susceptible
<i>Acer saccharum</i>	Autumn Blush	3	
	Autumn Faith	3	
	Endowment		3
	Fairview		3
	Fall Fiesta	3	
	Flax Mill Majesty		3
	Goldspire		3
	Legacy	3	
	Morton		3

Anthracnose			
Species	Cultivar	Reference	
		Resistant	Susceptible
<i>Acer saccharum</i>	Seneca Chief		3
	Sugar Queen		3
	Sweet Shadow		3

Tar Spot infection of maple is caused by several fungi in the genus *Rhytisma* which cause raised, black spots to form on upper leaf surfaces. While the disease rarely causes lasting damage to the health of trees, the spots are unsightly and heavy infections can result in early leaf drop (19).

Maple species susceptible to both *R. americanum* and *R. punctatum* include *A. glabrum* (Rocky Mountain maple), *A. macrophyllum* (bigleaf maple), *A. negundo* (box-elder), *A. pseudoplatanus* (sycamore maple), *A. rubrum* (red maple), *A. saccharinum* (silver maple), *A. saccharum* (sugar maple), and *A. spicatum* (mountain maple). Species susceptible to *R. acerinum* include *A. campestre* (hedge maple), *A. ginnala* (Amur maple), and *A. platanoides* (Norway maple) (17).

New Mexico State University reports *A. grandidentatum* (bigtooth maple) ‘JFS-NuMex3’ Mesa Glow® has improved resistance to tar spot fungus and powdery mildew (18).

Verticillium Wilt caused by the soil-borne fungus *Verticillium dahliae* is a disease of *Acer* spp. and other woody plants. It is the most destructive disease of ornamental maples (2) and damage is common in nurseries and landscapes (17). The fungus interferes with transport of water and can cause leaf wilt, defoliation, branch dieback, and death. Symptoms are variable and difficult to diagnose in the field—if suspected, send a sample to a diagnostic lab for confirmation. The fungus can live in soil for years, so it’s best not to plant susceptible species such as maple in sites with a history of the disease.

Norway maple* is especially susceptible to verticillium wilt. The cultivars ‘Jade Glen’ and ‘Parkway’ are reported to be tolerant (21). Red and sugar maples (*A. rubrum*, *A. saccharum*) are more resistant than Norway or silver maples (*A. platanoides*, *A. saccharinum*) (25).

*Norway maple (*A. platanoides*) is considered invasive in much of the US. In New York State, it is a regulated plant by the Dept. of Agriculture and Markets Invasive Species Regulations (dec.ny.gov/docs/lands_forests_pdf/isprohibitedplants2.pdf). Regulated plants may be sold but must have a warning label indicating the potential for invasive spread.

Find alternatives to invasive regulated plants at: nysipm.cornell.edu/agriculture/ornamental-crops/greenhouse-resources/alternatives-ornamental-invasive-plants-sustainable-solution-new-york-state

INSECTS

Japanese Beetle, *Popillia japonica*, is a common foliage feeder of many landscape plants. Red and silver maples (*A. rubrum*, *A. saccharinum*) are resistant and rarely fed on, while Japanese and Norway maples (*A. palmatum*, *A. platanoides*) are susceptible (4, 12).

Japanese Beetle		
Species/Hybrids	Cultivar	Reference
		Resistant
<i>Acer campestre</i>	Queen Elizabeth™ (‘Evelyn’)	5
	Metro Gold® (‘Panacek’)	6
	Streetside® (‘JFS Schichtel2’)	7
<i>Acer saccharum</i>	Apollo® (‘Barrett Cole’)	1, 8
	Autumn Blush	1
<i>Acer truncatum</i> x <i>A. platanoides</i>	Pacific Sunset® (‘Warrenred’)	9

Potato Leafhopper, *Empoasca fabae*, has more than 200 plant hosts and is mostly known as a field crop pest. Many ornamental plants, including maples, can also be affected. Feeding injury by nymphs and adults, known as “hopperburn”, causes leaves to curl and turn brown at the margins. Injury on healthy mature trees is primarily aesthetic. Nursery stock may sustain more serious injury, particularly *A. rubrum* (15, 16).

Potato Leafhopper		
Species/Hybrids	Cultivar	Reference
		Resistant
<i>Acer campestre</i>		16
<i>Acer platanoides</i>	Emerald Queen	15
	Parkway	15
<i>Acer rubrum</i>	Brandywine	14, 20, 23
	Cumberland	20
	New World	14
	Red Rocket	14, 20
	Somerset	20, 24
	Sun Valley	20, 24
<i>Acer x freemanii</i>	Autumn Blaze® ('Jeffersred')	15, 20
	Indian Summer® ('Morgan')	20
<i>Acer truncatum</i> x <i>A. platanoides</i>	Pacific Sunset® ('Warrenred')	16

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 underway to eradicate Asian longhorned beetle infestations. Larval feeding underneath the bark interferes with transport of water and nutrients, eventually killing the tree.

The Asian longhorned beetle has a broad host range of hardwood trees, but maples are highly preferred (13). According to the USDA Animal and Plant Health Inspection Service, Amur maple (*A. ginnala*) is less favored and Japanese maple (*A. japonicum*) is seldom attacked (22).

Bagworm, *Thyridopteryx ephemeraeformis*, feeds on more than 125 plant species and is a common pest on many evergreen and deciduous ornamental trees and shrubs, including maple (10). Larvae feed on foliage, binding leaves together to form bag enclosures to overwinter eggs. A severe infestation can defoliate and kill plants. Researchers at the University of Tennessee report paperbark maple (*A. griseum*) and Trident maple (*A. buergeranum*) are resistant maple alternatives (11).

REFERENCES

1. Blackwood, K.R., J.L. Sibley, C.H. Gilliam, J.D. Williams, and A.W. Caylor. 2005. Japanese beetle feeding preference among sugar maple cultivars. Proc. Southern Nurs. Assoc. Res. Conf. 50:170-172.
2. Gleason, M., and J. Hartman. 2001. Maple diseases, pp. 236-241. In: R.K. Jones and D.M. Benson, editors. Diseases of Woody Ornamentals and Trees in Nurseries. APS Press, St. Paul, MN.
3. Hagan, A.K., K.L. Bowen, K.N. Conner, J.L. Sibley, and A.W. Caylor. 2016. Reaction of selected cultivars of sugar maple to anthracnose in North Alabama. Plant Health Progress 17(4):273-278. doi: [10.1094/PHP-RS-16-0047](https://doi.org/10.1094/PHP-RS-16-0047)
4. Held, D.W. 2004. Relative susceptibility of woody landscape plants to Japanese beetles (Coleoptera: Scarabaeidae). J. Arboric. 30(6):328-335.

5. J. Frank Schmidt & Son Co. "Acer campestre 'Evelyn' Queen Elizabeth™ Maple" JFS Introductions. jfschmidt.com/introductions/queenelizabeth/index.html
6. J. Frank Schmidt & Son Co. "Acer campestre 'Panacek' Metro Gold® Maple" JFS Introductions. jfschmidt.com/introductions/metrogold/index.html
7. J. Frank Schmidt & Son Co. "Acer campestre 'JFS Shichtel2' Streetside® Maple" JFS Introductions. jfschmidt.com/introductions/streetside/index.html
8. J. Frank Schmidt & Son Co. "Acer saccharum 'Barrett Cole' Apollo® Maple" JFS Introductions. jfschmidt.com/introductions/apollo/index.html
9. J. Frank Schmidt & Son Co. "Acer truncatum x Acer platanoides 'Warrenred' Pacific Sunset® Maple" JFS Introductions. jfschmidt.com/introductions/pacificsunset/index.html
10. Johnson, W.T., and H.H. Lyon. 1991. *Insects that Feed on Trees and Shrubs*. 2nd Ed. Cornell Univ. Press, Ithaca, NY.
11. Klingeman, W.E. 2001. Bagworm feeding preferences among native and ornamental maples. *Proc. Southern Nurs. Assoc. Res. Conf.* 46:184-189.
12. Loughrin, J.H., D.A. Potter, T.R. Hamilton-Kemp, and M.E. Byers. 1997. Response of Japanese beetles (Coleoptera: Scarabaeidae) to leaf volatiles of susceptible and resistant maple species. *Environ. Entomol.* 26(2):334-342. doi: [10.1093/ee/262.334](https://doi.org/10.1093/ee/262.334)
13. Meng, P.S., K. Hoover, and M.A. Keena. 2015. Asian longhorned beetle, an introduced pest of maple and other hardwood trees in North America and Europe. *J. Integ. Pest Mngmt.* 6(1):1-13. doi: [10.1093/jipm/pmv003](https://doi.org/10.1093/jipm/pmv003)
14. Pooler, M.R. 2001. Plant breeding at the U.S. National Arboretum: Selection, evaluation, and release of new cultivars. *HortTechnology* 11(3):365-367.
15. Potter, D.A., and P.G. Spicer. 1993. Seasonal phenology, management, and host preferences of potato leafhopper on nursery-grown maples. *J. Environ. Hort.* 11(3):101-106.
16. Seagraves, B.L., C.T. Redmond, and D.A. Potter. 2013. Relative resistance or susceptibility of maple (Acer) species, hybrids, and cultivars to six arthropod pests of production nurseries. *Pest Mngt. Sci.* 69(1):112-119. doi: [10.1002/ps.3375](https://doi.org/10.1002/ps.3375)
17. Sinclair, W., and H.H. Lyon. 2005. *Diseases of Trees and Shrubs*. 2nd Ed. Cornell Univ. Press, Ithaca, NY.
18. St. Hilaire, R. 2018. 'JFS-NuMex 3': Mesa Glow® bigtooth maple. *HortScience* 53(5):734-736. doi: [10.21273/HORTSCI12881-18](https://doi.org/10.21273/HORTSCI12881-18)
19. "Tar Spot of Maple: *Rhytisma* spp." Plant Disease Diagnostic Clinic, Cornell University. plantclinic.cornell.edu/factsheets/tarspotofmaple.pdf
20. Townsend, A.M., and L.W. Douglass. 1998. Evaluation of various traits of 40 selections and cultivars of red maple and Freeman maple growing in Maryland. *J. Environ. Hort.* 16(4):189-194.
21. Townsend, A.M., L.R. Schreiber, T.J. Hall, and S.E. Bentz. 1990. Variation in response of Norway maple cultivars to *Verticillium dahliae*. *Plant Disease* 74(1):44-46. doi: [10.1094/PD-74-0044](https://doi.org/10.1094/PD-74-0044)
22. USDA-APHIS-PPQ, Center for Plant Health Science and Technology, Otis Laboratory. aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases/asian-longhorned-beetle/ct_asian_longhorned_beetle
23. U.S. National Arboretum Plant Introduction. 2004. *Acer rubrum* 'Brandywine'. usna.usda.gov/assets/images/as_standard_image/Acer_rubrum_Brandywine.pdf
24. U.S. National Arboretum Plant Introduction. 1999. *Acer rubrum* 'Somerset' and 'Sun Valley'. usna.usda.gov/Newintro/somerset.pdf
25. "Verticillium Wilt Refresher". 2007, July 13. *Branching Out: An Integrated Pest Management Newsletter for Trees and Shrubs*, Vol. 14, No. 7.

OTHER RESOURCES

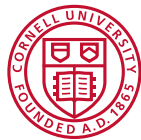
Dirr, Michael A. 2009. *Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses*. 6th ed. Stipes Publishing L.L.C., Champaign, IL.

Dirr, Michael A. 2011. *Dirr's Encyclopedia of Trees & Shrubs*. 1st Ed. Timber Press, Inc., Portland, OR.

Frank, S.D., W.E. Klingeman, N.A. Ward, S.A. White, and A.F. Fulcher. 2012. Maples – *Acer* spp., Chapter 10. In: A.F. Fulcher and S.A. White, editors. *IPM for Select Deciduous Trees in Southeastern US Nursery Production*. wiki.bugwood.org/IPM_book

“Missouri Botanical Garden.” missouribotanicalgarden.org

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



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