

A Classification of Hardy North American *Prunus* Cultivars and Native Species Based on Hardiness Zones

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The *Prunus* have been placed into hardiness zones according to the most northern areas in which they have been reported to grow without much winter injury.²

Table 1 is a list of the hardy native *Prunus* species of North America. They have been placed into hardiness zones based on their reported natural ranges.

Table 2 is a list of *Prunus* cultivars that have been reported hardy or growing with minimal injury in the range of hardiness zones from 4b (-30° to -20° F) to 1 (below -50° F). A cultivar is assumed to be hardy in the zone where it originated, therefore, the hardiness zone to which a cultivar is assigned corresponds to the hardiness zone in which it originated. The named cultivars were assumed to be adequately tested at their places of origin or at an experiment station before their release. Cultivar selection and release dates are included, when available, to indicate the length of the testing period before their release.

Figure 1 is a USDA plant hardiness zone map.³ The map is divided into zones of 10° F temperature differences according to the approximate range of the average annual minimum temperatures. Each zone is subdivided into two sections which indicate 5° F temperature differences. The section labeled "a" is the more northerly and this is the colder of the two.

This paper provides a broad look at *Prunus* hardiness in the northern United States and Canada. A classification such as this could be valuable

to the breeder in his search for cold hardy germplasm.

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²The classification scheme used in this paper is based on the scheme used by J. G. Strang and C. Stushnoff in "A Classification of Hardy North American Apple Cultivars Based on Hardiness Zones." *Fruit Varieties Journal* vol. 29 no. 4.

³*Fruit Varieties Journal* vol. 29 no. 4.

Table 1. Hardiness zones and characteristics of native *Prunus* species.

Native species	Growth habit	Fruit characteristics	Miscellaneous information	Reference
HARDINESS ZONE 4a (—30° to —20°F)				
<i>Prunus serotina</i> Black Cherry	tree 60-70' tall shrubby at N. limit	bitter but edible matures late Aug. or early Sept.	wood valuable for furniture	7, 31, 32
HARDINESS ZONE 3a (—40° to —30°F)				
<i>P. americana</i> Wild Plum	shrub or small tree to 30' suckers & produces thickets	tart	sometimes used as a rootstock but produces suckers	7, 31, 32
<i>P. besseyi</i> Western Sand Cherry	shrub, sprawling habit makes it of little use for ornamental purposes	bitter & astringent		7, 29, 30, 31
<i>P. nigra</i> Canada Plum	small tree up to 30' tall	sour ripens mid Aug. to early Sept.		7, 31, 32
<i>P. pumila</i> Sand Cherry	shrub 1½ to 5' tall	ripens late July & Aug.		7, 30, 35
HARDINESS ZONE 1 (below —50°F)				
<i>Prunus pennsylvanica</i> Pin Cherry	tree 40-50' tall	sour but edible matures late Aug. to early Sept.		7, 31, 32
<i>P. virginiana</i> Choke Cherry	shrub suckering growth	astringent but edible matures late Aug. or early Sept.	susceptible to X-virus disease	7, 31, 32

Table 2. Hardiness zones, parentage, origin, and relative hardiness of hardy *Prunus* cultivars.*

Cultivar	Parentage	Date /Date sel. / intro.	Origin	Relative hardiness	Reference
HARDINESS ZONE 4b (—30° to —20°F)					
Peach					
Gurney's Dakota	OP sdlg of Elberta	1921/1928	Yankton, S.D.	Ob	17, 24
Plum					
Dietz	<i>P. domestica</i>		St. Peter, Mn.		5
Splendid	sdlg of an American spp.	1930	Faribault, Mn.		17, 24
HARDINESS ZONE 4a (—30° to —20°F)					
Apricot					
Anda	sdlg <i>P. mandshurica</i>	1924/1936	Brookings, S.D.	H	10, 24
Chow	seed from Manchuria	1936/1936	Brookings, S.D.	VH	16, 24
Harbin	sdlg seed from Northern Manchuria	1944/1944	Brookings, S.D.	VH	20, 24
Harriet		1933/1942	St. Paul, Mn.	H	24
Hulan	sdlg seed from Northern Manchuria	1936/1936	Brookings, S.D.	VH	20, 24
Lalin	sdlg seed from Northern Manchuria	1936	Brookings, S.D.	VH	20, 24
Manchu	sdlg <i>P. sibirica</i>	1924/1936	Brookings, S.D.	H	5, 10, 24
Mandarin	sdlg seed from Northern Manchuria	1936/1936	Brookings, S.D.	VH	20, 24
Moongold	Superb x Manchu	1961	Excelsior, Mn.		5, 18, 24
Ninguta	sdlg <i>P. sibirica</i>	1924/1937	Brookings, S.D.	H	10, 24
Sansin	sdlg seed from Northern Manchuria	1936/1936	Brookings, S.D.	VH	20, 24
Sing	sdlg <i>P. mandshurica</i>	1924/1936	Brookings, S.D.	H	10, 24
Sino	<i>P. sibirica</i> (Manchurian strain)	1936/1936	Brookings, S.D.	VH, Ob	5, 24
Sungold	Superb x Manchu	1961	Excelsior, Mn.	VH	5, 18, 24
Sunshine	OP sdlg of Siberian apricot	1940/1950	Brookings, S.D.	H	11, 24
Tola	sdlg <i>P. sibirica</i>	1924/1936	Brookings, S.D.	H	5, 10, 24
Zun	sdlg seed from Northern Manchuria	1936/1936	Brookings, S.D.	VH	20, 24
Cherry					
Mesabi	Bing x a chance sdlg considered to be <i>P. cerasus</i>	1954/1964	Duluth, Mn.	VH	22, 24
Meteor	Montmorency x a selection of a Russian type tracing back 2 or more genera- tions to the vars. Vladimir & Shabianka	1952	Excelsior, Mn.	VH	3, 5, 18, 24

*Abbreviations for Table 2

H = Hardy
VH = Very hardy
EH = Extremely hardy

OP = Open pollinated
Ob = Obsolete variety
sdlg = Seedling

Cultivar	Parentage	Date /Date sel. / intro.	Origin	Relative hardiness	Reference
HARDINESS ZONE 4a (—30° to —20°F) continued					
Northstar	English Morello x Serbian Pie #1	1942/1950	Excelsior, Mn.	VH	2, 11, 24
Orient	self-pollinated sdlg <i>P. tomentosa</i>	1940/1949	Excelsior, Mn.		10, 24
Cherry Plums					
Deep Purple	<i>P. besseyi</i> 'Sioux' x <i>P. salicina</i> 'Elephant Heart'	1947/1965	Excelsior, Mn.	VH	6, 23, 24
Honey Dew	<i>P. besseyi</i> x (<i>P. americana</i> x <i>P. salicina</i>) 'Shiro'	1930/1950	Brookings, S.D.	H	13, 24
Mana	<i>P. besseyi</i> x <i>P. salicina</i> 'Burbank'	1933	Brookings, S.D.	Ob	24
Nicollet	(<i>P. avium</i> x <i>P. pennsylvanica</i>) x <i>P. besseyi</i>	1916/1925	Excelsior, Mn.	H	9, 24
Oka	OP sdlg Champa	1924	Brookings, S.D.	H	13, 24
St. Anthony	<i>P. besseyi</i> x <i>P. salicina</i> 'Satsuma'	1915/1923	Excelsior, Mn.	H	9, 24
Sanoba	Sapa x <i>P. besseyi</i>	1929	Brookings, S.D.		16, 24
Zumbra	(<i>P. avium</i> x <i>P. pennsylvanica</i>) x <i>P. besseyi</i>	1916/1920	Excelsior, Mn.	VH	4, 9, 24
Peach					
Manitou	siberian almond (<i>P. tenella</i>) x Bokhara peach (<i>P. persica</i>)	1923	Excelsior, Mn.		5
Plum					
Anoka	<i>P. salicina</i> 'Burbank' x <i>P. americana</i> 'DeSoto'	1918/1922	Excelsior, Mn.	H Ob	9, 24
Assiniboine	<i>P. nigra</i>	1908	Brookings, S.D.	H	5, 8
Elliot	<i>P. salicina</i> x <i>P. americana</i>	1911/1920	Excelsior, Mn.	VH	5, 9, 24
Ember	Shiro x S.D. no. 33	1918/1936	Excelsior, Mn.	H	5, 8, 9, 24
Fiebing	<i>P. salicina</i> 'Wickson' x (<i>P. americana</i> x <i>P. simonii</i>) 'Kaga'	1929/1929	Deephaven, Mn.	VH	8, 10, 24
Hennepin	<i>P. salicina</i> 'Satsuma' x <i>P. americana</i>	1918/1923	Excelsior, Mn.	H	9, 24
Kota	<i>P. americana</i> x <i>P. simonii</i>	1939	Brookings, S.D.		12, 24
La Crescent	(<i>P. americana</i> x <i>P. salicina</i>) 'Shiro' x <i>P. americana</i> 'Howard Yellow'	1919/1923	Excelsior, Mn.	H	8, 9, 24
Mendota	<i>P. salicina</i> 'Burbank' x <i>P. americana</i> 'Wolf'	1912/1924	Excelsior, Mn.		9, 24
Monitor	Burbank x <i>P. americana</i>	1918/1920	Excelsior, Mn.	VH	24
Mound	<i>P. salicina</i> 'Burbank' x <i>P. americana</i> 'Wolf'	1922	Excelsior, Mn.	H	9, 24
Newport	Omaha x <i>P. pissardi</i>	1923	Excelsior, Mn.		9, 33
Norseman	OP sdlg from Russia	1935/1963	Ottawa, Ontario	EH	22, 24
Pembina	<i>P. salicina</i> 'Red June' x <i>P. nigra</i>	1917/1923	Brookings, S.D.		22, 24
Pipestone	Burbank x (<i>P. salicina</i> x Wolf)	1928	Excelsior, Mn.	H	8, 9, 24
Radisson	<i>P. salicina</i> x <i>P. americana</i>	1925	Excelsior, Mn.		5, 9, 24

Cultivar	Parentage	Date sel. / intro.	Origin	Relative hardiness	Reference
HARDINESS ZONE 4a (—30° to —20°F) continued					
Redcoat	<i>P. salicina</i> 'Burbank' x <i>P. americana</i> 'Wolf'	1942	Excelsior, Mn.	H	5, 9, 24
Redglow	<i>P. salicina</i> 'Burbank' x <i>P. munsoniana</i> 'Jewell'	1919/1949	Excelsior, Mn.	H	10, 24
Red Wing	<i>P. salicina</i> 'Burbank' x <i>P. americana</i> 'Wolf'	1921	Excelsior, Mn.	H	5, 9, 24
South Dakota	American-Japanese hybrid	1907/1949	Brookings, S.D.	VH	10, 24
Superior	<i>P. salicina</i> 'Burbank' x (<i>P. americana</i> x <i>P. simonii</i>) 'Kaga'	1925/1933	Excelsior, Mn.		5, 8, 9, 24
Surprise	<i>P. americana</i> hybrid	1882	Sleepy Eye, Mn.		5
Tawena	<i>P. salicina</i> 'Apple' x <i>P. americana</i> 'Terry'	1924	Brookings, S.D.		21, 24
Tecumseh	Shiro x Surprise	1923	Brookings, S.D.		22, 24
Tonka	<i>P. salicina</i> 'Burbank' x <i>P. americana</i> 'Wolf'	1921	Excelsior, Mn.		5, 8, 9, 24
Underwood	Shiro x <i>P. americana</i> 'Wyant'	1916/1921	Excelsior, Mn.	VH	5, 9, 24
Winona	<i>P. salicina</i> x <i>P. americana</i>	1922	Excelsior, Mn.		5, 9, 24
HARDINESS ZONE 3a (—40° to —30°F)					
Apricot					
Leslie		1942/1943	Morden, Manitoba	Ob	9, 24
Morden 601	F ₂ selection of (a Siberian Apricot x Moorpark)	1940/1940	Morden, Manitoba	H	13, 24
Morden 604	Scout x McClure	1945/1946	Morden, Manitoba	H	10, 24
Robust	sdlg of seed from Manchuria	1940/1941	Morden, Manitoba	H	10, 24
Scout	seed of <i>P. armeniaca</i>	1930/1937	Morden, Manitoba	H	5, 10, 24
Cherry					
Coronation	OP sdlg Shudianka	1933/1937	Morden, Manitoba		5, 10, 24
Drilea	OP sdlg <i>P. tomentosa</i>	1938	Morden, Manitoba		13
Cherry Plums					
Alace	OP sdlg of Opata	1942	Brooks, Alberta	H	22, 24
Beta	OP sdlg of Opata	1948/1960	Saskatoon, Saskatchewan	H	19, 24
Convoy	sdlg of a Sandcherry hybrid	1941/1943	Valley River, Manitoba	H	24
Delta	Sapa & Oka	1950/1960	Saskatoon, Saskatchewan		19, 24
Dura	OP sdlg of Sapa	1936/1940	Morden, Manitoba	VH	24
Epsilon	Sapa & Oka	1950/1959	Saskatoon, Saskatchewan		19, 24
Gamma	Sapa & Oka	1950/1960	Saskatoon, Saskatchewan		19, 24
Heaver	OP sdlg of Opata	1944	Baljennie, Saskatchewan	H	24
Kappa	Sapa & Oka	1950/1960	Saskatoon, Saskatchewan		19, 24
Manor	OP sdlg of Sapa	1937/1945	Morden, Manitoba	H	24

Cultivar	Parentage	Date /Date sel. /intro.	Origin	Relative hardiness	Reference
HARDINESS ZONE 3a (—40° to —30°F) continued					
Mansan	<i>P. besseyi</i> x <i>P. hortulana</i>	1935	Morden, Manitoba		24
Mordena	OP sdlg of Compass	1930	Morden, Manitoba	H	24
Omega	Sapa & Oka	1950/1960	Saskatoon, Saskatchewan		19, 24
Prolific	OP sdlg of Opata	1930/1935	Rosthern, Saskatchewan	VH	18, 24
Ruby	OP sdlg of Compass	1930/1935	Rosthern, Saskatchewan	VH	18, 24
Sapalta	probably a sdlg of Sapa	1934/1941	Brooks, Alberta		5, 9, 24
Sigma	Sapa & Oka	1950/1960	Saskatoon, Saskatchewan		19, 24
Zeta	Sapa & Oka	1950/1960	Saskatoon, Saskatchewan		19, 24
Plums					
Acme	<i>P. nigra</i> & <i>P. salicina</i>	1948/1960	Saskatoon, Saskatchewan	H	19, 24
Beaver	OP sdlg Assiniboine	1925/1925			13, 24
Bounty	open pollinated sdlg of <i>P. nigra</i> ‘Assiniboine’	1933/1939	Morden, Manitoba	VH	8, 10, 24
C.K.C.		1933	Rosthern, Saskatchewan	H	13, 24
Dandy	OP sdlg <i>P. nigra</i> ‘Assiniboine’	1923/1923	Valley River, Manitoba		13, 24
Ducie	<i>P. nigra</i> x <i>P. salicina</i>	1946/1960	Saskatoon, Saskatchewan	H	19, 24
Eclipse	<i>P. nigra</i> x <i>P. salicina</i>	1954/1960	Saskatoon, Saskatchewan	H	19, 24
Elite	<i>P. nigra</i> x <i>P. salicina</i>	1948/1960	Saskatoon, Saskatchewan	H	19, 24
Excell	<i>P. nigra</i> x <i>P. salicina</i>	1955/1960	Saskatoon, Saskatchewan	H	19, 24
Geddes	<i>P. nigra</i> x <i>P. salicina</i>	1947/1960	Saskatoon, Saskatchewan	EH	19, 24
Gilman	<i>P. nigra</i> x <i>P. salicina</i>	1944/1960	Saskatoon, Saskatchewan	H	19, 24
Goldbay	F ₂ OP sdlg of <i>P. americana</i> ‘Valley River’	1943	Wawanesa, Manitoba	Ob	22, 24
Hazel	<i>P. americana</i>	1929	Morden, Manitoba		5
Hinchliff	<i>P. nigra</i> x <i>P. salicina</i>	1960/1960	Saskatoon, Saskatchewan	H	19, 24
Hoffman	<i>P. nigra</i> x <i>P. salicina</i>	1955/1960	Saskatoon, Saskatchewan	H	19, 24
Ivanovka	<i>P. salicina</i> (<i>P. triflora koreana</i>)	1943	Morden, Manitoba	H	5, 24
McRobert	OP sdlg <i>P. nigra</i>	1929	Gilbert Plains, Manitoba	H	13, 24
Mina	OP sdlg of Pembina	1934	Morden, Manitoba	H	11, 24
Mordel	OP sdlg of <i>P. nigra</i> ‘Assiniboine’	1930	Morden, Manitoba	H	11, 24
Morden 124	Brooks (<i>P. pumila</i>) x Sapa (<i>P. hortulana</i>)	1941/1947	Morden, Manitoba	VH	13, 24
Morden 125	OP sdlg <i>P. salicina</i>	1936/1947	Morden, Manitoba	H	13, 24
Norther	OP sdlg <i>P. nigra</i> ‘Assiniboine’	1933/1944	Morden, Manitoba	H	10, 24
Olson	selection of <i>P. nigra</i>	1920/1920	near Lake Dauphin, Manitoba		13, 24
Parkside	<i>P. salicina</i> x <i>P. nigra</i>	1955/1960	Edmonton, Alberta	H	22, 24
Patterson Pride	<i>P. nigra</i> x <i>P. salicina</i>	1949/1960	Saskatoon, Saskatchewan	H	19, 24
Perfection	<i>P. nigra</i> x <i>P. salicina</i>	1954/1960	Saskatoon, Saskatchewan	H	19, 24

Cultivar	Parentage	Date sel. / Date intro.	Origin	Relative hardiness	Reference
HARDINESS ZONE 3a (—40° to —30°F) continued					
Prairie	<i>P. nigra</i> x <i>P. salicina</i>	1948/1960	Saskatoon, Saskatchewan		19, 24
Ptitsin 9	sdlg from Manchuria	1939/1939	Morden, Manitoba	H	24
Robinson	<i>P. nigra</i> x <i>P. salicina</i>	1947/1960	Saskatoon, Saskatchewan	H	19, 24
Russian Green Gage	<i>P. domestica</i>	1925	Morden, Manitoba		5
Saskatchewan	<i>P. nigra</i> x <i>P. salicina</i>	1953/1960	Saskatoon, Saskatchewan	H	19, 24
Stevens	sdlg of a native plum (<i>P. americana</i>)	1930	Valley River, Manitoba	VH	13, 24
Superb	<i>P. nigra</i> x <i>P. salicina</i>	1954/1960	Saskatoon, Saskatchewan	H	19, 24
Supreme	<i>P. nigra</i> x <i>P. salicina</i>	1947/1960	Saskatoon, Saskatchewan	H	19, 24
Tiorn Sladky	<i>P. domestica</i>	1943	Morden, Manitoba	Ob	5, 24
Wilbur	sdlg from N.E. Hansen Brookings, S.D.	1919/1920	Valley River, Manitoba		21, 24
	<i>P. americana</i>				
Wilson River	selection of a native plum	1920	Valley River, Manitoba	VH	13, 24
Sandcherry					
Black Beauty	selection of sandcherry	1938	Charleswood, Manitoba	H	17, 24
Brooks	selection of <i>P. pumila</i>	1934	Brooks, Alberta	H	13, 24
Honeywood	OP sdg of Sapa	1953/1956	Parkside, Saskatchewan		24
Leafland		1950/1957	Carlos, Alberta	H	24
Mando	selection of <i>P. besseyi</i>	1931	Morden, Manitoba		24
Manmoor	selection of <i>P. besseyi</i>	1929	Morden, Manitoba		24
Oahe	OP sdg of <i>P. besseyi</i>	1937	Brookings, S.D.		24
Ruby	OP sdg of <i>P. besseyi</i>	1948/1953	Brookings, S.D.		17, 24
HARDINESS ZONE 3b (—40° to —30°F)					
Apricot					
Mantoy	OP sdg from Manchuria	1943/1957	Mandan, N.D.	H	15, 24
Cherry Plum					
Cooper	OP sdg of <i>F₁</i> (<i>P. besseyi</i> 'Compass' x <i>P. hortulana mineri</i>)	1930/1935	Fargo, N.D.	probably Ob	14, 24
Hiawatha	OP sdg of Sapa	1942/1957	Mandan, N.D.		24
Sacagawea	OP sdg of Sapa	1942/1957	Mandan, N.D.	VH	15, 24
Plum					
Chilcott	OP sdg of <i>P. americana</i>	1926/1947	Mandan, N.D.	H	12, 24, 28
Chinook	OP sdg of <i>P. nigra</i> 'Ojibwa'	1942/1957	Mandan, N.D.	H	15, 24
Gracious	OP sdg of Emerald	1941/1957	Mandan, N.D.	VH	15, 24
Mantet	OP sdg of <i>P. americana</i>	1947	Mandan, N.D.	VH	24, 28

Cultivar	Parentage	Date / Date sel. / intro.	Origin	Relative hardiness	Reference
HARDINESS ZONE 2b (—50° to —40°F)					
Cherry					
Baton Rouge	<i>P. tomentosa</i> x <i>P. besseyi</i>		Dropmore, Manitoba		5
Dropmore	<i>F₂</i> (<i>P. cerasus</i> x <i>P. pennsylvanica</i>)	1952	Dropmore, Manitoba	EH	24
Cherry Plum					
Eileen	<i>P. besseyi</i> x <i>P. tomentosa</i>	1939	Dropmore, Manitoba		5, 22, 24
Manorette	OP sdlg of Manor	1952/1964	Moose Range, Saskatchewan		21, 24
Skinner Favorite	<i>P. besseyi</i> x <i>P. salicina</i>	1956	Dropmore, Manitoba		19, 24
Wessex	OP sdlg of (<i>P. besseyi</i> x Mordel plum)	1950/1964	Moose Range, Saskatchewan	EH	21, 24
Plums					
Dropmore Blue		1941	Dropmore, Manitoba	H	22, 24
Mandarin	OP sdlg of <i>P. salicina</i>	1940/1941	Dropmore, Manitoba	H	10, 24
Winered	<i>P. salicina</i> x <i>P. besseyi</i>	1955	Dropmore, Manitoba		19, 24
HARDINESS ZONE 1 (below —50°F)					
Cherry					
Shubert	<i>P. virginiana</i> <i>P. virginiana</i>			H	33

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BOOK REVIEW

Anatomy of Seed Plants, 2nd Ed. 1977, Katherine Esau. John Wiley & Sons, Inc., Publishers, 605 Third Avenue, New York, NY 10016. Price \$16.95.

The "Anatomy of Seed Plants" is intended primarily for students who have had a relatively limited experience in the study of plants. If one is dealing with plants as do horticulturists, agronomists, foresters, plant pathologists, or ecologists it is important to know what the plant is like and how it functions. This knowledge is obtained by studying the structure of the plant, its development, and its various activities.

The author states that in this interrelationship of sciences, anatomy plays a major role, and that a realistic interpretation of plant functions by the physiologist must rely on a thorough knowledge of the structure of cells and tissues associated with that function. Better understanding of these functions has been enhanced by descriptions of structures of the plants concerned with photosynthesis, movement of water, translocation of food and absorption by roots. The explanation of the success or failure of many horticultural practices such as grafting, pruning, vegetative propagation and the associated phenomena of callus formation, wound healing, regeneration and development of adventitious roots and buds is more

meaningful as the structural features underlying these phenomena are properly understood.

The "Anatomy of Seed Plants" has an excellent outline for plant structure, evidence of much thought in its preparation. All phases of development have been expertly outlined, so that a specific reference can be found within a matter of seconds.

The subject matter of this text includes an introduction and chapters on development of the seed plant, the cell, cell wall, parenchyma and collenchyma, sclerenchyma, epidermis, xylem: general structure and cell types, xylem: variations in wood structure, vascular cambium, phloem, periderm, secretory structures, the root: primary state of growth, the root: secondary state of growth and adventitious roots, the stem: primary state of growth, the stem: secondary growth and structural types, the leaf: basic structure and development, the leaf: variations in structure, the flower: structure and development, the flower: reproductive cycle, the fruit, the seed, embryo and seedling.

This is a valuable reference for those who are teaching and doing research with plants. For those who are only interested in growing plants, it reveals the fascinating aspects of plant growth and will provide a better understanding of how plants function.

—Roy K. Simons