Why is Native Landscaping Important to You and the Semiarid West?

Are you interested in creating an attractive, environmentally friendly landscape while reducing your water and maintenance requirements? Do you want a beautiful yard, garden, school, park, or parking area? Try a Xeriscape™ with native plants.

Whether you’re a newcomer to the northern Great Plains and Rocky Mountains or you just want fresh, new landscaping ideas, this booklet will help you select and grow native plants that are naturally adapted and will thrive for years under our extreme environmental conditions. The goal of this booklet is to provide an overview of native landscaping principles and practices. It integrates the principles of several conservation initiatives such as reduced water, energy, and chemical usage; wildlife habitat enhancement; and invasive weed management. Native plant, in the context of this booklet, means native to the United States.

What is Xeriscape™?

Xeriscape (pronounced zeer-izcape) is derived from the Greek word, xeros, meaning “dry.” It’s the wise use of water through water-efficient landscaping. The word Xeriscape conjures up visions of a dry, desert-like landscape when, in fact, its focus is how to landscape appropriately in areas with seasonal water supply shortages. Denver Water holds the trademark on the term and has developed 7 Xeriscape Principles.

7 Principles of Xeriscape

1. Plan and Design Comprehensively
2. Improve Soil with Amendments
3. Reduce Lawn Areas
4. Use Appropriate Plants and Group According to Water/Environmental Needs
5. Irrigate Efficiently
6. Use Mulches
7. Maintain Your Landscape

Comparisons of traditional landscapes and Xeriscapes have shown that up to 50 percent savings can be achieved in water usage alone. Other studies indicate potential savings of nearly 30 percent in maintenance and labor, 64 percent in fertilizers, 44 percent in fuel and 22 percent in herbicides and pesticides (At Home with Xeriscape™, Xeriscape Colorado, Inc).

Xeriscape and Native Plant Benefits

**Economic**
- Lower Water and Maintenance Costs
- Enhanced Real Estate Values
- Increased Survivability of Plantings
- Edible and/or Decorative Products

**Environmental**
- Improved Water and Soil Conservation
- Reduced Use of Petroleum Products
- Improved Air Quality/Carbon Sequestration
- Enhanced Urban Wildlife Habitat
- Reduced Water Contamination

**Aesthetic**
- Increased Year-Round Visual Interest
- Increased Urban Wildlife Viewing
- Encouraged Link with Nature
- Enhanced Quality of Life

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In many parts of the West, where rainfall is scarce, landscaping accounts for half of all residential water consumption. Outdoor landscaping offers the single biggest opportunity for water savings to a typical American family. That's because most people pour a lot more water on their greenery than they really need. In fact, it is estimated that 55 percent of all landscape problems are caused by over watering (A Consumers Guide to Water Conservation©, 1993 American Water Works Association).

Yucca: this evergreen plant brings a bold, dramatic touch to a dry landscape. American Indians used the leaves to make baskets and the roots to produce soap.

Golden currant: berries used for jelly making.

Big bluestem: fall color.
Landscape design is a problem solving, step-by-step process that includes, but is not limited to, project research and analysis, development of plans and diagrams for functional and aesthetic use of plant materials, design implementation and construction, and landscape maintenance. Any landscaping project must first start with a plan; one that takes into consideration your needs, the limitations and obstacles of the site, and the resources that you have available. Site conditions need to be evaluated and matched with the planned landscape goals and desired plant characteristics.

### Site Inventory & Assessment
Planning and design begins with a thorough site inventory and assessment of the following factors:

- **Current and Historic Land Use**
  - How has the property been used or altered in the past? Is it forested land, an irrigated valley bottom, dryland pasture, native rangeland, or along a stream or perennial wetland? Are there other signs of former tillage activity? What level of clean up will be necessary? These are important considerations before entering the next landscape phases: design, site preparation, plant selection.

- **Vegetative Inventory**
  - Native species evolved to perpetuate themselves in harmony with their environment. Furthermore, plants have established niches within diverse plant communities. These time-tested relationships should be recreated as closely as possible for successful native landscaping. Look around and see what plants are already growing on the site or a similar site nearby. Consider why a particular plant might be located there. Does it grow there as part of a natural plant community? Was it planted, or introduced by humans? Was it planted by nature, i.e. wind, water, animals? Try to identify the plants and determine if they are annual or perennial.

- **Soil**
  - Soil plays an extremely important role in a plant’s ability to adapt and survive on a site. Plan to salvage topsoil prior to any construction disturbance to secure a desirable plant growth media. Soil testing is advisable to determine the following soil attributes:
    - **Texture.** Soil texture is the relative percentage of sand, silt, and clay particles. A loam soil is ideal for plant growth. It is made up of equal parts of sand, silt, and clay.
    - **Physical/Chemical.** Physically, an ideal garden soil consists of 50 percent solids, 25 percent water, and 25 percent air by volume. The soil’s solid portion includes soil, rock and organic matter. The soil organic matter serves as a valuable nutrient source, assists with water retention and infiltration, and promotes root growth through aeration. Chemically, the pH measures the acidity or alkalinity of the soil. Plants have preferences for certain pH levels. In the northern Great Plains and Rocky Mountains most soils are alkaline. Soil salinity and sodicity is a measure of the amount of calcium, magnesium, and sodium salts. High salinity or sodicity is not conducive to healthy plant growth. Salts desiccate plants and can become toxic to many plant species.

- **Climate**
  - Across the northern Great Plains and Rocky Mountains, extreme variability and unpredictability in climate is normal. Native plant community adaptation depends primarily on the extremes of temperature and precipitation.
    - **USDA Winter Hardiness Zones.** This map categorizes areas by average annual minimum temperature and should be used to determine plant species adaptation. (See WHZ map on following page.)
    - **Elevation/Topography/Aspect/ Hydrologic regime/Landscape position.** These elements influence the length of the growing season, number of frost-free days, wind, sunlight, snow cover, soil depth, and other factors. Local effects of landscape position and microclimates around structures can modify growing conditions.

- **Vegetative Inventory**
  - Native forbs found growing on a sandstone outcrop.

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Information gathered in the site inventory is used to diagram existing conditions and identify functions of various spaces. To better visualize how things appear, drawings and/or design plans are developed to assure that each space gets specific attention and to determine relationships between spaces. The number of steps, or preliminary drawings, necessary to complete a landscape design is dependent on the size and scale of the project and the amount of detail incorporated at each stage of the process.

USDA Winter Hardiness Zones

- Zone 5b (-10 to -15)
- Zone 2b (-40 to -45)
- Zone 3a (-35 to -40)
- Zone 3b (-30 to -35)
- Zone 4a (-25 to -30)
- Zone 4b (-20 to -25)
- Zone 5a (-15 to -20)
- Zone 5b (-10 to -15)

Degrees Fahrenheit

- Zone 2a (-45 to -50)
- Zone 3a (-35 to -40)
- Zone 3b (-30 to -35)
- Zone 4a (-25 to -30)
- Zone 4b (-20 to -25)
- Zone 5a (-15 to -20)
- Zone 5b (-10 to -15)

The use of color principles, based on the distinction between warm and cool, is a good guide when designing floral displays. Red, orange and yellow are warm colors that attract attention and seem to advance toward the viewer. Blue and green are cool colors that tend to recede from the viewer.

Eye Grabbers

### Do
- Group 3, 5 or 7 plants together
- Match size of plant to scale of site
- Accent with bright, warm colors
- Vary size and spacing
- Unifying

### Don’t
- Scatter single plants here and there
- Incorporate many big trees on small lot
- Apply many variations of color
- Repeat similar shapes
- Overpowering
- Disorganized
- Boring

Color combinations can be contrasting (yellow and blue) or complimentary (red and orange).
**Site Preparation**

**Existing Sod**
If you have existing areas of unwanted turf, pasture, or undesirable native vegetation, it must be physically or chemically removed. In larger windbreak or shelterbelt plantings it is recommended that the site be chemically and mechanically fallowed for one growing season to control vegetation and store moisture.

**Sod Removal**
Completely remove sod and discard or utilize elsewhere.

**Chemical Control**
Apply a non-selective herbicide such as glyphosate to green growth that has 3-4 inches of height. Spraying during active early growth may require multiple applications. Glyphosate is most effective when applied in September.

**Intact Soil Profile**
If there is minimal impact to the topsoil, or if at least 2-4 inches of topsoil remain, there is adequate growing media.

**Incorporate Organic Matter**
Deep roto-till or disk to incorporate dead sod following chemical treatment, or remaining roots after sod removal, into the top 6 inches of soil.

**Weed Control**
Control perennial weeds or unwanted plants well in advance of landscaping. Do not use any chemicals having a harmful residual effect on planned landscaping plant material. Caution: Apply all chemicals according to label directions.

**No Topsoil or Mixed with Subsoil**
To build a more favorable topsoil, organic matter and fertility must be added. Amendments such as composted manure, straw, and lawn clippings can be used. Incorporate organic material into the top 4-6 inches of soil.

**Bare Soil**
Construction activities may completely disturb the soil profile and eradicate all existing vegetation. The necessary site treatment is determined by the extent of disturbance.

**Seedbed Preparation**
If compaction has resulted from heavy traffic during construction, the site should be ripped and tilled to improve soil tilth and moisture percolation. Site preparation will have significant impact on the ultimate success of any planting. Following tillage, the seedbed should be firmed, but not compacted. A firm seedbed helps control planting depth and facilitates good seed-soil contact. If possible, the site should be irrigated well in advance of seeding or planting to allow settling of manipulated soils. Reshape or contour as needed after soil dries and prior to planting.

**Seeding**
Seed should be planted at a depth of 1/4 to 1/2 inch, with some of the very small-seeded species planted just below the soil surface. Planting with a double-disk drill assures proper seed placement, but may result in undesirable rows in a landscaping situation. A Brillion®-type drill will uniformly dribble and cover the seed. Broadcast seeding requires light roughening of the soil surface prior to scattering seed and raking or dragging to cover seed.

**Transplanting**
Many accent or specimen plants must be transplanted as containerized material into beds, rock gardens or borders. Containerized plants are usually started from seed and are well established before planting. Successful plant salvage from native sites is generally limited. Rhizomatous and stoloniferous plants can be easily transplanted. However, only young or smaller bunchgrasses and taprooted plants are moved successfully. Any transplanting of wildland material should be done while plants are dormant.

**Broadcast seeding.**

Many native grasses and flowers are available from commercial nurseries.
Choosing the Right Grasses and Wildflowers

**Tag Tips:**
Scientific Latin name of one or two words, for example *Aster laevis*.

*Zone* numbers, i.e., 3 means better adaptation to colder temperatures than 4.

Sun, partial sun, or shade tells you the tolerance of the plant to light.

Water requirements in inches per year should fit natural, local precipitation amounts.

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**Plant Adaptation**
Select plants that are naturally adapted to survive in local environmental conditions.

- Reputable nurseries and garden centers choose native and introduced plant material that is adapted to the area. A plant's adaptation to a certain environment can be researched. However, the only way to ensure a plant's true identity is by the scientific name, which provides positive identification of the species. Common names vary in time, place, and culture.
- When purchasing plants and seed, be on the lookout for information on winter hardness. The best indicator is a designated USDA Winter Hardiness Zone listed on the tag or label. Ask questions about local adaptation and the plant's origin. Plants or seed from a milder climate or a more southern location may not be hardy.
- Replacement guarantees may be available and will vary from within six months up to one year from purchase. Guarantees are limited by the fact that proper plant care after purchase is beyond the control of the seller.
- Digging and transplanting plants from the wild into a home landscape is usually unsuccessful. Wildland plants have extensive root systems and often have special needs that cannot be retained. In many places, it is illegal to dig plants in the wild.

**Plant Types**

**Grasses**
- Bluebunch wheatgrass
- Sheep fescue
- Little bluestem used as ornamental

**Wildflowers**
- Blackssampson echinacea
- Purple prairie clover
- Aster
- Two varieties of penstemon
- Arnica
- Phacelia
- Lupine

Grasses are common components in a landscape. They reproduce by seed and above- or below-ground stems. Grasses can be compact and tufted, erect in bunches, creeping on the ground's surface, or spreading as sod. Height varies from ground-hugging to several feet tall.

- Cool-season species green up early and actively grow from spring until mid-summer.
- Warm-season species begin growth in early summer and remain active until mid-autumn. In fall they have attractive foliage and are generally the most attractive grasses of the season.

**Plant Attributes and Features**
When choosing plants, strive for contrast, harmony and boldness to provide interesting variety throughout the year. It will take time for plants to mature, so allow plenty of room for growth. Perennials are plants that live longer than two years and life spans range from just a few years, up to many years. Longevity is often referred to as short- or long-lived.

- **Herbaceous perennials** grow and die back to the soil surface every year.
- **Woody perennials** are trees and shrubs that persist above ground year after year.
- **Annual and biennial life spans** require replanting every one or two years.

Some plants have developed strategies to cope with low-water environments. These are defense mechanisms designed to gather and preserve precious water. Look for plants with leaves that are fuzzy, light-colored, seem blue-tinged, or have spines.

**Nature’s Defenses**
- Hairy, sticky or wavy leaf surfaces deflect wind and channel water droplets.
- Short, narrow, incised leaves have smaller surface area and lose less water to evaporation.
- White or silvery-colored leaves reflect the sun’s rays and modify leaf temperatures.
- Spines, prickles, and aromatic foliage defend against loss of stem tissue and moisture from hungry, thirsty predators.
- Small, less showy flowers with little or no fragrance attract less attention from predaceous insects and grazing animals.

**Wildlife Enhancements**
- Fragrance
- Wildflowers
- Herbs or medicinals
- Color schemes or seasonal bloom schedules
- Recreation of natural habitats

Creating Native Landscapes in the Northern Great Plains and Rocky Mountains

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**Garden Attractions**

- Northern arnica in cottonwood trees
- Tortoiseshell butterfly feeding on senecio blossom

Some wildflowers require direct sunlight for 6 to 8 hours per day. As sunlight decreases, plant height and bloom size decrease. Bloom season and duration of bloom vary, so coordinate the extension and overlap to ensure interesting color throughout the entire growing season.
Choosing the Right Trees and Shrubs

Selecting the Best Type of Nursery Stock For Your Budget and Construction Needs

<table>
<thead>
<tr>
<th>Type</th>
<th>ADVANTAGES</th>
<th>DISADVANTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bareroot</td>
<td>inexpensive • ease of planting • field grown hardiness</td>
<td>• special handling and storage • long time period until maturity • decreased root area • easily desiccated • timing of planting is critical • poorer survival</td>
</tr>
<tr>
<td>Container</td>
<td>moderate cost • flexibility in handling, storage, planting • intact root system • better survival</td>
<td>• limited water/nutrient reservoir • more expensive than bareroot • potentially girdling roots • potentially root bound</td>
</tr>
<tr>
<td>B&amp;B</td>
<td>mature size/instant effect • better survival</td>
<td>handling, storage, planting labor • expensive</td>
</tr>
</tbody>
</table>

Plants that are dug and shipped as dormant 1- to 3-year-old stock without any soil surrounding their roots. Deciduous plants are primarily produced this way, although some evergreens can be grown using this method.

Plants that are grown in a pot. Avoid plants grown in the field and then transplanted to a pot just prior to sale.

(Balled and Burlapped). Hand or mechanically dug field-grown plants that have their roots and surrounding soil wrapped in burlap fabric secured with twine. Used primarily for large, field-grown stock.

A form of B&B that utilizes a wire basket to secure the rootball in lieu of twine. The baskets are untied from the trunk but remain in place during planting.

Tree and Shrub Health

The outward appearance of a plant can provide insight into its overall health. Examine nursery stock closely before purchasing it.

Healthy Roots
- Actively growing stock should have white root tips.
- Healthy plants should have enough fibrous root mass to retain the shape of the rootball once the container or burlap is removed.
- Bareroot material should have a shoot:root ratio of 1:1 or 1:2 with extensive, fibrous roots.

**TIP:** Avoid plants with signs of dead, discolored, shriveled, or water-soaked roots. Remove unhealthy or deformed roots with a sharp pruner prior to planting.

Healthy Trunk and Branches
- A healthy tree trunk should be straight, slightly tapered, and capable of remaining upright on its own. It should be uniformly branched along its length with half the leaf area in the lower two-thirds of the canopy.
- The trunks of large trees should be firmly connected to the rootball (i.e., not move independently).
- Branches should be free from signs of mechanical injury, sunburn, sunscald, insect, disease, or other forms of stress.
- The branches and tops of trees should not be severely pruned back (headed).
- Stems should be firm and smooth without a wrinkled appearance or soft texture.

**TIP:** Avoid plants with especially small leaves or with leaves that are unusually yellow or with brown, scorched margins.

Healthy Foliage
- Adequate and uniform foliage.
- Leaves appropriately sized and uniformly colored for the species.
- No signs of bud swell or growth should appear on dormant stock.

**TIP:** On healthy tissue, a shallow cut of the stem reveals a light green cambium layer between the bark and the wood.
Grasses can bring texture and softness into a landscape design. The wide variety of native grasses provides endless opportunities for adding color, providing a diversity of sizes and shapes, and offering relatively low maintenance. Favorable characteristics of most grasses include low water and fertility requirements; they reach their ultimate size quickly, have a high resistance to insects and diseases, and generally can fend for themselves. The use of native grasses for low maintenance landscaping can include a broad range of uses, i.e., ground cover, monoculture manicured lawns, individual accent or specimen plants, and prairie or meadow restoration.

Ground Cover
Grasses that spread by rhizomes, stolons (above-ground runners), or tillers are prime candidates for ground cover and site stabilization. Steep slope stabilization may require structural stabilization prior to plant establishment. Initial weed control is critical until the cover plants are established well enough to shade out or crowd out any unwanted plants.

Lawns
The use of native grasses for a manicured lawn involves the same site preparation and establishment techniques as with a Kentucky bluegrass lawn. The seeding rates are increased (500 Pure Live Seeds (PLS) per square foot) to ensure a dense, solid stand. Depending on the amount of water applied to a site (natural or supplemental) the plant density will eventually adjust to that which the site can maintain. Mulching and early supplemental water will help ensure a good initial stand. Rhizomatous species will continue to fill in the open spaces, but bunchgrass stands may develop gaps if the initial establishment is sparse. Although the emphasis of this publication is on native species, there are some introduced grasses that, because of their drought tolerance and low maintenance, can be used for manicured lawns.

Prairie/Meadow
In some suburban areas and particularly in rural settings, a person may want to restore large areas to native prairie or meadows, blending native prairie or meadows, blending with other plants & weeds. To restore a natural plant community there are several establishment options; e.g., 1) seed general mixtures and interplant to increase diversity; or 3) transplant all plants to spacing and composition desired. Once established, native prairies or meadows are virtually maintenance-free and, in most cases, perpetuate themselves forever.

Grasses for Ground Cover and Lawns

<table>
<thead>
<tr>
<th>Species</th>
<th>Cultivars</th>
<th>Life Form</th>
<th>Soil Preference</th>
<th>Lawn lbs PLS/1000 sq ft</th>
<th>Prairie lbs PLS/acre</th>
<th>Drought Tolerance</th>
<th>Trampling Resistance</th>
<th>Mowing Tolerance</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COOL-SEASON</strong></td>
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<td>Native</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>western wheatgrass (Pascopyrum smithii)</td>
<td>Rosana Rodan</td>
<td>rhizomatous</td>
<td>X</td>
<td>X</td>
<td>4</td>
<td>8</td>
<td>Moderate</td>
<td>Good</td>
<td>Good forms open sod, bluish in color</td>
</tr>
<tr>
<td>thickspike wheatgrass (Elymus lanceolatus)</td>
<td>Critana Barrock Schwindimar</td>
<td>rhizomatous</td>
<td>X</td>
<td>X</td>
<td>3.5</td>
<td>6</td>
<td>Good</td>
<td>Fair</td>
<td>Finer leaved than western wheatgrass, good seedling vigor</td>
</tr>
<tr>
<td>streambank wheatgrass (Elymus lanceolatus)</td>
<td>Sodar</td>
<td>rhizomatous</td>
<td>X</td>
<td>X</td>
<td>3.5</td>
<td>6</td>
<td>Good</td>
<td>Fair</td>
<td>Similar to thickspike, good seedling vigor</td>
</tr>
<tr>
<td>green needlegrass (Nassella viridula)</td>
<td>Lodorn</td>
<td>bunchgrass</td>
<td>X</td>
<td>X</td>
<td>3</td>
<td>5</td>
<td>Moderate</td>
<td>Fair</td>
<td>Best in a mix with other cool-season grasses</td>
</tr>
<tr>
<td>Introduced</td>
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</tr>
<tr>
<td>crested wheatgrass (Elymus lanceolatus)</td>
<td>Ephraim Roadcrest</td>
<td>rhizomatous</td>
<td>X</td>
<td>X</td>
<td>3</td>
<td>7</td>
<td>Excellent</td>
<td>Good</td>
<td>Good drought resistance</td>
</tr>
<tr>
<td>sheep fescue (Festuca arundinacea)</td>
<td>Covan Bighorn</td>
<td>bunchgrass</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>2</td>
<td>Good</td>
<td>Fair</td>
<td>Fine-leaved, competitive with other plants &amp; weeds</td>
</tr>
<tr>
<td>hard fescue (Festuca glaucescens)</td>
<td>Durar</td>
<td>bunchgrass</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>2</td>
<td>Good</td>
<td>Fair</td>
<td>Fine-leaved, short stature</td>
</tr>
<tr>
<td>tall fescue (Festuca arundinacea)</td>
<td>Alta Fawn</td>
<td>bunchgrass</td>
<td>X</td>
<td>X</td>
<td>2.5</td>
<td>6</td>
<td>Moderate</td>
<td>Good</td>
<td>Coarse leaves, high tolerance of trampling</td>
</tr>
<tr>
<td>Canada bluegrass (Poa compressa)</td>
<td>Reubens Talon Foothills</td>
<td>rhizomatous</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>Moderate</td>
<td>Good</td>
<td>Will form sod, not as tight as Kentucky bluegrass</td>
</tr>
<tr>
<td>Russian wildrye (Phleum pratense)</td>
<td>Bozisky-Select</td>
<td>bunchgrass</td>
<td>X</td>
<td>X</td>
<td>3</td>
<td>7</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent drought resistance</td>
</tr>
<tr>
<td><strong>WARM-SEASON (Native)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>blue grama (Bouteloua gracilis)</td>
<td>Bad River Wilis Almas</td>
<td>bunchgrass</td>
<td>X</td>
<td>X</td>
<td>1</td>
<td>2</td>
<td>Excellent</td>
<td>Excellent Good</td>
<td>Short stature, infrequent mowing, late greenup</td>
</tr>
<tr>
<td>buffalograss (Buchloe dactyloides)</td>
<td>Bismark Topgun Plots</td>
<td>stoloniferous</td>
<td>X</td>
<td>X</td>
<td>9</td>
<td>15</td>
<td>Good</td>
<td>Excellent Good</td>
<td>Short, stature, infrequent mowing, late green-up, best results with plugs</td>
</tr>
<tr>
<td>side oats grama (Bouteloua curtipendula)</td>
<td>Kildere Pierre</td>
<td>bunchgrass</td>
<td>X</td>
<td>X</td>
<td>3</td>
<td>5</td>
<td>Moderate</td>
<td>Fair</td>
<td>Tallness of grama grasses</td>
</tr>
</tbody>
</table>

Suggested Native Grassland Seeding Mixtures

- **Mountain/Foothills**
  - bluebunch wheatgrass (Pseudoroegneria spicata)
  - Idaho fescue (Festuca idahoensis)
  - big bluegrass (Poa annua)
  - mountain brome (Bromus marginatus)

- **Tallgrass Prairie**
  - big bluestem (Andropogon gerardii)
  - little bluestem (Schizachyrium scoparium)
  - switchgrass (Panicum virgatum)
  - Indian grass (Sorghastrum nutans)

- **Mixed Prairie (Upland)**
  - bluebunch wheatgrass (Pseudoroegneria spicata)
  - prairie june grass (Koeleria macrantha)
  - needle & thread (Stipa comata)
  - Indian rice grass (Achnatherum hymenoides)

- **Mixed Prairie (Lowland)**
  - western wheatgrass (Pascopyrum smithii)
  - green needlegrass (Nassella viridula)
  - thickspike wheatgrass (Elymus lanceolatus)
  - blue grama (Bouteloua gracilis)
Accent or specimen grasses are individual plants or clusters that are space-planted, usually with weed barrier and bark, gravel or decorative rock mulching. These types of plants are best established using containerized plant material transplanted in desired spacing and patterns. Many of the warm-season and tall staturesd grasses are used because of their fall colors and attractive seedheads, with secondary advantages of wildlife food and cover. Specimen plants may require some fall/winter or early spring maintenance to remove dead plant material and unwanted plant litter. The bunchgrass varieties of grasses are ideal for specimen plantings because they do not spread, retaining their individuality in a space-planted design.

Buying Seed
Much of the grass utilized in native landscaping will be established from seed. The buyer must be aware of what they are buying, both in terms of quality and what undesirable material may be in the seed lot. All seed sold in Montana and Wyoming is required to meet certain standards; i.e., the seed lot can’t have more than 2 percent weed seed and must be totally free of certain noxious weeds. By buying certified seed you are guaranteed that it is indeed the species and variety/cultivar as labeled, has minimum purity and germination levels, and meets specific limits on the amount of weeds and other crops allowed.

What Should A Seed Tag Tell You?
Seed tags vary in layout and design from state to state, but all have generally the same information.

### Grasses for Landscape Accents

<table>
<thead>
<tr>
<th>Species</th>
<th>Cultivars</th>
<th>Life-form</th>
<th>Mature Height</th>
<th>Fall Color</th>
<th>Soil Preference</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool-season (Native)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian brome</td>
<td>Rimrock</td>
<td>bunchgrass</td>
<td>1-2'</td>
<td>pale yellow</td>
<td>X X</td>
<td>attractive spreading seed head, seeds utilized by birds &amp; mammals</td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>Nezpar</td>
<td>bunchgrass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian wildrye</td>
<td>Trailhead</td>
<td>bunchgrass</td>
<td>5-8'</td>
<td>yellow/tan</td>
<td>X X</td>
<td>tall stature, good background plant</td>
</tr>
<tr>
<td>Basin wildrye</td>
<td>Magnar</td>
<td>bunchgrass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bluebunch wheatgrass</td>
<td>Goldar</td>
<td>bunchgrass</td>
<td>1-2'</td>
<td>pale yellow</td>
<td>X X X</td>
<td>state grass of Montana, attractive plant at maturity</td>
</tr>
<tr>
<td>Prairie junegrass</td>
<td>No releases</td>
<td>bunchgrass</td>
<td>6-18”</td>
<td>pale yellow</td>
<td>X X X</td>
<td>small stature, delicate blue-green leaves with compact seed head</td>
</tr>
<tr>
<td>Warm-season (Native)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big bluestem</td>
<td>Bison</td>
<td>bunchgrass</td>
<td>5-7'</td>
<td>reddish/purple</td>
<td>X X X</td>
<td>tall stature, turkey-foot shaped seed head, good border or background plant</td>
</tr>
<tr>
<td>Little bluestem</td>
<td>Badlands</td>
<td>bunchgrass</td>
<td>2-3’</td>
<td>reddish</td>
<td>X X X</td>
<td>shorter robust bunches with attractive red fall colors</td>
</tr>
<tr>
<td>Switchgrass</td>
<td>Decatur</td>
<td>bunchgrass</td>
<td>3-5’</td>
<td>golden yellow</td>
<td>X X</td>
<td>seed head is an open panicle, seeds readily used by birds and small mammals</td>
</tr>
<tr>
<td>Switchgrass</td>
<td>Forestburg</td>
<td>bunchgrass</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian ricegrass</td>
<td>Tomahawk</td>
<td>bunchgrass</td>
<td>4-6’</td>
<td>yellow/bronze</td>
<td>X X X</td>
<td>tall stature, good border or background plant</td>
</tr>
<tr>
<td>Sideoats grama</td>
<td>Killdeer</td>
<td>bunchgrass</td>
<td>1-2’</td>
<td>yellow</td>
<td>X X X</td>
<td>unique seed head with oat-like spikelets along one side of spike</td>
</tr>
<tr>
<td>Bluegrasses</td>
<td>Bad River</td>
<td>bunchgrass</td>
<td>6-12’</td>
<td>pale yellow</td>
<td>X X X</td>
<td>eye-shaped seed head, excellent drought tolerance, good for rock garden</td>
</tr>
<tr>
<td>Prairie sandreed</td>
<td>Goshen</td>
<td>rhizomatous</td>
<td>5-7’</td>
<td>pale yellow</td>
<td>X X</td>
<td>prefers sandy soil, good for sandy soil stabilization</td>
</tr>
</tbody>
</table>

Pure Live Seed—PLS is determined by multiplying total germination by purity and dividing by 100 (\( \frac{97.35 \times 89}{100} = 86.64 \)) meaning that 86.64 percent of this bulk material is actually viable seed of the tagged species.

Seed that didn’t germinate but was determined to be alive with Tetrazolium (TZ) test.

Germination determined by a standard lab analysis.

**Grasses**

---

Bluebunch wheatgrass.

‘Rimrock’ Indian ricegrass.

‘Trailhead’ basin wildrye.

Blue grama.
Wildflowers

Prefers perennial wildflowers live for more than 2 years. They offer something for everyone and are relatively easy to maintain.

- **Seeding.** Wildflower seeds are often very small, fluffy, or irregular-shaped, making it difficult to control the total amount dispersed. For example, aster and yarrow are better introduced as small plugs, that way there is less chance of overseeding and crowding out other species in the garden.

- **Potted Plants.** Containerized material should be healthy—leaf and stem colors appear normal with little or no yellowing or discoloration. Smaller containers are less expensive but greater numbers are required to fill an area. Larger material will be readily noticeable but cost more to install.

- **Planting.** Prepare the soil well ahead of planting. Avoid planting during the hot, dry months of summer. Follow spacing recommendations. Keep potted plants watered prior to and after transplanting. Sow seed into a firm, moist seedbed, mulch lightly, and apply frequent, light sprinkler irrigation. Monitor and inspect for insect pests and control weeds as they appear.

- **Maintenance.** To extend the flowering period and promote re-bloom, "deadhead" the flower after it dies: use sharp pruning shears to cut and remove the dead blossom. When plants reach maturity, divide the crown into smaller portions and transplant into another area, recycle to a like-minded gardener, or add to the compost pile. In late fall or early spring cut back all dead plant parts. By removing debris, pest and disease problems are reduced and interference with new growth is minimized.

**Landscape Uses**

Wildflower use in the landscape is unlimited, as plants are available in many sizes, shapes and colors. The development of a landscape plan is recommended and landscape design professionals can be consulted for assistance. Locate and group plants together that have similar water and light requirements.

Poisonous Plants

It’s wise to inquire about a plant’s potential toxicity before placing it in a landscape. The foliage of some plants is known to be poisonous to people, pets, and domestic livestock. A few of the more common ones include bleeding heart, buttercup, clematis, foxglove, goldenrod, horsetail, larkspur, monkshood, oak, poppy, and water hemlock. Visit your local bookstore or library, or the website provided in the reference section.

### Wildflowers for Native Landscapes

**Common Name** | **Scientific Name** | **Soil** | **WHZ** | **Precip. inches** | **Longevity** | **Color** | **Light** | **Ht. feet** | **Bloom Season** | **Feature**
---|---|---|---|---|---|---|---|---|---|---
common yarrow | Achillea millefolium | C, M, F | 2b-5a | 9 | LP | W | PSb-FS | 1-2 | S-5u | Dr, M
western pearlwort | Anaphalis margaritacea | C, M | 3a-4b | 10 | SP | W | PSb-FS | 1-2 | Su | M
littleleaf yarrow | Antennaria microphilida | C, M, F | 2b-4b | 12 | SP | W | FS | 1 | LS-Su | Dr
smooth aster | Aster laevis | C, M, F | 3a-4b | 12 | MP | B | PSb-FS | 2-3 | Su | Bt, Dr
white prairie clover | Dalea candida | C, M | 3a-4b | 12 | LP | W | FS | 1-3 | Su | M
purple prairie clover | Dalea purpurea | C, M | 3a-4b | 14 | LP | Pu | PSb-FS | 1-2 | Su | Bt
blackseam prairie clover | Echinacea angustifolia | M, F | 3a-4b | 12 | LP | P | FS | 2-3 | Su | Bt, Dr, M
alpine flower bucklewheat | Erigeron umbellatus | C, M, F | 3b-4b | 10 | LP | W-F | FS | 1 | Su | Bt
blanket flower | Gaillardia aristata | C, M, F | 3a-4b | 10 | LP | Y | FS | 3 | Su | Bt, Dr, M
sticky geranium | Geranium viscosissimum | C, M, F | 3a-4b | 14 | LP | L | PSb-FS | 2-3 | LS-Su | M
boreale sweetwheat | Hedyoserum boreale | C, M, F | 3a-4b | 12 | LP | P | FS | 1-2 | Su | Bt, Dr
maxiflora sunflower | Helianthus maximiliani | C, M, F | 3b-5a | 14 | SP | Y | FS | 4-6 | LS-ESu-EF | Bt, Dr
shoow goldeneye | Helianthus multiflorus | C, M | 3b-4b | 14 | SP | Y | FS | 3 | M-Su-ESu | Bt, Dr
dogged gayfeather | Liatris puncata | C, M, F | 3b-4b | 10 | LP | P | FS | 1-2 | LS-ESu-EF | Dr, Bt
lewis flax | Linum lewisi | C, M | 3a-4b | 10 | SP | B | PSb-FS | 1-2 | LS-Su | M
lupine | Lupinus | C, M | 3a-4b | 10 | SP | B | PSb-FS | 1-2 | LS-Su | M
wildongrasseas bbcelam | Monarda fistulosa | C, M | 3a-4b | 12 | LP | Y | FS | 2-3 | Su | Bt, Dr, M
rays pogonopore | Oenothera polyanaetha | C, M, F | 3b-4b | 8 | LP | Y | FS | 1 | LS-ESu | D, M
beardtongue | Penstemon | C, M | 3a-5a | 10 | A-SP | All | Sh-FS | 1-4 | ESu | Bt, Bt, Dr
silverleaf phacelia | Phacelia hastata | C, M, F | 3b-4b | 10 | LP | W | FS | 1-2 | LS-Su | Dr
spiny phlox | Phlox hoodii | C, M | 3b-4b | 10 | LP | W | FS | 1-2 | LS-Su | Dr
woolly cinquefoil | Potentilla hippiana | C, M, F | 3b-4b | 14 | SP | Y | FS | 1-2 | ESu | Bt, Dr
prairie coreflower | Ratibida columnifera | C, M | 3a-4b | 10 | SP | Y | FS | 1-3 | Su | Bt, Dr, M
scarlet globemallow | Sphaeralcea coccinea | M, C | 3a-5a | 8 | P | O | FS | 1 | Su | Dr, M
prairie threemats | Thermopsis rhomboidea | M, F | 3b-4b | 8 | LP | Y | FS | 1-2 | LS-Su | Dr
american vetch | Vicia americana | M, C, F | 3b-5a | 10 | B | FS | 1-2 | LS-Su | M

**Feature**
- **C** Coarse (sands to gravels), **M** Medium (intermediate combinations), **F** Fine (silts to clays);
- **WHZ** 1 WHZ2 Precip. Longevity 3 Color 4 Light 5 Ht. Bloom Season 6 Feature 7

**Mass Plantings**

Specimens

Specimens are separate, individual plants that attract attention to their ornamental beauty. They are generally selected for large size and stature, or for unusual shape, color or texture. Specimens function as solitary elements for viewing from all sides or as a dominant piece in a mass planting. They should be used sparingly to avoid attracting attention to many different points.

**Borders**

Border plants are used along the edge of a structure, hard surface, or lawn area. They function as hedges, screens, traffic guides, and foundation plantings. Open and semi-open space can be defined with the use of borders. Avoid creating visual chaos by limiting the number of plant types.

**Ground Covers**

Spreading and low-growing plants work well to cover areas that are impractical to maintain as a lawn. They are used on slopes, along pathways, under shade or tree canopies, and between plants in flower beds. Consider converting lawn space to a ground cover for reduced water consumption.
Trees and Shrubs for Native Landscapes

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Rate of Growth</th>
<th>Minimum Precip. (in.)</th>
<th>USDA Winter Hardiness Zone</th>
<th>Saline Soil Tolerance</th>
<th>Overall Landscape Aesthetics</th>
<th>20-Year Height (feet)</th>
<th>Mature Width (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>but oak</td>
<td>Quercus macrocarpa</td>
<td>s-m</td>
<td>12</td>
<td>2</td>
<td>mt</td>
<td>f</td>
<td>18 to 25</td>
<td>20 to 35</td>
</tr>
<tr>
<td>green ash</td>
<td>Fraxinus pennsylvanica</td>
<td>m</td>
<td>10</td>
<td>3</td>
<td>mt</td>
<td>f</td>
<td>20 to 30</td>
<td>30 to 40</td>
</tr>
<tr>
<td>honeylocust</td>
<td>Tilia americana</td>
<td>m</td>
<td>12</td>
<td>3</td>
<td>mt</td>
<td>f</td>
<td>15 to 20</td>
<td>30 to 40</td>
</tr>
<tr>
<td>ponderosa pine</td>
<td>Pinus ponderosa</td>
<td>m</td>
<td>12</td>
<td>3</td>
<td>mt</td>
<td>f</td>
<td>16 to 20</td>
<td>25 to 30</td>
</tr>
<tr>
<td>Douglas fir</td>
<td>Pseudotsuga menziesii</td>
<td>m-s</td>
<td>14</td>
<td>3</td>
<td>mt</td>
<td>p-f</td>
<td>12 to 18</td>
<td>20 to 28</td>
</tr>
<tr>
<td>lime pine</td>
<td>Pinus flexilis</td>
<td>m-s</td>
<td>10</td>
<td>3</td>
<td>nt</td>
<td>m-h</td>
<td>12 to 20</td>
<td>15 to 30</td>
</tr>
<tr>
<td>Colorado spruce</td>
<td>Picea pungens</td>
<td>m</td>
<td>12</td>
<td>2</td>
<td>nt</td>
<td>p-f</td>
<td>16 to 20</td>
<td>15 to 25</td>
</tr>
<tr>
<td>common hackberry</td>
<td>Celtis occidentalis</td>
<td>m</td>
<td>12</td>
<td>3</td>
<td>mt</td>
<td>p-f</td>
<td>15 to 20</td>
<td>10 to 20</td>
</tr>
<tr>
<td>western mountain ash</td>
<td>Sorbus stellata</td>
<td>m</td>
<td>15</td>
<td>3</td>
<td>nt</td>
<td>p-f</td>
<td>10 to 15</td>
<td>10 to 12</td>
</tr>
<tr>
<td>paper birch</td>
<td>Betula papyrifera</td>
<td>m-r</td>
<td>H</td>
<td>nt</td>
<td></td>
<td></td>
<td>15 to 20</td>
<td>20 to 30</td>
</tr>
<tr>
<td>quaking aspen</td>
<td>Populus tremuloides</td>
<td>r</td>
<td>H</td>
<td>1</td>
<td>nt</td>
<td>m</td>
<td>15 to 20</td>
<td>15 to 25</td>
</tr>
<tr>
<td>black cottonwood</td>
<td>P. balsamifera ssp.</td>
<td>r</td>
<td>H</td>
<td>2</td>
<td>nt</td>
<td>f</td>
<td>40 to 50</td>
<td>35 to 40</td>
</tr>
<tr>
<td>narrowleaf cottonwood</td>
<td>P. angustifolia</td>
<td>r</td>
<td>H</td>
<td>2</td>
<td>nt</td>
<td>f</td>
<td>30 to 40</td>
<td>25 to 35</td>
</tr>
<tr>
<td>plains cottonwood</td>
<td>P. deltoides ssp.</td>
<td>r</td>
<td>H</td>
<td>2</td>
<td>nt</td>
<td>f</td>
<td>40 to 50</td>
<td>35 to 40</td>
</tr>
<tr>
<td>Shrubs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rocky Mountain juniper</td>
<td>Juniperus scopulorum</td>
<td>s-m</td>
<td>10</td>
<td>3</td>
<td>mt</td>
<td>f</td>
<td>10 to 12</td>
<td>12 to 20</td>
</tr>
<tr>
<td>common juniper</td>
<td>Juniperus communis</td>
<td>s-m</td>
<td>12</td>
<td>2</td>
<td>mt</td>
<td>f</td>
<td>3 to 5</td>
<td>4 to 8</td>
</tr>
<tr>
<td>silverberry</td>
<td>Leucopaxus commutatus</td>
<td>m</td>
<td>12</td>
<td>2</td>
<td>mt</td>
<td>f-p</td>
<td>4 to 8</td>
<td>3 to 6</td>
</tr>
<tr>
<td>American plum</td>
<td>Prunus americana</td>
<td>m</td>
<td>14</td>
<td>3</td>
<td>mt</td>
<td>f-p</td>
<td>6 to 10</td>
<td>8 to 10</td>
</tr>
<tr>
<td>common snowberry</td>
<td>Symphoricarpos allius</td>
<td>m</td>
<td>14</td>
<td>3</td>
<td>mt</td>
<td>f-p</td>
<td>1 to 3</td>
<td>1 to 3</td>
</tr>
<tr>
<td>mallow ninebark</td>
<td>Physocarpus malvaceus</td>
<td>m</td>
<td>15</td>
<td>3</td>
<td>nt</td>
<td>p-f</td>
<td>2 to 3</td>
<td>3 to 4</td>
</tr>
<tr>
<td>Lewis' mockorange</td>
<td>Philadelphus lewissii</td>
<td>s-m</td>
<td>15</td>
<td>3</td>
<td>nt</td>
<td>p-f</td>
<td>3 to 6</td>
<td>3 to 6</td>
</tr>
<tr>
<td>golden currant</td>
<td>Ribes aureum</td>
<td>m</td>
<td>12</td>
<td>2</td>
<td>mt</td>
<td>f-p</td>
<td>3 to 5</td>
<td>3 to 6</td>
</tr>
<tr>
<td>silver buffaloberry</td>
<td>Shepherdia argentea</td>
<td>m</td>
<td>10</td>
<td>2</td>
<td>t</td>
<td>f</td>
<td>6 to 12</td>
<td>8 to 14</td>
</tr>
<tr>
<td>Canada buffaloberry</td>
<td>Shepherdia canadensis</td>
<td>s</td>
<td>14</td>
<td>3</td>
<td>nt</td>
<td>f-p</td>
<td>5 to 5</td>
<td>6 to 8</td>
</tr>
<tr>
<td>chokecherry</td>
<td>Prunus virginiana</td>
<td>m</td>
<td>12</td>
<td>2</td>
<td>mt</td>
<td>p-f</td>
<td>10 to 12</td>
<td>10 to 20</td>
</tr>
<tr>
<td>western sand cherry</td>
<td>Prunus pumila var.</td>
<td>s-m</td>
<td>12</td>
<td>2</td>
<td>mt</td>
<td>f</td>
<td>3 to 5</td>
<td>3 to 5</td>
</tr>
<tr>
<td>skunkbush sumac</td>
<td>Rhus trilobata</td>
<td>s-m</td>
<td>10</td>
<td>3</td>
<td>mt</td>
<td>p-f</td>
<td>3 to 6</td>
<td>4 to 8</td>
</tr>
<tr>
<td>'Woods' rose</td>
<td>Rosa woodsii</td>
<td>m</td>
<td>12</td>
<td>2</td>
<td>nt</td>
<td>p-f</td>
<td>4 to 5</td>
<td>4 to 6</td>
</tr>
<tr>
<td>staghorn sumac</td>
<td>Rhus typhina</td>
<td>m</td>
<td>10</td>
<td>3</td>
<td>nt</td>
<td>mt-p</td>
<td>8 to 10</td>
<td>8 to 15</td>
</tr>
<tr>
<td>shrubbery cinquefoil</td>
<td>Persicaria forbesiana</td>
<td>m</td>
<td>14</td>
<td>3</td>
<td>nt</td>
<td>p-f</td>
<td>6 to 15</td>
<td>10 to 20</td>
</tr>
<tr>
<td>serviceberry</td>
<td>Ameranthus altifolius</td>
<td>m</td>
<td>12</td>
<td>4</td>
<td>nt</td>
<td>p-f</td>
<td>6 to 8</td>
<td>10 to 15</td>
</tr>
<tr>
<td>fourring saltbush</td>
<td>Atriplex x agrestis</td>
<td>s-m</td>
<td>10</td>
<td>2</td>
<td>mt</td>
<td>t</td>
<td>1 to 3</td>
<td>2 to 5</td>
</tr>
<tr>
<td>winterfat</td>
<td>Krasschenksonianum anata</td>
<td>m</td>
<td>10</td>
<td>3</td>
<td>nt</td>
<td>f</td>
<td>1 to 3</td>
<td>1 to 3</td>
</tr>
<tr>
<td>cutleaf mt. mahogany</td>
<td>Cercocarpus ledifolius</td>
<td>s</td>
<td>10</td>
<td>3</td>
<td>nt</td>
<td>p-f</td>
<td>4 to 8</td>
<td>2 to 10</td>
</tr>
<tr>
<td>big sagebrush</td>
<td>Artemisia tridentata</td>
<td>m</td>
<td>8</td>
<td>3</td>
<td>nt</td>
<td>f-p</td>
<td>1 to 6</td>
<td>4 to 8</td>
</tr>
<tr>
<td>red understory</td>
<td>Cornus sericea</td>
<td>s</td>
<td>H</td>
<td>2</td>
<td>nt</td>
<td>p-f</td>
<td>6 to 8</td>
<td>10 to 15</td>
</tr>
<tr>
<td>Groundcovers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>bearberry</td>
<td>Arctostaphylos uva-ursi</td>
<td>s</td>
<td>14</td>
<td>2</td>
<td>nt</td>
<td>p-f</td>
<td>0.25 to 0.5</td>
<td>2 to 3</td>
</tr>
<tr>
<td>Oregon grape</td>
<td>Malonia repens</td>
<td>s</td>
<td>14</td>
<td>2</td>
<td>nt</td>
<td>p-f</td>
<td>0.5 to 1</td>
<td>4 to 6</td>
</tr>
<tr>
<td>horizontal juniper</td>
<td>Juniperus horizontalis</td>
<td>s</td>
<td>12</td>
<td>3</td>
<td>nt</td>
<td>f</td>
<td>0.5 to 1.5</td>
<td>5 to 8</td>
</tr>
<tr>
<td>Vine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Virginia creeper</td>
<td>Parthenocissus quinquefolia</td>
<td>m</td>
<td>14</td>
<td>3</td>
<td>nt</td>
<td>p-f</td>
<td>0.5 to 0.75</td>
<td>25+</td>
</tr>
</tbody>
</table>

1=-slow, m=moderate, r-rapid, H-hydric (needs moisture advantage); T-tolerant, mt-moderately tolerant, nt-not tolerant; F-full sun, p-partial, s-shade; L-low, m-medium, h-high.

After purchase, the care and handling of plant material from the time it is delivered until the time it is installed is the responsibility of the customer.

Bareroot plants are shipped dormant and should be planted as soon as possible, usually within 72 hours of receipt. Optimum storage is 34°F in refrigerated cooling at a relative humidity of 80 to 90 percent. For short storage intervals (less than 3 days), bareroot plants can be kept in cool, shaded locations outdoors. Keep the roots covered with sterile, moistened media. The media should be just moist enough that only a few drops of water can be squeezed from a single handful of material. Keep seedlings out of direct sun, protected from wind desiccation and heat build-up, and keep the roots moist. Never allow the roots to dry out, even briefly, prior to planting. Keep bareroot plants in cold storage until they are needed for outplanting. Bareroot plants should show no signs of active growth, even bud swell, prior to planting.

Container plants offer more flexibility in planting, handling, and storage than bareroot stock. Potted plants have a limited reservoir of water and may require daily watering during active growth. Container stock can be planted as either dormant or active-growing plants. Store potted plants in a wind-protected area under filtered light. Water until drainage occurs from the bottom of the pot.

Balled and Burlapped (B&B) material often requires special handling given the size and weight of the plant, roots, and soil. Do not move B&B plants by the trunk alone. Support the trunk and rootball simultaneously to assure the roots are not broken at the trunk surface. Never drop a B&B plant abruptly on the ground, even from a slight elevation. Gently slide or roll large B&B plants into the planting hole. Never attempt to move an excessively wet rootball. Store B&B material as you would container plants. Media such as a sand:peat mix may be needed to cover the rootball during long-term storage. Special provisions may be needed to secure the plants during storage in high wind locations.
Creating Native Landscapes in the Northern Great Plains and Rocky Mountains

Trees and Shrubs
Anatomy of a Properly Planted Tree

Always call your local utility company before digging.

Bareroot


Step 1: Dig hole 1.5 times wider than the rootball and slightly deeper. Backfill the bottom of the hole with friable, native soil for proper planting depth.

Step 2: If present, break through impervious soil layers to allow root penetration.

Step 3: Final planting depth should place top of rootball level with existing soil grade.

Step 4: Make sure trunk is vertical.

Step 5: Remove container or roll back laces and burlap and bury in hole.

Step 6: Backfill hole with native, friable soil and then saturate to remove air pockets.

Step 7: Small berm to retain water in rootball zone.

Step 8: Use protective devices to protect trunks from mechanical damage from mowers and trimmers.

Step 9: For tall stock, 2-4 stakes to prevent wind damage; bury stakes 1/3 to 1/2 their length.

Step 10: Protect trunk from guy wires with hose. Attach supports 1/2 to 2/3 up the tree.


Step 12: 1-3 inches of high quality organic mulch. Avoid mulching against trunk.

Containers and Balled and Burlapped

TIP: Always remove the plant from the pot prior to planting.

TIP: The removal of burlap is unnecessary although it should be unrolled from the trunk of the tree and rolled back into the planting hole and covered with soil to prevent wicking. Synthetic wraps must be totally removed to prevent girdling.

TIP: Do not leave roots exposed to the air for even brief periods. Keep bareroot plants covered with moist burlap during the planting process. Make sure roots are fully extended and vertical in planting hole. Follow the B&B steps as appropriate.
In the development and maintenance of a native landscape, water conservation is the driving force behind efficient and aesthetic designs. Plants should be grouped in separate water-use zones according to their needs and function within a landscape. Monitoring soil moisture to determine when to irrigate is better than using a pre-set schedule. The soil water-holding capacity will vary with soil type, amount of organic matter and climatic conditions.

Supplemental Water Requirements

- **Seedings:** A moist soil profile, prior to planting, will increase seeding success. Watering should be done in frequent, light applications during the first 4-6 weeks to ensure good seed germination, emergence, and root development. The use of an organic mulch can reduce the potential fluctuations in surface soil moisture and soil temperature during this critical establishment period.

- **Transplants:** Young transplants require frequent and regular watering until root development can provide the proper shoot/root ratio. Some woody species (oak in particular) spend several years developing an extensive root system before a corresponding increase in above-ground development is realized.

- **Established Plantings:** There are two times during the year it is critical that the rooting zone of a plant be at or near field capacity—fall and early spring. Fall moisture is essential for the health and vigor of the plant as it prepares itself for the winter months. Trees, in particular, should be deep watered in the fall to prepare for possible warm periods during the winter months. As temperatures warm up in the spring there is an urgent need for water to support rapid early growth.

Other Considerations

- South and west exposures require more frequent watering than north or east exposures.
- Sloping landscapes require water to be applied more slowly than flat surfaces to allow adequate infiltration and prevent runoff.
- With severe slopes, establish berms or terraces to hold water and stabilize the slope.
- Avoid using sprinklers that throw a fine mist high in the air.
- Avoid watering during hot, windy, or rainy weather.

Water Conservation Strategies

**Zoning**

<table>
<thead>
<tr>
<th>High Watering Zones</th>
<th>Moderate Watering Zones</th>
<th>Low Watering Zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 gals. added per sq. ft. per growing season</td>
<td>10 gals. added per sq. ft. per growing season</td>
<td>2-3 gals. added per sq. ft. per growing season</td>
</tr>
<tr>
<td>1/2' 3 times/wk</td>
<td>3'/4 once/wk</td>
<td>1/2' bi-monthly</td>
</tr>
</tbody>
</table>

Approx 30' added/season Approx. 18' added/season Approx. 5' added/season

**Shading/Shielding**

Plants that require more moisture or prefer shade can be located beneath or on the shady side of larger plants, fences, or buildings. Afternoon sunlight is more intense, so plants to be shaded should be put on the easterly side of large plants or structures.

**Mulching/Landscape Fabric**

Mulches are used to minimize evaporation, and to reduce weed growth and erosion. Apply mulch directly to the soil surface or over a landscape fabric. Don’t use black plastic unless it’s been perforated; it prevents air and water from reaching plant roots and it reduces beneficial soil organisms.

**Organic Mulches**

Inorganic mulches such as rocks or gravel rarely need replenishment and are good in windy areas. Apply in a layer 1-3 inches deep between plants.

Newly seeded areas can be mulched with weed-free hay, straw or composted grass clippings. This will help retain soil moisture, increase site stability (reduce soil and water erosion), and provide more uniform heat at the time of seed germination. Apply mulch in a layer no more than 1/2 inch deep over the seeded area.

**Caution:** Rock mulch can serve as a heat sink and also reflect heat to surrounding plants and buildings.

**Mulches such as rock or bark can be placed on top of the landscape fabric to attain a particular aesthetic appearance.**

**Infiltration Rates and Soil Water by Soil Texture**

<table>
<thead>
<tr>
<th>Soil Texture</th>
<th>Infiltration Rate</th>
<th>Available Vegetated</th>
<th>Bare</th>
<th>Infiltration Rate</th>
<th>Available Vegetated</th>
<th>Bare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandy</td>
<td>2.5</td>
<td>1.2</td>
<td>0.50</td>
<td>Silty</td>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Loamy</td>
<td>1.0</td>
<td>0.5</td>
<td>1.25</td>
<td>Clayey</td>
<td>0.3</td>
<td>0.1</td>
</tr>
</tbody>
</table>

The frequency of irrigation is dependent primarily on the moisture requirements of the plants and the water-holding capacity of the soil. Plants should be carefully monitored for signs of moisture stress, i.e., loss of leaf turgidity (drooping), curling of leaf edges, and leaf discoloration.

**Drip Emitters**

The most efficient use of water is the slow, deliberate metering of water directly to individual plants. Drip systems can be installed underground or laid across the soil surface. Most drip systems work with low pressure and often require a filtration system to prevent the clogging of emitters. Drip systems must be monitored to avoid oversaturation below the soil surface.

Soaker hoses deliver water slowly and with very little loss to evaporation.

*Loose stone mulch, such as crushed limestone or gravel, can be applied over a landscape fabric to reduce soil erosion and provide a more uniform heat distribution.*

*Photo: The Mennonite Homestead by New American Library.*

*Photo: Soaker hose by Ed's Irrigation.*
Creating Native Landscapes in the Northern Great Plains and Rocky Mountains

Mowing

When mowing, it is recommended that a 3-inch stubble height be left. With taller-statured grasses an even higher stubble height may remain. Various grass species respond differently to mowing. Rhizomatous species are stimulated by frequent cropping while bunchgrasses are often stressed or even eliminated by frequent cutting.

The mowing frequency and intensity will vary according to the species and intended use of a particular stand of grass:

- Manicured Lawn. Maintained at uniform height. Most sod-forming species are naturally short-statured.
- Biomass Removal. The purpose of mowing is to reduce the amount of dormant or dead stems and leaves for such purposes as fire prevention. Cutting of potential snowdrifts or just removal of dormant plant material at the end of a growing season.
- Weed Control. Mowing, especially during the establishment year, can help with weed control by not allowing annual weeds to set seed.
- Species and intended use of a particular stand of grass:

Mowing frequency and intensity vary depending on the species and intended use of the stand.

Pruning/Trimming

Pruning is usually done on woody plants, but can also refer to the removal of seedheads and other mature plant parts from herbaceous plants.

Herbaceous Plants

Maturing seedheads can be pruned to stimulate secondary flowering or prolong vegetative growth later in the growing season. Mature specimen plants can be left to add winter color or aid in trapping snow. Otherwise, herbaceous material should be trimmed and removed in late fall or early winter. Herbaceous specimen plants left standing over winter should be trimmed in early spring to remove dead plant material and unwanted plant litter.

Woody Plants

- At an early age woody plants should be pruned to conform with the intended use and landscape design. Trim to single stem or leave as multi-stem plant.
- Prune lower branches to provide lower stem sanitation or to alleviate shading of adjacent ground cover plants.
- Prune disease or insect-affected plant parts to minimize spread.
- Remove rubbing, deformed, and dead branches.
- Prune interior limbs to reduce wind resistance.
- Conifers should be pruned in spring or early summer.
- deciduous trees and shrubs should be dormant-pruned in late fall or winter.

Fertilizer

Most of the and semiarid native plants do not need supplemental fertilization if established on natural soil conditions. If subsoil is exposed or the soil is very sandy, some fertilization may be warranted. Excess fertilization will increase biomass production, thus increasing soil moisture requirements for the plants.

Adopt an Integrated Pest Management (IPM) approach to controlling weeds, insects, and disease. This approach incorporates monitoring to determine the level of infestation with a combination of control measures, i.e., cultural practices, pesticides, biological control, choosing plants with pest and disease resistance, maintaining good plant health (vigor), practicing good sanitation, and properly timed control measures. Cultural practices include tillage, hand-pulling of weeds or hand-plucking of insects, and mowing.

Insects

Native vegetation will probably attract more desirable insects than pests. Butterflies and other pollinators will be attracted by flowering forbs and shrubs. Conscientious use of pesticides, use of less toxic compounds (insecticidal soap, dormant oil spray, diatomaceous earth), and strategic placement of insect deterring plants should solve most insect pest problems. Monitor insect populations closely so that control measures can be implemented in the early stages of infestation.

Diseases

Sanitation is key to disease control and prevention. With careful monitoring and early detection, most diseases can be avoided. As with insects, native plants have evolved a natural immunity to many diseases. With selective pruning, excess litter removal, and in some cases, by using fire, diseases in a natural landscape will be minimal. Avoid late afternoon or evening watering of foliage.

Animals

Native landscaping, especially in rural and suburban areas, will attract potentially damaging animals (deer, rabbits, rodents, beavers). Until plants are large enough to withstand browsing, some form of plant protection may be necessary (see Plant Protection section). The planting of less palatable plants and trees is a feasible alternative.

Weeds

Perennial weeds should be dealt with prior to implementation of a landscape plan. Annual weeds can be reduced by not allowing them to go to seed. The first two establishment years require the most maintenance, but once your landscape plants are established maintenance becomes easier and more routine. Caution should be used when using any herbicide within the rooting zone of woody plants.

Nitrogen Phosphorus Potassium

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Photo courtesy of T. P. Recreat.

Using Chemicals

Follow the label for proper pesticide application rates and target species.

For insect and disease damage it is important to properly identify the insect or pathogen before attempting any control measures.
Protection is the preventative maintenance aspect of plant care. Although we often think of protection in terms of avoiding damage from animals or people, protection includes any proactive steps to minimize plant stress and maintain health. An important first step in this process is to select well-adapted species and then maintain them in a vigorous condition.

Protecting Plants from Desiccation

Desiccation occurs when the rate of water loss (transpiration) from the plant exceeds its ability to extract moisture from the soil. Numerous factors contribute to desiccation including temperature, wind speed, sun exposure, soil texture, available soil moisture, and stage of plant growth.

- Water in anticipation of high plant demands.
- Saturate the soil in the fall and early winter in order to reduce winter desiccation.
- Use anti-desiccant spray when planting seedlings, transplanting nursery stock, or in the fall to protect exposed plants. Install landscape fabric and mulch to conserve soil moisture.
- Use shingles or screens on the south and west sides of newly planted seedlings to reduce wind desiccation and sun exposure.
- If possible, do not locate plants in exceptionally windy areas unless temporary protection is provided.

Protecting Plants from Animals

Ornamental landscapes attract and provide habitat for numerous animals including deer, rabbits, gophers, mice, and other wildlife. Although some designs intentionally incorporate features to attract wildlife, damage to landscape plants can be serious and may warrant the need for protection. The type and cost of protection varies with the value of the plants and the potential for damage.

Repellents. Repellents are products that, when applied to the plant or soil, discourage animals from feeding on or otherwise damaging the plant. They are:
- Usually low-cost products
- Well suited for use in gardens, orchards, nurseries, and ornamental landscapes
- Generally only effective for a short period of time and require multiple applications in order to continue providing protection
- Increasingly ineffective as browse and forage become limited

Exclusion. In general, exclusion systems provide more absolute protection than other techniques. These barriers may be physical and/or electrical in mode of action. Physical barriers include wire cylinders and cages, ventilated plastic tubing, netting, wraps, fences, screens, and ornamental landscapes.

Culture. Cultural practices such as weed control, brush management, pruning, and mowing can be used to reduce cover in the vicinity of the target plant. Remove tall, dense herbaceous vegetation from around trees and shrubs to discourage rodents.

Plant Selection. Browsing damage can sometimes be reduced by selecting plants that are not preferred by wildlife and livestock. Keep in mind that starving animals will utilize nearly all edible vegetation.

Using Domestic Animals for Plant Protection. Secured dogs and other domestic animals are sometimes effective in scaring away unwanted wildlife. New designs that incorporate wireless fences have proven effective in the nursery industry.

Animal Removal. In some cases, it may be necessary to relocate damaging animals. Contact your county animal control department.

Sacrificial Crops. Highly palatable, low cost crops can sometimes be used to lure wildlife away from landscape plants. Caution should be used when designing such systems to avoid attracting additional animals into the area. This is probably best suited to farm or ranch situations.

Always consider public safety, especially that of children, when developing a protection plan.

<table>
<thead>
<tr>
<th>Strategies for Protection from People</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common People Problems</strong></td>
</tr>
<tr>
<td>Mower and weed trimmer injury to trees and shrubs</td>
</tr>
<tr>
<td>+ install weed barrier and mulch around base of tree</td>
</tr>
<tr>
<td>+ install ornamental fence</td>
</tr>
<tr>
<td>+ plant flowers or ground cover around base of tree</td>
</tr>
<tr>
<td>Heavy traffic</td>
</tr>
<tr>
<td>+ construct a sidewalk or path</td>
</tr>
<tr>
<td>+ construct a fence or wall</td>
</tr>
<tr>
<td>+ install warning signs (commercial)</td>
</tr>
<tr>
<td>Misapplied chemicals and fertilizers</td>
</tr>
<tr>
<td>+ always follow label instructions</td>
</tr>
<tr>
<td>+ base fertilizer applications on soil test results (if some is good, more is not necessarily better)</td>
</tr>
<tr>
<td>+ consult with a professional</td>
</tr>
<tr>
<td>Improper mowing</td>
</tr>
<tr>
<td>+ keep blades sharp to prevent tearing</td>
</tr>
<tr>
<td>Improper pruning</td>
</tr>
<tr>
<td>+ use sharp, high-quality pruners</td>
</tr>
<tr>
<td>+ if unsure, hire a professional</td>
</tr>
</tbody>
</table>

Beaver damage to a cottonwood tree.

Livestock damage.

Sidewalks help protect plants in heavy traffic areas.
Spring...

1. Prune evergreen shrubs.
2. Mow lawn to a height of 3 inches leaving clippings on the lawn.
3. Check lawn to determine if it needs aeration.
4. Compost garden prunings to reduce trash volume and recycle nutrients back into the garden.
5. Plant trees, shrubs, and most plants now.
6. Pressurize and check all zones of automatic sprinkler system to make sure there are no leaks. Set the system for shorter and/or less frequent cycles during the cool spring months.

Summer...

1. Water plants in early morning, according to plant needs, to maintain healthy root and top growth and to reduce water loss by evaporation.
2. Control aphids and mites with insecticidal soaps to spare beneficial insects and provide long-term pest control.
3. Prune spring-flowering shrubs just after blooms are finished. Leave the branch collar instead of making flush cuts.
4. Keep ahead of the weeds by mowing and hand-pulling. Use herbicides sparingly and apply according to label recommendations.

Fall...

1. Compost equal parts of dry leaves and green plant materials for next year's soil amendment.
2. Prepare the soil for next year's landscape plantings and vegetable garden.
3. Water landscape plants for good establishment and winter survival.
4. Drain and blow out irrigation system.
5. Apply repellents and barriers to reduce animal damage.
6. Install snow fence on the windward side of landscape plantings to trap additional moisture and protect sensitive plants from winter desiccation.
7. Fertilize lawn.

Winter....

1. Prune deciduous trees and late summer-blooming deciduous shrubs.
2. Soak root zone on a monthly basis if there has been no winter precipitation and if soil is not frozen. Especially watch the evergreens.
3. Watch south-facing slopes and windy areas for winter drying and water as needed.

Relax and enjoy your landscape!
About this Publication

Authors:
USDA Natural Resources Conservation Service Bridger Plant Materials Center Staff: Mark Majerus, Plant Materials Center Manager; Connie Reynolds, Resource Conservationist; Joe Sciauna, Horticulturist; and Susan Winslow, Agronomist.

USDA Natural Resources Conservation Service Staff: Larry Holzworth, Plant Materials Specialist; Elizabeth Woodson, Resource Conservationist.

Project Coordinator:
Elizabeth Woodson, Resource Conservationist, USDA Natural Resources Conservation Service

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Montana Association of Conservation Districts
Lower Musselshell Conservation District
USDA Natural Resources Conservation Service

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USDA Natural Resources Conservation Service

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Photography:
Art Today (stock photos)
Marieanne Hanser
Linda Iverson
Tracy McReath

USDA Natural Resources Conservation Service

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Design and Illustration:
Soil survey map (p. 2) by Steve VanFossen, USDA Natural Resources Conservation Service
CAD graphic (p. 3) by Miguel Camacho Serna, University of Arizona

B&B tree planting (p. 11) by Mary Myers, USDA Natural Resources Conservation Service

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Design by Mary Myers, USDA Natural Resources Conservation Service

References:
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Hill, C. and J. Knight, Minimizing Deer Damage to Residential Plantings, Montguide - MT9814.


Tips on Land & Water Management for Small Farms and Ranches in Montana. Montana Department of Natural Resources and Conservation, Conservation and Resource Development Division. Helena, MT.

Wind River Seed. Practical Planting Tips for Wildflowers. Manderson, WY.

Other Sources of Information:
Conservation Districts
Extension Service
Garden clubs
Landscapers
Local garden centers
Native plant societies

Web Sites:
www.plants.usda.gov
www.xeriscape.org
www.pprl.usu.edu
www.firewise.org
(Living With Wildfires/Firewise Landscaping)
www.nifc.gov
(National Interagency Fire Center)

Additional information may be obtained from your local USDA Natural Resources Conservation Service Office listed in your phone book under US Government, Department of Agriculture, USDA Service Center.

For additional copies of this publication, or permission to reproduce all or part of it, contact:
Montana Association of Conservation Districts
501 North Sanders Helena, MT 59601
(406) 443-5711
mail@macdnet.org
or
USDA Natural Resources Conservation Service
10 E. Babcock, Rm. 443
Bozeman, MT 59715
(406) 587-6842

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