

**Table 1. Average killing temperatures for roots of selected species of woody ornamental plants.**

Highest temperature that killed more than 50% of root system and reduced top growth

Scientific Name	Common Name	°F	°C
<i>Magnolia soulangiana</i>	Saucer Magnolia	23	-5.0
<i>Magnolia stellata</i>	Star Magnolia	23	-5.0
<i>Cornus florida</i>	Flowering Dogwood	20	-6.7
<i>Daphne cneorum</i>	Garland Flower	20	-6.7
<i>Ilex crenata</i> 'Convexa'	Convex Japanese Holly	20	-6.7
<i>Ilex crenata</i> 'Hetzi'	Hetz Japanese Holly	20	-6.7
<i>Ilex crenata</i> 'Stokesii'	Stokes Japanese Holly	20	-6.7
<i>Ilex opaca</i>	American Holly	20	-6.7
<i>Pyracantha coccinea</i>	Fire Thorn	18	-7.8
<i>Cryptomeria japonica</i>	Japanese Cedar	16	-8.9
<i>Cotoneaster horizontalis</i>	Rock Cotoneaster	15	-9.4
<i>Viburnum carlesii</i>	Korean Spice Viburnum	15	-9.4
<i>Cytisus praecox</i>	Warminster broom	15	-9.4
<i>Buxus sempervirens</i>	Common Boxwood	15	-9.4
<i>Ilex glabra</i>	Inkberry Holly	15	-9.4
<i>Euonymus fortunei</i> 'Carrierei'	Carrier Euonymus	15	-9.4

<i>Euonymus fortunei</i> 'Argenteo-marginata'	Variiegated Euonymus	15	-9.4
<i>Hedera helix</i> 'Baltica'	Baltic Ivy	15	-9.4
<i>Pachysandra terminalis</i>	Japanese pachysandra	15	-9.4
<i>Vinca minor</i>	Common Periwinkle	15	-9.4
<i>Pieris japonica</i> 'Compacta'	Compact Pieris	15	-9.4
<i>Acer palmatum</i> 'Atropurpureum'	Bloodleaf Japanese Maple	14	-10.0
<i>Cotoneaster adpressa</i> <i>praecox</i>	Nan-Shan Cotoneaster	10	-12.2
<i>Taxus x media</i> 'Nigra'	Nigra Yew	10	-12.2
<i>Rhododendron</i> 'Gibraltar'	Gibraltar Azalea	10	-12.2
<i>Rhododendron</i> 'Hinodegiri'	Azalea hybrid	10	-12.2
<i>Pieris japonica</i>	Japanese Pieris	10	-12.2
<i>Leucothoe fontanesiana</i>	Drooping Leucothoe	5	-15.0
<i>Pieris floribunda</i>	Flowering Pieris	5	-15.0
<i>Euonymus fortunei</i> 'Colorata'	Purple Leaf Wintercreeper	5	-15.0
<i>Juniperus horizontalis</i>	Creeping Juniper	0	-17.8
<i>Juniperus horizontalis</i> 'Douglasii'	Waukegan Juniper	0	-17.8
<i>Rhododendron</i> <i>carolinianum</i>	Carolina Rhododendron	0	-17.8
<i>Rhododendron</i> <i>catawbiense</i>	Catawba Rhododendron	-10	-23.3
<i>Rhododendron</i> P.J.M. <i>hybrids</i>	P.J.M. Rhododendron	-10	-23.3
<i>Potentilla fruticosa</i>	Shrubby Cinquefoil	-10	-23.3

<i>Picea glauca</i>	White Spruce	-10	-23.3
<i>Picea omorika</i>	Serbian Spruce	-10	-23.3

Source: Havis, J.R. 1964. Root hardiness of woody ornamentals. HortScience 11(4):385-386.

**Table 2: Root hardiness of containerized herbaceous perennials**

Growing medium temperature causing significant injury (Unsalable, unacceptable regrowth)

Scientific Name	Common Name	°F	°C
<b>Tender</b>			
<i>Aster lateriflorus</i> var. <i>horizontalis</i>	Calico Aster	28	-2.2
<i>Digitalis x mertonensis</i>	Strawberry Foxglove	24	-4.4
<i>Geum quellyon</i> 'Mrs. Bradshaw'	Chilean Avens	24	-4.4
<i>Hibiscus moscheutos</i> 'Disco Belle Hybrids'	Disco Belle Hibiscus	>38	>3.3
<i>Houttuynia cordata</i> 'Chameleon'	Chameleon Plant	28	-2.2
<i>Kniphofia uvaria</i> 'Pfitzei'	Torchlily	27	-2.8
<i>Polystichum tsussimense</i>	Korean Rock Fern	> 38	>3.3
<i>Thelypteris kunthii</i>	Kunth's Maiden Fern	28	-2.2
<i>Tricyrtis formosana</i> 'Amethystina'	Japanese Toad Lily	28	-2.2
<b>Intermediately Hardy</b>			
<i>Astilbe x arendsii</i> 'White Gloria'	False Spirea	15	-9.4
<i>Campanula glomerata</i> var. <i>acaulis</i>	Clustered Bellflower	15	-9.4
<i>Caryopteris x clandonensis</i> 'Longwood Blue'	Bluebeard	21	-6.1
<i>Chrysanthemum coccineum</i>	Painted Daisy	21	-6.1
<i>Coreopsis grandiflora</i> 'Sunray'	Tickseed	18	-7.8
<i>Dendranthema x grandiflora</i> 'Emily'	Garden Chrysanthemum	> 10	>-12.2

<i>Dendranthema x grandiflora</i> 'Megan'	Garden Chrysanthemum	> 10	>-12.2
<i>Dendranthema x grnadiflora</i> 'Ruby Mound'	Garden Chrysanthemum	> 10	>-12.2
<i>Dendranthema x grandiflora</i> 'Triumph'	Garden Chrysanthemum	> 10	>-12.2
<i>Erodium x variabile</i> 'Roseum'	Heron's Bill	18	-7.8
<i>Erysimum hieraclifolium</i>	Wallflower	21	-6.1
<i>Gaillardia x grandiflora</i> 'Goblin'	Goblin Blanket Flower	14	-10.0
<i>Hebe macrocarpa</i> 'Margret'	Hebe 'Margret'	18	-7.8
<i>Hemerocallis</i> 'Joan Senior'	Daylily	15	-9.4
<i>Heuchera sanguinea</i> 'Chatterbox'	Coral Bells	14	-10.0
<i>Leucanthemum x superbum</i> 'Alaska'	Shasta Daisy	15	-9.4
<i>Phlox paniculata</i> 'David'	Garden Phlox	21	-6.1
<i>Tiarella cordifolia</i> var. <i>collina</i> 'Dunvegan'	Heartleaf Foamflower	15	-9.4
<i>Tiarella cordifolia</i> var. <i>collina</i> 'Oakleaf'	Heartleaf Foamflower	21	-6.1
<i>Tricyrtis hirta</i> 'Miyazaki'	Toad Lily	21	-6.1
<i>Verbena canadensis</i> 'Homestead Purple'	'Homestead Purple' Verbena	18	-7.8
<i>Veronica</i> 'Sunny Border Blue'	Speedwell	21	-6.1
<b>Hardy Perennials</b>			
<i>Achillea</i> 'Coronation Gold'	Yarrow, Sneezewort	8	-13.3
<i>Achillea filipendulina</i> 'Parker's Variety'	Fernleaf Yarrow	12	-11.1
<i>Campanula takesimana</i>	Korean Bellflower	2	-11.1

<i>Dendranthema x grandiflora</i> 'Baby Tears'	Garden Chrysanthemum	<10	<-12.2
<i>Dendranthema x grandiflora</i> 'Debonair'	Garden Chrysanthemum	<10	<-12.2
<i>Gaillardia x grandiflora</i> 'Monarch Group'	Monarch Blanket Flower	12	-11.1
<i>Heuchera americana</i> 'Dale's Strain'	Coral Bells	12	-11.1
<i>Hylotelephium (Sedum)</i> <i>spectabile</i> 'Brilliant'	Showy Stonecrop	-6	-21.1
<i>Lythrum salicaria</i> 'Robert'	Purple Loosestrife	12	-11.1
<i>Monarda</i> 'Marshall's Delight'	Bee Balm	8	13.3
<i>Penstemon fruticosus</i> 'Purple Haze'	Shrubby Penstemon	12	-11.1
<i>Phlox divaricata subsp.</i> <i>Laphamii</i> 'Chattahoochee'	Wild Sweet William	7	-13.9
<i>Phlox glaberrima</i> 'Morris Berd'	Smooth Phlox	7	-13.9
<i>Phlox paniculata</i> 'White Admiral'	Garden Phlox	8	-13.3
<i>Physostegia virginiana</i> 'Summer Snow'	Obedient Plant, False Dragonhead	7	-13.9
<i>Rosmarinus officinalis</i> 'Arp'	Rosemary	12	-11.1
<i>Salvia x superba</i> 'Stratford Blue'	Hybrid Sage	10	-12.2
<i>Sedum</i> 'Autumn Joy'	Stonecrop	-11	-23.9
<i>Tanacetum coccineum</i> 'Robinson's Mix'	Pyrethrum Daisy	10	-12.2
<i>Tiarella cordifolia var.</i> <i>collina</i> 'Slick Rock'	Heartleaf Foamflower	12	-11.1
<i>Tiarella cordifolia var.</i> <i>collina</i> 'Laird of Skye'	Heartleaf Foamflower	8	-13.3
<i>Tiarella cordifolia</i> 'Running Tapestry'	Heartleaf Foamflower	12	-11.1

Source: Perry, L. P. 1998. *Herbaceous Perennials Production: A Guide from Propagation to Marketing*. NRAES-93. pp 56.

Copyright © 2021 Rutgers, The State University of New Jersey. All rights reserved.

**February 2015**

For more information: [njaes.rutgers.edu](http://njaes.rutgers.edu).

*Cooperating Agencies:* Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and Boards of County Commissioners. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.