



# Low Input Landscaping

Jo Ann Robbins, Robert Mahler, and Karen Loeffelman

**G**ardening inputs are materials and resources brought in from outside the borders of your yard or garden. Pesticides, fertilizers, and irrigation water are some of these inputs. Even your labor, and the gasoline needed to operate lawnmowers, edgers, and hedge clippers are inputs. If you have an input-intensive landscape, chances are you spend more time, energy, and money than necessary. With more inputs, the chances for environmental contamination, such as leaching of chemicals into the ground water, increase. A healthy, sustainable landscape will require fewer inputs.

Most homeowners want to have a healthy, attractive landscape. How can this be accomplished and still reduce gardening inputs? Think of your garden as a self-perpetuating ecosystem, a grouping of plants, animals, and other organisms interacting with each other and their environment. In your garden ecosystem, you will see ornamental plants, fruit trees, vegetables, and weeds; but there is much more. Your landscape is also home to animals, insects, and birds. Your soil should be teeming with worms, insects, and microorganisms such as bacteria and fungi.

In your garden ecosystem, you have three basic interacting types of organisms: producers, consumers, and decomposers. The trick to low input landscaping is to reach a balance between these three types of organisms.

**P**roducers are green plants that convert sunlight, carbon dioxide, and water into energy for plant growth through a process called "photosynthesis." Producers create all the energy needed to make your garden ecosystem function smoothly.

**C**onsumers are the organisms that feed on live plant or animal material. Some consumers are animals and insects that eat green plants in your garden. Others are animals that eat other animals in your garden.

**D**ecomposers use dead plant and animal materials as an energy source. We can see some of these decomposers with the naked eye, like earthworms and some insects. Other decomposers are microscopic. Decomposers activate and recycle nutrients in your garden ecosystem.

A balanced ecosystem produces, uses, and recycles nutrients. Increasing inputs, such as pesticides, fertilizers, or water may imbalance your garden ecosystem. However, increasing outputs can also cause an imbalance. The primary output of a landscape is plant material. Removing flowers, vegetables, grassclippings, or leaves from



your garden depletes your ecosystem of nutrients. Soil loss or removal is also an output. The more imbalance of inputs and outputs, the greater the imbalance of the system and the greater the possibility for environmental damage or degradation, and the greater the need for even more inputs.

How can a gardener escape the input-output imbalance? Certain management strategies will promote garden health, maintain a balanced garden ecosystem, and lead to a healthy, sustainable garden. These management strategies will result in a low input landscape.

## Pest management strategies

There are several ways to reduce pests in your landscape by promoting plant and ecosystem health.

### Create a garden with diversity.

Plant a combination of different types of plants in your garden to create varying conditions and habitats. Mix annual and perennial plants.

Select woody, herbaceous, evergreen, and deciduous types to eliminate groups of like plant materials that will be more susceptible to insects and diseases. Plant diversity also adds to the uniqueness of your garden. Use of limited turf areas reduces grass monoculture. Pest problems may still occur, but having only a few scattered woody needleleaf evergreens will limit infection by a single pest more than if there is a solid planting of woody evergreens throughout your yard. Plant products such as flowers, fruits, and cast-off

leaves will occur at differing times and will foster different pollinators, consumers, and decomposers. Diversity also creates better conditions for wildlife such as birds. Different levels of plant growth create ideal conditions for wildlife, while enhancing the visual effect. Choose tall trees and shrubs, short trees and shrubs, short plants, and ground covers.

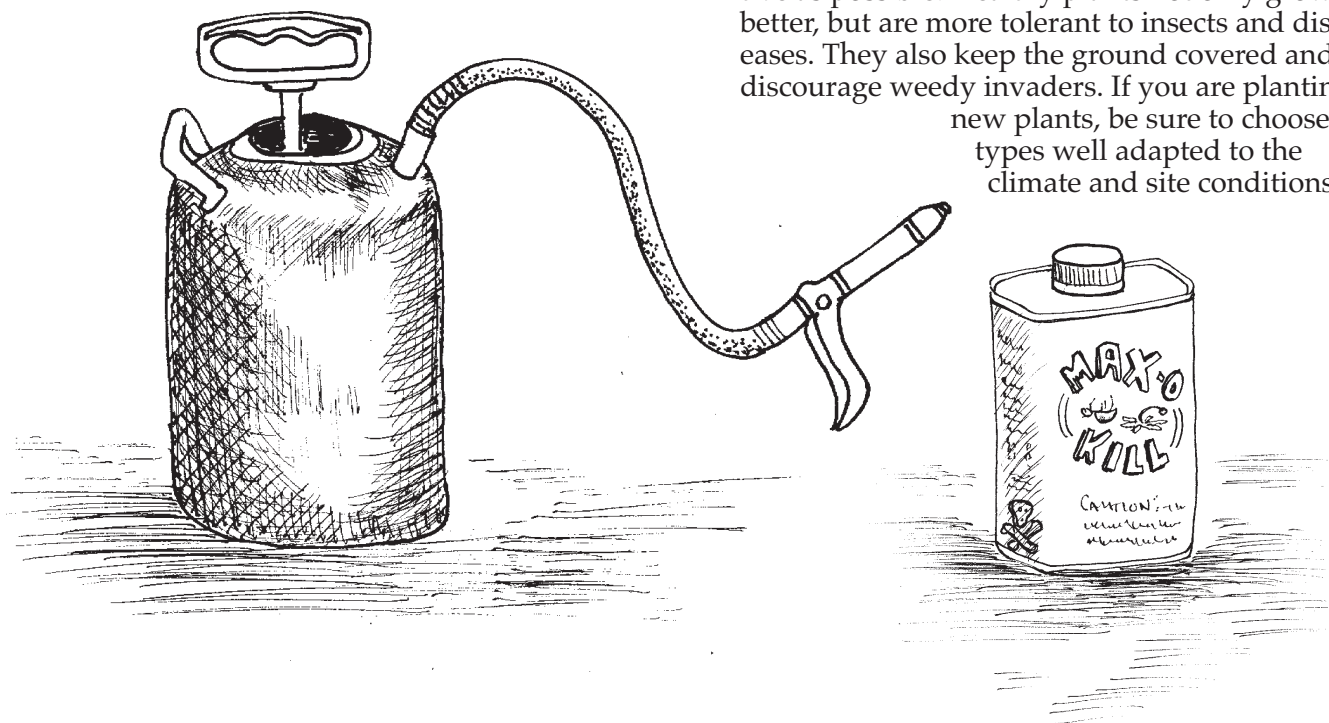
### Know what is in your garden.

Identify your garden plants. Know exactly what genera and species you have in your garden, and research their environmental needs. Knowing what environmental conditions are ideal will help you to provide conditions favorable for plant growth. You will also be able to predict what types of insects or diseases may affect your plants.

Positively identify any insects in your garden or plants you think might be weeds. Sometimes insects are not present at damaging levels. Insects may be totally harmless species, and even beneficial. If they do turn out to be damaging insects, knowing exactly what they are will help you control them, either by cultural methods such as changing environmental conditions, or by pesticides. Invading plants may be weedy species. Others are ornamental, or contribute to the diversity of your garden ecosystem. Positive identification of weeds will help in their control. For example, perennial species require different eradication techniques than annuals.

### Maximize conditions for healthy plant growth.

Plants are the producers in your garden ecosystem. You want to make sure they are as productive as possible. Healthy plants not only grow better, but are more tolerant to insects and diseases. They also keep the ground covered and discourage weedy invaders. If you are planting new plants, be sure to choose types well adapted to the climate and site conditions in



your yard. This includes the choice of lawn grass. A plant in the wrong conditions requires special care (more water, more pruning, winter protection, and fertilizers). Well-adapted plants are healthier and more tolerant to insect attack and diseases. These plants always require fewer inputs.

Be sure to space plants to allow ample root and top growth at maturity. Make sure the plant you choose will mature at a size to fill the space you have. Well spaced plants are healthier, exhibit mature beauty, and require little shearing or pruning.

Group plants according to their water needs and water them appropriately. For instance, plant some areas of your yard to low water use plants. Because they all require the same water management, you can water them accordingly and they will thrive. Consider the light requirements of plants. Do they grow best in sun or shade? Learn what type of light they need and arrange accordingly.

Finally, find out what insect pests and diseases are common to your area and choose plants that are resistant. Remove any pest-ridden plants and replace them with better adapted plants that will be healthy under your garden conditions.

### Protect beneficial organisms.

All insects in your garden are consumers or decomposers. The only ones you do not want in your garden are those that threaten the health of your plants. Consider tolerating those that threaten only plant beauty. Learn to recognize the eggs and larvae of insects so you will recognize the damaging ones. Some insects destroy certain damaging insects, so you want to be sure to recognize beneficial insects, such as lady bugs. Some beneficial insects feed on weedy plants. Develop a garden habitat that encourages beneficial insects. Diversity of plant materials helps create a friendly environment. Commercial mixes of annual and perennial plants are available that

provide habitat for beneficial insects. Habitat for birds, frogs, and other beneficial wildlife can be created through careful plant choice for food and cover. Soil micro- and macro-organisms can be encouraged by ample additions of organic matter to the soil and by not over-tilling the soil.

### Use the most environmentally sound solution to solve problems.

Avoid spraying insecticides that kill beneficial insects along with any damaging species. Introduce beneficial insects into your garden instead of using a pesticide. Beneficial insect species are commercially available that can destroy many common garden pests. Determine the level of damaging insects in your garden by using insect traps. Chemicals in these traps attract only a certain insect. By monitoring pest levels, you can determine if and when you should use some method of control. Remember, you can usually tolerate a certain level of damage on your plants, especially if they are otherwise healthy. Waiting to apply controls will give the beneficial insects a chance to do their job and keep the damaging insect population in check. If you determine that you must use a chemical control, use the least toxic control available. This will cause less impact on your beneficial insects and your garden ecosystem as a whole, while reducing the chance of environmental pollution. Insecticidal soaps, oil sprays, and botanical insecticides are all available commercially. Spot spraying only the infested plants will reduce the amount of pesticide put into the environment while providing effective control.

Control plant diseases and some insects by cultural methods involving changing the plant environment. Altering the humidity, changing a watering schedule, thinning plant foliage, and increasing light





exposure are examples of cultural changes. Explore these possibilities before resorting to a pesticide. Knowing the best growing conditions for your plants and positively identifying the problem are essential to apply cultural controls.

Control weeds mechanically with techniques like hoeing. When you keep the soil covered with mulch it helps reduce weed growth. Keep competition high with other desirable plants to deny weeds a place to grow. Use herbicides only when mechanical and cultural methods are inadequate or impractical for your situation.

### **Use pesticides correctly.**

If cultural and mechanical pest controls are not adequate and you choose to use any type of pesticide, be sure to follow the label directions for correct rate, application, and safety. Know exactly what pest you are trying to kill and use a chemical that is specific for the target pest. Make sure the chemical damages other non-target organisms as little as possible. Use the rate listed on the label. Do not be tempted to increase the rate thinking it will increase the effectiveness. Increased rate will only increase chemical use resulting in more expense, increased environmental contamination, and greater potential damage to the garden ecosystem.

### **Store and dispose of pesticides properly.**

Try to judge how much pesticide you will need for a season and buy only that amount. This will eliminate the need to store the material. If you have left-over pesticides, be sure to store them in a safe, secured place. Keep all chemicals in their original containers. If you dispose of a pesticide be sure to do it according to federal, state, and local regulations. Many communities sponsor a yearly hazardous waste collection program. This is a good opportunity to safely dispose of excess pesticide materials.

## **Nutrient management strategies**

Adding excess fertilizer to your garden ecosystem can cause serious imbalances. Add fertilizer only in the amount needed and in a form and manner that makes nutrients available to plants. There are several ways you can reduce the need to bring fertilizers into your garden ecosystem.

### **Compost garden organic materials.**

Be sure to keep all plant materials produced in your garden within the ecosystem. This includes all plant materials such as leaves, grassclippings,

and any seed-free weeds. Compost is an excellent soil amendment that provides organic materials, microorganisms, and plant nutrients to the soil. The composting process enhances the population of decomposers within the garden ecosystem. Use compost as a mulch. Composting reduces garden inputs and eliminates the single largest output from home landscapes. This enhances the garden ecosystem while reducing the volume of materials sent to landfills.

### **Leave grassclippings on the lawn.**

By mowing your lawn at the correct time, you will be able to leave the grassclippings right where they fall. Mow most lawn grasses used in home landscapes to a length of 1 to 3 inches, depending on the grass species. Research has shown that a taller lawn grows thicker, develops a better root system, is more resistant to drought, tolerates insects and diseases more effectively, and crowds out weeds. Remove only 1/3 of the top growth of the lawn at each mowing. Clippings that fall into the grass release small amounts of nitrogen, phosphorous, and potassium for plant use as they decompose. Clippings will not contribute to thatch in a well-managed lawn. Conditions that reduce microbial activity contribute to thatch. Too much fertilizer and water added to your lawn results in reduced microbial action resulting in a thatch build up.

### **Build healthy soil.**

A healthy soil will provide better growing conditions for plants and maintain its own fertility. Improve soil health by adding organic matter such as compost to enhance soil structure and aeration, as well as water and nutrient holding capacity. Regular additions of organic matter help build a biologically active soil. Growing an annual cover crop, or green manure, and tilling it into the soil also provides plenty of organic material. Nitrogen-fixing cover crops, such as clover, will add extra nitrogen to soil. Try to maintain soil pH at a level that is best for plant growth. Neutral (pH 7) or slightly acid (pH 6.0 to 6.5) is best for most garden plants.

### **Test soil before applying fertilizers.**

A soil test will tell you the amounts of plant nutrients already available in the soil. There is no benefit to adding more than is needed for plant growth. Be sure to test for the main nutrients needed: nitrogen (N), phosphorus (P), potassium (K), and sulfur (S). A soil test can also measure pH and percentage of organic matter. Sample soil from the top 12 inches of soil. This is where many garden plants have the majority of their roots. For

more details on how to take a soil sample refer to the University of Idaho publication EXT 704, "Soil Sampling."

### **Apply the correct type and rate of fertilizers.**

Based on soil test results, amend soils with either organic or inorganic fertilizers. Naturally derived materials such as manure, compost, rock phosphate, cottonseed meal, blood meal, and bone meal are organic fertilizers. They will vary widely in their nutrient content and generally require soil microbial action to release the plant nutrients. Organic fertilizers will supply the necessary plant nutrients, while improving the soil structure, aeration, and water-holding capacity.

Chemically manufactured fertilizers with exact nutrient contents are inorganic. They are easy to apply and needed in relatively small amounts. Apply inorganic fertilizers only in the exact amounts needed as indicated by a soil test. Excess application can result in leaching and potential environmental contamination.

### **Time fertilizer applications correctly.**

Whatever type of fertilizer you choose to use, be sure to supply only as much as needed for

healthy plant growth. This applies to all plants, but is especially important in lawn areas. Excess fertilizer can damage plants and the environment. Be sure to apply at the correct growth stage or time of year for maximum benefit and to minimize leaching of nitrogen into the groundwater.

## **Erosion control strategies**

Most homeowners rarely consider erosion. However, soil loss is an output from your garden ecosystem that can damage surface water quality in nearby rivers, lakes, ponds, and streams. You can reduce erosion several ways .

### **Protect soil surfaces vulnerable to erosion.**

Bare soil surfaces are vulnerable to erosion. Light soil and soil on slopes are particularly susceptible. In order to eliminate erosion, keep your soil covered with a living inorganic or organic mulch. Living mulch can be plants of any type that have fibrous root systems and cover the ground densely such as clover or grasses. Inorganic mulches include permeable or impermeable plastic sheeting and /or rock. Organic mulches such as sawdust, straw, and grass clippings reduce erosion and eventually break down to enhance soil conditions.



Mulches of all types reduce the intensity of water droplets on the soil surface from sprinklers.

### **Improve soil structure.**

Soil structure refers to the arrangement of soil particles or their aggregates (the aggregation of sand, silt, and clay into shapes with distinct sizes and strengths). A good structure helps soils resist the erosion process. Addition of organic matter such as compost, leaves, grass clippings, or tilled-in cover crops increases soil water-holding capacity and improves soil structure

### **Perform tillage operations when appropriate.**

Never work a wet soil or overtilt, as this destroys soil structure. Poor soil structure increases the possibility of erosion and provides inadequate growing conditions for roots. Till soil only when necessary.

## **Water management strategies**

Excess water use may result in nutrient leaching below the effective rooting depth of plants. This breaks the nutrient cycling within the garden ecosystem. There are several ways you can manage water in your landscape to promote plant and ecosystem health.

### **Use only as much water as necessary.**

If your plants are grouped according to water needs, it will be easy to water them often enough to assure healthy growth. Apply only as much water as the plants need. Never overwater. Make sure that the water saturates only the plant root zone. This minimizes leaching of nutrients and pesticides. Apply water only when plants require irrigation. Check soil moisture by digging into

the soil in the rooting zone. Note how soil holds together when squeezed hard in your fist and the effect when ball is broken between the thumb and forefinger. Be sure to repair all leaks in hoses and faucets so that the water goes only where you want it.

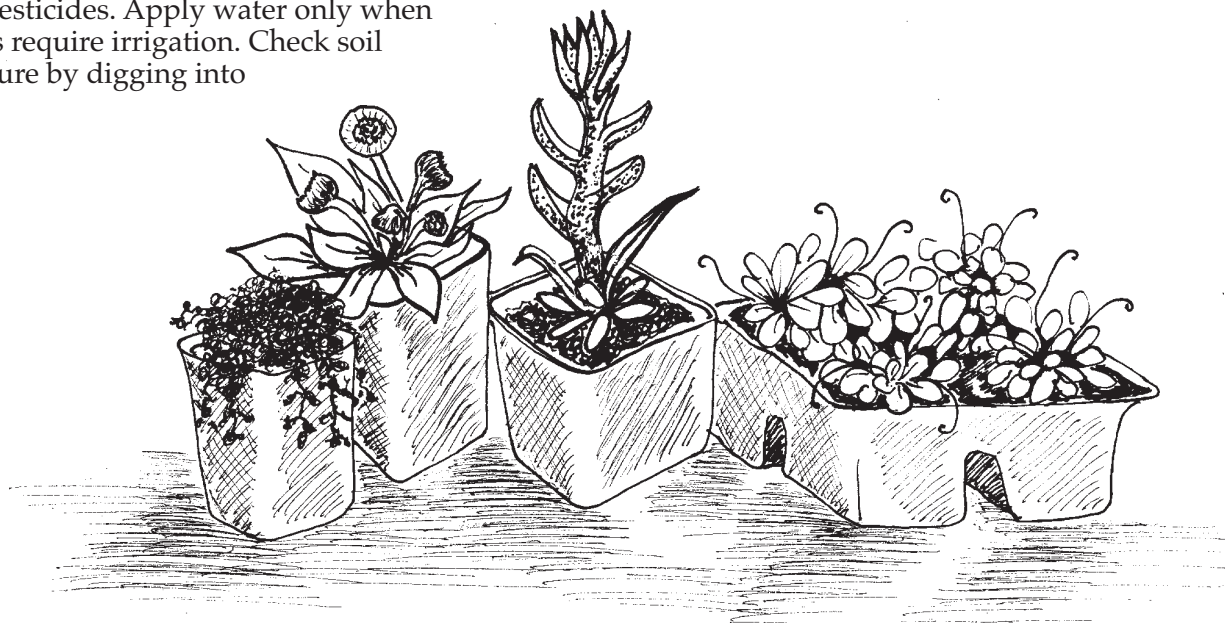
### **Design an efficient irrigation system.**

Whatever water delivery system you use in your garden, make sure the system applies water at a rate that can be absorbed by the soil. This avoids runoff. Drip lines and other types of micro irrigation apply water exactly and efficiently. Strive for uniform water application. Finally, make sure that your irrigation system waters only areas containing plants, not sidewalks, decks, parking lots, or streets.

## **Summary**

How can a gardener escape the input-output imbalance? Using these management strategies will promote garden health, maintain a balanced garden ecosystem, and lead to a healthy, self-sustaining garden. These strategies will result in a low-maintenance garden system requiring much lower inputs. With outputs curtailed, those products are put to use within the garden. This maintains garden health and beauty.

**The authors** – JoAnn Robbins is an Extension educator and horticulturist at the University of Idaho's Blaine County Extension Office. Robert Mahler is a soil scientist and Karen Loeffelman is a support scientist. Both work at UI's Department of Plant, Soil, and Entomological Sciences in Moscow.





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