

The Resistance of Montreal's Trees and Shrubs to Ice (1998)

Observations made by the staff of the Department of Parks, Gardens and Green Spaces (City of Montreal)

Weak	Moderate	Strong
Abies balsamifera*	Acer negundo	Acer (asian dwarf)
Acer ginnala	Acer platanoides	Acer Fremani (red x sugar)
Acer negundo	Acer rubrum	Acer platanoides (columnare)
Acer pensylvanicum	Acer saccharinum	Acer rubrum (Armstrong)
Acer platanoides (Globosum)	Acer saccharum	Acer saccharum
Acer rubrum	Betula alleghaniensis*	Acer saccharinum (pyramida.)
Acer saccharinum	Carya sp.	Aesculus sp.
Acer tataricum	Celtis occidentalis	Amelanchier sp.
Alnus sp.	Crataegus sp.	Carpinus caroliniana
Betula papyrifera	Fagus grandifolia	Carya sp.
Betula populifolia	Fraxinus nigra	Catalpa sp.
Betula (introduced sp)	Fraxinus americana	Cornus sp.
Celtis occidentalis	Gleditsia sp.	Corylus colurna
Crataegus sp.	Juglans sp.	Crataegus crus-galli
Eleagnus angustifolia	Malus sp.	Crataegus chrysocarpa
Euonymus compacta	Ostrya virginiana	Crataegus punctata
Fraxinus pennsylvanica	Phellodendron amurense	Fraxinus americana
Gleditsia sp.	Pinus strobus*	Ginkgo biloba
Juniperus (conical)	Pinus nigra	Gymnocladus dioicus
Lonicera (not trimmed)	Populus deltoides	Hamamelis sp.
Pinus banksiana*	Populus simonii (fastigiata)	Juglans sp.
Pinus resinosa*	Prunus virginiana (Shubert)	Juniperus (crawling)
Platanus occidentalis	Quercus rubra	Larix sp.
Populus deltoides	Sorbus sp.	Magnolia (Merryl)
Prunus serotina	Tilia cordata	Malus (upright specimens)
Prunus virginiana*	Ulmus americana	Morus alba
Quercus coccinea		Ostrya virginiana
Robinia pseudoacacia		Phellodendron amurense
Rhus sp.		Picea abies
Salix sp.		Picea glauca
Thuja (multiple stems)		Picea pungens
Ulmus americana (and cultivars)		Pinus nigra
Ulmus rubra		Populus alba (pyramidalis)

Populus nigra (italica)
Populus simonii (fastigiata)
Populus canescens (towers)
Prunus padus
Quercus alba
Quercus bicolor
Quercus macrocarpa
Quercus palustris
Quercus rubra
Quercus robur (fastigiata)
Sorbus sp.
Syringa reticulata
Thuja (with one trunk)
Tilia cordata (with single
leader)
Tsuga canadensis *
Ulmus glabra (camperdownii)

**Information drawn from : B. Boulay (1998). The ice storm of 1998 (The probable consequences in the affected forested areas). Ministère des ressources naturelles du Québec. Direction de la conservation des forêts. 15 p.*

APPENDIX 2 : The Resistance of Montreal's Trees and Shrubs to Ice (1998)

Observations made by the staff of the Department of Parks, Gardens and Green Spaces
(City of Montreal)

Weak

- Abies balsamifera*
- Acer ginnala
- Acer negundo
- Acer pensylvanicum
- Acer platanoides (Globosum)
- Acer rubrum
- Acer saccharinum
- Acer tataricum
- Alnus sp.
- Betula papyrifera
- Betula populifolia
- Betula (introduced sp.)
- Celtis occidentalis
- Crataegus sp.
- Eleagnus angustifolia
- Euonymus compacta
- Fraxinus pennsylvanica
- Gleditsia sp.

- Juniperus (conical)
- Lonicera (not trimmed)
- Pinus banksiana*
- Pinus resinosa*
- Platanus occidentalis
- Populus deltoides
- Prunus serotina
- Prunus virginiana*
- Quercus coccinea
- Robinia pseudoacacia
- Rhus sp.
- Salix sp.
- Thuja (multiple stems)
- Ulmus americana (and cultivars)
- Ulmus rubra

Moderate

- Acer negundo
- Acer platanoides
- Acer rubrum
- Acer saccharinum
- Acer saccharum
- Betula alleghaniensis*
- Carya sp.
- Celtis occidentalis
- Crataegus sp.
- Fagus grandifolia
- Fraxinus nigra
- Fraxinus americana
- Gleditsia sp.
- Juglans sp.
- Malus sp.
- Ostrya virginiana
- Phellodendron amurense
- Pinus strobus*
- Pinus nigra
- Populus deltoides
- Populus simonii (fastigiata)
- Prunus virginiana (Shubert)
- Quercus rubra
- Sorbus sp.
- Tilia cordata
- Ulmus americana

Strong

- Acer (asian dwarf)

- Acer Fremani (red x sugar)
- Acer platanoides (columnare)
- Acer rubrum (Armstrong)
- Acer saccharum
- Acer saccharinum (pyramida.)
- Aesculus sp.
- Amelanchier sp.
- Carpinus caroliniana
- Carya sp.
- Catalpa sp.
- Cornus sp.
- Corylus colurna
- Crataegus crus-galli
- Crataegus chrysocarpa
- Crataegus punctata
- Fraxinus americana
- Ginkgo biloba
- Gymnocladus dioicus
- Hamamelis sp.
- Juglans sp.
- Juniperus (crawling)
- Larix sp.
- Magnolia (Merryl)
- Malus (upright specimens)
- Morus alba
- Ostrya virginiana
- Phellodendron amurense
- Picea abies
- Picea glauca
- Picea pungens
- Pinus nigra
- Populus alba (pyramidalis)
- Populus nigra (italica)
- Populus simonii (fastigiata)
- Populus canescens (towers)
- Prunus padus
- Quercus alba
- Quercus bicolor
- Quercus macrocarpa
- Quercus palustris
- Quercus rubra
- Quercus robur (fastigiata)
- Sorbus sp.
- Syringa reticulata
- Thuja (with one trunk)
- Tilia cordata (with single leader)
- Tsuga canadensis *
- Ulmus glabra (camperdownii)

**Information drawn from : B. Boulay (1998). The ice storm of 1998 (The probable consequences in the affected forested areas). Ministère des ressources naturelles du Québec. Direction de la conservation des forêts. 15 p.*

APPENDIX 1 : Criteria To Classify The Resistance Of Trees To Ice Storms

A. Weak Degree of Resistance (not in order)

- fast growing tree
- tree with a weak apical dominance (without a central axis)
- tree with fairly weak wood that breaks easily
- tree with its crown invaded by insects and rot fungi
- a drought stressed tree growing in poor light conditions
- tree with included bark
- tree with primary branch without secondary branches between its fork and its end
- tree with overpruned branches
- tree with leaves that stay attached during winter (Quercus, Fagus)
- tree with horizontal or elongated branches
- tree with bad formation cuts
- tree with many small and thin branches
- tree with too many branches (different orders) that grows in open spaces
- tree with V shaped crown
- tree with frost cracks near the main crotch
- tree that bears fruits during winter
- tree with rotten wood near its main crotch

b. Moderate and Strong Degree of Resistance (not in order)

- tree with a strong apical dominance with one central axis
- tree with big branch structures
- tree with very few small crotches
- tree with a short and stout crown
- tree with flexible branches
- tree with an upward and elongated crown
- native species
- tree that has not been overpruned
- tree with predisposed genetic baggage