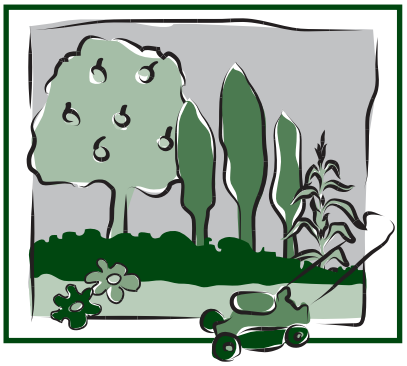
Colorado State University Extension

Sustainable Landscaping

Fact Sheet No. **7.243** Gardening Series | **Yard**



By J.E. Klett and A. Cummins*

What does the term 'sustainable landscaping' mean? There are varying definitions but sustainable landscaping should include an attractive environment that is in balance with the local climate and requires minimal resource inputs, such as fertilizer, pesticides, gasoline, time, and water. Sustainable landscaping begins with an appropriate design that includes functional, cost efficient, visually pleasing, environmentally friendly and maintainable areas. For additional information, see fact sheet 7.220, *Colorado Gardening: Challenge to Newcomers* and 7.228, *Xeriscaping: Creative Landscaping*.

There are short-term as well as long-term goals for a sustainable landscape. For example, a short-term goal may include saving water or installing and using a compost bin. Composting locally grown crops and kitchen waste and returning it back to the garden increases soil organic matter and helps plant growth. See 7.212, *Composting Yard Waste* for more information on composting techniques.

A long-term goal may be to create a more self-sustaining garden. This includes all aspects of total plant health care, proper plant selection, reduced inputs and maintainability.

Soils, Composting and Fertilizers

Much of Colorado has heavy, clay soils. Clay texture can lead to poor water and oxygen penetration. In addition, Colorado soils often lack organic material. To improve plant health, soil amendments are often necessary.

The choice of a soil amendment greatly depends on what is being planted. Native plants may be adapted to local soil conditions and might not necessarily benefit from soil amendments. Many non-native plants establish more quickly and develop a healthier root system with the addition of organic soil amendments.

Improving the overall condition of your soil—including permeability, aeration and drainage—is a slow process. The addition of organic materials such as composted grass clippings, manure, and fall leaves, can improve soil condition over a period of time. Garden soil that provides good water retention and both oxygen and water permeability (loam texture) may take 10 or more years to create. Incorporate 3-4 cubic yards of organic matter per 1,000 square feet per year. Be sure that organic matter is incorporated completely into the existing soil. For more information on soils, see Garden Notes #711, *Vegetable Garden Soil Management and Fertilization*, 0.502, *Soil Test Explanation*, 7.235, *Choosing a Soil Amendment*, and 7.236, *Landscaping on Expansive Soils*.

Base fertilizer applications on a soil analysis and specific plant requirements (see 0.500, *Soil Sampling*). Many annual flowers or bedding plants and vegetables have a higher nitrogen and phosphorus requirement than herbaceous perennials, shrubs and trees. Some native plants can actually decline from too many applications of fertilizers. Most have lower nitrogen and phosphorus needs, having adapted to the lower fertility conditions of Colorado native soils. Determine the fertilizer requirements for your individual situation. Excessive fertilizer application is not a sustainable practice.

Irrigation

Often, a portion of Colorado is in, or on the verge of a drought. Average annual moisture for the Denver Metro area is

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Quick Facts

- When designing a sustainable landscape, long-term success is accomplished through a series of short-term goals.
- A functional and attractive design will be unique to a specific site and should be based on a careful review process.
- Identify what inputs are currently excessive.
- Develop a budget and timeline that are realistic and celebrate the accomplishment of each short-term goal.

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Appropriate Design

As part of the design process, answer the following questions:

- How will the space be used?
- What are the site conditions? Is there a need for renovation?
- What is the timeline and what is the budget?
- How much time will be needed to maintain the landscape?
- What resource uses are too high?
- Visually, what look is trying to be achieved?

approximately 12 to 14 inches. The Front Range is a high plains desert with the San Luis Valley, Arkansas Valley and the Western Slope exhibiting even drier conditions. Therefore, water conservation is essential. Prevent water loss through evaporation by using organic mulches. Add 3 to 4 inches around flower beds and under trees but avoid mounding mulch against tree trunks as this practice can encourage disease and insects.

Group plants that have similar water requirements together. Designate parts of your landscape for higher or lower water use. For example, place a vegetable garden in the higher use area and a native shrub border in a lower water use area.

Using irrigation technology to reduce water use is an important rule of sustainable landscaping. Consult with a certified irrigation technician or a certified landscape irrigation auditor and request a water audit of existing systems. Consider drip or sub-surface irrigation for more efficient water use. Regular maintenance of existing systems is necessary to assure efficient water utilization.

Even if the system is new, irrigation heads may need realignment and adjustment to prevent overspray onto the sidewalk or street. Sprinkler systems should be designed for uniform coverage with some overlap. Irregular patterns will create dry areas interspersed with overly wet areas. Sustainable landscaping means using water appropriately and avoiding waste. See fact sheets 7.239, *Operating and Maintaining a Home Irrigation System* and 4.702, *Drip Irrigation for Home Gardens*.

Hardscape Selection

The choice of building materials for the landscape is extensive. Explore options for utilizing reused materials in your landscape. For example, used bricks or broken concrete can be used for retaining walls or raised beds. Also, recycled plastic material may be an appropriate choice for decking or fences. However, an example of inappropriate recycled materials for use in a garden is the use of creosote-impregnated railroad ties to build a raised bed. The chemicals used to treat the wood can leach into the soil and are not safe to use near food crops.

Plant and Turf Selection

Select the right plant for the right place. Plants not adapted to the local environment require more resources. Plants placed in inappropriate growing conditions (lighting, moisture, temperature, etc.) become stressed and are more prone to pest problems. Plants suited to Colorado, whether native or exotic, are more sustainable. Always consider the mature size of the plant prior to placement in the landscape.

A principle of sustainable landscape is to limit the amount of irrigated turf to areas of high use by the homeowner. Select turf species adapted for your location and use. For more information on plant and turf selection see Garden Notes #561.

Dealing with Diverse Sites

Plant for Shade

Use deciduous plants to create shade in the summer to help cool the home, while allowing light penetration in the winter as solar heating. Evergreen trees planted close to the home can create shade year round and block winter sun.

South and west facing parts of the house receive the most intense sunlight; north and east exposures are generally cooler. Therefore, shading the south and west side will contribute to summer cooling. See 7.225, *Landscaping for Energy Conservation* for further information.

Often two large deciduous trees can provide sufficient summer shading for a single family home. Consider the mature size of tree species before planting; plant the trees far enough from the house to avoid foundation problems. Avoid fast-growing species that are weak-wooded and easily break in wind or snow. See 7.419, *Large Deciduous Trees* for appropriate selections.

Plant for Wind Protection

Cold winds can penetrate a building in the winter and may be responsible for some heat loss during windy days. In Colorado, prevailing winds blow from the northwest, therefore, landscaping for wind protection should be concentrated on the north and northwest sides of the building at a distance of one to three times the mature height of the trees. Evergreens provide the most wind protection. See 7.403, *Evergreen Trees* for appropriate selections and 7.225 *Landscaping for Energy Conservation*.

Slopes

An appropriately graded site should provide drainage away from permanent structures. Steep slopes should be terraced with a series of raised beds or planters to reduce erosion potential.

Landscape design begins with an understanding of the future use of the property. Lot size, house size, local covenants and budget all play into the design planning process. A professional landscape designer or architect can assist with the construction planning and plant selection. The design process generally includes:

- a base plan
- site inventory and analysis
- construction documents
- implementation
- maintenance

Implementation sequence:

- Obtain permits and locate underground utilities
- Clear the site of any debris, such as undesirable sod and weeds
- Use care to control the roots of perennial weeds, such as bindweed and thistle, with repeat treatments of systemic herbicides to minimize future weed problems in the new landscape
- Create a rough grade and identify major drainage issues
- Install drainage system if needed
- Construct masonry and wood projects
- Incorporate soil amendments
- Install metal or wood edging and create shrub borders and planting areas
- Install sprinkler heads and drip irrigation
- Plant all one gallon containers or larger including balled and burlaped or bareroot material
- Install bedding plants, ground covers and turf areas
- Maintain the landscape

Landscape Lighting

Municipalities and other government agencies are moving toward decreasing light pollution. For these reasons, incorporate appropriate light schemes into the landscape including down-lighting. A sustainable solution is to use solar garden lighting.

Maintenance of the Sustainable Landscape

Many organic yard waste materials can be composted including leaves, grass clippings, vegetable and flower plants and small amounts of woody material. Do not place weeds, diseased plants or plants sprayed with chemicals in your compost bin. Remember, compost is used as a soil amendment, not a soil fertilizer. See 7.212, *Composting Yard Waste* and Garden Notes #231, *Plant Nutrition* for additional information.

Reduce Pest Problems

Most pest problems directly correspond with the health and condition of the plant. Stressed and weakened plants are more susceptible to disease and insect problems. Maintaining plant health will prevent most pest problems.

Start with pest-free plant materials and supplies; check for diseases and insects by inspecting all plant parts including leaves, stems and roots, before you purchase them. Roots should be firm and light in color.

Plant diversity in a yard can discourage plant pests. A diverse plant population often increases beneficial organism populations. Beneficial organisms include birds, insects, and microorganisms. Multiple plantings of a single species are less sustainable.

If a pest problem develops, a correct diagnosis is important. Different plant problems have various solutions. Contact your local Colorado State University Extension office or garden center for diagnosis and treatment options.

If treatment is needed, investigate all of the possibilities. Commonly, the first reaction is to opt for a pesticide but there are alternatives. Some treatment options include physical barriers, pruning, sanitation, irrigation adjustments, mulch, and proper plant selection.

If pesticides are the best option, choose one that has the host and the pest on the label. In most cases, a selective pesticide is better than a broad-spectrum pesticide because it tends to have less impact on non-target organisms. Make sure to read and follow pesticide label directions.

Other Maintenance Tasks:

- Annually aerate lawn areas
- Reapply mulch as necessary
- Fertilize as directed
- Remove dead plant debris
- Prune woody plants