Work Session Staff Summary
June 6, 2023

To:	Mayor Carolyn Skowyra and Dillon Town Council
From:	Ned West, AICP, Sr. Town Planner
Subject:	Native Species Garden & Conscientious Water Use
Agenda Item:	3

Action to be Considered:
Consideration of supporting a native species display and educational garden in Dillon Town Park and other conscientious water use policies.

Background/Time Frame:
- June 6, 2023: Town Council Introduction to the Native Species Garden Concept

Supporting Information:
The Planning Department has been working with the Planning and Zoning Commission on proposed amendments and updates to the Town of Dillon Comprehensive Plan (Comp. Plan). Among the suggested amendments being developed relate to water resources, the Colorado Water Plan, source water protection, and conscientious water use. Also being touched on in the Comp. Plan amendment work is the importance of community wellness, not just physical, but mental health, and how well designed and maintained outdoor green spaces can improve community well-being.

Native Species Educational Garden:
Town staff has long envisioned a native species display and educational garden in Dillon to exhibit Colorado native species well suited for the Dillon montane environment. With the support of the High Country Conservation Center (HC3) and the gardeners of Leslie's Community Garden in Dillon Town Park, along with the support of the Dillon Public Works Department, the vision for a "Coloradoscaped" educational garden has growing potential. A space adjacent to Leslie's Garden has been identified as being well suited to such a native garden. Please see ***Figures 1 & 2*** for the potential native garden concept area. With the Town Council's support, staff can start to move forward with designing such a space this year with potential implementation in the spring of 2024.

The idea is that an attractive landscaped space could be designed and planted with native species along with associated educational placards and species information to influence landscape transitions to the Dillon environment appropriate species with a focus on reducing irrigation water use. Think of areas of the Yampa River Botanic Park, Steamboat Springs, as a reference for the vision of plantings with placards. Plant species recommended by the Colorado State University Extension could be incorporated into the design and plant selection for the

educational garden. See ***Exhibit A*** for various recommendations and fact sheets from the CSU Extension and specifically those in the montane life zone (approximately 8,000 to 9,500 feet).

HC3 has grant funds to support the design and education elements of such an educational native species space. They have identified a landscape and irrigation firm well suited to assist the Town with the design of such a native species display garden, and HC3 offers to fund the design effort and the educational components to follow. The Town would need to fund the purchase of plants and support the community gardeners in planting and maintaining the native garden. An initial investment could be planned for during the 2024 budget cycle. Undoubtedly, Public Works would be involved in maintaining the space just as they will the remainder of Town Park, but members of Leslie's Community Garden have offered to contribute their time as well through their commitment to volunteer time to the garden as a component of being members of it. Irrigation is already available for Leslie's Garden, and a new set of zones could be created for the native garden with drip irrigation installed for much of the space to exhibit water efficiency.

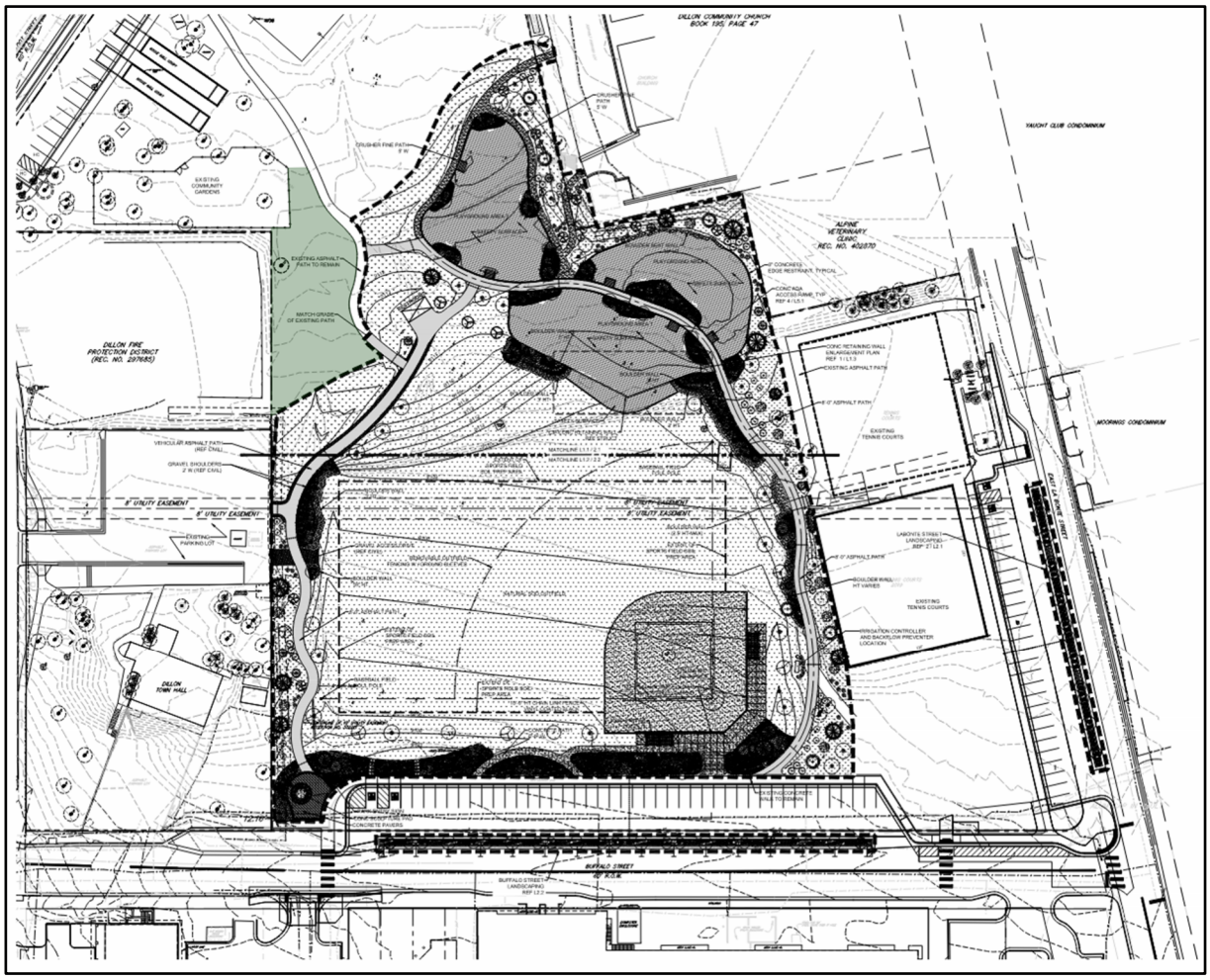


Figure 1. Vicinty of the Proposed Native Species Educational Garden in Town Park

The goals associated with the implementation of such an educational display garden are to create a beautiful, natural landscape in Town Park, to improve soil, to encourage the reduction of turf areas, to encourage the design and installation of efficient irrigation systems, to educate the community on appropriate plant selection and associated water demands, to reduce evapotranspiration rates which are so much higher on turf areas, and to educate the community on maintaining native species planting areas and xeriscapes.

The Town could also consider incentive programs or an annual award program for properties that exhibit the greatest transition from sod lawns to native plantings or properties that exhibit the highest quality "Coloradoscape" such as the program in Castle Rock, CO, to encourage front lawn makeovers: https://crconserve.com/245/ColoradoScape-Contest. State funds related to such turf replacement projects could potentially be sought to help offset such a program, https://cwcb.colorado.gov/turf.

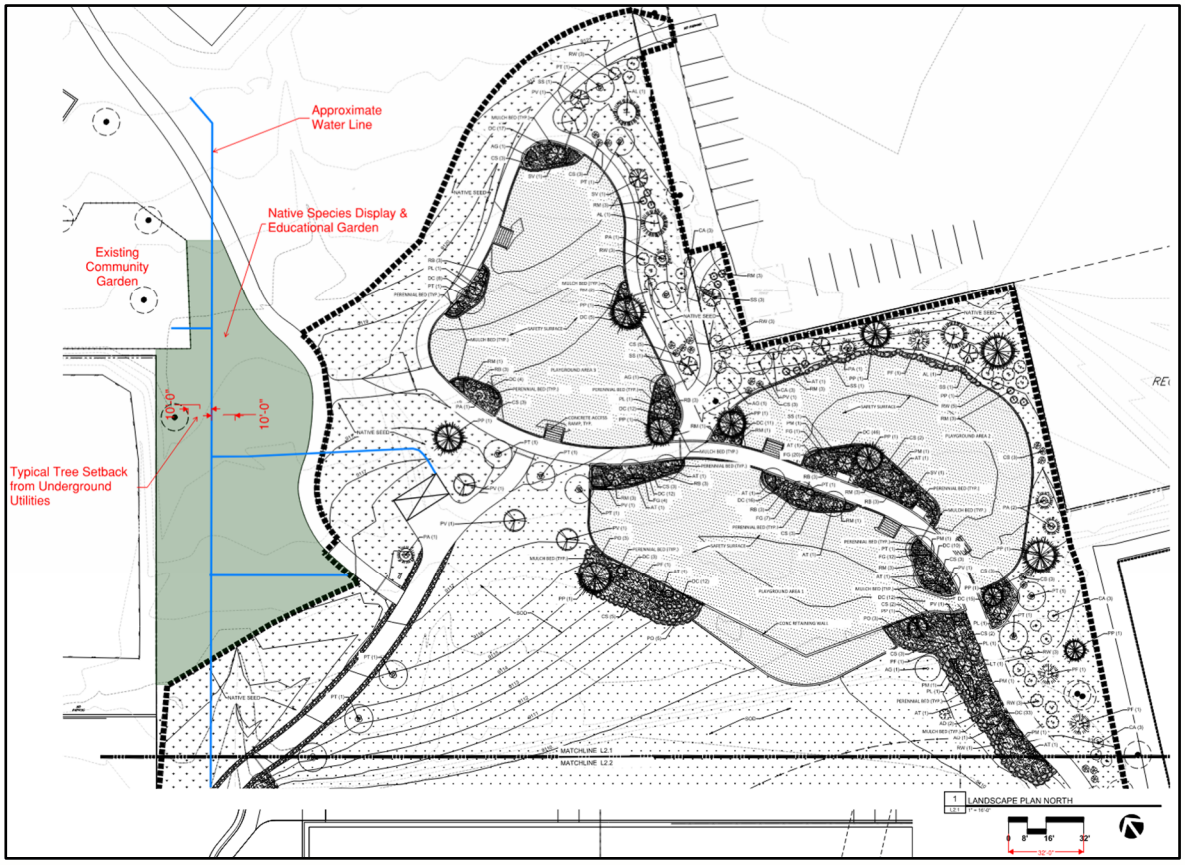


Figure 2. Proposed Native Species Educational Garden Adjacent to the Community Garden

Water Efficiency and Source Water Protection Policies:

Town staff are part of the Water Quality & Water Quality (QQ) efforts through participation in meetings, education series, and conferences coordinated through the Northwest Colorado Council of Governments (NWCCOG). Member communities are focused on our headwater

influences on the Colorado River and the Colorado Water Plan in general. In addition, Dillon continues to champion protection of its raw source water drainage basin of Straight Creek. Wildfire fuels mitigation work is being done in the basin this summer through shared Dillon and National Forest Foundation (NFF) funding. This is the first of potentially a long-range effort to protect Dillon's water resource through wildfire fuels mitigation work. Through QQ, the Town is also looking into other source water protection measures that might be implemented.

In support of conscientious water use, two staff members have received QWEL certification (Qualified Water Efficient Landscaper) and are currently working to refine the irrigation of many public spaces to reduce the irrigation water use by the Town. Some public spaces, such as the multi-use field in Town Park, the Dillon Amphitheater, and flower planting locations, require more intensive irrigation schedules, often daily to maintain to revitalize them after heavy use. Many other public spaces can transition to more efficient irrigation schedules.

This brings to this discussion the County-wide efforts to unify watering schedules as a potential water efficiency policy for the Town to consider. The concept being that odd-addressed properties can water their landscapes on certain alternating days, and even-addressed properties could water on the opposite alternating days. See ***Exhibit B*** for the proposed program being adopted by the County and Frisco. Although these entities are seeking to mandate such a unified watering schedule through ordinance adoption, it is currently the opinion of the Dillon Water Department that the Town first consider unified watering schedules on a voluntary basis, but that the Town could align with the schedule pattern.

Conclusion:
Conscientious water use policies along with education, the proposed native species garden, and the Town's efforts to change their irrigation schedules in many public spaces can be guiding programs to lead by example to potentially influence community members and positively influence their water consumption related to landscape irrigation.

Budget Impact:
To be determined.

Questions/Information Requested from Council:

1. Does the Town Council support the native species educational garden concept?
2. Does the Town Council direct staff to move forward with developing a native species design in the proposed area in Town Park utilizing the financial support of HC3?
3. Does the Town Council want to consider including funding for the native species educational garden in the 2024 budget process?
4. Does the Town Council wish to consider a unified watering schedule? Voluntary or mandatory?
5. Does the Town Council desire more information on other potential implementable policies for source water protection?

Exhibit 'A'

CSU Recommended Native Species

&

Xeriscaping

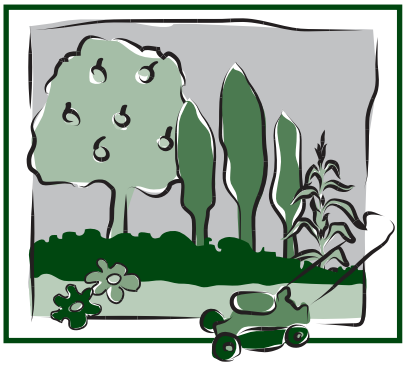
Fact Sheets

Colorado State University Extension

Native Herbaceous Perennials for Colorado Landscapes

Fact Sheet No. **7.242** Gardening Series | **Flowers**

By I. Shonle, L.G. Vickerman and J.E. Klett*



Why Grow Native Herbaceous Perennials?

There are many benefits to using Colorado native herbaceous perennials for home and commercial landscapes. They are naturally adapted to Colorado's climates, soils and environmental conditions. When they are correctly sited, they make ideal plants for a sustainable landscape. Native herbaceous perennials require less external inputs such as watering, fertilizing and other cultural factors when the planting site mimics the plant's native habitat.

Using Colorado natives in landscapes may attract a variety of wildlife including mammals, birds, butterflies and other native pollinators. Rapid urbanization in the state is reducing biodiversity (the number of different species found in a given area) as habitat is removed for building and road construction. Landscaping with natives on a large, or small, scale helps maintain biodiversity that otherwise would be lost to development.

The perennials listed in Table 1 were specifically chosen because they require low or moderate amounts of water. Not all perennials listed are available at all nurseries and garden centers, so it may be necessary to contact a number of commercial outlets to find a specific plant. If a perennial is not sold in the trade, asking for it may improve its future availability. Native perennials should not be collected from the wild because this reduces biodiversity, causes a disturbed area that may be invaded by weeds, and may be illegal. Transplanting a plant from the wild to the garden is rarely successful because of root damage and transplant shock.

*I. Shonle, Colorado State University Extension agent, Gilpin county; J. Klett, Extension landscape horticulture specialist and professor, department of horticulture and landscape architecture. L.G. Vickerman, former Extension agent, contributed to the first edition.4/2014

Figure 1: *Callirhoe involucrata* (Purple poppy mallow).

Most of the perennials listed in Table 1 are available as container-grown plants. Native perennials often do not have as great a visual impact in the container or immediately after planting as do traditional horticultural species. Over time, however, they will reward the homeowner with their natural beauty.

Where to Grow Native Herbaceous Perennials

Due to Colorado's varying elevation and topography, native plants are found in a variety of habitats. To maximize survival with minimal external inputs, plants should be selected for your site's life zone and the plant's moisture, light and soil requirements. Even if a plant is listed for a particular life zone, the aspect (north, south, east or west facing) of the proposed site should match the moisture requirement. For example, a prairie zinnia, which requires full sun and has a very low moisture requirement, should not be sited with plants requiring higher moisture needs. Similarly, a prairie zinnia should not be planted on the north side of a building, where there is increased shade and moisture could severely affect its growth and appearance.

Growing native perennials does not exclude using adapted non-native plants. There are many non-native plants that are adapted to Colorado's climate and can

Quick Facts

- A Colorado native perennial is defined as a plant existing in Colorado prior to European settlement.
- Native plant gardens create wildlife habitat for a variety of birds, mammals and insects.
- Landscaping with native plants makes a significant contribution to biodiversity that otherwise would be lost to development.
- Native plant communities in Colorado vary due to differences in exposure, elevation, rainfall, soils and temperature extremes. These plant communities make Colorado visually distinct from other parts of the country.

www.ext.colostate.edu

Figure 2: *Gaillardia aristata* (Blanket flower).

Figure 3: *Penstemon strictus* (Rocky Mountain penstemon).

Figure 4: *Tradescantia occidentalis* (Spiderwort).

be used in a native landscape as long as moisture, light and soil requirements are similar. Even if a site has a non-native landscape that requires additional inputs (such as an irrigated landscape on the plains), dry land native plants can be used in non-irrigated pockets within the non-native landscape. These native "pocket gardens" can be located in areas such as median strips and next to hardscapes that are difficult to irrigate. Note that in years with less than normal rainfall, non-irrigated landscapes may suffer in appearance.

Some communities regulate landscape appearance or the type of plants which may be used. Before initiating a landscape design, check with local authorities, including homeowner's associations, to discover any regulations that may affect the design.

Culture and Maintenance

There are three ways to establish a native herbaceous planting: 1) use nursery grown transplants, 2) direct seeding, or 3) using a combination of transplants and seeding. Successful establishment of native transplants requires supplemental moisture from a few months to several years after planting, but this can gradually be reduced. Seedings benefit from supplemental watering until plants are established. Weed control prior to planting seed is critical for success. Nursery grown transplants are best planted in spring or early fall. Seeds can be planted from early to late spring or preferably in late fall.

Native plants can often be successfully grown in unamended soils. Most natives do not require nutrient rich, high organic content soil, and can often become overgrown or short lived in such soils. However, many native plants require well-drained soils. To amend clay soils, add 10 percent compost and 15 percent small aggregate (i.e., pea gravel) by volume to clay/clay loam and incorporate into the root zone. Creating a small berm and planting on the top can also be helpful to improve drainage. To amend excessively well-drained sandy or rocky soils, add 3 percent compost by volume.

A diverse planting of native herbaceous perennials can support a wide variety of wildlife throughout the season. Leave vegetation standing after the first hard frost to provide over-wintering sites for beneficial insects and birds.

Using native herbaceous perennials offers many benefits in addition to reduced maintenance. The need for fertilizers and pesticides can be greatly reduced or eliminated. Once established, native plantings can help conserve water. Our native plant communities make Colorado visually distinct from other parts of the country and will provide a better sense of place.

Figure 5: *Campanula rotundifolia* (Harebells).

Figure 6: *Monarda fistulosa* (Bee balm).

Figure 7: *Mirabilis multiflora* (Desert four o'clock).

Figure 8: *Zinnia grandiflora* (Prairie zinnia).

Table 1. Native herbaceous perennials for Colorado landscapes.

Scientific name[1] Common name	Planting Elevation[2]	Bloom time[3]	Exposure	Moisture[4]	Color	Height	Comments
Allium cernuum Nodding onion	To 10,000'	M	Sun to part shade	l-m	Pink	5-24"	Waxy foliage; nodding flowers from bulbs; attracts butterflies; well-drained soils.
Amsonia jonesii Blue star	To 7,000'	E-M	Sun	l	Blue	10-15"	Clusters of star-shaped flowers; foliage turns clear yellow in fall; Plant Select®.
Anaphalis margaritacea Pearly everlasting	To 10,500'	M	Sun	l-m	White	12-20"	Silvery foliage; button-like clusters on top of upright stems; excellent dried flower; most soils.
Anemone multifida Windflower	To 10,000'	E-M	Sun to part shade	l-m	White to pink-red	12-24"	Deeply cut dark green leaves form a rounded clump; flowers borne on wiry stems; organic soils.
Antennaria parvifolia and A. rosea Pussytoes	To 11,000'	E-M	Sun to part shade	l-m	Cream to pink	2-6"	Spreading mat of silver gray foliage; flowers in small clusters resemble cat toes; good between flagstones or in rock gardens; well- drained soils.
Aquilegia caerulea Blue columbine, Colorado Columbine	To 11,000'	E-M	Part shade	m	Blue/purple and white	12-36"	Delicate lobed leaves; large spurred flower; Colorado state flower; attracts hummingbirds; foliage often turns reddish in fall; organic soils.
Aquilegia chrysantha Golden columbine	To 11,000'	E-M	Sun to part shade	l-m	Yellow	24-36"	Robust plant with lobed leaves; many spurred flowers; attracts hummingbirds; reseeds readily; Plant Select®; clay or organic soils.
Artemisia frigida Fringed sage	To 10,000'	N/A	Sun	l	N/A	8-24"	Aromatic feathery silver foliage; evergreen; subshrub; insignificant bloom; well-drained soils.
Artemisia ludoviciana Prairie sage, Silver sage	To 10,000'	N/A	Sun	l	N/A	15-30"	Coarse silver foliage; insignificant bloom; aggressive grower; well-drained soils.
Asclepias tuberosa Butterfly weed	To 7,000'	M-L	Sun	l	Orange	18-36"	Umbrella-like clusters of flowers, narrow green leaves; attractive to butterflies; may be difficult to establish.
Berlandiera lyrata Chocolate flower, greeneyes	To 8,000'	M	Sun	l-m	Yellow with green/red centers	12-18"	Mounded rosette of lyre-shaped leaves; daisy like flowers with chocolate scent; thrives in heat; Plant Select®; well-drained soils.
Callirhoe involucrata Purple poppy mallow, Wine cups	To 7,000'	M-L	Sun	l-m	Magenta with white centers	4-10"	Spreading groundcover with scalloped leaves; long blooming; likes heat; Plant Select®; dry clay soils.
Calylophus lavandulifolius Sundrops	To 7,000'	M	Sun	l	Lemon yellow (spent flowers turn orange)	4-8"	Spreading habit; green narrow leaves; four-petaled flowers solitary on stems; long blooming; likes heat; well-drained soils.
Calylophus serrulatus Plains yellow primrose	To 7,000'	M	Sun	l	Yellow	15"	Mounding subshrub with narrow leaves; heavy bloomer; well-drained soils.
Campanula rotundifolia Harebells	To 13,000'	M-L	Sun to part shade	l-m	Purple	8-15"	Narrow delicate foliage; nodding bell shaped flowers; most soils.
Clematis scottii Scott's sugarbowls	To 8,500'	E	Sun to part shade	l-m	Purple	8-15"	Mounds of lacy foliage with nodding purple flowers; attractive to bumblebees; Plant Select Petite®
Dalea purpurea Purple prairie clover	To 7,500'	M	Sun	l	Purple	24-36"	Narrow leaflets; slender stems; cylindrical heads of fragrant flowers; fixes nitrogen; well-drained soils.

(Table 1, Continued)

Table 1. Native herbaceous perennials for Colorado landscapes.

Scientific name[1] Common name	Planting Elevation[2]	Bloom time[3]	Exposure	Moisture[4]	Color	Height	Comments
Erigeron speciosus Aspen daisy, Showy daisy	To 9,500'	M	Sun to part shade	l-m	Lavender blue with yellow center	12-18"	Rich green foliage; daisy-like flowers; attracts butterflies; most soils.
Eriogonum umbellatum Sulphur flower	To 10,500'	M	Sun	l	Sulphur yellow ages to rust brown	6-12"	Mat of leathery green foliage with silver undersides; turns reddish in fall; flowers attract butterflies; well-drained soils.
Gaillardia aristata Blanket flower	To 9,000'	M	Sun	l	Yellow (to yellow/red) with red/brown centers	18-24"	Fuzzy gray-green leaves; large daisy flowers; well-drained soils.
Geranium viscosissimum Sticky geranium	To 9,500'	E-M	Sun to part shade	l-m	Pale pink to rose/purple with darker veins	12-24"	Lobed leaves turn red in fall; open clusters of flowers with sticky stems; well-drained soils.
Geum triflorum Prairie smoke	To 10,000'	E	Sun to part shade	l-m	Cream to deep pink	6-12"	Rosettes of gray-green fernlike foliage; nodding flowers followed by long pink feathery seed heads; prefers moist clay or organic soils.
Helianthus maximiliana Maximilian sunflower	To 6,500'	L	Sun	l-m	Yellow	60-120"	Lance-shaped leaves on stout stems; showy flowers; spreads aggressively by rhizomes, esp. in moister soils; most soils.
Heliomeris multiflora Showy goldeneye	To 10,000'	L	Sun	l	Yellow	18-30"	Heavily branched with narrow leaves; prolific sunflower-like flowers; available only from seed; reseeds aggressively; well-drained soils.
Ipomea leptophylla Bush morning glory	To 7,000'	M-L	Sun	l	Lavender purple	24-36"	Spreading mounded plant with linear leaves; huge tap root; morning glory-like flowers; long lived; sandy or sandy loam soils.
Ipomopsis aggregata Scarlet gilia, Fairy trumpets	To 9,000'	M	Sun	l	Red, pink and white	12-30"	Rosette of finely divided leaves; trumpet-shaped flowers; attracts hummingbirds; biennial; reseeds readily; well-drained soils.
Liatris punctata Gayfeather, Blazing star	To 7,500'	L	Sun	l	Rose purple	12"	Rigid linear leaves; stout spikes of fringed flowers; attracts butterflies; well-drained soils.
Linum lewisii Blue flax	To 9,500'	Mid	Sun, part shade	l-m	blue	12-24"	Fine blue-green foliage; saucer-shaped flowers; reseeds readily; well-drained soils.
Lupinus argenteus Silver lupine	To 10,000'	M	Sun	l	White to deep purple	12-36"	Palm-shaped leaf; spikes of pea-like flowers; attracts butterflies; well-drained soils.
Mondarda fistulosa Bee balm, Wild bergamot	To 9,000'	M	Sun	l-m	Pink to lavender	12-36"	Upright growth with fragrant foliage; profuse wispy flowerheads; good air circulation will lessen powdery mildew; well-drained soils.
Mirabilis multiflora Desert four o'clock	To 8,000'	M-L	Sun, part shade	l	Pink to purple	12-30"	Blue-green leaves; wide spreading mounded habit; trumpet-shaped flowers with yellow stamens open late morning; well-drained soils.
Oenothera caespitosa White-tufted evening primrose	To 9,000'	M	Sun	l	White with pink buds	6-12"	Dense rosette of dark gray/green leaves; fragrant flowers open in late afternoon, fade the next morning; well-drained soils.
Pulsatilla patens Pasque flower	To 9,000'	E	Sun	l-m	Lavender	6-12"	Wooly foliage with cup-shaped flowers followed by feathery seed heads; well-drained soils.

(Table 1, Continued)

Table 1. Native herbaceous perennials for Colorado landscapes.

Scientific name[1] Common name	Planting Elevation[2]	Bloom time[3]	Exposure	Moisture[4]	Color	Height	Comments
Penstemon ambiguus Bush or sand penstemon	To 6,500'	M-L	Sun	l	Whitish pink	24-30"	Freely branching bushy plant with woody base; phlox-like flowers clustered towards top of stem; sandy soils.
Penstemon angustifolius Pagoda or narrow-leaved penstemon	To 7,500'	M	Sun	l	Sky blue	12"	Narrow blue-green foliage can be evergreen; numerous tubular flowers encircle stalks; requires well-drained soils.
Penstemon barbatus Scarlet bugler penstemon	To 9,000'	M	Sun	l	Scarlet to red	24-36"	Slender tall stalks with foliage clustered at base; tubular flowers favored by hummingbirds; well-drained soils.
Penstemon caespitosus Mat penstemon	To 9,000'	E-M	Sun	l	Blue to violet	4-6"	Mat forming with trailing stems; excellent for rock gardens; well-drained soils.
Penstemon glaber Smooth penstemon	To 9,000'	M	Sun	l	Deep blue/ purple	12-18"	Stout upright stems; tubular flowers; well-drained soils.
Penstemon grandiflorus Shell leaf penstemon	To 8,500'	M	Sun	l-m	White, pink, and purple	24-36"	Waxy blue-green semi-evergreen foliage; large tubular flowers; can be short lived but reseeds readily; well-drained soils.
Penstemon mensarum Grand Mesa penstemon	To 9,000’	M	Sun	l	Blue	24-30”	Stunning cobalt flowers on narrow spikes; evergreen leaves; Plant Select®.
Penstemon secundiflorus Orchid/Sidebells penstemon	To 9,500'	M	Sun	l-m	Pink/purple	6-18"	Waxy blue-green foliage; tubular flowers emerge from one side of the stalk; rocky soils.
Penstemon strictus Rocky Mountain Penstemon	To 10,000'	M	Sun to part shade	l-m	Blue to blue-purple	12-30"	Robust grower; narrow glossy green leaves; tubular flowers in open spikes; develops powdery mildew if crowded; well-drained soils.
Penstemon virens Bluemist penstemon	To 10,000'	E-M	Sun to part shade	l-m	Light blue to blue/violet	6-12"	Dense basal rosette of bright green leaves; profuse clusters of small flowers; good for rock gardens; rocky soils.
Penstemon virgatus Wand bloom penstemon	To 10,000'	M	Sun	l-m	Pale blue to violet	12-30"	Erect slender stalks; linear upright leaves; tubular flowers; well-drained soils.
Penstemon whippleanus Whipple's penstemon	To 12,000'	M	Sun to part shade	l-m	Wine purple or white	10-20"	Clustered stems; whorls of nodding tubular flowers; adaptable to moister soils.
Polemonium caeruleum Jacob’s ladder	To 9,000’	M	Part shade	m	Blue-purple	18-24”	Clusters of bell-shaped flowers on upright plants; small pinnately compound leaves.
Ratibida columnifera Prairie coneflower, Mexican hat	To 7,500'	M-L	Sun	l	Yellow	12-24"	Upright slender stalks; finely divided leaves; prominent central cone surrounded by drooping petals; short-lived but reseeds; well-drained soils.
Rudbeckia hirta Black-eyed Susan	To 9,000'	M	Sun to part shade	m	Yellow with brown to black center	12-24"	Fuzzy green leaves with daisy-like flowers; biennial to short lived perennial; reseeds; most soils.
Solidago canadensis Goldenrod	To 7,000'	M	Sun to part shade	l-m	Yellow	12-36"	Upright stems; spreads by underground rhizomes; spikes of flowers; attracts butterflies and bees; mistakenly blamed as cause of hayfever; clay or loam soils.

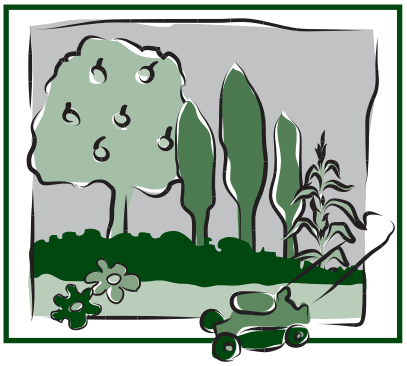
(Table 1, Continued)

Table 1. Native herbaceous perennials for Colorado landscapes.

Scientific name[1] Common name	Planting Elevation[2]	Bloom time[3]	Exposure	Moisture[4]	Color	Height	Comments
Sphaeralcea coccinea Scarlet globemallow	To 8,000'	E-M	Sun	l	Coral red, orange	8-12"	Hairy gray-green leaves; vigorous rhizomes; small hollyhock-like flower; well-drained coarse soils.
Stanleya pinnata Prince's plume	To 9,000'	M	Sun	l	Yellow	24-48"	Gray-green leaves; large plume-shaped flower spikes; can be short lived; well drained soils.
Thelesperma filifolium Navajo tea, Greenthread	To 8,000'	M-L	Sun	l-m	Yellow	16-24"	Vase-shaped clump; finely dissected leaves; profuse daisy- like flowers over long period; well-drained soils.
Thermopsis divaricarpa Golden banner	To 11,000'	E-M	Sun to part shade	l-m	Yellow	18-24"	Spreads vigorously by rhizomes; needs room; showy spikes of pea-like flowers; well-drained soils.
Tradescantia occidentalis Spiderwort	To 8,000'	M	Sun to part shade	l-m	Purple/blue	12-24"	Upright stalks above grass-like foliage; clusters of three petaled flowers each lasting a day; most soils.
Verbena bipinnatifida Spreading vervain	To 8,000'	E-L	Sun	l	Rose/purple	6-10"	Sprawling stems with deeply cut leaves; prolific bloomer; attracts butterflies; well-drained soils.
Zinnia grandiflora Prairie zinnia, Golden paperflower	To 6,000'	M-L	Sun	l	Yellow	6-8"	Mounding habit with wispy leaves; prolific bloomer; flowers have a papery texture; requires well-drained soils.

[1]As commonly sold in the trade. For equivalents, see botanical publications.
[2]Planting elevations are estimates of where plants may be successfully grown as landscape plants. In many cases, species may be successfully planted at a lower elevation with supplemental irrigation or at higher elevations with protection.
[3]Bloom time E=Early (March through end of May); M=Mid (June through Mid-August); L=Late (Mid-August through frost).
[4]Moisture requirement l=Low; m=Moderate.
Plant Select® is a program that seeks and distributes information about the best plants for gardens from the high plains to the intermountain region. It is a cooperative program administered by the Denver Botanic Gardens and Colorado State University Extension, together with landscape and nursery professionals throughout the Rocky Mountain region and beyond.

Colorado State University
Extension



Xeriscaping: Trees and Shrubs

Fact Sheet No. **7.229** Gardening Series | **Trees and Shrubs**

by J.E. Klett, C.R. Wilson and S. Carter*

Plants that will prosper in Colorado's climate without benefit of ample irrigation require careful selection. This is especially true of woody trees and shrubs that are more expensive investments than herbaceous plants, both in terms of money and time to grow.

As a long-term investment, select and plant trees and shrubs only after careful evaluation of the site's soil, drainage and exposure to heat and wind. While some xeric plants tolerate reduced water, they may not function well in soils low in oxygen. Many of the state's dense clay soils have minimal room to accommodate enough water and oxygen to meet plant root needs. Preparing soils by adding organic amendments prior to planting can often overcome water-oxygen concerns during initial establishment. Reduced water using trees and shrubs are best planted in areas separate from lawns, unless lawns are also a reduced water use type. Regardless of how durable woody plants are for survival in xeric conditions, many plants need at least two growing seasons to establish. Water during establishment, then gradually reduce irrigation.

Adequate soil drainage plays an important role in preventing soils from water logging, which leaves no room for oxygen. Conduct a subsoil drainage test by digging an 18 x 18 inch hole, filling it with water and timing how long it takes to drain. Water that stands in the hole for more than 30 minutes indicates poor drainage. If amending the soil doesn't solve drainage problems, drain tile or planting on berms (mounds) of well-drained soil brought to the site may be other solutions. Build berms to a minimum height of 24 inches.

Some trees and shrubs may perform poorly in hot south or windy west exposures and are better sited in cooler east or north exposure.

The following list of durable trees and shrubs will prosper in reduced water situations. For more specifics, check with your local extension office for the best plants for your area and microclimate.

See tables 1-4 for tree and shrub recommendations

Quick Facts

- Select trees and shrubs for xeric landscapes based on both adaptation to Colorado's climate and the ability to prosper in reduced water situations.
- Assess site soil, drainage irrigation method and exposure before selecting trees and shrubs.
- Apply adequate water during the first years of plant establishment, then gradually reduce irrigation.
- Woody plants are a long-term investment.

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Table 1. Large trees for xeriscapes.

Plant name	Height/ Spread (ft)	Growth Rate	Comments
Acer negundo Boxelder	40 x 30	F	Fast growing shade tree for harsh sites. 'Sensation' is a seedless male tree that doesn't attract boxelder bugs, yellow to red-orange fall color.
Catalpa speciosa Western catalpa	50 x 35	M	Large, heart-shaped leaves with fragrant white flowers in June followed by long, thin seed pods.
Celtis occidentalis Common hackberry	45 x 45	M	Irregular habit when young maturing to rounded crown. Distinctive knobby bark. Trees shed leaves during drought. Red-purple berries.
Gleditsia triacanthos inermis Thornless honeylocust	35 to 55 x 25 to 45	M	Many varieties available that vary in size. Thornless and many varieties podless. Fine textured foliage turns yellow in fall.
Gymnocladus dioicus Kentucky coffeetree	55 x 35	S	Large compound leaves. Females bear seedpods that remain on trees through winter. Ridged bark, stout branches and coarse winter texture.
Juniperus scopulorum Rocky Mountain juniper	30 x 15	S	Native evergreen with blue-green foliage. Berry-like cones that are dark blue in the second year. Prefers full sun. Many varieties.
Koelreuteria paniculata Goldenrain tree	30 x 30	M	Compound leaves emerge red turn to green. Yellow clusters of flowers in summer are followed by lantern-like fruit.
Pinus aristata Bristlecone pine	35 x 20	S	Native evergreen with dark pine green needles bearing white flecks.
Pinus ponderosa Ponderosa pine	60 x 30	M	Native evergreen with long, yellow-green needles in clusters of two or three. Plate-like bark is cinnamon to dark brown.
Quercus macrocarpa Bur oak	70 x 60	M	Fiddle-shaped leaves borne on stout, corky-ridged branches. Adapts to alkaline soils. Distinctive fringed acorns.
Robinia pseudoacacia 'Purple Robe' locust	35 x 25	M	Compound leaves emerge with purple tint. Dark purple fragrant flowers in May to June. Very susceptible to locust borer.

Table 2. Small trees for xeriscapes.

Plant name	Height/ Spread (ft)	Growth Rate	Comments
Acer grandidentatum Bigtooth maple (Wasatch maple)	25 x 25	S	Small tree or large shrub. Tolerant of dry and alkaline soils. Dark green leaves turn red-yellow fall color.
Acer tataricum Tatarian maple	20 x 20	M	Single or multi-stemmed tree. Pink to red winged seeds in summer with yellow fall color. Tolerates alkaline soils. 'Hot Wings' is a newer variety with distinctive red fruits and reddish fall color.
Crataegus ambigua Russian hawthorn	20 x 15	M	Lightly thorned tree with finely cut, glossy green leaves. Clusters of white flowers followed by bright red fruits.
Crataegus crus-galli inermis Thornless cockspur hawthorn	15 x 15	M	Thornless horizontal branches bear glossy leaves, white flowers and persistent red fruit.
Pinus edulis Pinyon pine	25 x 15	S-M	Native, bushy evergreen with gray-green, stiff needles. Bears small, rounded cones with edible seeds.
Prunus armeniaca Apricot	20 x 20	M	Glossy, heart-shaped leaves cover a broad, spreading tree. Early, white-pink blossoms, rarely bares fruit due to spring frosts.
Pyrus ussuriensis Ussurian pear	25 x 20	M	White flower clusters produced before dark green leaves that turn yellow in fall. 'Prairie Gem' is a dense tree with an upright, oval form and strong branching.
Quercus gambelii Gambel oak	20 x 12	M	Native large shrub or small tree with irregular spreading branches dark green leaves and tan acorns.

Table 3. Evergreen xeriscape trees.

Plant name	Height/ Spread (ft)	Growth Rate	Comments
Cupressus arizonica Arizona Cypress	60 x 30	M	Cone spaped evergreen tree with grayish to bluish green scale-like foliage, does well in the Grand Junction area.
Juniperus monosperma One Seeded Juniper	30 x 30	S	Native shrubby evergreen with dark blue to purple or brown berry-like cones, and dark green scalelike foliage. Culturally significant. Grows at 5,000-7,000' elevation.
Juniperus scopulorum Rocky Mountain Juniper	30 x 15	S	Native evergreen with blue-green foliage. Berry-like cones that are dark blue in the second year. Prefers full sun. Many varieties. Sea level to 9000' elevation.
Juniperus utahensis Utah Juniper	25 x 25	S	Native short evergreen tree that is very long lived. Juvenile foliage is needle-like. This tree has a large taproot and doesn't produce seed till about 30 years old. Elevations of 3,000-8,000'.
Pinus aristata Bristlecone pine	35 x 20	S	Native evergreen with dark pine green needles bearing white flecks, arranged around the branches. Grows in elevations up to 11,700' (tree line).
Pinus edulis Pinyon pine	25 x 15	S-M	Native, bushy evergreen with gray-green, stiff needles. Bears small, rounded cones with edible seeds. 4,500-8,000' elevation.
Pinus ponderosa Ponderosa Pine	60 x 30	M	Native evergreen with long, yellow-green needles in clusters of two or three. Plate-like bark is cinnamon to dark brown. Grows sea level to about 9,000' elevation.

Table 4. Shrubs for xeriscapes.

Plant name	Height Spread (ft)	Flower color/month	Comments
Amorpha canescens Leadplant	3 x 4	Purple/Jul-Aug	Silver-gray foliage, fine texture, fruit not important
Artemisia cana Silver artemesia	5 x 3	Yellow/Aug-Sept	Stiff, upright branches, slender gray leaves, native of Colorado mountain meadows
Artemisia tridentata Big sage	10 x 6	Yellow/Aug-Sept	Silver, aromatic foliage; bark shreds with age, native
Atriplex canescens Saltbush	5x 4	Yellow/Jul-Aug	Gray green leaves, upright spreading form, four winged fruit on female plants, tolerates alkaline soil
Berberis thunbergii Japanese barberry	3 x 5	Yellow/Apr-May	Dwarf and purple leafed forms available, site in good light, single spines, red persistent fruit
Berberis x 'Tara' Emerald Carousel ™ Emerald Carousel barberry	4 x 5	Yellow-Apr-May	Rounded form, arching branches, prefers sun, red persistent fruit, orange to red fall foliage color appears early and lasts long, good for alkaline soils
Buddleia alternifolia 'Argentea' - Silver Fountain butterflybush	10 x 8	Violet/May-Jun	Arching form, silver-gray foliage, fine texture, flowers on old wood, attracts butterflies, extremely hardy
Caragana arborescens Siberian peashrub	12 x 10	Yellow/May-Jun	Upright, olive-green branches, bears small spines, produces pea-like pods, tolerant of poor soils and windy sites
Caryopteris x clandonensis Blue mist spirea	4 x 4	Blue-violet to purple/Jul-Sept	Silver green foliage, upright branches, persistent dry tan fruit, attracts bees
Cercocarpus ledifolius Curlleaf mountain-mahogany	20 x 12	Cream yellow/Apr not showy	Large shrub or small upright tree, evergreen foliage, seeds with twisted, feathery tails; Foothills native
Cercocarpus montanus Mountain-mahogany	8 x 6	Cream yellow/Apr - May, not showy	Open spreading growth habit, gray-green leaves, feathery twisted seed tails in late summer
Chamaebatiaria millefolium Fernbush	5 x 6	White/Jun-Jul	Fern-like gray green leaves, fine-textured and aromatic, rounded form
Chrysothamnus spp. Rabbitbrush	6 x 6	Yellow/Aug-Sep	Open, rounded form, green to white stems, silvery green leaves, reseeds
Cowania mexicana Cliff rose	6 x 6	Creamy Whiter Apr-May	Upright semi-evergreen shrub, gray-green leaves, feathery seed tails
Elaeagnus umbellata Autumn-olive	15 x 15	Silvery flowers Apr-May	Large spreading shrub, green leaves with silvery undersides, may sucker and spread
Ephedra equisetina Bluestem jointfir	4 x 5	Not important	Upright leafless stems are blue-green year round, red berries midsummer on female plants, vigorous spreader
Fallugia paradoxa Apache plume	5 x 5	White/May-Aug	Small leaves, fine-textured, whitish stems, rose-colored feathery-tailed seeds, some suckering
Fendlera rupicola Cliff fendlerbush	5 x 5	White/Jun	Glossy foliage, new reddish bark turns gray with age, upright irregular growth, fragrant flowers
Forestiera neomexicana New Mexican privet	12 x 10	Yellow/Apr	Erect arching branches, rounded form, blue-black fruit on female, yellow fall color
Hippophae rhamnoides Sea-buckthorn	18 x 12	Yellow/Mar-Apr	Upright, spreading shrub with slender thorns, narrow silvery leaves, orange fruit on females persists into winter
Holodiscus dumosus Rock spirea	4 x 4	White/May-Jun	Upright spreading habit, fine-textured foliage turns red in fall, rust colored seedheads in fall
Juniperus spp. Juniper	Many sizes	Not important	Available in many foliage colors, forms and textures, see Evergreen Shrubs fact sheet 7.414
Ligustrum vulgare 'Cheyenne' , Cheyenne privet	10 x 6	White/Jun-Jul	Upright, rapid grower, dark green foliage, black fruit in late summer into winter, used for hedges, fragrant flowers
Pinus mugo Mugo pine	Many sizes	Not important	Many forms and growth habits, see Evergreen shrubs fact sheet 7.414
Potentilla fruticosa Cinquefoil (potentilla)	4 x 4	Yellow/White/Pink Jun-frost	Compact, spreading and upright forms, varied foliage color, full sun for best flowering
Prunus besseyi Sand cherry	6 x 6	White/Apr-May	Upright rounded form, gray green leaves, purplish black fruit, red fall color
Rhus glabra cismontana Smooth sumac	6 x 6	Yellow/Jun-Jul	Rounded, suckering shrub, red fall color, fuzzy maroon persistent fruit
Rhus trilobata Threeleaf sumac	6 x 6	Yellow, May	Dense rounded shrub, three-lobed leaves turn orange to red in fall, some red fruit
Rubus deliciosus Boulder raspberry	6 x 6	White/May-Jun	Slender arching branches form vase-shaped habit, small purple fruit in late summer
Shepherdia argentea Silver buffaloberry	15 x 12	Yellow/Apr-May	Dense spreading branches with spines, silvery-green leaves, yellow to orange-red berries on female plants
Symphoricarpos albus Snowberry	4 x 4	White/Jun	Arching, spreading habit with blue-green foliage, white blue-green foliage, white berries persist, suckers
Symphoricarpos x chenaultii 'Hancock' Hancock coralberry	3 x 6	Pink/Jun	Spreading growth habit with blue-green fine textured foliage, red berries persist. excellent ground cover
Syringa vulgaris Common lilac	15 x 12	Purple/Apr-May	Upright vase-shaped form, heart-shaped blue-green leaves
Viburnum lantana Wayfaring tree viburnum	12 x 10	White/May	Broad rounded form, dark green, leathery foliage with deep set veins, crimson fruit turns black in fall, burgundy red fall color

COLORADO STATE UNIVERSITY
EXTENSION

Xeriscaping: Ground Cover Plants

Fact Sheet 7.230 Gardening Series | Yard

By J.E. Klett and C.R.Wilson (5/20)*
*Revised by L. Langelo***

Ground cover plants are appealing for their variety of ornamental features that add interest to landscapes. They provide a variety of textures and colors, help to reduce soil erosion and can function as a transition between landscape spaces. They offer alternatives to turfgrasses in some situations.

A ground cover should spread by itself. Species that produce rhizomes or stolons or that spread by offsets or tip layering are good choices for ground covers. Ideally, they will develop rapidly into a dense cover. Some grow so fast they can become invasive.

Ground covers also can enhance the beauty of shrub borders and break up the monotony of mulched areas. Xeric ground cover plants may be the answer for difficult landscape areas that are difficult to mow or water, require extra maintenance or are less suitable for turfgrass such as:

- landscaped medians, parking strips, traffic islands and rights-of-way along streets;
- steep slopes that are impractical in lawns or a mowing hazard;
- hot, dry areas on south and west exposures;
- deeply shaded areas beneath trees or shrubs, along north sides of walls and fences, between buildings and in front of low windows.

Soils and Exposure

The key to successful ground cover establishment is good soil preparation. Some ground covers spread by offshoots or runners and are more apt to fill in quickly where the soil has good aeration and drainage. Improve soils with good quality organic matter before planting. Incorporate 3 to 5 cubic yards of compost or other organic soil amendment into 1000 square feet of area.

Pay attention to exposure. Tables 1 and 2 indicate ground cover plants for sun or shade as well as bloom characteristics and useful comments.

Weed Control and Maintenance

Prior to planting ground covers, make sure that existing weeds are hoed, pulled or killed with an herbicide. Perennial weeds can be especially troublesome later if not eliminated prior to planting. Glyphosate herbicide controls many weeds if applied a few weeks prior to planting. This herbicide does not leave a harmful soil residue, allowing planting in treated areas 10 to 14 days after spraying. Follow label directions when using.

Quick Facts

- Plants that are low-growing (generally less than 24 inches) and spread easily are suitable ground cover plants.
- Suitable places for xeric ground covers include dry slopes, landscape medians, parking strips, traffic islands and street rights-of-way.
- Consider ground covers on hot, dry, south and west exposures as well as for dense, dry shade.
- Improve soils before planting ground covers.
- Ideally, a ground cover should grow dense enough or be mulched to inhibit weeds.

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Weeds can be discouraged by using weed barrier fabrics, anchoring with U-shaped wire pins. Plant through slits cut into the barrier. Apply mulch on top of the fabric. Avoid the use of solid sheet plastic as a weed barrier.

All ground covers require maintenance, some more than others. Ground covers that develop flowers and fruit often require more maintenance than evergreen ground covers.

Table 1. Xeric ground cover plants for full sun.

Plant Name	Height (in)	Flower Color	Bloom time	Remarks
Achillea serbica Serbian yarrow	4-8	White	Spring	Toothed, gray leaves
Achillea tomentosa Woolly yarrow	2-4	Yellow	Summer	Woolly, gray foliage in low mats
Antennaria dioica Pussytoes	1-2	White to pink	Late spring to early summer	Persistent gray-green foliage in dense mats; excellent for rocky slopes
Artemisia frigida Fringed sage	6-15	Yellow	Late summer	Blooms not showy, silver gray fringed foliage, woody stems
Bouteloua gracilis Blue grama grass	12-18	Tan	Summer to fall	Clump-forming native, sow seed to form solid cover, shade intolerant
Callirhoe involucrata Prairie winecups	6-12	Red	Summer to fall	Vigorous trailing stems, Plant Select®
Cerastium tomentosum Snow-in-summer	6-8	White	Spring to summer	Gray foliage, aggressive spreader
Ceratostigma plumbaginoides Plumbago	8-12	Violet-blue	Late summer to fall	Shiny green leaves, purplish fall leaf color
Delosperma sp. Iceplant	1-6	Red, yellow, white, fuchsia	Spring to fall	Succulent leaves
D. floribundum 'Starburst'	4-6	Pink with white centers	Summer to fall	Cushion growth form, requires dry soil in winters, Plant Select®
D. 'John Proffit' Table Mountain	2-4	Fuchsia	Spring to fall	Durable, leaves turn purple in winter, Plant Select®
D. 'Kelaidis' PP#13,876 Mesa Verde	2-4	Salmon-pink	Spring to fall	Vigorous, compact habit, Plant Select®
D. nubigenum Hardy Yellow	1-2	Yellow	Early to mid summer	Light green, compact foliage turns purplish in winter
D. 'Psfave' LAVENDER ICE™	2-3	Lavender	Spring to fall	Foliage turns purple in winter, Plant Select®
Duchesnia indica Mock strawberry	4-6	Yellow	Late spring to summer	Aggressive creeper, inedible red fruit
Eriogonum umbellatum Sulfur flower	3-6	Yellow	Early to mid summer	Flower stalk 8 inches, foliage in a low mat, reddish in winter, native
E. umbellatum v. aureum 'Psdowns' Kannah Creek buckwheat	6-12	Yellow	Summer	Foliage turns reddish in winter, Plant Select®
Festuca glauca Blue fescue grass	6-15	Tan	Summer	Bunch grass producing tufts of blue-gray foliage
Juniperus horizontalis Creeping juniper	2-24			Evergreen, several foliage colors
'Bar Harbor'	8-10			Gray-blue foliage, purplish winter color
'Blue Chip'	8-10			Silver-blue foliage, purple in winter
'Icee Blue'	2-4			Compact silver-blue foliage turns purplish in winter
'Hughes'	12-24			Silvery blue foliage turns light purple in winter, distinct radial branching
'Prince of Wales'	4-6			Ground hugging foliage turns plum in winter
'Wiltonii' ('Blue Rug')	4-6			Very low, silver-blue; purplish winter tinge
Juniperus sabina 'Buffalo'	12-18			Bright green foliage on horizontal branches
Marrubium rotundifolium Silverheels horehound	4-6			Silver-fringed rounded foliage, Plant Select®
Nepeta Psfike PP#18,904 Little Trudy® catmint	8-10	Lavender	Spring to fall	Silvery foliage, low compact habit
Penstemon caespitosus Mat penstemon	1-4	Blue	Early summer	Spreading carpet-like growth habit
Penstemon linarioides var. *coloradoensis* Silverton® bluemat penstemon	8-12	Lavender	Late spring to early summer	Evergreen silver foliage, Plant Select®
Penstemon pinifolius Pineleaf penstemon	6-10	Red-orange	Summer	Needle-like leaves
'Mersea Yellow'	6-8	Yellow	Summer	Needle-like leaves
Phlox subulata Creeping phlox	6	Red, white, lavender	Spring	Moss-like foliage
Persicaria affinis Himalayan border jewel	8-12	Pink	Summer	Aggressive creeper
Potentilla neumanniana Creeping potentilla	2-4	Yellow	Late spring to early summer	Low mat, aggressive
Salvia daghestanica Platinum sage	8-10	Dark blue	Spring to early summer	Silvery white foliage, slow spreading, Plant Select®
Sedum acre Goldmoss sedum	2-4	Yellow	Early summer	Bright green evergreen leaves
Sedum kamtschaticum Kamschatka stonecrop	4-6	Orange to yellow	Late summer	Toothed, glossy dark green leaves

Table 2. Xeric ground cover plants for part shade to shade

Plant Name	Height (in)	Flower Color	Bloom time	Remarks
Arctostaphylos uva-ursi Kinnikinnick	4-6	Pink	Spring	Evergreen, red berries, native
Euonymus fortunei 'Coloratus' Wintercreeper	12-18	Not important	Not important	Glossy dark green leaves turn purple in winter
Mahonia repens Creeping Oregon grape	6-18	Yellow	Spring	Evergreen holly-like foliage turns reddish in fall, native
Vinca minor Periwinkle	4-6	White or purple	Spring	Semi-evergreen, dark glossy green leaves

Colorado State University
Extension

Ornamental Grasses

Fact Sheet No. **7.232** Gardening Series | **Yard**

by C.R. Wilson*

The term **ornamental grass** is used to include not only true grasses (Gramineae) but close relatives such as sedges (Cyperaceae), rushes (Juncaceae), hardy bamboos (particularly the genus *Phyllostachys*), and others. This fact sheet presents ornamental grasses adapted to the Rocky Mountain region. Listings are for USDA hardiness zones 5, 4 and 3. Some popular, tender grasses grown as annuals also are listed.

Native American Grasses for Drier Sites

Grasses are useful in different types of landscapes ranging from formal gardens to native, plains and meadows. Native grasses add a sense of place to Colorado gardens. Settlers moving from east to west found a succession of different grass species. Examining this succession and the differences in climate and soils teaches gardeners about the cultural requirements of native grasses.

In the eastern part of the Midwest, also known as the Corn Belt, grows the tall grass prairie. The grass in this area can reach the height of a person or more. The soil is highly organic, the climate is more humid, and the soil moisture is more consistent. Dominant grasses include big bluestem (*Andropogon gerardii*), switch grass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*). Rainfall in this region averages 25 to 30 inches or more.

West of the Corn Belt in the present day Wheat Belt lies the transitional mixed grass prairie between tall and short grasses. Rainfall is less in many years and the subsoil is permanently dry, limiting grass height to 2 to 4 feet. Grasses include little bluestem (*Schizachyrium scoparium*), Western wheatgrass (*Agropyron smithii*), June grass (*Koeleria macrantha syn. K. cristata*) and needle grass (*Stipa spartea*). These grasses are mixed with species from the adjoining tall and short grass prairies depending on the soils, year and the rainfall that ranges from an average of 18 to 24 inches.

The Front Range and Eastern Plains of Colorado are part of the short grass prairie that lies in the rain shadow of the Rocky Mountains. This is a high and dry steppe climate dominated by short grasses of inches in height that include buffalo grass (*Buchloe dactyloides*) and blue grama (*Bouteloua gracilis*), the state grass of Colorado. The area is semi-arid and the average annual rainfall is 10 to 15 inches.

Gardeners growing native gardens should understand the differences in rainfall where these grasses are native and plan supplemental irrigation accordingly. Generally among the natives, the taller the grass, the more water the plant requires.

Grasses for Moderately Moist to Moist Gardens

Grasses from many parts of the world are commonly used in American gardens. Many of these are from the moist climates of Asia and Europe and must be amply watered. Some natives such as switch grass (*Panicum virgatum*) also require regular irrigation in Colorado's semiarid climate.

Among the most widely used Asian grass introductions are the Maiden grasses (*Miscanthus* species) and their many varieties. Some, such as variegated Japanese silver grass, have been grown in America for a century and are still very popular. *Miscanthus* are noted for their silky flower tassels that persist into winter. New varieties have been bred for flowers that emerge well above the foliage, earlier flowering, and plants that don't fall over. One of the newer varieties, 'Morning Light' is rapidly gaining in popularity.

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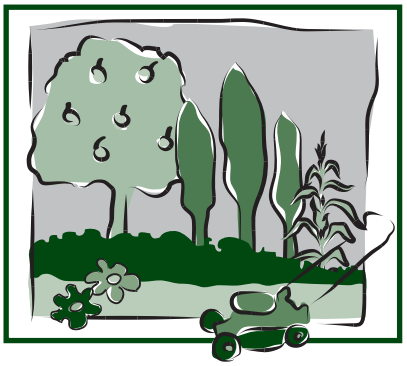

Quick Facts

- Grasses are adaptable and can grow in poorer soils better than many other garden plants.
- Grasses require little effort to maintain.
- Grasses come in many heights, colors, textures and have varying water requirements.
- Grass seed heads and foliage add fall and winter interest.
- Dried grasses have many decorative uses indoors and out.
- Grasses can be used as groundcovers, specimen plants, for erosion control, and as vertical design elements.

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Figure 1: Indian grass (*Sorghastrum nutans*).

Figure 2: Little bluestem (*Schizachyrium scoparium*).

Figure 3: Karl Foerster's feather reed grass, *Calamagrostis* x *acutiflora* 'Karl Foerster.'

Newer varieties of other grasses continue to be introduced. An example is 'Northern Lights' tufted hairgrass (*Deschampsia cespitosa*), a non-flowering variety with cream white and pink variegated leaves.

Feather reed grass (*Calamagrostis x acutiflora* 'Karl Foerster') has a wheat-like look that makes it one of the showiest and most popular grasses. It grows in upright clumps lending a vertical accent. The straight, greenish flower spikes form in May to June, turn golden, then bleach tan and persist into the winter.

Grasses in this group notable for their shade tolerance include Northern sea oats (*Chasmanthium latifolium*), tufted hair grass (*Deschampsia cespitosa*) and Korean feather reed grass (*Calamagrostis brachytricha*).

Design and Care

Grasses add variety to many types of gardens, including water, Japanese, rock, wildlife, craft, xeriscape, container and others. Ornamental grasses add two elements to the garden experience that are not readily obtained from many other plants: movement and sound. Grasses look well against a dark background and placed to catch morning or evening light.

Grasses add a significant vertical presence to the winter landscape and are commonly left standing until spring. The dried foliage of ornamental grasses is combustible during the winter and is likely best removed in public and commercial sites.

Some grasses grow best under warm temperatures (warm season) and others in cooler temperatures (cool season). Plant ornamental grasses in the spring. Container-grown grasses can be planted all season, stopping a month before first frost. Late planting of grass divisions is not recommended, particularly for warm season types.

Grasses generally grow best in three to five hours of direct sun each day. In shade, these grasses may not bloom, are often lax and tend to fall over, and may not develop peak fall color.

Most grasses can benefit from mulching and many from cutting back, usually just before new growth begins in the spring. Use hedge shears and wear gloves to prevent cuts from the razor-sharp edges of some species.

Figure 4: Prairie dropseed (*Sporobolus heterolepis*).

Figure 5: Pink Crystals ruby grass (*Melinus nerviglumis* 'Pink Crystals').

Figure 6: Moor grass (*Molina caerulea*).

A number of perennial grasses form root masses that can be very difficult to divide and transplant. Most annual types can easily be grown from seed.

Few pests bother grasses. If aphids or mites appear, spray with a strong stream of water to control the problem.

Table 1. Ornamental grasses for dry conditions. Note: Native refers to grasses native to the Midwest, Colorado and the Southwestern United States.

Name	Hardiness zone and season	Height (ft.)	Comments
Achnatherum hymenoides (syn. *Oryzopsis hymenoides*) Indian rice grass 'Nezpar' - greater cold hardiness	3 - cool	1.5 - 2	Narrow, medium-green leaves form tufted clumps. Airy flower panicles on wiry stems. Native that grows well in sands and well-drained soils. Turns dormant with summer heat. Shade intolerant. Fresh and dried flowers. To 8,000 ft.
Andropogon gerardii Big bluestem	4 - warm	3 - 6	Native with blue green foliage in a stiff, upright clump. Fall blooming. Three-branched seed heads resemble bird's feet. Orange fall color. Tolerates clay but best in sandy soil. Prefers moisture, will withstand drier soils. Shade intolerant. To 7,500 ft.
Bouteloua curtipendula Side-oats grama	4 - warm	1 - 2.5	Native prairie grass noted for one-sided seed head arrangement. Gray-textured foliage in clumps. Heavy or sandy soil. To 9,000 ft.
Bouteloua gracilis Blue grama	3 - warm	1 - 1.5	A clump-forming, hardy, native grass. Use in unirrigated areas and with wildflowers. All soils. Shade intolerant. To 9,500 ft.
Eragrostis trichodes Sand love grass	5 - cool	1 - 2	Medium green foliage in small clumps. Pink flowers turn golden on 3-foot stalks from mid- to late summer. A native, not for clay or poorly drained soil. Shade intolerant. To 6,500 ft.
Festuca arizonica Arizona fescue	3 - cool	1 - 1.5	Native, fine-textured grass with blue-green leaves. Best in clay soils. Provide some supplemental water. To 10,000 ft.
Festuca cinerea, *F. glauca* Blue fescue 'Boulder Blue'- compact, very blue and heavy bloomer 'Elijah Blue' - powder blue variety 'Sea Urchin' - compact tufted shape	4 - cool	0.5 - 1.5	Small, blue to bright green clumps with tan to gold-toned seed-heads. Many varieties. Provide some supplemental water. Sun to partial shade. Excellent for sands and not for heavy, wet soils. Divide often to renew. Evergreen in zone 5. Introduced from central Europe. Species hardy to 10,000 ft.
Festuca idahoensis Idaho fescue 'Siskiyou Blue' - spruce blue	5 - cool	1.5	Native. The thin leaves are longer than *F. ovina* lending a soft look. Light shade, all soil types. To 11,000 ft.
Helictotrichon sempervirens Blue oat grass	4 - cool	2.5	Dense, blue, pointed leaves in mostly upright, tufted clumps. One-sided seed heads in June begin white then turn golden. Sun to light shade. Semi-evergreen. From central Europe. To 9,000 ft.
Koeleria macrantha (syn. K. cristata) June grass	4 - cool	1	A small, green, native clump grass with showy, white flower panicles in June. A host for butterfly larvae. Interplant with wildflowers. Shade tolerant and also shows wide soil tolerance. To 11,000 ft.
Nassella tenuissima Silky threadgrass	5 - cool	1.5	Erect clumps of fine textured, yellow-green leaves. Silky seed heads backlight well and form waves in mass plantings. Also useful in containers and for dried flowers. Becomes dormant in hot, dry weather. Tolerates light shade. Reseeds. Native to New Mexico and Texas. To 6,000 ft.
Schizachyrium scoparium Little bluestem 'Blaze'-pink-orange to red-purple fall color 'Cimmaron' - blue foliage 'The Blues' - bright blue with purple to burgundy fall color	3 - warm	2 - 3	Green to blue-green to blue clumps. Fluffy, white seed plumes. Orange to red fall color. Native best grown in clay soils. Tolerates light shade. Drought tolerant. To 7,500 ft. See figure 2.
Sorghastrum nutans Indian grass 'Bluebird' - blue-gray foliage 'Holt' - early bloom, fall color 'Sioux Blue' - blue foliage	4 - warm	3 - 5	Tall grass prairie native. Foliage color varies, turns yellow then orange in fall. Tan-yellow seed heads. Shade intolerant. Prefers moisture, will withstand drier soils. To 6,500 ft. See figure 1.
Sporobolus heterolepis Prairie dropseed	4 - warm	3	Thin, fine-textured, emerald leaves, gold to orange-red in fall. A native accent plant. Provide some moisture. Tolerates light shade. Seeds attract birds. See figure 4.

Table 2. Ornamental grasses for moderately moist to moist gardens.

Name	Hardiness zone and season	Height (ft.)	Comments
Arrhenatherum elatius ssp. bulbosum 'Variegatum' - Variegated bulbous oat grass	4 - cool	0.5 - 1	White-striped tufts of foliage. Oat-like flower spikes in May-June. Grow in partial shade and moist conditions.
Calamagrostis x acutiflora 'Karl Foerster'-Foerster's feather reed grass 'Overdam' - Overdam feather reed grass - white variegated foliage best in light shade	4 - cool	2 - 3	Showy, upright, arching clump. Medium green, stiff foliage. Orange to yellow fall color. Flower spikes persist into winter. Tolerates heavy soils. Medium dry to moist conditions. 'Karl Foerster' blooms earlier and is more useful in short growing season areas than *C. arundinacea*. See figure 3.
Calamagrostis brachytricha *(Stipa brachytricha)* Korean feather reed grass	4	3	Tolerates partial shade. Provide adequate moisture. Tall, feathery pinkish-gray flower heads.
Carex grayi Gray's or morning star sedge	4	2 - 2.5	Light green leaves in clumps. Noted for clusters of 1-inch fruits resembling spiked maces. Prefers moist conditions. Native.
Carex morrowii Japanese sedge	5	1	Semi-evergreen, arching clumps with bright green or variegated foliage. Provide consistent moisture, light shade, well-drained soils.
Carex muskingumensis Palm sedge	4	2	Slowly spreading with palm-like foliage that yellows in full sun. Requires shade and moist conditions.
Chasmanthium latifolium Northern sea oats	5 - cool	2	Noted for its showy, drooping flowers and light green, upright, bamboo-like foliage. Flat green flowers start green, turn copper. Blooms well in shade. Reseeds.
Deschampsia cespitosa Tufted hair grass 'Northern Lights' - pink, white and gold variegated foliage, non-blooming	4 - cool	3 - 4	Dark green, tufted foliage. Airy flower panicles change from green to yellow to near purple. All soils except unamended, heavy clay. Requires some supplemental moisture and grows in light shade. To 12,000 ft.
Holcus lanatus Velvet grass	5 - cool	1	Soft, gray-green foliage with white flower panicles in midsummer. Provide moisture, partial shade and well-drained soil.
Leymus arenarius (*Elymus arenarius*) Blue lyme grass	4 - cool	2 - 3	Blue foliage in mounded clumps turns yellow in fall. Quite invasive in loose soils. Seed heads not notable.
Miscanthus 'Giganteus' (*M. floridulus*) Giant silver grass	4 - warm	8	Giant arching form with 10 inch, fluffy silver flowers. Does not bloom every year in Colorado. Provide ample moisture.
Miscanthus oligostachys Small Japanese silver grass	4 - warm	3 - 4	Short, wide leaves have a bamboo look. Early flowers, arching form. More useful than maiden grass in small scale landscapes.
Miscanthus sacchariflorus Silver banner grass	3 - warm	6	Large grass useful in colder climates. Less desirable than giant silver grass in warmer zones.
Miscanthus 'Purpurascens' - Flame grass	4	5	Flowers open pale pink then turn silver, tolerates light shade, reliable orange-red fall color.
Miscanthus sinensis Maiden or silver grass 'Gracillimus' - silver leaf midribs, fine texture and copper-colored flowers 'Morning Light' - white leaf margins, red flowers turn cream, tolerant of light shade 'Nippon' - compact, fine texture, red-bronze fall color 'Silberfeder' - vase shape and leaves with silver midrib 'Strictus' - porcupine grass has stiff leaves with yellow bands 'Variegatus' - white-striped leaves, shade tolerant 'Yaku Jima' - compact 3-4 feet, copper flowers, red fall color 'Zebrinus' - white leaf bands	4b- 5-warm 4	5 - 6	Widely used grass for variable leaf color, arching form and persistent, whisk-like flowers. One of the most - and longest-used grasses in American gardens. Many varieties are available varying in leaf color, size and texture. Watch for new varieties with outstanding ornamental characteristics for testing in your garden.
Molina caerulea ssp. *arundinacea* Moor grass 'Heidebraut' - compact (4 ft.) 'Moorhexe' - compact with purple flowers 'Skyracer' - tall 'Windspiel' - gold flowers	4 - warm	7	Light green, arching foliage turns yellow in fall. Brown, yellow or purple flowers fade to tan. Full sun. Grow in moist soil that is not extremely alkaline. Mature leaves and flowers break at the base minimizing winter interest. See figure 6.
Panicum virgatum Switch grass 'Heavy Metal' - blue foliage 'Prairie Sky' - sky-blue foliage	4b - warm	4 - 5	Stiff, upright clumps with showy, airy flowers of pink, red or silver in midsummer. Tolerates soil extremes. Good cut flower. Native. Yellow fall color. To 7,500 ft.

Table 2 (cont.). Ornamental grasses for moderately moist to moist gardens.

Name	Hardiness zone and season	Height (ft.)	Comments
Pennisetum alopecuroides Fountain grass 'Hameln' - compact, 2 ft. 'Little Bunny' - 1.5 ft. 'Moudry' - brown-black flowers	5 - warm	3	Bright green foliage, bottlebrush flowers. Some varieties freeze out in coldest winters.
Phalaris arundinacea 'Feesey' Ribbon grass	4 - warm	2 - 3	Pink-white leaves with green stripes. Enclose to keep it from spreading. Blooms decorative, requires moisture.
Saccharum ravennae Plume grass	5 - warm	4	Fluffy, cream-colored flowers on 8-foot stalks in August. Northern substitute for tender pampas grass, *Cortaderia selloana*.
Sesleria autumnalis Autumn moorgrass	4b-5 - cool	1.5	Olive green foliage in tufted mounds. Narrow, purplish flower spikes persists through winter.

Table 3. Annual grasses.

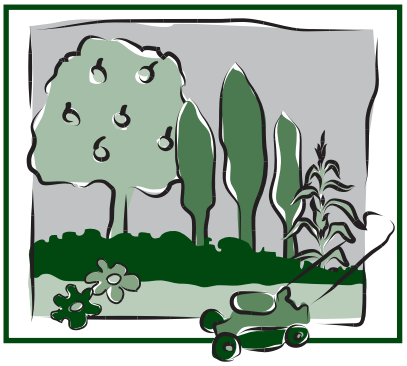
Name	Hardiness zone and season	Height (ft.)	Comments
Cortaderia selloana 'Pumila' Dwarf pampas grass	6 - warm	3	Dwarf and more cold hardy version of tender pampas grass that may be semi-perennial once established in the very warmest parts of Zone 5. Fluffy white flower heads. (*Saccharum ravennae,* plume grass, is recommended as a reliable perennial substitute.)
Cymbopogon citratus Lemon grass	Annual	2	Useful for citrus aroma and as a cooking herb. Grow in pots and bring indoors at the first sign of frost.
Melinus nerviglumis Ruby grass 'Pink Crystals'	Annual	1 - 2	Blue-green foliage with ruby pink blooms in early summer that eventually turn white. Best in a warm location in full sun. Good for fresh and dried arrangements. See figure 5.
Pennisetum setaceum 'Rubrum' Tender fountain grass	Annual	2 - 3	The red variety of this annual grass is widely sold for use in containers and annual flower beds.
Pennisetum villosum Feather top	Annual	2	Silky, rabbit tail-like flowers emerge green turn creamy white. Bright green leaves.
Pennisetum glaucum 'Purple Majesty' - Purple Majesty millet	Annual	4	The burgundy-purple leaves and bottlebrush flower stalks make this a standout in beds and containers. Good cut flower.

COLORADO STATE UNIVERSITY
EXTENSION

Native Trees for Colorado Landscapes

Fact Sheet No. **7.421** Gardening Series | **Trees and Shrubs**

by J. Klett, B. Fahey, R. Cox and I. Shonle*



Why Grow Native Trees?

There are many benefits to using Colorado native trees for home and commercial landscapes. Colorado native trees are naturally adapted to their specific Colorado climate, soil, and environmental conditions. When correctly sited, they can be ideal plants for a sustainable landscape that requires reduced external inputs such as watering, fertilizing, and pruning. In order to realize these benefits, the planting site must approximate the natural environmental conditions of the plant in its native habitat.

Another benefit of using Colorado native trees in landscapes is that they attract a wide variety of wildlife including mammals, birds, and butterflies. Rapid urbanization in the state is reducing biodiversity as habitat is removed for building and road construction. Landscaping with natives on a large or small scale can maintain biodiversity that otherwise could be lost to development.

The trees listed in Table 1 are grown by some Colorado nurseries and are becoming more available in the commercial sector. However, not all trees listed are available at all nurseries, so you may need to contact several commercial outlets to find a specific plant. If a tree is not sold in the trade, asking for it may help increase its availability. Native trees should not be collected from the wild because this reduces the biodiversity and causes a disturbed area that may be invaded by weeds.

Most of the trees listed in Table 1 are available as container-grown plants. Native trees often do not have as great a visual impact in the container or immediately after planting as do traditional horticultural species. Over time, they reward the homeowner with their natural beauty and other benefits.

Where to Grow Native Trees

There are several factors to consider when designing a native landscape. Due to Colorado's variation of elevation and topography, native plants are found in many habitats. In order to maximize survival with minimal external inputs, trees should be selected to match the site's life zone and the plant's moisture, light, and soil requirements. Even if a plant is listed for a particular life zone, the aspect (north, south, east, or west facing) of the proposed site should match the moisture requirement. For example, a Colorado blue spruce, which has a high moisture requirement, should

Figure 1: Ponderosa pine cones (*Pinus ponderosa*)

Figure 2: Alder fruit (*Alnus tenuifolia*)

Quick Facts

- A Colorado native tree can be described as existing in Colorado prior to European settlement.
- Native plant communities make Colorado visually distinct from the eastern, southern or western United States.
- Native plant gardens are wildlife habitats and each plant contributes to the biodiversity of the state.
- Landscaping with natives on a large or small scale can maintain biodiversity that otherwise would be lost to development.

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1/2018

Figure 3: Ponderosa pine (*Pinus ponderosa*)

Figure 4: Bristlecone pine *(Pinus aristata)*

Figure 5: Douglas-fir cone (*Pseudotsuga menziesii)*

not be sited with plants of dissimilar water needs. Similarly, a Colorado blue spruce should not be planted on a south-facing slope, where a significant amount of additional moisture would be required.

Growing native trees does not exclude the use of adapted non-native plants. There are many non-native plants that are adapted to Colorado's climate and can be used in a native landscape as long as moisture, light, and soil requirements are similar. If a site has a non-native landscape that requires additional inputs (such as an irrigated landscape on the plains), dry land native plants can be used in non-irrigated pockets within the non-native landscape. These native "pocket gardens" can be located in areas such as parkways and next to hardscapes that are difficult to irrigate.

Some communities regulate landscape appearance or the type of plants that may be used. So before completing a landscape design, check with local authorities, including homeowner's associations, to discover any regulations that may affect your design.

Life Zones of Colorado

Colorado can be divided into five life zones that are broadly defined by the plant communities that occur at the approximate elevations described below. The Plains life zone, 3,500 to 5,500 feet, is located in eastern Colorado where the majority of Colorado's population resides. It is dominated by grasslands and streamside cottonwoods. In western Colorado, the Upper Sonoran life zone is located at altitudes below 7,000 feet, and in the San Luis Valley, below 8,000 feet. This zone is characterized by semi desert shrublands and piñon pine-juniper woodlands at its upper limit.

The Foothills life zone occurs from 5,500 to 8,000 feet and is dominated by dry land shrubs such as Gambel oak and mountain-mahogany, and in southern and western Colorado, piñon-juniper woodlands and sagebrush. The Montane zone consists of ponderosa pine, Douglas-fir, lodgepole pine, and aspen woodlands at elevations of 8,000 to 9,500 feet. Dense forests of subalpine fir and Engelmann spruce dominate the Subalpine zone at 9,500 to 11,500 feet. The Alpine zone above 11,500 feet is a treeless zone made up of grasslands called tundra. Species

Figure 6: Douglas-fir (*Pseudotsuga menziesii)*

Figure 7: Gambel oak (*Quercus gambelii)*

requiring medium to high moisture occur along watercourses throughout all zones.

Culture and Maintenance

Successful establishment of native trees may require supplemental moisture after planting. Once established, the watering frequency can be reduced or eliminated, if the plant was sited in its native environmental conditions. Container-grown trees can be planted at any time during the growing season. Container-grown native trees are often grown in a soilless mixture of peat and bark, so the planting site should be amended with some organic material. Another option would be to carefully wash off the media from the container grown plant and plant it bare root.

Using native trees offers many benefits in addition to reduced maintenance. Natives are part of our natural heritage and the ecosystems of Colorado. Native plant communities make Colorado visually distinct from the eastern, southern, or western United States. Native plant gardens are wildlife habitats and each plant contributes to the biodiversity of the state.

Table 1. Native trees for Colorado landscapes.

Scientific Name[1]	Common Name(s)	Planting Altitude in feet[2]	Native Colorado Life Zone[3]	Moisture[4]	Evergreen/ Deciduous	Comments[5]
Large trees (45+ ft when mature)						
Abies concolor	white fir, concolor fir	4,000 - 10,000	Foothills - Montane	M - H	E	Symmetrical, pyramidal shape; for large landscapes; attractive, soft, blue-green needles; grows best where protected from wind.
Abies lasiocarpa arizonica	corkbark fir, subalpine fir	7,000 - 11,000	Montane - Subalpine	M - H	E	Narrow, pyramidal habit; blue-green needles; corky, white bark; less commonly available; potential for use at lower elevations.
Acer negundo	boxelder	4,500 - 7,500	Plains - Foothills, Upper Sonoran	M - H	D	Maple with compound leaves; found along streams; rapid grower; weak-wooded; short-lived; female trees attract nuisance boxelder bugs.
Picea engelmannii	Engelmann spruce	5,000 - 11,000	Montane - Subalpine	M - H	E	Large, densely pyramidal tree with blue-green needles and reddish, scaly bark when mature; found at high elevations with subalpine fir where it performs best; less commonly available.
Picea pungens	Colorado spruce	4,000 - 9,500	Foothills - Montane	M - H	E	Colorado state tree; sharp, stiff needles ranging from green to silvery-blue; horizontal branching.
Pinus contorta latifolia	lodgepole pine	6,000 - 11,000	Montane - Subalpine	M	E	Light green needles; persistent cones; tall, narrow form in native habitat; broader habit in landscape site; requires well-drained soils.
Pinus flexilis	limber pine	4,000 -10,000	Montane - Subalpine	L - M	E	Green to blue-green needles in bundles of 4-5; flexible twigs; larger, ornamental cones.
Pinus ponderosa	ponderosa pine	4,000 - 9,000	Foothills - Montane	L - M	E	Longer, yellow-green needles; bark has vanilla fragrance on warm days; turns cinnamon color with age.
Pinus strobiformis	Southwestern white pine	4,000 - 8,500	Foothills - Montane	L - M	E	Blue-green needles; large cones; scaly bark when mature; faster-growing; less commonly available.
Populus angustifolia	narrowleaf cottonwood	4,000 - 9,500	Foothills - Montane	H	D	Vertical growth habit; willow-like leaves; suckers heavily; best in natural areas along streams; males do not produce cotton; yellow fall color.
Populus sargentii	Plains cottonwood	4,000 - 7,000	Plains - Foothills, Upper Sonoran	H	D	Fast-growing; broad, irregular canopy; triangular leaves; males do not produce cotton.
Populus x acuminata	lanceleaf cottonwood	4,500 - 8,500	Foothills	H	D	Fast-growing; upright, rounded, dense branching; spear-shaped, drooping leaves; less suckering; natural hybrid between Plains and narrowleaf cotton-woods; males do not produce cotton.
Pseudotsuga menziesii	Douglas-fir	4,500 - 11,000	Foothills - Montane	M	E	Fast-growing; soft, medium to dark green needles; pyramidal shape; unique cones; alternate host for gall insects on spruce.
Small - Medium Trees (10 - 45 ft when mature)						
Acer grandidentatum	bigtooth maple, Wasatch maple	4,500 -7,000	Foothills - Montane[3a]	L - M	D	Native to southwest, with occurrences in Montezuma County; often multi-stem form; degree of orange-red fall color varies.
Alnus tenuifolia	thinleaf alder	5,000 - 10,000	Foothills - Subalpine	H	D	Large shrub or small tree; often multi-stemmed; yellow fall color not reliable; persistent fruits resemble miniature pine cones; found along streams; gray bark; sun to part shade.
Betula occidentalis (Betula fontanalis)	Western water birch, Rocky Mountain birch	5,000 - 9,000	Foothills - Montane	H D		Small tree or large shrub; bronze-red bark; found along streams, often with thinleaf alder; yellow fall color; requires additional moisture in dry winters.
Juniperus monosperma	oneseed juniper	4,000 - 7,500	Plains - Foothills[3b]	L	E	Multi-stemmed tree with small, scale-like leaves; found on dry rocky slopes, often with piñon.
Juniperus osteosperma	Utah juniper	5,000 - 9,000	Upper Sonoran - Foothills[3a]	L	E	Spreading, multi-stemmed tree with small, scale-like leaves; large, grayish-blue, berry-like fruits are important food for small mammals and birds.

Table 1 (cont.). Native trees for Colorado landscapes.

Scientific Name[1]	Common Name(s)	Planting Altitude in feet[2]	Native Colorado Life Zone[3]	Moisture[4]	Evergreen/ Deciduous	Comments[5]
Small - Medium Trees (10 - 45 ft when mature)						
Juniperus scopulorum	Rocky Mountain juniper	4,000 - 8,000	Foothills - Montane	L	E	Variable growth habit, often upright to columnar; male and female flowers on separate plants; found on dry mountain slopes and mesas; berry-like fruits are important food for small mammals and birds.
Pinus aristata	bristlecone pine	5,000 - 11,000	Montane - Subalpine	L - M	E	Rounded to pyramidal shape; branches have bottlebrush appearance; short, dark green needles with specks of white resin; spiny cones; needs well-drained soil; slow-growing.
Pinus edulis	piñon, pinyon pine	4,000 - 7,500	Foothills - Montane, Upper Sonoran	L	E	Compact, bushy tree with grayish-green needles in bundles of two; small rounded cones; edible seeds develop when planted in grove for cross-pollination; best in dry, well-drained site.
Populus tremuloides	quaking aspen	4,000 - 10,000	Foothills - Subalpine	H	D	Leaves flutter in slight breeze; short-lived, suckers; best in well-drained mountain soils.
Quercus gambelii	Gambel oak, scrub oak	4,000 - 8,500	Foothills - Montane	L - M	D	Shades of red, orange, yellow, and brown in fall; acorns provide excellent wildlife food.
Salix amygdaloides	peachleaf willow	3,500 - 7,000	Plains - Foothills, Upper Sonoran	H	D	Fast-growing; lance-shaped leaves; new twig growth orange-yellow; ascending branches; found along streams.

[1] As commonly sold in the trade. For equivalents, see botanical publications.

[2] Planting altitudes are estimates of where plants may be successfully grown as landscape plants. In many cases, species may be successfully planted at a lower zone with supplemental irrigation or a higher zone with protection.

[3] Approximate life zone elevations: Plains - below 5,500 ft. in eastern CO; Upper Sonoran - below 7,000 ft. in western CO and below 8,000 ft. in San Luis Valley; Foothills - 5,500 - 8,000 ft.; Montane - 8,000 - 9,500 ft.; Subalpine - 9,500 - 11,500 ft.; Alpine - above 11,500 ft. Species requiring medium to high moisture occur along watercourses throughout all zones. For simplicity, life zones were taken from *Grassland to Glacier* by Mutel and Emerick, first edition, 1984. For a more detailed treatment of Colorado ecosystems, see second edition, 1992.

[3a] Native to Western Slope; [3b] Native to Eastern Slope

[4] Moisture Requirement: L - Low, M - Moderate, H - High

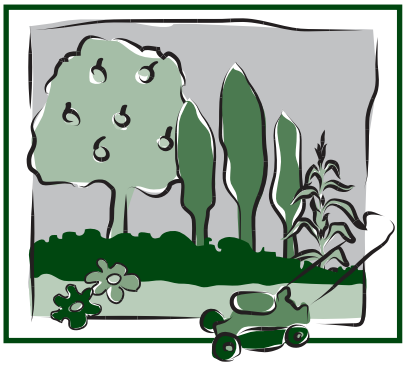
[5] Except where noted, plants prefer full sun.

COLORADO STATE UNIVERSITY
EXTENSION

Native Shrubs for Colorado Landscapes

Fact Sheet No. **7.422** Gardening Series | **Trees and Shrubs**

by J. Klett, B. Fahey, R. Cox and I. Shonle*



Why Grow Native Shrubs?

There are many benefits to using Colorado native shrubs for home and commercial landscapes. Colorado native shrubs are naturally adapted to their specific Colorado climate, soils, and environmental conditions. When correctly sited, they can be ideal plants for a sustainable landscape that requires reduced external inputs such as watering, fertilizing, and pruning. In order to realize these benefits, the planting site must approximate the natural environmental conditions of the plant in its native habitat.

Another benefit of using Colorado natives in landscapes is that they may attract a wide variety of wildlife including mammals, birds, and butterflies. Rapid urbanization in the state is reducing biodiversity as habitat is removed for building and road construction. Landscaping with natives on a large or small scale can maintain biodiversity that otherwise could be lost to development.

The shrubs listed in Table 1 are grown by some Colorado nurseries and are becoming more available in the commercial sector. However, not all shrubs listed are available at all nurseries, so it may be necessary to contact a number of commercial outlets to find a specific plant. If a shrub is not sold in the trade, asking for it may help increase its availability. Native shrubs should not be collected from the wild because this reduces biodiversity and causes a disturbed area that may be invaded by weeds.

Most of the shrubs listed in Table 1 are available as container-grown plants. Native shrubs often do not have as great a visual impact in the container or immediately after planting as do traditional horticultural species. Over time, they will reward the homeowner with their natural beauty and other benefits.

Figure 1: Mountain-mahogany fruit (*Cerocarpus montanus*)

Where To Grow Native Shrubs

There are several factors to consider in designing a native landscape. Due to Colorado's wide variation of elevation and topography, native plants are found in a variety of habitats. In order to maximize survival with minimal external inputs, plants should be selected to match the site's life zone and the plant's moisture, light, and soil requirements. Even if a plant is listed for a particular life zone, the aspect (north, south, east or west facing) of the proposed site should match the moisture requirement. For example, a red twig dogwood, which has a high moisture requirement, should not be sited with plants of dissimilar water needs. Similarly, a red twig dogwood should not be planted on a south-facing slope, where a significant amount of additional moisture would be required.

Growing native shrubs does not exclude the use of adapted non-native plants. There are many non-native plants that are adapted to Colorado's climate and can be used in a native landscape as long as moisture, light, and soil requirements are

Quick Facts

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- Landscaping with natives on a large or small scale can maintain biodiversity that otherwise would be lost to development.

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*J. Klett, Colorado State University Extension landscape and horticulture specialist; B. Fahey, Jefferson County Extension natural resources/horticulture agent; R. Cox, Arapahoe County Extension horticulture agent (retired), and I. Shonle, Gilpin County Extension Director/Agent. 1/2018

Figure 2: Golden currant (*Ribes aureum)*

Figure 3: Twinberry fruit (*Lonicera involucrata*)

Figure 4: Red-berried elder (*Sambucus racemosa)*

Figure 5: Wild rose (*Rosa woodsii)*

similar. Even if a site has a non-native landscape that requires additional inputs (such as an irrigated landscape on the plains), dry land native plants can be used in non-irrigated pockets within the non-native landscape. These native "pocket gardens" can be located in areas such as parkways and next to hardscapes that are difficult to irrigate.

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The Foothills life zone occurs from 5,500 to 8,000 feet and is dominated by dry land shrubs such as Gambel oak and mountain-mahogany, and, in southern and western Colorado, piñon-juniper woodlands and sagebrush. The Montane zone consists of ponderosa pine, Douglas-fir, lodgepole pine, and aspen woodlands at elevations of 8,000 to 9,500 feet. Dense forests of subalpine fir and Engelmann spruce dominate the Subalpine zone at 9,500 to 11,500 feet. The Alpine zone above 11,500 feet is a treeless zone made up of grasslands called tundra. Species requiring medium to high moisture occur along watercourses throughout all zones.

Culture and Maintenance

Successful establishment of native shrubs may require supplemental moisture after planting. Once established, the watering frequency can be reduced or even eliminated if the plant was sited in its native environmental conditions. Container-grown shrubs can be planted at any time during the growing season. Container-grown native shrubs are often grown in a soiless mixture of peat and bark, so the planting site should be amended with some organic material. Another option would be to carefully wash off the media from the container grown plant and plant it bare root.

Using native shrubs offers many benefits in addition to reduced maintenance. Natives are part of our natural heritage and the ecosystems of Colorado. Native plant communities make Colorado visually distinct from the eastern, southern or western United States. Native plant gardens are wildlife habitats and each plant contributes to the biodiversity of the state.

Figure 6: Western chokecherry (*Prunus virginiana melanocarpa)*

Figure 7: Wax currant (*Ribes cereum)*

Figure 8: Waxflower (*Jamesia americana)*

Figure 9: Serviceberry (*Amelanchier alnifolia)*

Table 1. Native shrubs for Colorado landscapes.

Scientific Name[1]	Common Name(s)	Planting Altitude in feet[2]	Native Colorado Life Zone[3]	Moisture[4]	Evergreen/ Deciduous	Comments[5]
Large shrubs (6 - 10 ft when mature)						
Acer glabrum	Rocky Mountain maple	5,000 - 10,500	Foothills - Montane	L - M	D	Small, rounded tree to large shrub; usually multi-stemmed; smooth, gray branches with red buds; fall foliage yellow; shade tolerant.
Amelanchier alnifolia	serviceberry	5,000 - 10,000	Foothills - Subalpine	L - M	D	Upright to spreading branches; small, rounded leaves; clusters of small white flowers; blue-black fruit attractive to wildlife; orange to red fall color.
Cercocarpus ledifolius	curl-leaf mountain-mahogany	4,500 - 9,000	Upper Sonoran[3a]	L - M	E	Thick, dark evergreen leaves curl during drought conditions; feathery, attractive seed heads; irregular growth habit; large shrub to small tree.
Cercocarpus montanus	mountain-mahogany	4,000 - 8,500	Foothills - Montane	L - M	D	Open growth habit; feathery, attractive seed heads; wedge-shaped leaves.
Cornus sericea	red twig dogwood; red-osier dogwood	4,500 - 10,000	Plains - Montane	M - H	D	Red stems in winter; flat, white flower clusters followed by white to blue fruits attractive to birds; yellow to red fall color; streamside understory plant; shade tolerant.
Cowania stansburianna	Cliffrose	4,000 - 7,500	Upper Sonoran[3a]	L	E	Large oval shrub; rigid, gnarled branches; small, lobed olive green leaves, fragrant, creamy colored flowers, followed by feather-tailed seeds.
Forestiera neomexicana	New Mexico privet	4,500 - 7,500	Upper Sonoran[3a]	L	D	Large shrub to small tree; dense, grayish-green foliage; yellow flowers before leaves; blue-black fruit on females; light tan bark; yellow fall color; good for screening.
Fraxinus anomala	single-leaf ash	4,500 - 6,000	Upper Sonoran[3a]	L - M	D	Large shrub or small tree, often multi-stemmed; found in dry canyons in southwest CO; yellow fall color; less available.
Mahonia fremontii	Fremont mahonia	4,500 - 7,000	Upper Sonoran[3a]	L	E	Large shrub, often multi-stemmed; blue holly-like leaves, fragrant yellow flowers in spring followed by red berries.
Peraphyllum ramossissimum	Squaw apple	5,500 - 9,000	Upper Sonoran[3a]	L	D	Shrub with fragrant white flowers in spring followed by crabapple-like fruit.
Prunus americana	American plum, wild plum	4,500 - 8,500	Plains - Foothills	L - M	D	Thicket-forming; white flowers before leaves; fruit good for preserves; attracts wildlife; cold and drought tolerant; yellow to red fall color; found along canyons and slope bottoms.
Prunus pensylvanica	pin cherry	5,000 - 8,000	Foothills[3b]	M	D	Large shrub to small tree; thicket-forming; shiny, green leaves; red, edible fruit; shade tolerant; white flowers; red fall color.
Prunus virginiana melanocarpa	Western chokecherry	4,500 - 8,500	Plains - Montane, Upper Sonoran	M	D	Irregular, branching shrub with shiny, dark green leaves and elongated flower clusters; suckers to form thickets; dark purple fruit excellent for preserves; reddish-orange to yellow fall color.
Ptelea trifoliata	hop tree, wafer-ash	4,000 - 6,500	Plains - Foothills[3b]	M - H	D	Shrub or small tree with three-parted foliage; drought and shade tolerant; small, fragrant flowers; yellow fall color; persistent hop-like fruit.
Quercus undulata	wavyleaf oak	4,000 - 6,500	Foothills[3b]	L	D - E	Blue-green, leathery leaves with wavy edges; leaves persist in winter; coarse bark; native to southeast CO; less available.
Rhamnus smithii	Smith buckthorn	5,000 - 7,500	Foothills[3a]	L - M	D	Upright habit with dark green shiny leaves; black fruit in late summer on female plants; yellow fall color; good screen plant; Plant Select®[5a].
Rhus glabra	smooth sumac	4,000 - 8,000	Plains - Foothills, Upper Sonoran	L - M	D	Open, rounded thicket-forming shrub; bright green leaves; pyramidal clusters of yellow flowers produce fuzzy, dark red fruits in fall that persist into winter; outstanding yellow-orange-red fall color.
Robinia neomexicana	New Mexico locust	4,500 - 9,000	Foothills	L - M	D	Thicket-forming thorny shrub, green leaves; showy pink flowers in the spring.
Salix exigua	sandbar willow	4,000 - 9,000	Plains - Foothills, Upper Sonoran	H	D	Thicket-forming; gray-green narrow leaves; salinity tolerant; yellowish-gray catkins before leaves; yellow fall color.
Salix monticola	Rocky Mountain willow, yellow mountain willow	6,000 - 10,500	Montane	H	D	Broad, rounded shrub; narrow, deep green leaves, yellow fall color; arching yellow twigs attractive in winter; common streamside willow found in mountain areas.

Table 1 (cont.). Native shrubs for Colorado landscapes.

Scientific Name[1]	Common Name(s)	Planting Altitude in feet[2]	Native Colorado Life Zone[3]	Moisture[4]	Evergreen/ Deciduous	Comments[5]
Shepherdia argentea	silver buffaloberry	4,500 - 7,500	Plains - Foothills, Upper Sonoran	L - M	D	Thorny shrub to small tree; thicket-forming; silver, rounded leaves; golden to red, edible, bitter fruits on females; attracts wildlife.
Sorbus scopulina	native mountain-ash	6,000 - 10,000	Foothills - Subalpine	M	D	Large shrub to small tree with divided leaves; white flower clusters followed by orange fruit; attractive to wildlife; orange to red fall color; found in moist sites on slopes in rocky canyons.
Medium shrubs (4 - 6 ft when mature)						
Amelanchier utahensis	Utah serviceberry	5,000 - 9,000	Upper Sonoran[3a]	L-M	D	Thicket-forming shrub with fragrant white flowers in spring; edible blue berries in summer; attracts wildlife; yellow fall foliage.
Amorpha fruticosa	false indigo, leadplant	3,500 - 6,000	Plains[3b]	L	D	Open, wide-spreading shrub; feathery, green foliage; spikes of deep blue flowers in summer; yellow fall color; deer resistant.
Artemisia tridentata	big sagebrush	4,500 - 9,500	Upper Sonoran	L	E	Silver-colored evergreen with peeling grayish bark; leaves densely hairy and aromatic; wildlife browse plant; does not tolerate high moisture.
Betula glandulosa	bog birch	5,000 - 11,000	Subalpine	H	D	Globe-shaped shrub with small, rounded dark green leaves on reddish-brown erect stems; yellow to red fall color; better at higher altitudes.
Fallugia paradoxa	Apache plume	3,500 - 8,000	Plains, Upper Sonoran[3b]	L	D - E	Open, rounded shrub; small, grayish-green leaves; whitish, shreddy bark; white, rose-like flowers; fuzzy, pink seed heads appear all summer; native to San Luis and Arkansas Valleys; Plant Select®[5a].
Fendlera rupicola	cliff fendlerbush	4,000 - 8,000	Upper Sonoran[3a]	L	D	Small, grayish-green, narrow leaves with edges rolled under; white to pink flowers; reddish-tan bark; less available.
Holodiscus dumosus	rock-spirea, mountainspray	5,000 - 10,000	Foothills - Montane	L - M	D	Upright shrub; arching, slender branches with pyramidal sprays of white flower clusters that turn rust; fall foliage colored bronze-red; sun to partial shade; found on rock outcrops and cliff bases.
Purshia tridentata	antelope bitterbrush, antelope-brush	5,000 - 9,000	Foothills - Montane	L	D	Spreading shrub with small, oval leaves and pale-yellow flowers in early summer; requires dry, coarse soils; important browse plant for wildlife.
Rhus trilobata	three-leaf sumac, skunkbush	3,500 - 9,000	Plains - Foothills, Upper Sonoran	L	D	Arching branches with glossy, green, three-parted leaves; small yellow flowers before leaves; reddish, hairy, edible fruits; orange to red fall color.
Ribes aureum	golden currant	4,000 - 10,000	Plains - Foothills, Upper Sonoran	L - M	D	Arching growth habit; yellow flowers in late spring; yellow to black fruit attracts birds; well-drained sites; orange to red fall color.
Ribes cereum	wax currant	4,000 - 10,000	Foothills	L	D	Rounded growth form; lobed, leathery leaves; lacks spines; pink tubular flowers in spring; edible orange-red berries in summer; attracts birds.
Ribes inerme	whitestem currant	6,000 - 10,000	Foothills - Montane	M	D	Rounded growth habit; few if any spines; whitish stems becoming reddish-brown and flaky; small, pink flowers followed by edible, tart, wine-red fruit.
Ribes lacustre	bristly currant, swamp currant	8,000 - 10,000	Montane - Subalpine	H	D	Low-growing shrub with spines; lobed leaves; greenish-purple flowers in droopng clusters followed by bristly purple fruit; native along streams; browse plants for livestock and game.
Rubus deliciosus	boulder raspberry	4,500 - 9,000	Foothills	L - M	D	Arching growth habit with peeling, cinnamon colored bark; shade tolerant; spineless; large, white, rose-like flowers in spring followed by sparse raspberry-like fruits.
Rubus parviflorus	western thimbleberry	5,000 - 10,000	Montane	M - H	D	Large, maple-like leaves; white, rose-like flowers followed by edible fruits; best in shady, moist locations.
Salix irrorata	bluestem willow	5,000 - 9,000	Foothills	H	D	Rounded, upright shrub; spreading silver-blue twigs; glossy green linear leaves; yellow fall color.
Sambucus racemosa	red-berried elder	5,000 - 12,000	Foothills - Subalpine	M - H	D	Upright to arching growth form; shiny compound leaves; stout branches; white flower clusters in early summer followed by bright red berries; yellow fall color; found along streams; attracts birds.

Table 1 (cont.). Native shrubs for Colorado landscapes.

Scientific Name[1]	Common Name(s)	Altitude in feet[2]	Colorado Life Zone[3]	Planting Native Moisture[4]	Evergreen/ Deciduous	Comments[5]
			Small shrubs (less than 4 ft when mature)			
Amorpha canescens	silvery leadplant	3,500 - 7,500	Plains - Foothills[3b]	L	D	Erect, dense shrub with gray-green, fern-like foliage; tall spikes of violet-purple flowers in midsummer; tolerates drought and poor soils.
Arctostaphylos patula	manzanita, bearberry	6,000 - 9,000	Foothills - Montane[3a]	L	E	Spreading growth habit with dense foliage; mahogany-red stems; oval, bright green erect leaves; pink flowers in spring followed by dark brown, small apple-like fruits; does best on well drained soils.
Arctostaphylos uva-ursi	kinnikinnik	5,000 - 10,000	Foothills - Subalpine	L - M	E	Mat-forming evergreen with small oval leaves; pink urn-shaped flowers followed by red fruits; requires well-drained gravelly soils; attracts wildlife; needs light shade.
Artemisia cana	silver sagebrush	5,000 - 10,000	Montane	L - M	E	Mounding growth habit; branches become gnarled; aromatic, silver-gray leaves.
Atriplex canescens	fourwing saltbush	4,000 - 8,000	Plains, Upper Sonoran	L	D - E	Light green to gray small leaves; interesting four-winged fruits on female plants; tolerates poor or salty soils; slow-growing.
Ceanothus fendleri	Fendler ceanothus, mountain-lilac	5,000 - 9,000	Foothills - Montane	L	D	Spiny, low shrub with small, white flower clusters in late spring; wildlife browse plant; grows on coarse soils; less available.
Ceratoides lanata	winterfat	3,500 - 9,500	Plains, Upper Sonoran	L	D - E	Dense, erect shrub covered with white woolly fruits; grayish-green leaves persist in winter; excellent forage for wildlife.
Chrysothamnus nauseosus	rabbitbrush, rubber rabbitbrush	5,000 - 10,000	Plains - Foothills, Upper Sonoran	L	D	Size and growth habit varies with subspecies; narrow aromatic leaves; young stems green to silvery-gray; showy clusters of yellow flowers on new growth in late summer attract butterflies; can be aggressive.
Jamesia americana	waxflower	5,500 - 10,000	Foothills - Montane	M	D	Flat-topped shrub with upright branches; distinctly veined heart-shaped leaves with white undersides; shreddy, reddish bark; waxy, white flowers in late spring; red fall color; shade tolerant; needs well-drained soil.
Juniperus communis	common juniper	5,000 -10,000	Foothills - Subalpine	L - M	E	Low-growing; needle-like leaves with whitish stripes; bluish-gray, berry-like fruit; shade tolerant; needs well-drained soil.
Lonicera involucrata	twinberry	5,000 - 11,000	Montane - Subalpine	M - H	D	Shade-tolerant upright oval shrub with erect branches; bright green leaves; creamy yellow trumpet-shaped flowers in pairs followed by black fruit enclosed in a red cup.
Mahonia repens	creeping Oregon grape-holly	5,000 - 9,500	Foothills - Montane	L - M	E	Low-growing; thicket-forming ground cover; blue-green leaves turn purplish in winter; yellow flowers followed by edible, blue grape-like fruit; shade tolerant; may winter burn in windy, exposed sites.
Paxistima myrsinites	Mountain lover	6,000 - 11,000	Foothills, Montane	M	E	Spreading to prostrate shrub with small leathery leaves and inconspicious flowers. Tolerates shade.
Philadelphus microphyllus	littleleaf mock-orange	5,000 - 8,000	Foothills, Upper Sonoran	L - M	D	Rounded, compact slow-growing shrub with small gray-green leaves; fragrant white star-shaped flowers.
Physocarpus monogynus	mountain ninebark	5,500 - 10,000	Foothills - Montane	M	D	Interesting shreddy bark on older branches; white to rose-colored flowers in small heads; good wildlife cover; leaves resemble currant; yellow to maroon fall color; less available.
Potentilla fruticosa	shrubby cinquefoil	5,000 - 11,000	Montane - Subalpine	M	D	Open, rounded shrub; single yellow flowers throughout summer; many cultivated forms available from nurseries.
Prunus besseyi	Western sand cherry	3,500 - 8,500	Plains - Foothills[3b]	L - M	D	Upright, rounded open shrub with grayish-green leaves; numerous white, single, fragrant flowers followed by purplish-black fruits that attract birds; red fall color. 'Pawnee Buttes' is a low, spreading groundcover; Plant Select®[5a].

Table 1 (cont.). Native shrubs for Colorado landscapes.

Scientific Name[1]	Common Name(s)	Planting Altitude in feet[2]	Native Colorado Life Zone[3]	Moisture[4]	Evergreen/ Deciduous	Comments[5]
Rosa woodsii	Woods rose, wild rose	3,500 -10,500	Foothills - Subalpine	L - M	D	Spiny, dark reddish-brown stems; thicket-forming; dark green, compound leaf; single, large pink flowers in early summer; reddish-orange fruits; browse plant for wildlife.
Shepherdia canadensis	russet buffaloberry	5,000 -11,500	Montane - Subalpine	M	D	Prostrate to upright shrub; brown, thornless branches; dark green, oval leaves with russet-colored scales beneath; inconspicuous flowers followed by red to orange bitter fruit on females; attractive to wildlife; shade tolerant.
Symphoricarpos albus	snowberry	5,000 - 8,500	Foothills	L - M	D	Arching growth habit; thicket-forming; rounded, blue-green leaves; shade tolerant; pink, bell-shaped flowers in summer; large white berries in fall persist into winter; attracts birds and small mammals.

[1] As commonly sold in the trade. For equivalents, see botanical publications.
[2] Planting altitudes are estimates of where plants may be successfully grown as landscape plants. In many cases, species may be successfully planted at a lower zone with supplemental irrigation or a higher zone with protection.
[3] Approximate life zone elevations: Plains - below 5,500 ft. in eastern CO; Upper Sonoran - below 7,000 ft. in western CO and below 8,000 ft. in San Luis Valley; Foothills - 5,500 - 8,000 ft.; Montane - 8,000 - 9,500 ft.; Subalpine - 9,500 - 11,500 ft.; Alpine - above 11,500 ft. Species requiring medium to high moisture occur along watercourses throughout all zones. For simplicity, life zones were taken from *Grassland to Glacier* by Mutel and Emerick, first edition, 1984. For a more detailed treatment of Colorado ecosystems, see second edition, 1992.
[3a]Native to Western Slope; [3b]Native to Eastern Slope.
[4] Moisture Requirement: L - Low, M - Moderate, H - High.
[5] Except where noted, plants prefer full sun.
[5a] Plant Select is a cooperative program of Colorado State University, Denver Botanic Gardens and the Green Industry with the purpose of introducing the very best plants for gardens from the High Plains and beyond.

Exhibit 'B'

HC3

Unifiying Watering Schedules

Across Summit County

Fact Sheet

HIGH COUNTRY CONSERVATION CENTER

Unifying Watering Schedules Across Summit County

Background: Drought and warming temperatures across the Southwest are predicted to worsen while the population is predicted to grow. Along the Colorado River, this has culminated in the need to collectively participate in water conservation measures that are timely, equitable, actionable, and bold. With some cities resistant to statewide water conservation standards, "regional approaches are needed." Following participation in the Growing Water Smart event, one solution identified for the Summit County community in fall of 2020 was to consider improved (unified) and/or mandatory watering schedules: "**time of day/week requirements are the low hanging fruit of water conservation and efficiency**." In fall of 2022, HC3 worked with a graduate student to conduct extensive research and recommend a unified schedule paired with outreach for the Summit County community.

Project Goal: Work with local governments to adopt the unified watering schedules recommended below, which are based on a similar project in the Roaring Fork Valley and align with local feedback received during the research process.

Proposed Summit County Irrigation Schedule		
Last full number in address is even	Nights to water: Tue, Thu, Sat	Time to water: Overnight, 6pm – 9am
Last full number in address is odd	Nights to water: Wed, Fri, Sun	

Following adoption of unified schedules, High Country Conservation Center (HC3) will use existing grant funds to advertise the new schedules, coordinate communications with water districts, partner with landscapers to support implementation, and conduct community outreach to help residents understand the benefits of saving water. The project helps governments build resiliency and lead by example, and it aligns with the locally adopted, state approved Blue River Watershed Water Efficiency Plan.

Supporting Information: The research process included review of existing studies, interviews with Roaring Fork stakeholders (who are embarking on a similar project), and interviews with town staff, elected officials and water providers. Unified schedules, even if voluntary, set a baseline for future conservation measures. Additionally:

- A unified irrigation schedule reduces confusion. Water users across the county benefit from clear guidance, which correlates with increased compliance. Currently, HC3 cannot promote watering schedules because the few existing schedules in place are all different.
- Legislators and administrators responsible for resource conservation benefit from the establishment of a common system that may be adjusted in times of drought.
- Several landscapers contacted by HC3 support countywide consistency.
- A unified irrigation schedule exemplifies collaborative resource management. Unified schedules were identified by a consultant in 2022 as a top opportunity for communitywide collaboration.
- Unified schedules serve as a stepping stone for future measures such as separate landscape meters, minimum efficiency standards, and limiting turf.

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Research available upon request