



MT200101 AG reviewed 1/05

# Fire-Resistant Plants for Montana Landscapes

Dr. R.E. Gough, Professor and Horticulture Extension Specialist and Jason Lamb, Senior Undergraduate Horticulture major, Department of Plant Sciences and Plant Pathology, Montana State University, Bozeman

Fires can damage soil and reduce its capacity to hold moisture. This can affect plants' ability to survive. However, there are a number of groundcovers, herbaceous plants, shrubs and trees that are fire-resistant and are listed here.

**A**ny plant will burn if it is dry enough and the fire slow enough and hot enough. The ability of a plant to survive a fire depends upon the speed and type of fire, the time of year, the moisture-holding capacity of the plant and the plant species.

Slow-moving fires can do more damage than those that move rapidly across a site. In forest settings, crown fires that travel from the crown of one tree to another often are more damaging than other types because they destroy the foliage and thus reduce the plants' capacity to photosynthesize. This inability to manufacture carbohydrates weakens the plant and makes it more susceptible to subsequent winter damage and pest infestations. Young trees are more severely affected by this type of fire than older trees.

Ground fires kill the cambium and phloem (parts of the plant responsible for its growth), often girdling or partially girdling the plant, which can lead to the death of the plant.

However, new tissue laid down in the following spring allows many damaged trees to survive.

Succulent plants and those full of water (for instance, in spring), survive fires better than trees with low moisture contents. Shrubs often survive by their ability to re-sprout from their bases.

## Degradation of Site Quality

Fires burn soil organic matter, reducing the soil's capacity to store water and fostering compaction. They accelerate erosion and increase the magnitude of fluctuations in soil temperatures. As much as 70 percent of the nitrogen and some other nutrients are lost by volatilization, ash convection, and subsequent leaching after hot fires. However, the nitrogen is often replaced quickly by rain, increased soil microbial activity, and nitrogen fixation. Some nutrients are also released from burned organic matter, often making the total availability of mineral nutrients to the plants higher after the fire than before. Site quality deteriorates more on coarse sands and heavy soils than on sandy and loamy soils.

Following a fire, prune out dead branches and be sure the remaining plants are watered well. There may be no reason to add huge quantities of fertilizer.

Under forest conditions, tree species with thicker, corky bark -- western larch, ponderosa pine, Douglas fir, long-leaf pine and bur oak -- often escape severe fire damage. Those with thinner bark, such as alpine fir, Engelmann spruce and lodgepole pine, and many younger trees, are more likely to be killed by ground fires. Conifers as a group are considered more susceptible

to fire damage than deciduous species because of their high resin content.

Following is a list of plant species adapted to Montana that have been noted to be fire resistant. Not all species on this list will grow in all parts of the state. Refer to "Choosing Trees and Shrubs for Montana Landscapes" (Montana Extension Bulletin EB 123), "Choosing Herbaceous Perennials and Biennials" (MontGuide 9903) and "Growing Annual Flowers" (MontGuide 9501) for more information on growing site conditions for selected species.

We have also avoided categorizing plants as "fast-growing" or "slow-growing" since this can be misleading -- there are too many variables that can affect the rate of growth of a plant. Some information in the tables pertains only to observations on a single cultivar, but there is little reason to believe that other cultivars of the same species might not be equally resistant. In one case, an entire family (Rose) is generally considered to be fire-resistant. This family includes apples, pears, peaches, plums, apricots, nectarines, hawthorn, cotoneaster, juneberry, raspberry, blackberry and, of course, rose. Some entries include an entire genus (ash, for example) followed by some individual species. This is because some references list only a genus while others list particular species as being resistant.

## Fire-Resistant Plant Species Adapted to Montana

### *Groundcovers and Herbaceous Plants*

<u>Common Name</u>	<u>Genus and Species</u>
Alfalfa	<i>Medicago sativus</i>
Bergenia	<i>Bergenia spp.</i>
Blanket Flower	<i>Gaillardia x grandiflora</i>
Bluegrass, Kentucky	<i>Poa pratensis</i>
Buffalograss	<i>Buchloe dactyloides</i>
Candytuft, Evergreen	<i>Iberis sempervirens</i>
Carpet bugle	<i>Ajuga reptans</i>
Cinquefoil, Spring	<i>Potentilla tabernaemontanii</i>
Columbine	<i>Aquilegia spp.</i>
Coral Bells	<i>Heuchera sanguinea</i>
Coreopsis	<i>Coreopsis spp.</i>
Cotoneaster	<i>Cotoneaster ssp.</i>
Cotoneaster, Rock	<i>Cotoneaster horizontalis</i>
Cotoneaster, Bearberry	<i>Cotoneaster dammerii</i>
Daisy, Shasta	<i>Leucanthemum x superbum</i>
Daylily	<i>Hemerocallis spp.</i>
Drosanthemum	<i>Drosanthemum speciosum</i>
Dusty Miller	<i>Artemisa stelleriana</i>
Fescue	<i>Festuca spp.</i>
Fescue, Blue	<i>Festuca cinerea</i>
Fescue, Tall	<i>Festuca arundinacea</i>
Fescue, Creeping Red	<i>Festuca rubra</i>
Flax	<i>Linum spp.</i>
Fleabane	<i>Erigeron hybrids</i>
Four O'clock	<i>Mirabilis spp.</i>
Geranium, Hardy	<i>Geranium cinereum</i>
Geranium, Bloodred	<i>Geranium sanguineum</i>
Geranium	<i>Geranium spp.</i>
Ginger, Wild	<i>Asarum caudatum</i>
Hen and Chicks	<i>Sempervivum tectorum</i>
Iris	<i>Iris spp.</i>
Kinnickinnick	<i>Arctostaphylos uva-ursi</i>
Lambs Ear	<i>Stachys byzantina</i>
Lavender	<i>Lavandula spp.</i>
Lupine	<i>Lupinus spp.</i>
Mahonia, Creeping	<i>Mahonia repens</i>
Mock Strawberry	<i>Duchesnea indica</i>

## Fire-Resistant Plant Species Adapted to Montana

### *Groundcovers and Herbaceous Plants*

<u>Common Name</u>	<u>Genus and Species</u>
Mountain Spray	<i>Holodiscus spp.</i>
Myrtle, Dwarf Periwinkle	<i>Vinca minor</i>
Orchardgrass	<i>Dactylis glomerata</i>
Penstemon, Rocky Mountain	<i>Penstemon strictus</i>
Pinks	<i>Dianthus plumarius</i>
Poppy	<i>Papaver spp.</i>
Poppy, California	<i>Eschscholzia californica</i>
Potentilla	<i>Potentilla spp.</i>
Primrose, Mexican Evening	<i>Oenothera berlandieri</i>
Primrose	<i>Oenothera spp.</i>
Pussytoes	<i>Antennaria spp.</i>
Red Hot Poker	<i>Kniphofia uvaria</i>
Ryegrass	<i>Lolium spp.</i>
Sage	<i>Salvia spp.</i>
Sedum, Goldmoss	<i>Sedum acre</i>
Silver Spreader	<i>Artemisia caucasica</i>
Snow-in-Summer	<i>Cerastium tomentosum</i>
Stonecrop	<i>Sedum spathulifolium</i>
Stonecrop, Green	<i>Sedum album</i>
Strawberry, Wild	<i>Fragaria chiloensis</i>
Sunrose	<i>Helianthus mummularium</i>
Thrift, Common	<i>Armeria maritima</i>
Thyme, Wooly	<i>Thymus pseudolanuginosus</i>
Thyme, Creeping	<i>Thymus praecox articus</i>
Valerian, Red	<i>Centranthus ruber</i>
Violet, Canadian	<i>Viola canadensis</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Wheatgrasses, Western	<i>Agropyron cristatum</i>
Wheatgrass, Crested (low-growing)	<i>Agropyron cristatum</i>
Winterfat	<i>Eurotia spp.</i>
Yarrow	<i>Achillea spp.</i>
Yarrow, White	<i>Achillea millefolium white</i>
Yarrow, Fernleaf	<i>Achillea filipendulina</i>
Yarrow, Wooly	<i>Achillea tomentosa var. Moonshine</i>
Yucca	<i>Yucca filamentosa</i>

## Fire-Resistant Plant Species Adapted to Montana

### Shrubs

<u>Common Name</u>	<u>Genus and Species</u>
Antelope Brush	<i>Fendlera rupicola</i>
Buckthorn	<i>Rhamnus spp.</i>
Buffaloberry	<i>Shepherdia spp.</i>
Buffaloberry, Russett	<i>Shepherdia canadensis</i>
Buffaloberry, Silver	<i>Shepherdia angentea</i>
Cherry	<i>Prunus spp.</i>
Cherry, Sand	<i>Prunus besseyi</i>
Cherry, Nanking	<i>Prunus tomentosa</i>
Chokecherry	<i>Prunus virginiana</i>
Cinquefoil, Shrubby	<i>Potentilla fruticosa</i>
Deerbrush (Buckbrush)	<i>Ceanothus spp.</i>
Dogwood, Red-osier	<i>Cornus sericea (C. stolonifera)</i>
Gooseberries and Currants	<i>Ribes spp.</i>
Honeysuckle	<i>Lonicera spp.</i>
Lilac, Common	<i>Syringa vulgaris</i>
Mahogany, Mountain	<i>Cercocarpus spp.</i>
Mockorange	<i>Philadelphus spp.</i>
Plum, Native	<i>Prunus americana</i>
Pyracantha	<i>Pyracantha spp.</i>
Raspberry	<i>Rubus spp.</i>
Rose, most members of this family	<i>Rosaceae</i>
Saltbush	<i>Atriplex spp.</i>
Sumac, Skunkbush	<i>Rhus trilobata</i>

### Trees

<u>Common Name</u>	<u>Genus and Species</u>
Alder, White	<i>Alnus rhombifolia</i>
Ash	<i>Fraxinus spp.</i>
Ash, Green	<i>Fraxinus pennsylvanica</i>
Aspen, Quaking	<i>Populus tremuloides</i>
Birch	<i>Betula spp.</i>
Cottonwood	<i>Populus spp.</i>
Hackberry	<i>Celtis occidentalis</i>
Locust, Black	<i>Robinia pseudoacacia</i>
Maple	<i>Acer spp.</i>
Maple, Big-toothed	<i>Acer grandidentatum</i>
Maple, Boxelder	<i>Acer negundo</i>
Maple, Rocky Mountain	<i>Acer glabrum</i>
Olive, Russian	<i>Eleagnus angustifolia</i>
Poplar	<i>Populus spp.</i>
Narrowleaf Cottonwood	<i>Populus angustifolia</i>
Prunus	<i>Prunus spp.</i>



<http://www.montana.edu/wwwpb/pubs/mt200101.pdf>

For more online MontGuides, visit <http://www.montana.edu/publications>

Copyright © 2004 MSU Extension Service

We encourage the use of this document for nonprofit educational purposes. This document may be reprinted if no endorsement of a commercial product, service or company is stated or implied, and if appropriate credit is given to the author and the MSU Extension Service. To use these documents in electronic formats, permission must be sought from the Ag/Extension Communications Coordinator, Communications Services, 416 Culbertson Hall, Montana State University-Bozeman, Bozeman MT 59717; telephone (406) 994-2721; **E-mail - [publications@montana.edu](mailto:publications@montana.edu)**. To order additional publications call your local county or reservation Extension office, or visit [www.montana.edu/publications](http://www.montana.edu/publications)



The U.S. Department of Agriculture (USDA), Montana State University and the Montana State University Extension Service prohibit discrimination in all of their programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital and family status. Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Douglas L. Steele, Vice Provost and Director, Extension Service, Montana State University, Bozeman, MT 59717.

File under: Horticulture  
A-15 (Ornamentals)  
Reviewed Jan 2005  
(1000 105 KMM)