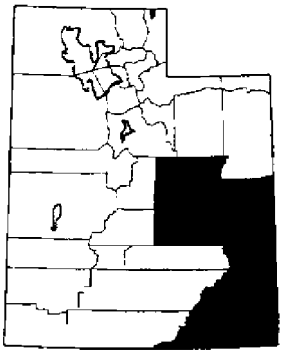

SELECTION AND CULTURE OF LANDSCAPE PLANTS IN UTAH

A GUIDE FOR CASTLELAND RC&D
CARBON, EMERY, GRAND, AND SAN JUAN COUNTIES

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What traveler, driving across Utah, has not marveled at its diversity of geography, climate and vegetation? From Joshua trees in the Mojave Desert, to alpine meadows, to pinion-juniper forests set against the red sandstone of the Colorado Plateau, it is truly a state of contrasts.

Ideally, Utah landscapes should be adapted to local conditions and enhance the natural beauty of the state. Unfortunately, most of our landscapes are patterned after those found in Europe or Northeastern America. Such landscapes are difficult to maintain and require more resources, such as water and fertilizer, than adapted landscapes. While there are no simple design recommendations that would be valid state-wide, localized guidelines can address the diversities of climate, soils, and other factors which affect plant growth.

The purpose of this publication is to recommend plants and landscape management procedures for various regions of the Southeast portion of Utah known as Castleland (Carbon, Emery, Grand, and San Juan Counties). Cold winters, hot summers, little rainfall, and poor soils make Castleland one of the state's most difficult regions for growing and maintaining landscapes. Proper landscape design and management can help prevent plant stress and death in these conditions. It also makes landscapes easier to maintain. The first step to successful landscaping is to understand the local climate and soil.

The Landscape Environment—Climatic Factors

The climate of southeastern Utah is very diverse. Frost-free seasons range from 220 days along the lower Colorado River to 20 days in the LaSal Mountains and Roan Plateau. Most communities have frost free seasons of 100–180 days (Table 1). Frost-free season information is critical to successful production of fruit and vegetables, and gardens should be planned accordingly. It is also important because of the damaging effect that early and late frosts can have on some landscape plants. Equally, if not more important, to landscape plants is the average minimum temperature of the region.

"Cold hardiness" refers to a plant's tolerance to winter cold. A cold hardiness map, published by the USDA in 1990, lists hardiness "zones" for the entire United States. Southeastern Utah encompasses zones 5a to 8a (-20°F to 10°F average annual minimum temperatures). The USDA map can give misleading information in Utah because of rapid changes in elevation. It is also possible to have occasional years with extreme winter cold that may cause plant damage beyond what would be expected based on the hardiness map. The data in Table 1 provide more detailed climate characteristics for communities in Castleland. There can be even more local conditions (called microclimates) that are the result of topography, walls, buildings, and courtyards. Cold hardiness **must** be a major consideration in choosing any landscape plant.

Climatic records provide information on how much moisture enters the landscape as precipitation, and how much water is lost from the landscape. Castleland has an average annual precipitation rate of 6–12 inches. Water lost from a landscape through transpiration by plants or evaporation from the soil surface is called evapotranspiration or ET. Climatic data for the month of July estimate that a turf area in a cool location, such as Scofield, would use about 0.14 inches of water per day (4½ inches per month), while warmer locations may use up to 0.2 inches per day (6 inches per month). These values are estimates only, and are influenced by local climatic conditions. Obviously, during July and other summer months, water is lost to ET faster than it is replaced by precipitation, therefore Castleland landscapes need irrigation, and/or plants adapted to dry conditions.

Table 1. Description of Community Climate Characteristics.

Community	Frost-Free Days	Hardiness Zone*	Moisture**
Scofield	40–60	5a	20
East Carbon	100–120	6a	10
LaSal	100–120	6a	12
Sunnyside	100–120	6a	12
Castle Dale	120–140	6a	7
Clawson	120–140	6a	8
Emery	120–140	6a	7
Huntington	120–140	6a	8
Monticello	120–140	6a	14
Orangeville	120–140	6a	8
Blanding	140–160	6b	12
Cleveland	140–160	6a	8
Elmo	140–160	6a	8
Ferron	140–160	6a	8
Helper	140–160	5b	12
Wellington	140–160	6a	7
Price	140–160	6a	8
Bluff	160–180	7a	6
Green River	160–180	6b	6
Moab	160–180	6b	9
Thompson	160–180	7a	8
Mexican Hat	180–200	8a	4
Montezuma Creek	180–200	8a	6

* Average minimum winter temperature

5a = -15 to -20 F 6b = 0 to -5 F
5b = -10 to -15 F 7a = 5 to 0 F
6a = -5 to -10 F 8a = 15 to 10 F

**Annual precipitation in inches.

The Landscape Environment—Soil Factors

Castleland soils fall within the broad classification of being cold to moderate in temperature, and generally dry. Soil textures include loam, clay loam, fine sand, fine sandy loam, and others. Some soils in the Carbon-Emery area may contain excess salt, which creates problems in many landscape situations. It is important to remember that even excellent native soils are usually reduced in quality during construction as a result of the mixing of subsoils with topsoil, compaction, and contamination of the soil with debris and chemicals. Compaction is a common problem and is serious because it restricts root growth, reduces water infiltration, and limits aeration.

Plant growth and ease of maintenance are improved immensely by high quality soils. Landscape soil quality can be improved by keeping it clean during construction, tillage to reduce compaction, and amending with fertilizers and organic matter. To correctly amend soils, an understanding of the following characteristics is required.

Soil texture: This refers to the percentages of sand, silt, and clay in a soil. Sandy soils drain quickly and retain little water or nutrients. Clay soils consist of much smaller particles and have less drainage, but better nutrient retention than sandy soils. Soils with appropriate balances of sand, silt, and clay are described as loamy. Loam soils, or close relatives such as clay loams or silt loams, are among the best soils for plant growth.

Soil structure: Structure refers to the degree to which small soil particles clump together, forming both large and small pores throughout the soil. This clumping aids water and air movement in the soil because water and air can move freely through the large pores. At the same time, the smaller pores within the aggregates hold water for plant use.

Soil organic matter: Organic matter is beneficial in soil because it decomposes to provide plant nutrients. Organic matter also improves water infiltration, drainage and retention in the soil, largely due to its ability to improve soil structure. Manure, compost, leaves, and grass clippings are sources of soil organic matter.

Nutrient status: The nutrient status of the soil refers to the amount of nutrients such as nitrogen, phosphorus, and potassium in the soil. These nutrients and several others are essential for proper plant growth. If nutrients are limited, then plant growth suffers because of deficiencies. On the other hand, excessive levels of nutrients or other compounds such as sodium chloride, can result in salty soils. Saline soils are difficult for plants to grow in because high levels of salts make it hard for plant roots to absorb water.

Soil pH: This refers to the acidity or alkalinity of the soil. It is important because the pH of the soil affects the availability of mineral nutrients to plants. For example, Utah soils have high levels of iron, an essential mineral. However, due to the high pH of these soils, the iron present is not readily available for plant growth.

The most effective way to determine a soil's characteristics is to have a soil test done. Soil testing is done by commercial laboratories, or through agencies such as the Soil Testing Laboratory at Utah State University. Instructions and sampling kits for soil tests are available at local County Extension offices.

Managing the Landscape Environment—Water Management

Summer landscape irrigation requirements are primarily met through irrigation. A problem common to arid regions is the tendency for over-irrigation, which wastes water and can damage many plants. Water supplies in Utah are limited, and will become more so as demand for water continues to increase. Conservation of water is important from both environmental and proper plant management perspectives. Remember though, limited water does not mean that landscaping must be limited. It is possible to retain beautiful and functional landscapes while conserving water. There are several things that can be done to conserve water in the landscape.

1. Planning: Planning for water conservation can provide many ways to save water within a highly functional and desirable landscape. Factors that should be planned for in the design include selecting appropriate plants, installing a well-designed irrigation system, proper preparation of the soil before planting, landscape weed control, and efficient maintenance. Information on plant materials and designs for water conservation can be obtained from this publication and the many references listed in the bibliography. Visits to local parks, gardens, golf courses and other landscaped areas can also provide a wealth of information.

2. Irrigation systems: Proper design and use of irrigation systems can provide substantial water savings in the landscape. Proper design insures that irrigation water is applied uniformly to the landscape. Uniform application prevents over-watering of large portions of the landscape when the system is left on long enough to get that one stubborn dry spot green. Design can also specify the use of water saving systems such as drip irrigation.

Even the most perfectly designed system will waste water if not managed correctly. Fortunately, there are a number of techniques which can be used singly, or together, to conserve water while irrigating.

- Know how much water you are applying. Irrigation should be applied based on *quantity* of water, not the length of application time. Sprin-kler system application rates can be determined by placing several straight sided containers (soup cans) in the landscape and measuring the water applied in a given time period. This information also gives some idea of how uniformly water is being applied.
- The landscape should be designed so that plants are grouped according to irrigation require-ments. With such a design, each control station can be set to provide the appropriate amount of water for the plants within that station. For example, a station covering the north side of a home will require less water (per square foot) than one on the south side.
- The amount of water applied at any one time should be sufficient to moisten the entire root zone. Sandy soils will require less water than clay soils. Shallow soils will also require less than deep soils. The best way to determine depth of irrigation is to use a soil probe (long screw-driver or soil corer) to determine how far the water has penetrated the soil. It may be necessary to apply water in a series of frequent, short applications to prevent surface runoff while thoroughly moistening the soil profile.
- Irrigate when plants need it, not on a pre-determined day of the week. There are a number of observational techniques that can be used to determine when to irrigate. The easiest is to observe the landscape and watch for signs of water stress in plants. Water stress usually shows up first in turf, and is characterized by a change in color from a bright green, to a dull blue-green. Dry turf will also show foot prints after it is walked on. There may be other plants in the landscape that show water stress before anything else, and they too can be used to schedule irrigation. If water is applied soon after stress appears, there is usually no harmful effect to the landscape. Irrigation scheduling can also be based on ET.

3. Plant hydrazones: Grouping plants together according to similar water requirements avoids wasteful over-watering and encourages proper growth. For many water efficient plants, there is such a thing as *too much* water. This guide provides recommended levels of watering as a general guide to "zone" planting. It is important to realize that there are not any magic numbers available which say exactly how much water should be applied to the landscape for any given plant. Water needs are dependent on the soil type, weather conditions, plant material, and amount of competition with weeds or desirable plants. The ratings given in any publication are simply guidelines.

4. Use mulches: One of the best things that can be done with any landscape is to use mulches of organic matter. It is hard to go wrong when adding such material to the soil, especially in the desert soils of Utah where organic matter is often very low. Mulches keep soil temperatures lower and reduce surface evaporation, thus holding the water near roots longer. Mulches suppress

weed growth and reduce competition with desirable plants. They also decompose over time and provide needed organic matter to the soil. Unshaded mulches may result in hot air temperatures above them. Therefore, use caution when using with small, tender plants.

5. **Proper use of turf:** There is a constant debate on how much water turf uses compared to other plants. Currently, researchers are looking for turfgrasses that can do well in low irrigation situations. Since turfgrasses are actively growing all summer long, they tend to use more water than other plants. For many types of activities, there is no good substitute for turf, so eliminating turf from the American landscape is usually not an option. However, reducing the amount of turf can save water. For instance, if the only time a turf area is walked on is when it is mowed, then it may be prudent to consider an alternative. Perennial flowers can be more water efficient and offer the benefit of color. Shrub beds installed with weed barriers can be attractive and low maintenance. There are also nontraditional turfgrasses, such as buffalograss, which can survive with little supplemental water. However, such grasses do not function the same as bluegrass in the landscape.

6. **Control weeds:** The ideal water conserving landscape loses no water through evaporation from the soil, or use by weeds. Evaporation can be controlled by mulches. Weeds can also be controlled by mulches, and by cultivation and herbicides. Remember, label directions must be followed when using herbicides in landscapes. A good reference is the Utah Horticultural Weed Control Handbook available from County Extension offices.

Managing the Landscape Environment—Soil Management

One of the main causes of landscape problems is inadequate soil preparation. Landscape soils are often compacted or contaminated by construction practices. If these problems are not corrected, plant growth will suffer for years. There are many simple practices that can dramatically improve soils damaged by construction.

When preparing a soil for planting, the first step is to reduce compaction by deep tillage or ripping of soil. This insures appropriate drainage and aeration. This cultivation should be done to the subsoil following construction and before the addition of top soil. The depth of cultivation should be 12–18 inches, and only needs to be enough to break up compacted soil layers. Finer tillage and grading can be done after topsoil is added.

Organic matter can also improve soil characteristics. Addition of organic matter is beneficial because it may temporarily reduce the pH (if acidic materials are used), improve nutrient and water retention, and insure good structure and aeration. Organic matter is best when used to modify an entire area rather than just a planting hole. The best method is to spread a layer on the surface of the topsoil and then cultivate it into the soil. It is usually not appropriate to amend a soil with sand or clay. Such practices may damage the soil more than improve it.

Two common problems in Castleland are alkaline soils (high pH) and salinity. Lowering soil pH is difficult for large areas, and is very expensive for an entire landscape. The best solution is to choose plants adapted to the existing pH, rather than try to change the pH to support unadapted plants. Irrigation with high quality water (low salts) in soils with adequate drainage controls most soil salinity since salts move freely with soil water. Soil drainage can be improved by reducing compaction and adding organic matter to the soil, or by the installation of drain tiles in areas with severe prob-lems. Salinity problems can also be reduced by applying an extra 10% water to help flush salts past the root zone. It is also possible to select plants that are salt tolerant.

Managing the Landscape Environment—Landscape Plant Selection

The answer to many landscape problems is as simple as selecting appropriate plants. Plants that are native or adapted to the local environment can thrive under minimum maintenance, while nonadapted plants often will not survive local soil and climatic conditions.

Cold hardiness is the first criterion in selecting landscape plants. Plant irrigation requirements and other factors are less critical because we can economically provide water, fertilizers, and pesticides. However, providing supplemental heat for landscape plants is too expensive to be an option. For some reason, people tend to choose plants that are at the very limit of their hardiness capability. The result of such selections is that many of these plants are injured or killed outright during periodic cold spells. To avoid the discouragement of seeing a carefully nurtured 10-year-old tree die, it is much better to select plants that are hardy for the zone they are grown in. Most plant material publications and catalogs are good sources of hardiness information.

While hardiness is the most critical aspect of plant selection, other factors are also very important. In a water conserving landscape, plants should be selected that tolerate minimum irrigation and extended dry periods. In areas with high pH soils, plants should be chosen that are not susceptible to iron chlorosis. Plants should also be

chosen based on their resistance to local disease and insect problems. For example, plants such as European weeping birch, silver maple, rhododendrons, and others are not recommended because of serious problems that occur with them in the landscape.

Some think that only native plants should be used in drought tolerant landscapes. While many native plants function extremely well as landscape plants, it is important to realize that some natives may not be adapted to the site in question. Just because a plant is native to Utah does not mean it is native to all of the habitats in Utah. In addition, there are many introduced plants that function as well as, or better than, some natives in low maintenance landscapes.

The following tables are lists of plants that are suitable for much of Castleland. Plants are classified as trees, shrubs, perennial flowers, and grasses. Each plant is listed with common and botanical names, and a description. While not comprehensive, these lists are a good place to start when choosing plants for a landscape, or when sitting down with a landscape architect. In these lists, a single zone number refers to the coldest recommended temperature zone. Where a range of zones is indicated, the larger number refers to the warmest recommended temperature zone. This upper limit is often unknown. The heading "water" refers to relative water requirements for acceptable growth. Water requirements are based on a scale of 0-3, with the definitions as follows:

0 No supplemental water is required after plants are established.

1 At least 1-inch of supplemental water per month may be required after plants are established.

2 At least 1-inch of supplemental water every 2 weeks may be required after plants are established.

3 At least 1-inch of supplemental water each week may be required after plants are established.

Plant dimensions are listed as height x width.

Trees

***Acer glabrum*—Rocky Mountain Maple**

zone 3 water 1

Deciduous, small tree growing rapidly to 20' x 15'. Green leaf color changing to yellow to orange in fall. Does well in sun or shade. Grown easily from seed, but hard to transplant. Stays shrub-like on poor sites.

***Acer grandidentatum*—Big Tooth Maple**

zone 3 water 1

Small, deciduous tree with bright fall colors of yellow to orange and red. Slow growth to 30' x 20'. Requires well-drained soils and full sun. Easily grown from seed. Transplants well if container-grown. Thought to be a close relative of the sugar maple.

***Acer campestre*—Hedge Maple**

zone 4–8 water 2

Deciduous with relatively small, green leaves. Grows to 30' x 30'. Tolerant of soil alkalinity. No serious disease or insect problems. A nice small maple.

***Acer platanoides*—Norway Maple**

zone 3–7 water 3

Deciduous with green to purple leaves depending on cultivar. Very dense shade. Moderate growth rate to 50' x 40'. Full sun. Tolerant as to soil type and pH if well-drained. Tolerant of air pollution. Problems with aphids, verticillium wilt, and leaf scorch.

***Acer pseudoplatanus*—Sycamore Maple**

zone 5–7 water 2

Deciduous with dark green leaves and little fall color. Moderate growth rate to 45' x 35'. Full sun to partial shade. Tolerant to salt and wind and a wide range of soils if well-drained.

***Acer tataricum*—Tatarian Maple**

zone 3–8 water 2

A deciduous, small tree (20' x 20') with slow to moderate growth. Often multi-stemmed. Wide range of fall colors. Adapts to a wide range of conditions and somewhat drought tolerant when established. Few disease or insect problems.

***Ailanthus altissima*—Tree of Heaven**

zone 4–8 water 0

Deciduous with pinnately compound, green leaves. No fall color. Fast grower to 40' x 30'. Full sun. Tolerates wide range of soils, pH 6–8, salinity, and air pollution. Trashy weak wood with profuse suckers. Susceptible to verticillium wilt. *Use only in the most difficult sites.*

***Betula occidentalis*—Western River Birch**

zone 3 water 3

Deciduous, multi-stemmed small tree which grows rapidly to 35' x 15'. Occurs naturally as a riparian plant. Multiple stems and copper-colored bark provide nice winter appearance. Transplants easily. Native.

***Catalpa speciosa*—Northern Catalpa**

zone 4–8 water 1

Deciduous, large-leafed tree with showy white flowers and long fruit pods. Moderate growth to 40' x 20'. Partial shade to full sun. Tolerant of wide ranges in soils and pH of 6–8. Withstands hot, dry conditions. Susceptible to verticillium wilt, but no major problems.

***Celtis occidentalis*—Common Hackberry**

zone 2–9 water 1

Deciduous with coarse, green leaves, yellow fall color, and ridged, corky bark. Moderate growth to 40' x 40'. Full sun. Tolerates a wide range of soils with pH of 6–8. Largely pest free except for leaf nipple gall, a cosmetic insect problem on leaves.

***Celtis reticulata*— Netleaf Hackberry**

zone 4 water 0

A deciduous native. Common to riparian areas of southern Utah. Susceptible to nipple gall.

***Eleagnus angustifolia*—Russian Olive**

zone 2–7 water 1

Deciduous with silvery-grey foliage. Fast growth to 20' x 20'. Full sun. Tolerant of most soil conditions, including high pH and salts. Susceptible to verticillium wilt. *Useful in extremely difficult situations, but invasive.* Check local weed ordinances.

***Fraxinus pennsylvanica*— Green Ash**

zone 3–9 water 2

Deciduous with green, compound leaves and yellow fall color. Fast growth to 40' x 30'. Full sun. Tolerant of salt, high pH, and poor soils. Select seedless varieties only. Susceptible to Ash borer which can cause significant damage. "Patmore" is a hardier selection.

***Ginkgo biloba*—Ginkgo/Maidenhair tree**

zone 3–8 water 2

Deciduous with green leaves and yellow fall color. Slow to establish with moderate growth rate to 50' x 30'. Full sun. Adaptable to soil conditions, air pollution, heat and salts. Does well in urban conditions.No insect or disease problems. Use male cultivars only (no fruit).

***Gleditsia triacanthos* var. *inermis*—Thornless Honeylocust**

zone 3–9 water 1

Deciduous with green compound leaves with small leaflets. Fast growth to 40' x 40'. Full sun. Tolerant to high pH and salt. Provides light shade, no heavy leaf litter. Susceptible to midge pod gall and thionectria canker.

***Gymnocladus dioicus*—Kentucky Coffeetree**

zone 3–8 water 1

Deciduous with large, green, doubly pinnate leaves. Slow to establish and grows to 60' x 40'. Full sun. Adaptable to soil conditions, but prefers deep loam. Tolerates urban conditions. No serious diseases or insects. Female trees will produce seed pods. Good tough tree.

***Juniperus scopulorum*—Rocky Mtn. Juniper**

zone 2–7 water 0

Evergreen native with bluish-green foilage. Slow growing to 10-30' x 3-10', depending on variety. Full sun. Tolerant to wide range of soil conditions if well drained but may suffer root rot if over irrigated. Good screen for harsh sites. Many cultivars.

***Juniperus virginiana*—Eastern Red Cedar**

zone 2–9 water 0

Evergreen. Moderate growth to 40' x 10'. Full sun. Soil, salt, and pH adaptable if well-drained. Tough plant for screening and naturalizing. No serious disease or insect problems. Many cultivars.

***Koelreuteria paniculata*—Golden Raintree**

zone 5–9 water 1

Deciduous with green, compound leaves and yellow fall color. Yellow flowers in mid-summer are followed by conspicuous seed pods. Moderate growth rate to 30' x 30'. Full sun. Soil and pH adaptable. Tolerant of harsh, urban conditions. No serious insects or diseases.

***Malus* species—Crabapple**

zone 2–8 water 2

Deciduous with a wide variety of tree forms and sizes, and leaf, flower, and fruit colors. New varieties have small, persistent fruit. Truly one of the hardiest flowering trees available. Adaptable as to soil type if well-drained. Full sun. Over 200 cultivars available.

***Morus Alba*—Mulberry**

zone 4–8 water 2

Deciduous with green leaves. Fast growing to 30' x 30'. Full sun to light shade. Tolerant of well-drained soils, air pollution, and salt. Weak wood, short lived. Use only fruitless cultivars.

***Picea pungens*—Blue Spruce**

zone 2–7 water 2

Evergreen native with green to blue foliage. Slow growing to 40' x 15'. Full sun. Must account for eventual size of this tree when planting in landscape. Only pest is the spruce gall adelgid, which is mainly a cosmetic problem.

***Pinus edulis*—Pinyon Pine**

zone 2 water 0

Evergreen native pine with gray-green, double needles. Slow growing to 20' x 15'. Full sun. Tolerant to well-drained, high pH soils. No serious disease or insect problems. Has edible pine nut.

***Pinus nigra*—Austrian Pine**

zone 4–7 water 1

Evergreen with long, dark green needles. Moderate growth rate to 45' x 25'. Full sun. Tolerant of city conditions, soils, heat, and alkalinity. No serious insect or disease problems.

***Pinus sylvestris*—Scotch Pine**

zone 2–8 water 1

Evergreen with relatively short needles. Moderate growth to 40' x 20'. Full sun. Soil tolerant if well-drained. Unique form and color. No serious insect or disease problems.

***Platanus x acerifolia*—London Planetree**

zone 4–8 water 2

Deciduous, large, green leaves with no fall color. Decorative scaling bark. Moderate growth rate to 70' x 70'. Full sun. Tolerant of soil type, air pollution, and pH. Problems with cankerstain, anthracnose, and frost cracking. Choose selected cultivars.

***Populus alba* 'bolleana'—Bolleana Poplar**

zone 3–8 water 1

Deciduous with green leaves and a white underside. Fast growing to a columnar 40' x 15'. Full sun. Tolerant to high pH soils, air pollution, and salt spray. Suckers. Good for a rapid growing screen or windbreak, but susceptible to many insects and diseases.

***Populus deltoides*—Eastern Cottonwood**

zone 3 water 2

Deciduous with large green leaves and yellow fall color. Very fast growing to 70–90' x 50'. Full sun. Tolerant to high pH soils. Good for a rapid growing shade tree in areas with ample room. Weak wooded. Susceptible to multiple pests. Use cottonless hybrids.

***Prunus virginiana* "Canada Red"—Canada Red Chokecherry**

zone 2 water 1

Deciduous, small tree/shrub with maroon red foliage. Grows to 20' x 10'. Red fruit in mid-summer. Requires well-drained, aerated soils. Will sucker.

***Pyrus calleryana*—Callery Flowering Pear**

zone 5–8 water 2

Deciduous. Small, formal tree with moderate growth to 30' x 20'. White flowers in spring with no fruit. Adaptable to varying soil types. Narrow crotch angles lead to breakage. No serious insect problems, though fireblight can be severe.

***Quercus gambelii*—Gambel's Oak**

zone 2 water 0

Deciduous, native oak with green leaves and brown fall color. Slow growing to 20' x 15'. Full sun. Tolerant of high soil pH, but must have well-drained soils. Susceptible to a number of native pests including the formation of galls.

***Robinia* "Idaho"—Idaho Flowering Locust**

zone 3–8 water 1

Deciduous, green leaves; attractive purple blossoms. Fast growing to 50' x 30'. Full sun. Tolerant to a wide range of soils. Good for use in difficult areas. Susceptible to borers.

***Sophora japonica*—Japanese Pagodatree**

zone 5–8 water 2

Deciduous, pinnately compound leaves. Moderate to fast growth to variable height and width (40' x 40'). Needs well-drained soil. Full sun. Tolerant to urban conditions. One of the few trees to bloom in mid-summer. Good leaves and flowers, though somewhat messy.

***Syringa reticulata*—Tree Lilac**

zone 3–7 water 2

Deciduous with green foliage and no fall color. Moderate growth to 20' x 15'. Needs well-drained soil and full sun. Is pH tolerant. Resistant to lilac borer and powdery mildew that occur on common lilac. Flowers in early spring.

***Tilia cordata*—Littleleaf Linden**

zone 3–7 water 3

Deciduous, often pyramidal-shaped tree. Grows to 60' x 30'. Easily transplanted. Full sun. Prefers well-drained soil and is soil-pH tolerant. Aphids can be a problem. Excellent shade tree with several nice cultivars.

***Ulmus parvifolia*—Lacebark Elm**

zone 5–9 water 2

Deciduous, introduced elm. Moderate to fast growth to 40' x 40'. Attractive bark. Adaptable to soil and pH conditions. Works well in urban settings. Much better than *Ulmus pumila* (Siberian Elm), though not as cold hardy.

***Zelkova serrata*—Zelkova**

zone 5–8 water 2

Deciduous with green leaves and yellow/orange fall color. Moderate growth to 50' x 50'. Full sun. Tolerates pH of 6–8. Wind, drought, and pollution tolerant. Suited to lawns and parks.

Shrubs

***Amorpha canescens*—Leadplant, False Indigo**

zone 2 water 1

Deciduous, pinnately compound leaves changing to yellow in fall. Purple flowers. Moderate growth to 2–4' x 4–5'. Full sun. Tolerant to wide range of soils.

***Aronia melanocarpa*—Black Chokeberry**

zone 3–8 water 2

A small, deciduous shrub growing to 5–10' in height. Suckers to form large thickets. Red fall color and purple/black fruit. Adaptable to many conditions. Variety *elata* is best for landscapes. Use as a mass planting.

***Artemisia cana*—Silver Sagebrush**

zone 3 water 0

Native, silver-leafed sage. Moderate growth of 3'–4' x 5'–10' width. Full sun. Tolerant of most soils. Suckers profusely.

***Artemisia frigida*—Fringed Sage**

zone 2 water 0

Native, silver-leafed evergreen. Rapid growing to 1' x 1'. Full sun. Soil tolerant. Used for border or color accent. Flower stalks may need to be trimmed.

***Caragana arborescens*—Siberian Peashrub**

zone 2–7 water 1

Introduced, deciduous shrub with moderate to fast growth up to 15–20' x 12–18'. Yellow flowers. Full sun. Tolerant of saline soils and salt spray, alkalinity, wind and drought. Good for hedge or windbreak in difficult situations.

***Caragana pygmaea*—Pygmy Peashrub**

zone 3–7 water 1

Deciduous. Moderate growth rate to a height of 2–3' x 4–5'. Yellow flowers. Full sun. Tolerant of various soil types, salt, and high pH.

***Cercocarpus ledifolius*—Curl-leaf Mountain Mahogany**

zone 2 water 0

Evergreen native with a dull, green, leaf color year-round. Slow growing to 15–20' x 15'. Needs well-drained soils and a pH of 6–7. Withstands shearing.

***Cercocarpus montanus*—Mountain Mahogany**

zone 2 water 0

Native, deciduous shrub with pink flowers and white fruit. Slow growing to 6–9' x 6' in full sun. Poor tolerance to salts. Grows best in well-drained soils.

***Chamaebatiaria millefolium*—Fernbush**

zone 4 water 1

Native, deciduous shrub with finely pinnate foliage. White blooms during the summer. Grows to 8' x 8'. Tolerant to high pH soils.

***Cornus sericea*—Redstem Dogwood**

zone 2–8 water 2

Native, deciduous shrub with outstanding red bark. Fast growing to 7' x 10'. Shade to full sun. Low salt tolerance. Adaptable to a wide range of soils and irrigation levels. Handsome utilitarian shrub, native to riparian areas. Susceptible to twig canker.

***Cotinus coggygria*—Smokebush**

zone 5–9 water 2

Deciduous with blue-green to purple leaves. Flowers have dense hairs giving a smokey appearance. Moderate growth to 10' x 10'. Adaptable to most well-drained soils and pH's. Full sun. Good for shrub border. No serious pests.

***Cotoneaster apiculatus*—Cranberry Cotoneaster**

zone 5–7 water 1

Deciduous with dark green leaves. Slow growth to 3' x 3–6'. Small pink flowers with prominent red fruit. Tolerates high pH, salinity, and drought. Needs well-drained soils. Effective as foundation plant or bank cover. No serious pests.

***Cotoneaster divaricatus*—Spreading Cotoneaster**

zone 5–7 water 1

Deciduous with dark green leaves. Moderate to fast growth to 5' x 6'. Small flowers and fruit. Tolerances similar to *C. lucidus*. One of the best cotoneasters.

***Cotoneaster lucidus*—Hedge Cotoneaster**

zone 4–7 water 1

Deciduous with green leaves turning yellow to red in fall. Small white flowers and black fruit. Full sun to partial shade. Tolerates soils with a pH of 6–8 and does best in well drained soils.

***Ephedra viridis*—Mormon Tea**

zone 4 water 0

Unique native shrub with green, leafless stems. Grows to 2–5' x 2–4'. Somewhat similar to Scotch broom in the landscape.

***Euonymous alatus* 'Compacta'—Dwarf Firebush**

zone 5–8 water 2

Deciduous, green leaves with brilliant red fall color. Slow growing to 6' x 6'. Full sun to full shade. Tolerant of high pH (6–8), but must be well-drained. Good, clean plant with multiple uses. Not drought tolerant.

***Fallugia paradoxa*—Apache Plume**

zone 5 water 0

Native, deciduous shrub with distinctive, plumed seed head. Flowers are inconspicuous. Grows to 5–8' x 4'.

***Forestiera neomexicana*— Desert Olive**

zone 6 water 0

Deciduous shrub or small tree native to the southwest. Grows to 20' x 8'. Fragrant flowers and small black berries.

***Forsythia* x *intermedia*—Forsythia**

zone 5–8 water 2

Deciduous with yellow blossoms early in spring. Full sun. Fast growing to 8' x 10'. Tolerant of high pH. Moderately tolerant to salt sprays. Withstands urban conditions and has no significant pest problems. Chief value is spring flowers.

***Holodiscus dumosus*—Rockspray Spiraea**

zone 3 water 1

Deciduous native shrub with green leaves and white/pink flowers in spring. Full sun. Slow growing to variable height and width. Requires well drained soils. Can tolerate high pH. No significant pest problems. Largely uncultivated.

***Juniperus chinensis*—Chinese Juniper**

zone 3–9 water 1

Evergreen shrub with many cultivars. Full sun. Requires well-drained soils or may be susceptible to root rot. Tolerant of most soil pH's.

***Juniperus communis*—Common Juniper**

zone 2–6 water 1

Hardy evergreen shrub with several cultivars. Slow growth to 5–10' x 8–12'. Gray-green to blue-green in color. Full sun. Wind tolerant. Adaptable to any well-drained soil.

***Juniperus horizontalis*—Creeping Juniper**

zone 3–9 water 1

Evergreen with green to blue/green color. Moderate growth to 1–2' x 4–8'. Full sun. Tolerant to most soils. More tolerant of heavy soils than other junipers. Many cultivars.

***Juniperus sabina*—Savin Juniper**

zone 3–7 water 1

Evergreen with moderate growth to 4–6' x 5-10', depending on cultivar. Full sun. Well-drained, dry soils. Tolerant of urban conditions. Good cultivars are "Broadmoor," "Buffalo," Calgary Carpet, and var. *tamariscifolia*. Potential for root rots.

***Ligustrum vulgare*—Privet**

zone 5–7 water 2

Glossy green foliage. Slow growing to 12' x 12'. Small, white flowers with black fruit. Selected varieties are improvements over the species. Used for hedges. Susceptible to twig blight.

***Mahonia fremontii*—Fremont Barberry**

zone 3 water 0

Native broadleaf evergreen with gray/green leaf color and a holly-like leaf. Slow growing to 5' x 3'. Full sun. Well-drained soil.

***Mahonia aquifolium*—Oregon Grapeholly**

zone 5–8 water 2

Broadleaf evergreen with leaf color from bronze-red-green-purple and a blue-black berry. Slow growth to 4' x 4'. Needs moist soils, shade (especially in winter) and low pH. Can do quite well in loam soils with higher pH.

***Mahonia repens*—Creeping Mahonia**

zone 3 water 1

Native broadleaf evergreen groundcover with green leaves changing to hues of green to red in fall; holly-like leaf. Slow growing to 1' x 1'. Partial shade to full sun. Tolerates high pH, but low salt tolerance. Requires well drained soils. No major pest problems.

***Pinus mugo*—Mugo Pine**

zone 2–7 water 1

Evergreen, two-needled pine. Slow growing to variable size. Full sun. Tolerant of high soil pH. Excellent alternative to junipers. Few disease or insect problems.

***Potentilla fruticosa*—Potentilla**

zone 2–7 water 1

Deciduous native plant with many selected cultivars. Slow growth to 1–4' x 2–4'. Wide range of flower colors. Full sun to partial shade. Withstands poor, dry soils if well-drained. Tolerant of high pH. Few diseases or pests. Good color and blooming period.

***Prunus besseyi*—Sand Cherry**

zone 3–6 water 1

Deciduous shrub with shiny gray-green leaves, yellow fall color, and white flowers. Full sun. Moderate growth to 4' tall. Low salt tolerance, but tolerant to heat and high pH. Few disease or insect problems, but does sucker.

***Prunus virginiana*—Chokecherry**

zone 2–6 water 1

Native deciduous shrub with green leaves changing to yellow in fall. Unique white flower followed by red-black berries. Full sun. Moderate growth rate to 12' x 8'. Tolerant to wide range of soils. Riparian. Susceptible to black knot. Suckers profusely. Fruit used for jellies.

***Pyracantha coccinea*—Firethorn**

zone 5–9 water 2

Broadleaf evergreen with white flowers and bright orange berries. Partial shade to full sun. Moderate to fast growth to 12' x 12'. Best with well-drained soil and near neutral pH. Susceptible to fireblight.

***Rhus glabra*—Smooth Sumac**

zone 2–9 water 1

Native deciduous shrub with green foliage, bright red fruit and fall leaf color. Fast growing to 9–15'. Full sun. Soil and salt spray tolerant. Few pests. Suckers.

***Rhus glabra* 'Cismontana'—Dwarf Mountain Sumac**

zone 2–9 water 1

Deciduous, dwarf shrub with green foliage, bright red fruit and fall leaf color. Fast growing to 2–5' x 3–4". Full sun. Forms suckers and can be invasive.

***Rhus trilobata*—Oakleaf Sumac**

zone 2 water 0

Native deciduous shrub with green foliage, red fall color and red berries. Full sun. Moderate growth rate to 6' x 10'. Tolerant of most soils. No serious pest problems.

***Rhus typhina*—Staghorn Sumac**

zone 3–8 water 1

Deciduous shrub with green leaves and bright red fall color and fruit. Full sun. Fast growing to 12' tall. Suckers readily and can be invasive. Tolerant to high pH and urban conditions. Few diseases.

***Rosa foetida bicolor*— Austrian Brier Rose**

zone 5–8 water 1

Deciduous with green leaves, deep yellow blossoms and hips. Full sun. Moderate growth rate to 4' x 4'. "Austrian Copper" is a fantastic cultivar with copper-red flower petals.

***Rosa foetida* 'Persiana'—Persian Yellow Rose**

zone 5–8 water 1

Similar to Austrian Copper, but with yellow blooms.

***Rosa rubrifolia*—Redleaf Rose**

zone 2-8 water 1

Deciduous with red/green foliage, pink flowers and orange hips. Full sun. Moderate growth to 4' x 4'.

***Rosa rugosa*—Rugosa Rose**

zone 2–7 water 1

Deciduous with leaves green to orange/red in fall. Fast growing to 5' x 5'. Tolerant to salt, pH, and most soils if well-drained. Very trouble free for a rose.

***Rosa woodsii*—Woods Rose**

zone 2 water 1

Deciduous, native rose with green foliage, pink blooms and orange fruit. Full sun. Moderate growth to 4' x 4'. Salt tolerant. Requires well-drained soil.

***Shepherdia argentea*— Silver Buffaloberry**

zone 2–6 water 0

Native, deciduous shrub with silver foliage and red/orange flowers and fruit. Full sun. Moderate growth to 10' x 10'. Tolerant to high pH and moderate salinity.

***Spirea* x bumalda— Bumald Spiraea**

zone 3–8 water 3

Deciduous shrub with light green leaves and lavender blooms. Full sun. Moderate growth to 2' x 2'. Not tolerant to high pH or soil salinity. Susceptible to iron chlorosis. Fruit and old blossoms rather unsightly.

***Symphoricarpos albus*—Snowberry**

zone 3–7 water 2

Deciduous with white flowers, white berries and green leaves. Full to partial shade. Fast growth to 4' x 4'. Tolerant to high pH but not soil salinity. Suckers. No serious disease or insect problems.

***Symphoricarpos oreophilus*—Mountain Snowberry**

zone 2 water 2

Native snowberry. Full sun to partial shade. Fast growing to 5' x 3'. Requires well-drained soil, low salinity, and neutral pH.

***Syringa meyeri* 'Palibin'—Dwarf Korean Lilac**
zone 3–7 water 2
Deciduous, dwarf shrub. Flowers lilac to lavender in color.

***Syringa patula*—Miss Kim Lilac**
zone 3–7 water 2
Deciduous, dwarf shrub growing to 3–5' x 3–5'. Glossy green leaves turn burgundy red in fall. Pale, lilac colored flowers.

***Syringa vulgaris*—Common Lilac**
zone 3–7 water 1
Deciduous shrub with green foliage and fragrant white to purple flowers. Full sun. Moderate growth to 10' x 10'. Tolerant of high pH and salt spray. Affected by powdery mildew and ash borer, but not seriously. Very tough, traditional plant. Many cultivars available.

***Taxus baccata*—English Yew**
zone 6–7 water 3
Evergreen shrub with dark green needle-like leaves. Size varies with cultivar but all are slow growing. Attractive red fruit. Requires moist, well-drained soil, but will tolerate alkalinity. Susceptible to southwest winter injury, weevil, and scale. Used for foundation plantings and screens on north of buildings.

***Taxus cuspidata*—Japanese Yew**
zone 4–7 water 3
Evergreen, dark green needle-like leaves. Slow growing to various sizes depending on cultivar; red fruit. Does very well in shade and is pollution tolerant. Problems similar to other yews. Used for foundation plantings, screens and hedges.

***Taxus* x *media*—Anglojap Yew**
zone 4–7 water 3
Similar to *Taxus cuspidata*. Slow growing to variable sizes. Many selected cultivars. Does well in shade and must be protected from winter sun. Soil should be well-drained, moist and acid to neutral.

***Yucca filamentosa*—Yucca**
zone 3 water 0
Native evergreen with long, narrow leaves and white blossoms on a tall spike. Full sun. Slow growing to 2' x 2'. Tolerant to salt sprays and high pH.

Grasses

***Bouteloua gracilis*—Blue Grama**
warm season water 1
Native, turf-type bunchgrass with blue-green color. Low-moderate height. Full sun. Moderately salt tolerant. Best with a loam soil.

***Buchloe dactyloides*—Buffalograss**
warm season water 0
Native, turf-type stoloniferous grass with blue-green color. Low height. Full sun.

***Festuca arundinacea*—Tall Fescue**
cool season water 2
A turf-type bunch grass with dark green color. Tall. Partial shade to full sun. Requires well drained soil. Salt tolerant.

***Festuca ovina*—Sheep Fescue**
cool season water 0
A blue/green bunch grass used as an ornamental/ground cover. Low-moderate height. Full sun. Requires low salinity and well drained soil.

***Festuca rubra*—Red Fescue**
cool season water 3
Turf-type; rhizomatous; green color.

***Lolium perenne*—Perennial Rye**
cool season water 3
Turf-type, bunch grass, with green color. Becoming more common in sports turf. Used in partial shade to full sun.

***Oryzopsis hymenoides*—Indian Ricegrass**
cool season water 0
Native, green,ornamental bunch grass. Moderate height. Moderately salt tolerant. Requires well-drained soil.

***Poa pratensis*—Kentucky Bluegrass**
cool season water 3
Native, rhizomatous turf. Moderate height. Low salinity tolerance. Needs well drained soils.

Perennials

***Achillea millefolium*—Yarrow**
zone 3 water 0
Native. Pink, red, white, and yellow flowers over green dissected leaf. Mid- to late season bloomer. Height 12–36". Use for borders or naturalized areas. Needs well-drained soils, full sun. Susceptible to mildew.

***Aegopodium podagraria* 'Variegatum' —Bishop's Weed**
zone 4–8 water 3
Leaves light green with white margin. Height 8–10". Vigorously growing and spreading. Full sun or shade, with shade best in warmer areas. No soil preference. Can be invasive. Tends to scorch and look unsightly in heat of summer.

***Anaphalis margaritacea*—Pearly Everlasting**
zone 4 water 1
Native. White flower with gray foliage. Mid- to late season bloom. Height 24–36". Use for borders. Needs well drained soils and partial shade. Can be invasive.

***Antennaria rosea*—Field Pussytoes**
zone 4 water 2
Native. White to pink flowers with white/gray foliage. Blooms early in season. Height 3–12". Use for rock gardens. Tolerant to wide range of soil types. Full sun.

***Arabis caucasica*—Rock Cress**
zone 5 water 2
White to rose color. Blooms early. Height 6–12". Use for edging or for rock gardens. Full sun to partial shade. Well-drained soils.

***Armeria maritima*—Sea Pink**
zone 4 water 2
Evergreen leaves in clumps with pink or white flowers. Leaves 3–4" with flowers to 12" tall. Blooms in mid- to late spring. Use in full sun. Salt and dry soil tolerant. Good for edges and rock gardens.

***Artemisia schmidtiana*—Silver Mound**
zone 3 water 0
Gray foliage with inconspicuous flowers. Height 12". Used for foliage and as a border. Requires well-drained soils and full sun. Susceptible to rust. Can become rather rank growing.

***Asclepias tuberosa*—Butterfly Weed**
zone 3 water 1
Native. Multiple flower colors with green foliage. Blooms mid to late season. Height 24–36". Used for border or naturalized areas. Tolerant to most soils. Full sun. Pest free.

***Aubrieta deltoidea*— Purple Rock Cress**
zone 4 water 1
Purple flowers bloom early to mid-season. Height 6". Use in bed, edging or rock garden. Use in full sun with well-drained soil. Should be trimmed to maintain compact form. No serious diseases or insects.

***Aurinia saxatile compactum*—Dwarf Basket of Gold**
zone 4 water 2
Yellow blooms with gray foliage. Early season bloomer. Height 4–6". Best use is for rock gardens. Requires a well-drained soil and full sun.

***Baptisia australis*—Blue False Indigo**
zone 4 water 2
Blue flowers. Good as a border plant. Full sun. Well-drained soil. A member of the legume family. Easy to grow and pest free.

***Callirhoe involucrata*—Poppy Mallow**
zone 3 water 0
White or purple blooms with green foliage. Blooms all season long. Height 6–12". Use in border or rock garden. Tolerant of soil extremes. Full sun.

***Campanula rotundifolia*—Bluebells of Scotland**
zone 3 water 3
Bright blue 1-inch flowers in early to late summer. Self seeding. Grows 1–2 feet high. Requires well drained soils and full sun.

***Centaurea montana*—Bachelor Button**
zone 3 water 1
Blue or white flowers with green to gray foliage. Blooms early to mid-season. Height 12–18". Use for border. Requires well-drained soil. Partial shade to full sun. Invasive.

***Centranthus ruber*—Jupiter's Beard**
zone 4 water 1
Pink, white, or red flowers with green foliage. Blooms in mid-season. Height 24–36", used for borders and naturalized areas. Requires well drained soils. Tolerant to high pH. Partial shade to full sun.

***Cerastium tomentosum*—Snow-in-Summer**

zone 3 water 2

White blooms on green to gray foliage. Blooms early to mid-season. Height 3–10". Used for borders and rock gardens. Requires well drained soils and full sun.

***Chrysanthemum x superbum*—Shasta Daisy**

zone 4 water 2

Green foliage with white ray flowers blooming from early summer to frost. Height 12–36". Fertile, moist, well-drained soils. Needs partial shade in warm environments. Used for cuttings or as a specimen plant. No serious problems.

***Coreopsis verticillata*—Threadleaf Coreopsis**

zone 4 water 2

A tall perennial with yellow flowers that are about 2 inches wide and bloom all summer. Fine textured foliage. Quite drought tolerant. Easy to grow in most well drained garden soils.

***Dianthus barbatus*—Sweet William**

zone 2 water 2

A self-sowing biennial. Grows 6–10 inches tall, with a flat cluster of flowers. Used in borders or rock gardens. No scent.

***Dianthus* "Zing Rose"—Zing Rose Dianthus**

zone 2 water 2

Grows to 6 inches tall. Blooms from June to summer with rose red flowers. Dense green foliage.

***Dicentra eximia*— Fringed Bleeding-heart**

zone 3 water 3

Finely dissected gray-blue evergreen leaves. 12–18" tall with pink to purple flowers. Partial shade with well-drained soil. Excellent for borders and rock gardens.

***Dicentra spectabilis*—Bleeding-heart**

zone 2 water 3

Pink, white, and red flowers with green foliage. Blooms in mid-season. Height 6–36 inches. Used for borders, requires well drained loam, partial shade. Susceptible to stem rot.

***Echinacea purpurea*—Purple Coneflower**

zone 3 water 0

Purple flowers with green foliage. Blooms in mid- to late season. Height 30–40". Use in borders or naturalized areas. Requires a well-drained soil. Full sun. Leaf spot disease.

***Euphorbia polychroma*—Cushion Spurge**

zone 4 water 0

Yellow flowers with green foliage. Blooms early. Height 12–18". Use as a border or specimen plant. Requires well-drained soil and full sun. Difficult to transplant.

***Gaillardia aristata*—Indian Blanket Flower**

zone 3 water 0

Native. Flowers are a mix of orange, red, and yellow. Blooms mid- to late season. Height 12–30". Use for cutting, border or naturalized areas. Tolerant to most soils. Full sun. Few serious problems.

***Hemerocallis* hybrids—Daylily**

zone 3 water 1

Multiple flower colors with green, grassy foliage. Blooms mid- to late season. Height 15–30". Use for borders or naturalized areas. Tolerant to most soils. Partial shade to full sun. Very few problems.

***Iberis sempervirens*—Candytuft**

zone 3 water 2

Forms a mound 6–12" by 24" with linear, evergreen leaves. White flowers in spring cover the whole plant. Needs full sun and well-drained soils. Best for rock gardens and edging. Should be cut back after blooming to keep full.

***Iris* Hybrids—Iris**

zone 3 water 1

Multiple flower colors with green, grassy foliage. Early blooming. Height 6–48". Use for borders and cut flowers. Tolerant to most soils, should be well-drained. Full sun. Can be minor problems with borers and rots.

***Kniphofia uvaria*—Red Hot Poker**

zone 5 water 1

Red and yellow flowers with green, grassy foliage. Blooms in mid-season. Height 24–36". Use for borders and as a specimen plant. Requires well-drained soils, full sun.

***Linum perenne*—Flax**

zone 3 water 0

Blue or white flowers with green foliage. Blooms in mid- to late season. Height 12–24". Use for naturalized areas or borders. Well drained soils. No serious problems.

***Lupinus* 'Russell Hybrid'—Lupine**

zone 3 water 3

Multiple flower colors with green foliage. Blooms in mid-season. Height 18–36". Use in borders. Requires well-drained soils. Quite tolerant to other soil factors. Partial shade to full sun.

***Monarda didyma*—Bee Balm**

zone 3 water 4

Multiple flower colors in white/red/purple. Blooms in mid- to late season. Height 18–42". Use in mass plantings and naturalized areas. Full sun to partial shade. Few pests, but may be invasive.

***Narcissus* species—Daffodil**

zone 3 water 2

Flowers of white, orange, or yellow. Blooms early. Height 6–24". Use in mass plantings or naturalized areas. Loam soil. Full sun. Best of spring flowering bulbs for naturalizing.

***Oenothera elata*—Showy Primrose**

zone 2 water 2

Native primrose with yellow, orange, or red flowers. Blooms from July to September. Height 24-48". Use as a border or naturalized areas. Full sun.

***Oenothera missourensis*—Missouri Primrose**

zone 3 water 1

Yellow, 3–4" wide blossoms that open in summer evenings. Tolerant of poor soils and full sun. Works well in rock gardens, edges, and raised beds.

***Papaver orientale*—Oriental Poppy**

zone 3 water 2

Red, orange or pink flowers with green foliage. Blooms early to mid-season. Height 24–48". Use as border or cut flowers. Needs well-drained soils and partial shade to full sun.

***Penstemon* species—Penstemon**

zone 2 water 0

Native group of several species with a wide range of flower colors. Blooms in mid-season. Height 12–36". Use as a border or naturalized. Requires well-drained soils and full sun. Over irrigation causes root rot. ***Barbatus*** (Beardlip Penstemon) is an excellent species.

***Perovskia atriplicifolia*— Russian Sage**

zone 5 water 1

Blue flower with gray foliage. Height 36–48". Blooms in mid- to late season. Use as a border plant. Tolerant to many soil types. Needs full sun.

***Phlox subulata*—Creeping Phlox**

zone 3 water 1

Purple, pink or white flowers with green foliage form a carpet-like mass of color in the spring. Blooms in mid-season. Height 3–9". Use as a rock garden plant. Needs well drained soils and full sun for best performance.

***Physostegia virginiana*—Obedient Plant**

zone 3 water 3

Rose-purple or white flowers on spikes to 2–4' tall. Grows well in full sun or partial shade. May require staking if in fertile soils. An aggressive spreader, it is good for back grounds and cut flowers.

***Pulsatilla vulgaris*—Pasque-Flower**

zone 5 water 1

Pubescent foliage; solitary blue to purple flowers with showy seed heads. Height 10–12". Blooms in early to mid-spring. Needs well-drained soils. No serious problems.

***Ratibida columnifera*—Prairie Coneflower**

zone 4 water 1

Native with yellow and purple flower and green foliage. Blooms in mid- to late season. Height 12–20". Use in naturalized areas. Needs well-drained soils and full sun.

***Rudbeckia hirta*— Gloriosa Daisy**

zone 3 water 1

Flowers in shades of red/yellow with green foliage. Blooms mid- to late season. Height 24–36". Use as a border plant. Tolerant of most soils. Full sun to partial shade. Susceptible to mildew and sawfly damage.

***Saponaria ocymoides*—Soap Wort**

zone 3 water 2

A 4–10" trailing plant with pink flowers in late spring. Does well in full sun with well drained, even poor quality soils. Good for rock gardens and stone walls. Should be cut back annually.

***Sedum* species—Sedum**

zone 4 water 0

Multiple flower colors with succulent foliage in shades of green to red. Blooms early. Height 8–18". Use as ground cover or rock garden plant. Well drained soils and full sun.

***Solidago hybrids*— Goldenrod**

zone 2 water 2

Native with yellow flowers and green foliage. Height 36–60". Use in borders or naturalized areas. Requires well-drained soils and partial shade to full sun. Susceptible to rust.

***Stachys bysantia*—Lamb's Ear**

zone 4 water 1

Lavendar blossom with gray foliage. Blooms mid- to late season. Height 8-24". Use in border. Does best in well-drained soils and full sun.

***Thymus* species—Thyme**

zone 3 water 3

Pink, red or white flowers with gray foliage. Blooms in mid-season. Height 3–8". Use as a rock garden plant. Tolerant to most soils and requires full sun.

***Tulipa* hybrids—Tulip**

zone 2 water 3

Multiple flower colors and forms with green foliage. Blooms early. Height 8–24". Use for naturalizing or as a border plant. Must have well-drained soils and full sun for good performance and prevention of bulb rots.

***Veronica spicata*—Spike Speedwell**

zone 3 water 1

Blue, pink, or red flowers. Blooms early to mid-season. Height 6–24". Use in border or rock gardens. Best performance in well-drained loams with partial shade to full sun.

***Vinca minor*—Periwinkle**

zone 4 water 3

Evergreen groundcover with blue blossoms. Blooms early. Height 6–8 inches. Use as a ground cover in full sun to full shade.

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