XERISCAPE

THE SEVEN PRINCIPLES OF LANDSCAPE WATER CONSERVATION

LA WATER

A City of Lethbridge Resource Management Initiative

www.lethbridge.ca

Xeriscape

*[**'xeros'** meaning dry and **'scape'** as in landscape]*

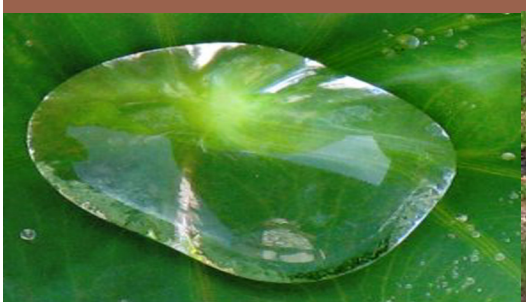
Xeriscaping refers to a set of principles that are practical and environmentally friendly. Xeriscaping is not the same as zero-scaping and does not focus on rocks, stone and gravel but on greenery.

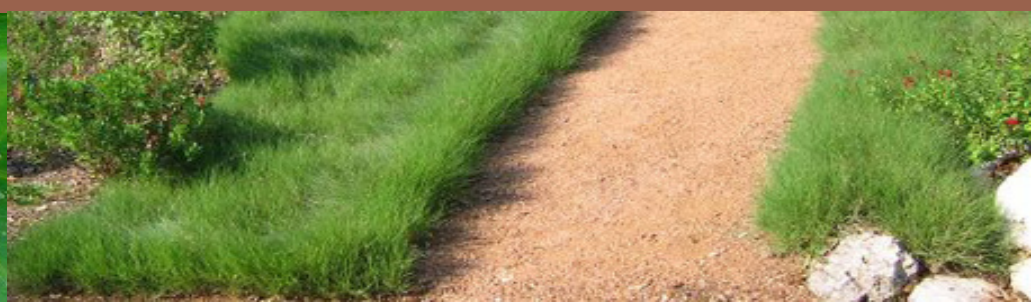
There are 7 principles of xeriscaping:

1) Plan & design
2) Improve the soil
3) Vegetation
4) Turf areas
5) Irrigation
6) Mulch
7) Maintenance

Benefits of Xeriscaping

- Beautify your urban spaces – spaces with more than just lawn are more attractive.
- Spend less time maintaining your yard and more time enjoying it.
- Protects our environment – overwatering causes erosion of coulee slopes and river banks.
- Municipalities can treat less water, saving money and chemical use.
- Showcase the attractive flowers and shrubs that naturally grow in the prairies.
- Conserve water – share this limited resource with others and leave some for fish and wildlife.
- Use less pesticides and fertilizers, thereby reducing the risk of polluting stormwater and saving money.





1 PLAN & DESIGN

The fundamental element of Xeriscape design is water conservation. Landscape designers constantly look for ways to reduce the amount of applied water and to maximize the use of natural precipitation.

Trying to create a landscape without a plan is like trying to build a home without blueprints. A plan provides direction and guidance and will ensure that water-conserving techniques are coordinated and implemented in the landscape.

The first step is to look at your existing landscape and create a base plan. This is a to-scale drawing showing the major elements of your landscape in terms of - outdoor activities, pathway system, function, context, existing trees and service area. The second step is to think about topography, orientation to the sun, existing vegetation, desireable views, prevailing winds and microclimates create different site conditions which lead to different water use zones.

This will help your designer select plants appropriate for specific exposures.

The final step is to develop a planting plan, indicating what types of plants should go where in your space.

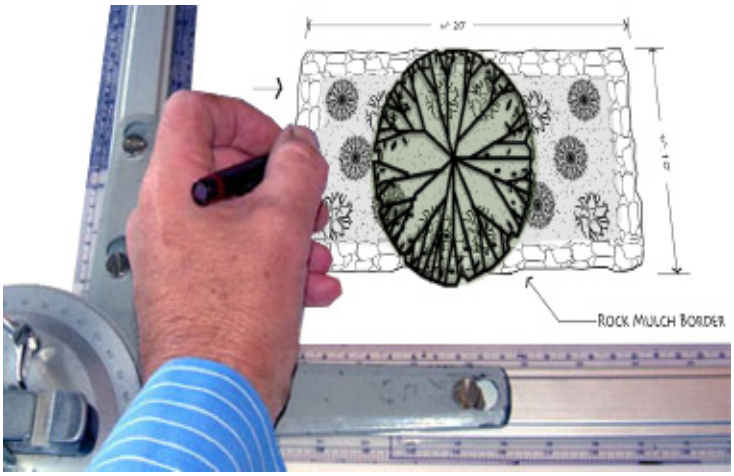
Tip...

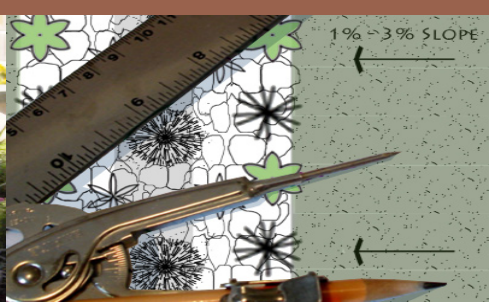
Windbreaks help keep the plants and soil from blowing dry. Use trees, hedges, shrubs or tall ornamental grasses as natural windbreaks

Xeriscapes can be divided into zones with different water requirements. An **"oasis,"** a zone with the highest water use, is usually where people spend more time. An oasis receives more water and, as a result, is cooler. This area also may require more maintenance and usually will be the landscape's most colorful area.

Beyond the oasis is a **transition zone** of moderate water use. The transition zone contains plants that require less frequent irrigation and usually requires less maintenance.

Further away may be a **low-water-use zone**, which requires no supplemental water or very infrequent irrigation during prolonged dry periods. Designing the landscape with areas of differing water demands is called **"hydrozoning."**





2 IMPROVE THE SOIL

The ideal soil in a water-conserving landscape does two things simultaneously: it drains quickly and stores water at the same time. Irrigation is necessary in a xeric landscape, at least during the first few years while the plants' root systems are developing.

Soil preparation is an important part of successful xeriscaping and gardening. When done prior to planting, soil testing can help determine which plants are best adapted to the site and which amendments are appropriate for improving the soil for the selected plants.

In the oasis and moderate-water-use zones, adding compost increases the soil's water-holding capacity. In the low-water-use zone, soil preparation may only consist of rototilling to loosen the soil and reduce the soil compaction associated with building construction in planting areas. Loosening the soil improves root development and allows better infiltration of water and air needed by plants' roots. This is important in all water-use zones. However, since soil disturbance promotes the germination of weed seeds, limit tilling to areas being planted.

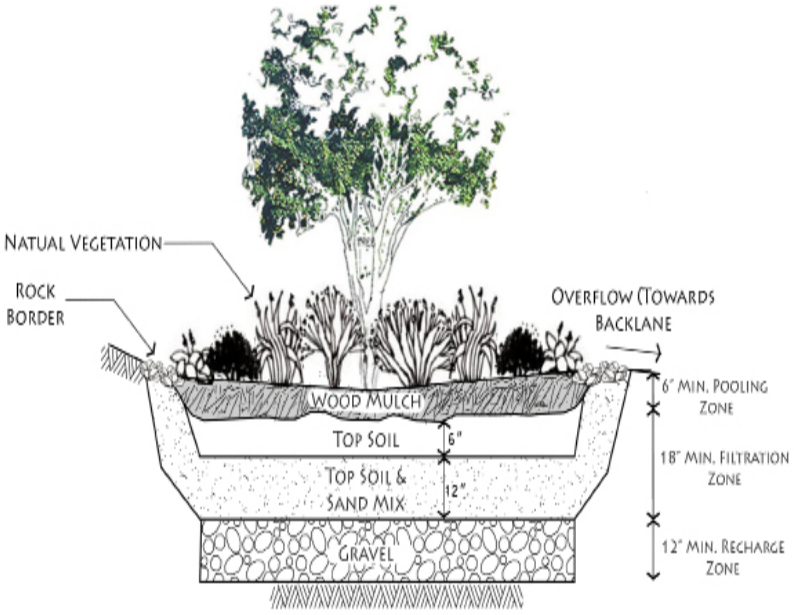
Most Western soils tend to be alkaline (high pH) and low in phosphorous. Adding bonemeal and rock phosphate will help.

Tip...

Add organic matter in the form of compost whenever you plant. This helps the soil hold extra moisture.

Each soil type has a unique structure and texture, drainage pattern, pH and nutrient content, and unfortunately there is no exact formula for soil improvement.

The best way to plant is to make sure that the root ball is level with the soil surface, then simply backfill with the same soil from the hole and remove any debris. Tamp the soil lightly to eliminate any air pockets and water thoroughly and add organic mulch such as bark chips or pine straw to the soil surface.



Mulch bed profile

3 VEGETATION

For best results, select plants that are native to your region. Plants that require less water are becoming more readily available in the nurseries. There are many very attractive plants for use in water-wise landscapes.

Start the draft design by using classifications (tree, shrub, annual flower bed, etc.) and/or by their function (screen planting, tree stand, location planting, etc.)

Next, the order in which specific plants or plant groupings is also important and is usually based on function. Trees are generally located first during the development of draft designs.

Once the design evolves, an outline will be formed; tree locations, plant beds and border locations, mass plantings, accent plants, perennials or shrubs.

When the outline is completed more specifics can now be added like plant selection, dimensions, texture and color.

Take into account the differences between the cool, shady microclimates and the sunny south and west exposures. Grouping plants with similar water needs enables you to use water more effeciently.

Tip...

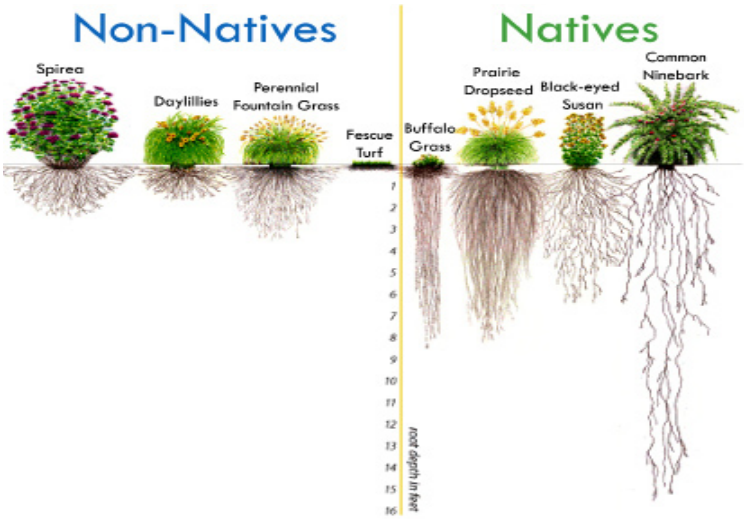
Use regionally-specific, native plants. Exotic species can be extremely invasive and can spread into natural ecosystems by birds and other wildlife.

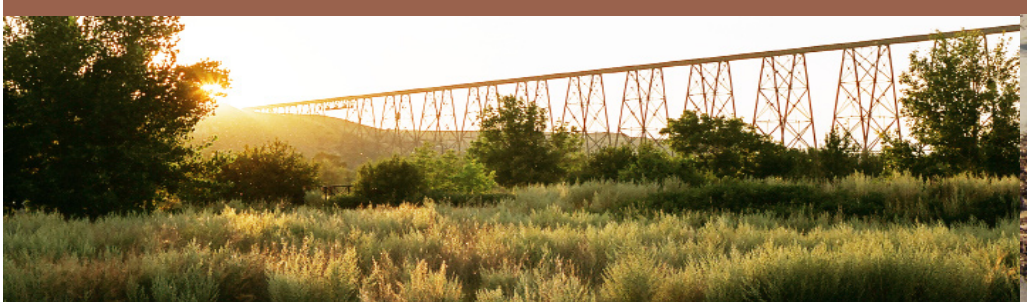
Optimize your Xeriscape by using drought-resistant plants. In general, these plants have leaves which are small, thick, glossy, silver-grey or fuzzy - all characteristics which help them save water.

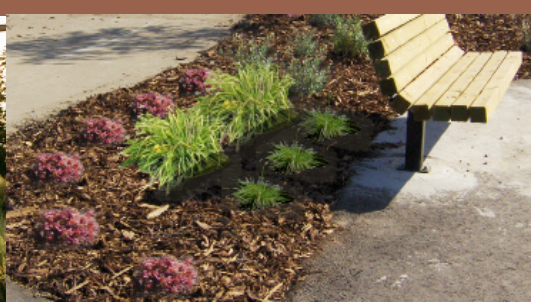
Select plants for their ultimate size. This reduces pruning maintenance.

For hot, dry areas with south and west exposure, use plants which need only a minimum of water. Along north and east-facing slopes and walls, choose plants that like more moisture. Most importantly, don't mix plants with high- and low-watering needs in the same planting area.

Trees help to reduce evaporation by blocking wind and shading the soil.







4 TURF AREAS

Reduce the size of turf areas as much as possible, while retaining some turf for open space, functionality and visual appeal. When planting new turf, or reseeding existing areas, use water-saving species adapted to your area.

One of the most controversial and misunderstood of the xeriscape principles is the concept of appropriate turf. Turfgrasses have a place in the landscape, even the xeriscape. Turf is easy to maintain, although it requires more frequent care than many other landscape plants.

Turf provides a play surface for children and pets. It is an important element in cooling the local environment, reducing erosion, and preventing glare from the sun.

Other ground cover plants can perform these functions - except providing a play area. Consider where and how large a turf area is desired, how it will be used, and during which seasons it will be used. You are then prepared to limit turf to useful spaces and determine which grasses will best serve your needs.

Limit the size of turf areas and use native grasses as much as possible. Fine fescues or rye grass is an excellent drought-tolerant alternative to thirsty Kentucky Blue Grass.

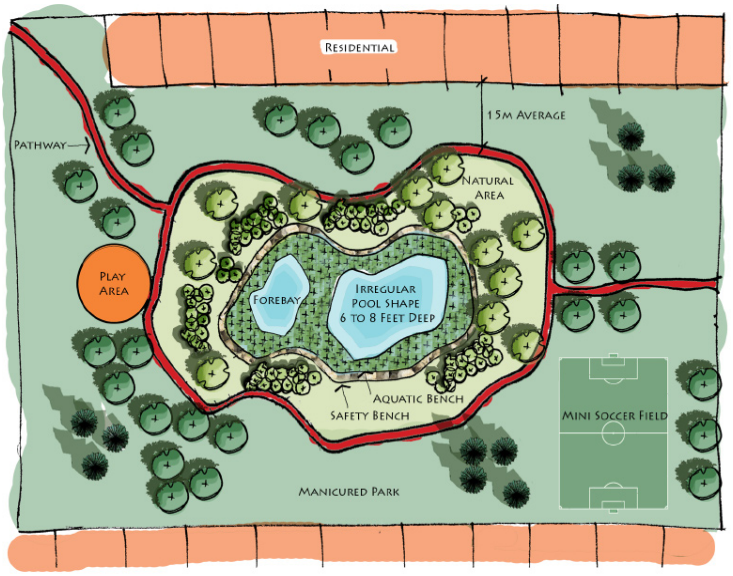
Tip...

Practice “cycle” irrigation on turf areas. This refers to watering just to the point of seeing runoff, then pausing to allow the turf to absorb the water. Resume watering when needed.

Practical turf areas serve a specific function in the landscape. A small ‘oasis’ of turf used as a border or catchement area, a playing surface of durable turf in recreational areas, or a blanket of turf on a highly erosive slope.

Turf grass provides a resillient, soft and cooling surface for active play or seating areas and should not be used as fill-in or ground cover.

It is best to provide topsoil at a depth of at least 15 cm (5-6 inches), for deep rooting and to water thoroughly but less frequently to maintain the deep roots needed for a healthy, drought tolerant turf area.



5 IRRIGATION

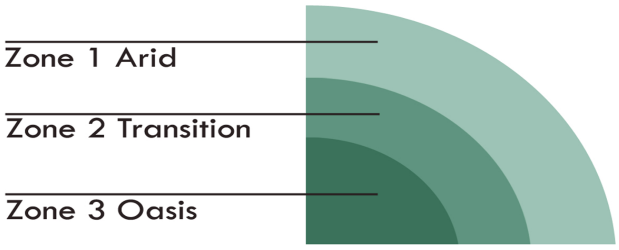
Water conservation is the goal, so avoid overwatering. Soaker hoses and drip-irrigation systems offer the easiest and most efficient watering for xeriscapes because they deliver water directly to the base of the plant.

Following establishment, irrigation may still be necessary depending on the landscape design and plants' needs. In Lethbridge, many landscapes need irrigation for at least a portion of the planted area for the life of the garden.

The oasis and the transition zones have the greatest need for irrigation, but it is wise to plan irrigation even in the low-water-use zone to allow for new planting, changes, and years of severe drought.

The irrigation system--whether automatic, manual, or hoses moved as needed--also is an integral part of landscape planning. It is the foundation around which the plantings are designed. The water-use zones--low, moderate, and oasis--should be separate from each other, and each managed independently. With in-ground irrigation systems, each zone should be under a separate valve.

The water should be applied as efficiently as possible. Sprinkler systems are appropriate in areas of turf, but drip, bubbler, and micro-spray systems or soaker hoses are more appropriate for shrubs, trees, and annual and perennial plantings.



5 Steps for successful Irrigation in a Xeriscaped Landscape:

1. **Hydro-Zoned** systems should deliver water at different rates depending on the requirements of each zone.

2. **Deep-watering** develops deep roots and allows those roots to extract adequate moisture from the soil when needed.

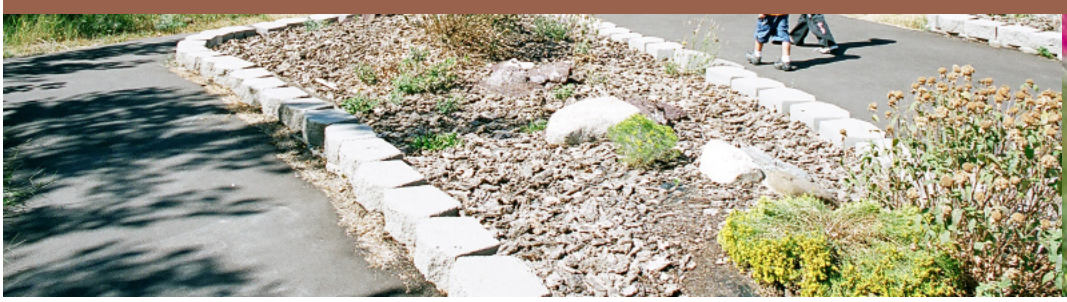
3. **Water seasonally**, as the seasons change so do the weather conditions and moisture availability. During rainy seasons automatic systems should be easily turned off or adjusted to water less.

4. **Water at night** or early morning to reduce evapotranspiration (water loss through evaporation).

5. **Run-off** water is wasted water and should be avoided. Organic matter and mulches retain moisture and improve water absorption.

Tip...

How much to water? Your plants should begin to wilt during the hottest part of the day, yet perk up as soon as it starts to cool.



6 MULCH

Cover the soil's surface around plants with a mulch, such as leaves, coarse compost, pine needles, wood chips, bark or gravel. Mulch helps retain soil moisture and temperature, prevent erosion and block out competing weeds.

Mulch provides a cover over the soil, reducing evaporation, soil temperature, and erosion. It also limits weed growth and competition for water and nutrients. Landscape mulch materials vary in their suitability for various uses.

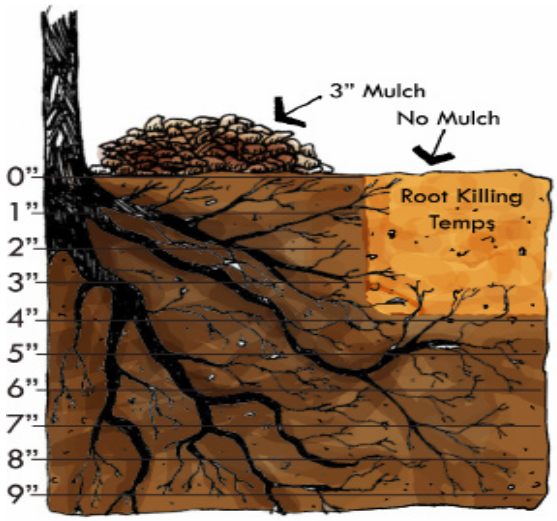
There are a range of mulches: Organic and inorganic. Organic mulches inlcude wood chips, straw, peat moss, sawdust, dry manure, leaves, pine needles, grass clippings and bark chips. Inorganic mulches include rock, gravel and fabricated materials.

Permeable weed barriers, bark, gravel, and other porous mulches allow water and oxygen to pass to plant roots. Dust will eventually collect over the weed barrier fabrics and allow growth of some weeds, so it is not a perfect solution, but these porous fabrics are useful for weed control when the bark or gravel covering it is less than 3 to 4 inches thick, or annual weed potential is great.

Organic mulches keep the soil moist and reflect less heat. They work well with plants adapted to cooler microclimates. Bark mulch should not be used on steep slopes or in drainage ways because it washes away in heavy rains.

Some plants native to very well drained soils grow better in gravel mulches. Remember, rock mulch becomes very hot in our climate and can injure or limit growth of some plants. Ultimately, the mulch should be shaded by landscape plants that will provide environmental cooling. Using gravel mulch alone as a landscape element may result increased weed control efforts.

Approximately 3-6 inches of mulch is neccessary for it to be effective.



Mulching

Tip...

Organic mulch will slowly incorporate with the soil, and will need to be "top-dressed", from time to time.

7 MAINTENANCE

Low-maintenance is one of the benefits of xeriscape. Keeping the weeds from growing up through the mulch may require some attention. Thickening the layer of mulch will help. Turf areas should not be cut too short - taller grass is a natural mulch which shades the roots and helps retain moisture. Avoid overfertilizing.

Maintaining the landscape cannot be forgotten, even in a xeriscape.

The design will determine the required maintenance. Any landscape will require some maintenance: pruning, removing trash that has blown into the landscape, occasional weeding and pest management, checking that the irrigation system is functioning properly, and adjusting automatic irrigation systems as the seasons change.

Xeriscaping offers a way to have beautiful, livable landscapes without excess water use. It allows some areas to be cooler and hospitable, while investing less water on parts of the landscape in which we spend less time. Even lower-water-use areas can be very attractive if the seven xeriscape principles are employed.

Using xeriscape makes our landscapes more compatible with our Southern Alberta environment.

Plantings: Healthy, actively growing plant systems that are biodiverse are the best defense against pests and diseases.

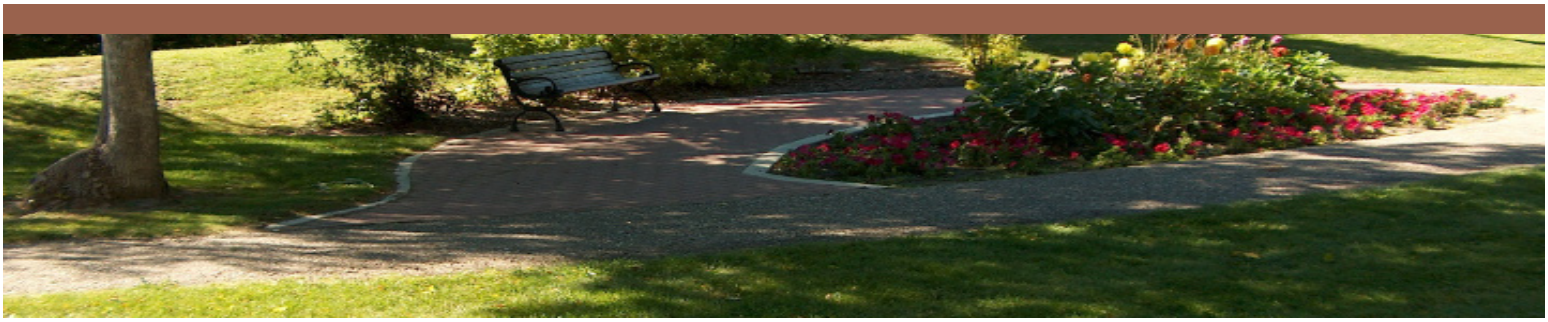
Turf Maintenance: Water deeply and less often to encourage deep roots and only when needed. A good rule for efficient fertilization is to sparingly apply Phosphorus in the spring to promote root development and Nitrogen in the late fall.

It is most effecient to mow high and often and to leave the clippings for added nutrients. The grass becomes more drought tolerant and heat resistant when the mower height is set to no lower than 2.5 to 3 inches.

Irrigation System: Overwatering increases insect control expenses, plant replacement costs, diseases and wasted water. Adjust watering according to seasonal changes and condition of plantings in the landscape. Winterize the system in mid-October and ensure the system is operating correctly in the Spring.

Tip...

Keep irrigation systems running properly. Avoid the lush, thirsty plant growth that results from over-watering.



REFERENCES

WEBSITES

http://alclanativeplants.com/

http://eartheasy.com/grow_xeriscape.htm

http://www.xeriscape.org/

http://www.lethbridge.ca/home/City+Hall/Departments/Environmental+Management/

FURTHER READING

Bennett, Jennifer. Dry-land gardening: a xeriscaping guide for dry-summer, cold-winter climates

Foster, Ruth S. Landscaping that saves energy and dollars

Perry, Bob. Landscape plants for western regions : an illustrated guide to plants for water conservation

Weinstein, Gayle. Xeriscape Handbook: A How-to Guide to Natural Resource-Wise Gardening

Williams, Sara. Creating the prairie xeriscape: low-maintenance, water-efficient gardening

Winger, David. Xeriscape color guide: 100 water-wise plants for gardens and landscapes