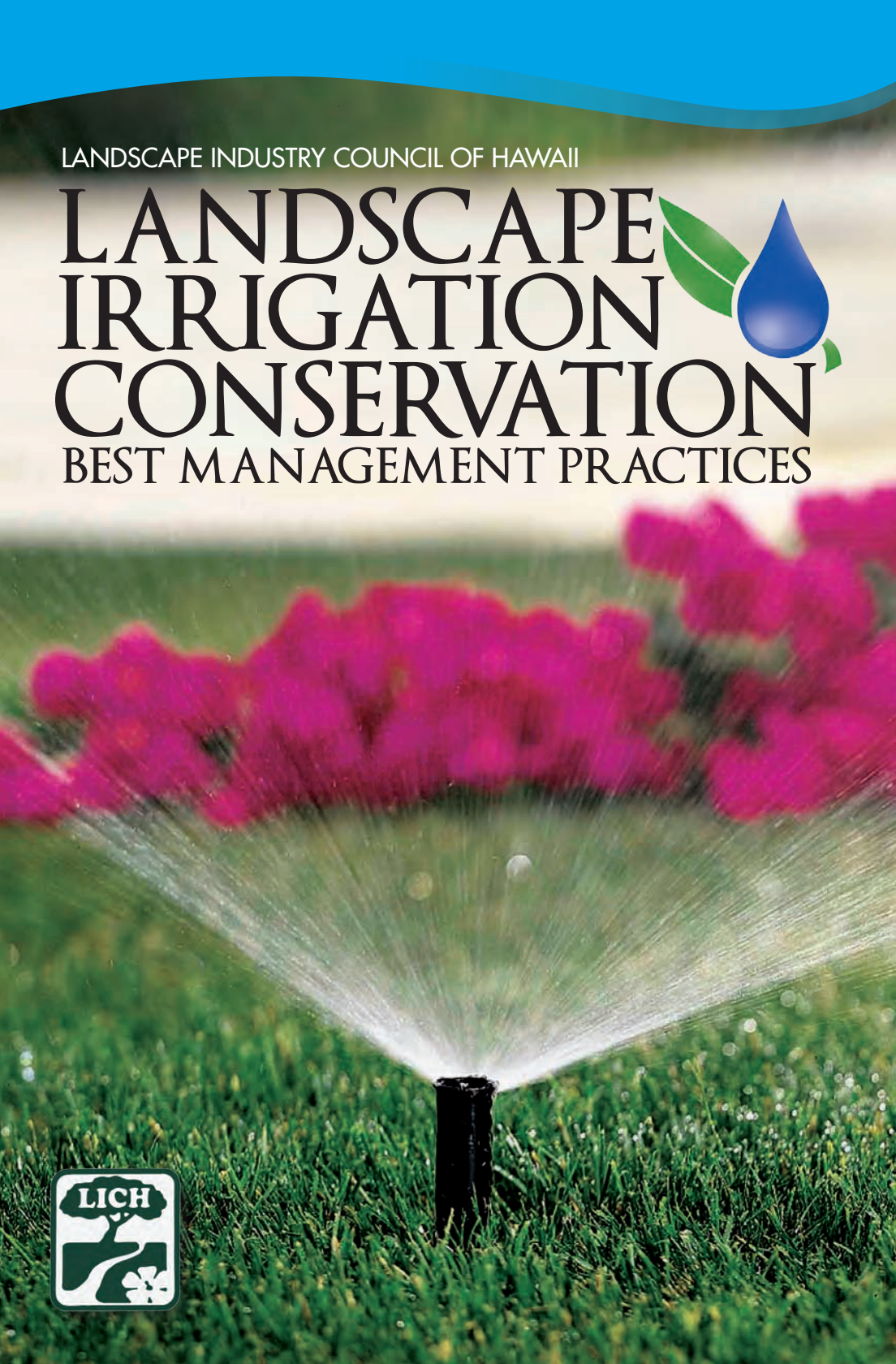
LANDSCAPE INDUSTRY COUNCIL OF HAWAII

LANDSCAPE IRRIGATION CONSERVATION

BEST MANAGEMENT PRACTICES



▶ CREATE A SUSTAINABLE FUTURE

LANDSCAPE IRRIGATION uses upwards of fifty percent or more of our household drinking water. A poorly maintained or installed irrigation system can waste up to fifty percent of water due to inefficient irrigation practices, poor components, evaporation and runoff.

MAINTAINING AND INSTALLING water efficient irrigation systems is one of the most effective ways to reduce wasted drinking water, reduce run-off, sediments and optimize plant health by applying the correct amount of water.

THE LICH LANDSCAPE IRRIGATION CONSERVATION Best Management Practices includes 16 installation and 10 maintenance low cost & practical measures to save upwards of fifty percent of our landscape irrigation water. Use this guide or consult with a certified landscape professional.

WATER is a precious resource for a sustainable future. Please do your part to conserve our drinking water.

TOP TEN BMPs BEST MANAGEMENT PRACTICES

THIS SYMBOL DENOTES THE TOP TEN WATER CONSERVATION BEST MANAGEMENT PRACTICES.

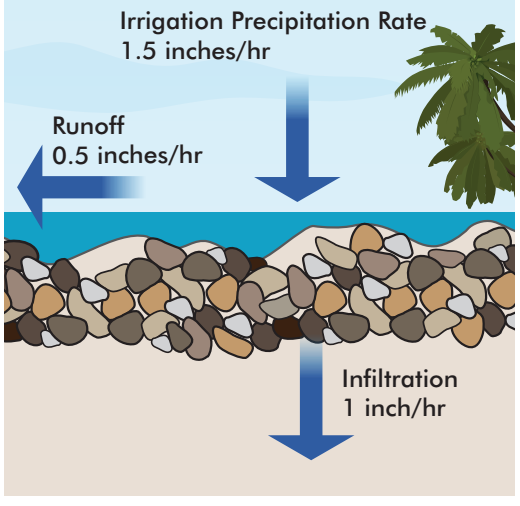
16 INSTALLATION BEST MANAGEMENT PRACTICES

1. Irrigation system plans and specifications should include post-construction documentation, including drawings of record (as-built drawings), maintenance recommendations, design precipitation rates and manufacturer's operational guide which will be available at the Engineer's or owner's office. Specifications should require a coverage test prior to acceptance and LICH water conservation best management practices.

Brochure graphics courtesy of the State of Hawaii Department of Transportation.

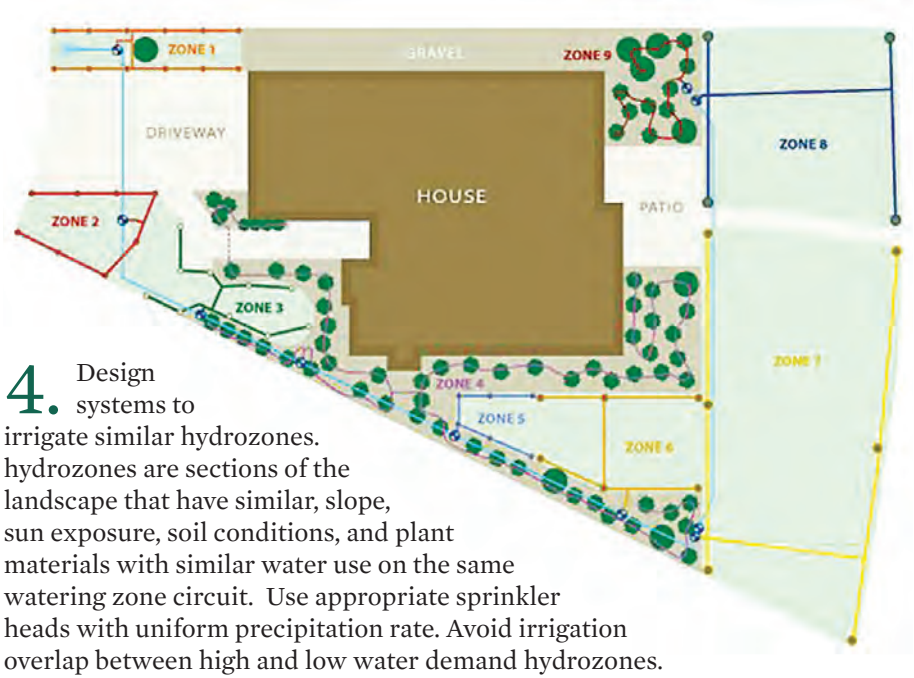
2. Design irrigation system with sprinklers spaced with head to head coverage or better. Head to head coverage means that the throw from one sprinkler overlaps the neighboring sprinkler in order to prevent dry spots and over watering.

3. Irrigate with a precipitation rate not exceeding soil infiltration rate. The speed at which an irrigation system applies water over a given area is referred to as the precipitation rate and is measured in inches per hour. One inch per hour is equivalent to 620 gallons per 1,000 square feet. Several factors at the design and installation stage, such as the type of sprinkler heads used, their spacing, and flow rate from each head, can affect an irrigation system's precipitation rate.



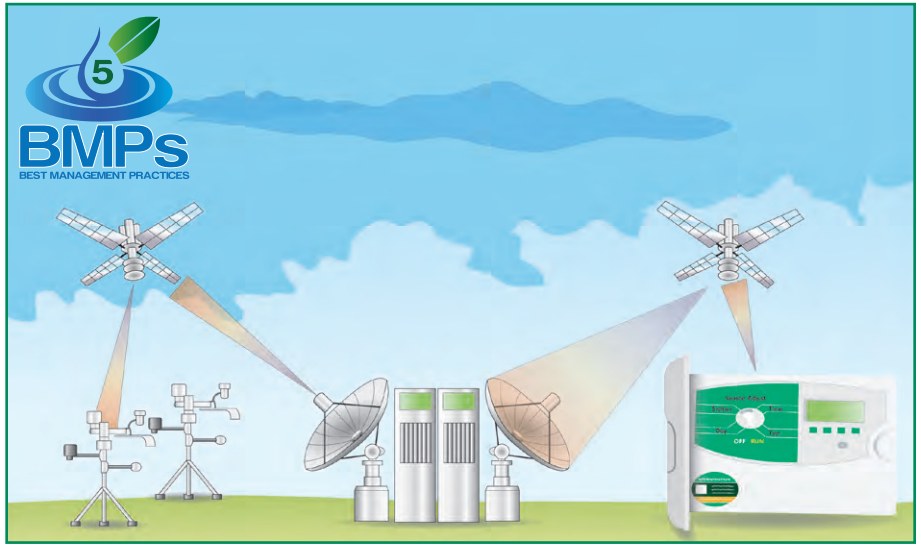
The rate at which water moves into and down the soil is called the infiltration rate. Different types of soils have different infiltration rates (e.g., clay soils absorb water slowly; loam soils have average absorption rates and sandy soils absorb water rapidly). Most soils in Hawaii are clay soils.

When the rate at which water is being applied (precipitation rate) is greater than the ability of the soil to absorb water (infiltration rate), water is wasted as runoff or by accumulating at the soil surface (ponding) and evaporating rather than being available to the plants. Reduce irrigation run times if ponding occurs.



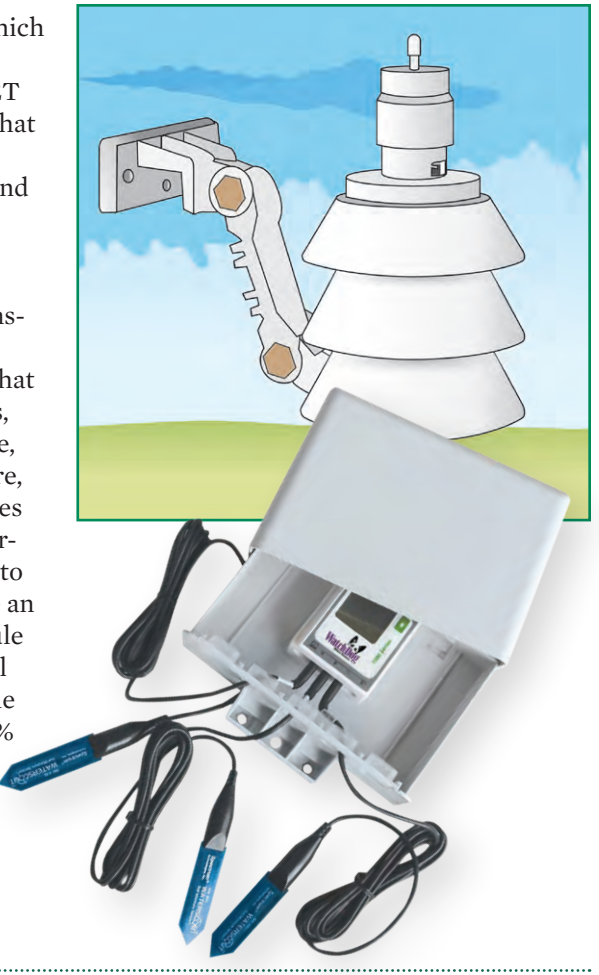
4. Design systems to irrigate similar hydrozones. hydrozones are sections of the landscape that have similar, slope, sun exposure, soil conditions, and plant materials with similar water use on the same watering zone circuit. Use appropriate sprinkler heads with uniform precipitation rate. Avoid irrigation overlap between high and low water demand hydrozones.

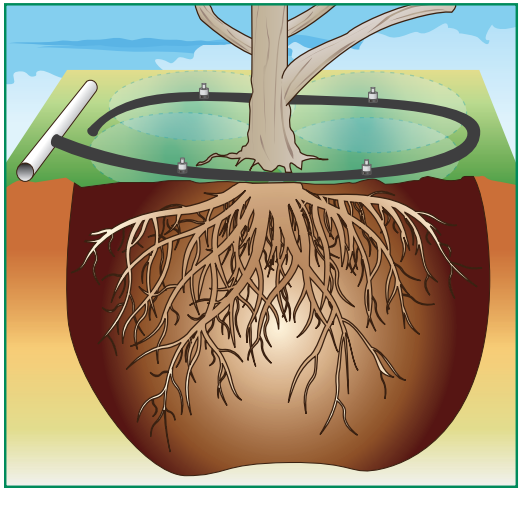
– Graphic courtesy of Rain Bird Corporation.



5. Use Smart Controllers (climate-based irrigation controller). Smart controllers operate by scheduling watering based on weather conditions. Some of the products use real time or historic weather data to schedule irrigation based on evapotranspiration (ET), which is determined by weather conditions and plant type. ET is the quantity of moisture that is both evaporated (E) from the soil and plant surfaces and transpired (T) by the plant.

ET systems continuously measure the local evapotranspiration (ET) factor using onsite sensors or satellites that monitor weather conditions, such as rainfall, temperature, wind speed and soil moisture, to constantly adjust run times and days to water. This information is then downloaded to the host controller to create an intelligent irrigation schedule that is just right for the local landscape requirements. The result can be as much as 30% reduction in water use.





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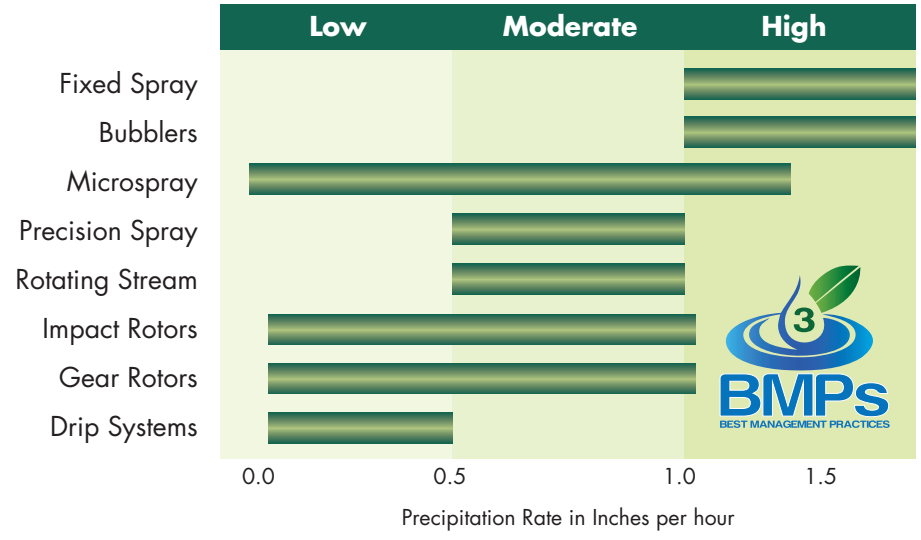
BMPs
BEST MANAGEMENT PRACTICES

6. Encourage the use of drip irrigation for individual specimen plants, shrubs and trees during establishment period. Place drip emitters around edge of root ball at planting and gradually move them farther out as the tree becomes established in order to cover the expanding root zone.

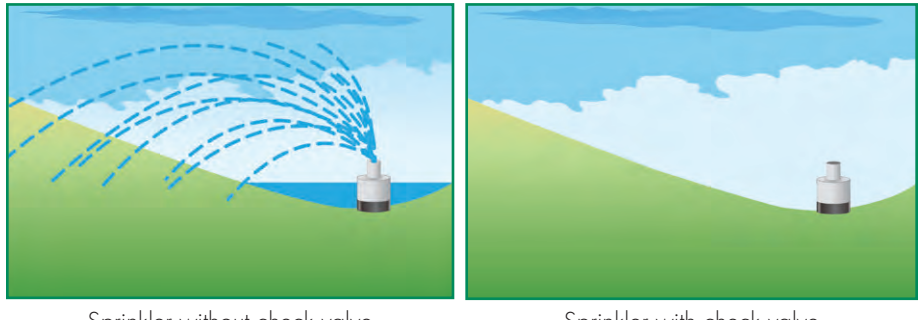
7. Use flow sensors with smart controllers to detect leaks or drastic changes in water use.

8. Use an irrigation submeter that measures water use on large sites. A water meter at the point of connection to each irrigation system will measure water consumption and provide useful water consumption information. Recording water use is part of the monthly inspection report. Installing an irrigation submeter may save on sewer charges because you can use the actual amount of water used for irrigation for the sewer deduction versus the standard deduction.

TYPICAL PRECIPITATION RATE RANGES



9. Use water conservation irrigation components, such as rotary nozzles, pressure regulated spray heads and valves, rain switches and high efficiency nozzles.



Sprinkler without check valve

Sprinkler with check valve

10. Sprinklers in low-lying areas and slopes should be equipped with check valves. Check valves prevent water from draining out and ponding at the lowest sprinkler head when the run time has ended.

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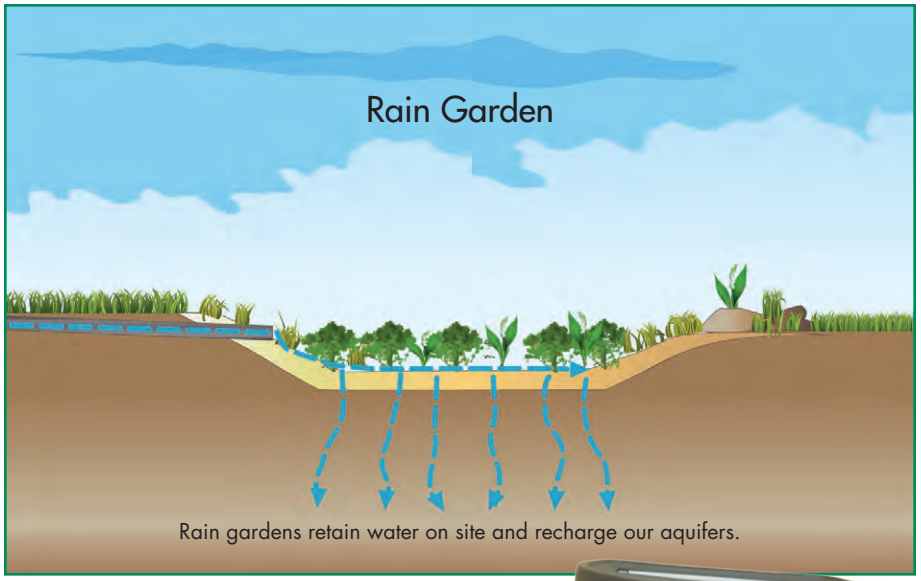
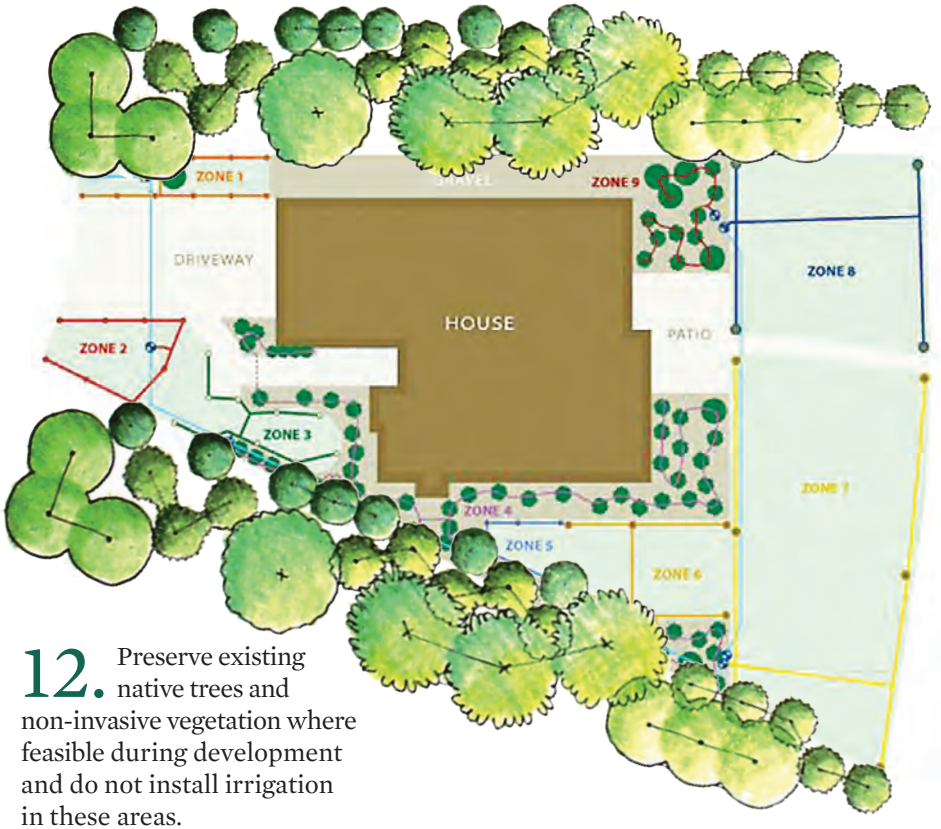


11. Incorporate Low Impact Development (LID) storm water design methods, including rain gardens, infiltration beds, rain barrels, swales, and basins, that allow water to collect and soak into the ground on site.



12. Preserve existing native trees and non-invasive vegetation where feasible during development and do not install irrigation in these areas.

13. Incorporate compost into soils at planting. Compost is decomposed organic matter (material derived from plants and animals) that can be used as fertilizer or soil amendment. Use of compost conserves water by improving water absorption and the water holding capacity of the soil. When added to sandy soils compost acts as a sponge to help retain water that would otherwise drain down below the reach of plant roots. When added to clay soils, compost makes the soil more porous, making it drain more efficiently. Using compost also reduces green waste going into our landfills.

Photo courtesy Honolulu Board of Water Supply

14. Xeriscaping refers to landscaping in a way that reduces or minimizes the use of supplemental water from irrigation. In other words, xeriscaping is the practice of using drought tolerant or "less thirsty" plants for landscaping. Encourage the use of xeriscaping practices to include native and non-invasive ornamental plants. Visit your local xeriscape garden like Halawa Xeriscape Garden for ideas.

15. Encourage the use of non-potable water for irrigation.

16. Use a qualified irrigation designer, irrigation supplier, landscape architect and installation contractor.

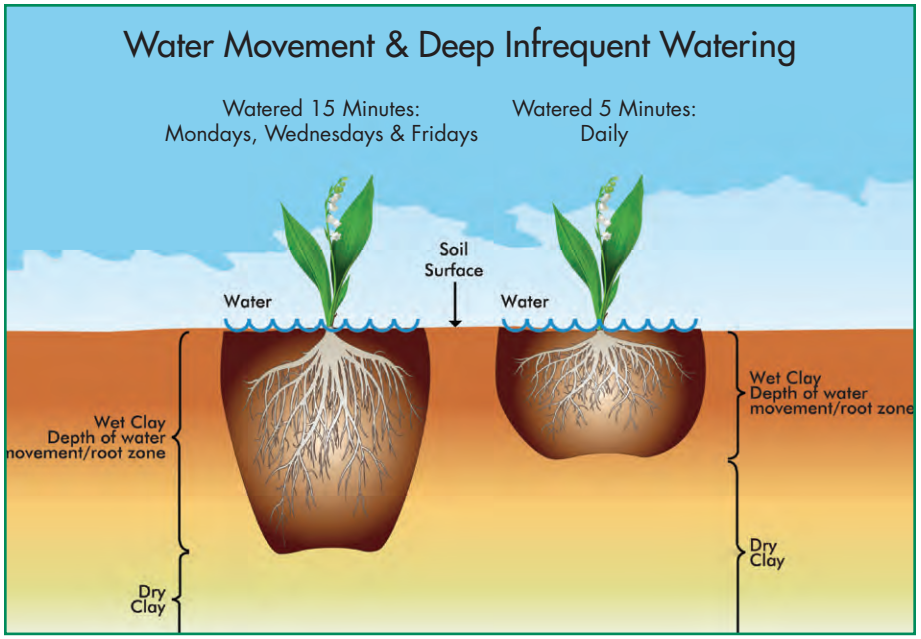
10 MAINTENANCE BEST MANAGEMENT PRACTICES

1. If not using a climate-based controller, manually manage controller run times and days to water according to soil conditions and seasonal weather conditions. Adjust runtimes at a minimum of four times a year: summer (dry season), winter (rainy season), and transition periods (fall and spring). Most controllers have a built in functions "Seasonal Adjust" or "Water Budget" to easily adjust for seasonal weather. If unsure, decrease run time until plants are stressed then slightly increase run time. Adjusting schedules saves upwards of 40% of outdoor water usage.

TYPICAL SEASONAL IRRIGATION SCHEDULE FOR HAWAII

Season	Irrigation Run Time	Days per Week
Summer (June to Aug.)	15 minutes	Every other day
Transition Periods (Fall: Sept. to Nov. and Spring: Mar. to May)	7 minutes	Every other day
Winter (Dec. to Feb.)	5 minutes	Twice per week

Run times shown for spray head zones. Rotor zones should be double run times shown.



2. Program irrigation controller to encourage deep watering by using longer, less frequent watering times to improve deep rooting and increase drought resistance. Avoid short daily watering, except for sandy soils.

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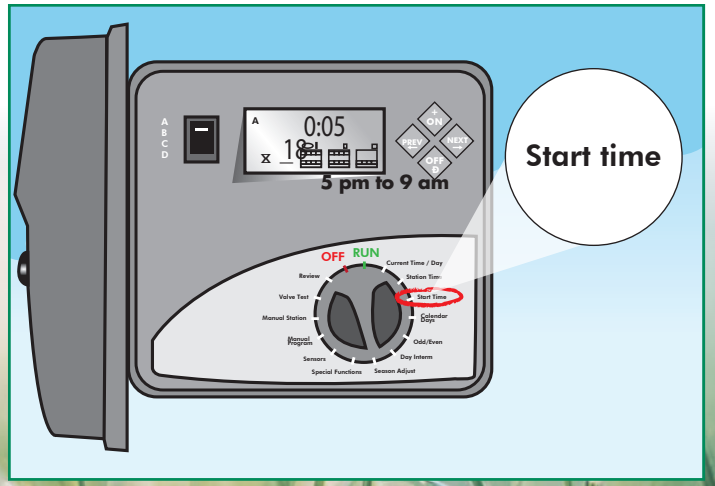
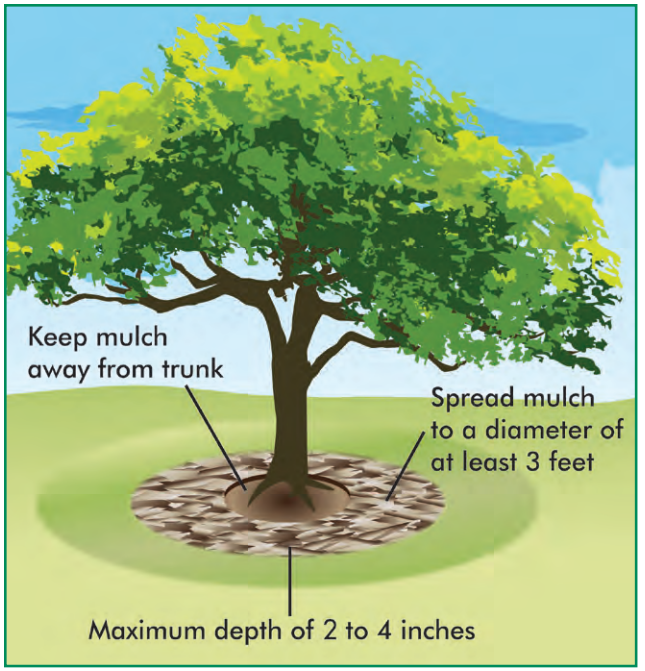


3. Sun and wind increase soil water evaporation. To reduce the amount of water evaporating from the soil surface, schedule night or early morning (5 p.m. to 9 a.m.) start times for established plantings. In areas where ponding, compaction, or runoff occurs, set 2-3 short run time cycles.



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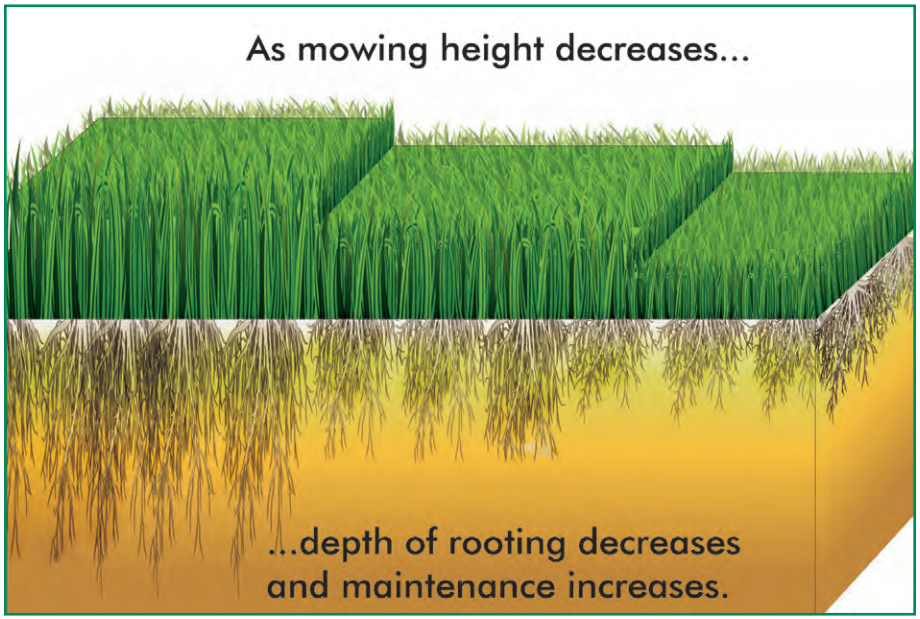
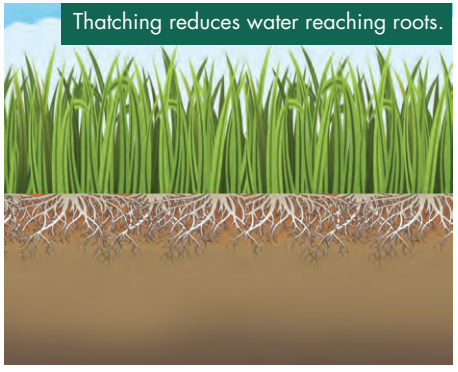
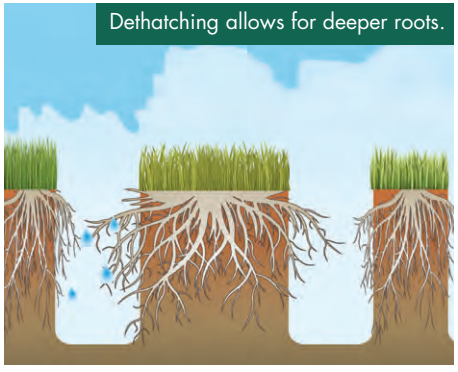
4. Mulch helps retain soil moisture. Mulch with wood chips around base of trees and shrub beds and refresh as necessary to maintain a minimum of two inches. Do not allow mulch to contact the base of trunk.



5. Allow grass to grow taller in summer months to conserve water and encourage deep rooting. Use higher mowing height but same mowing schedule. Mowing heights should stay within the recommended mowing height for each species of grass.



Before

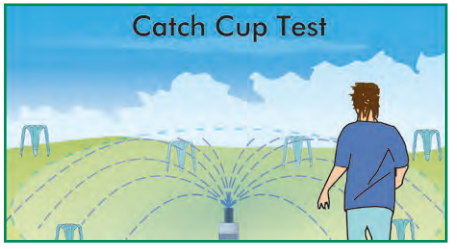


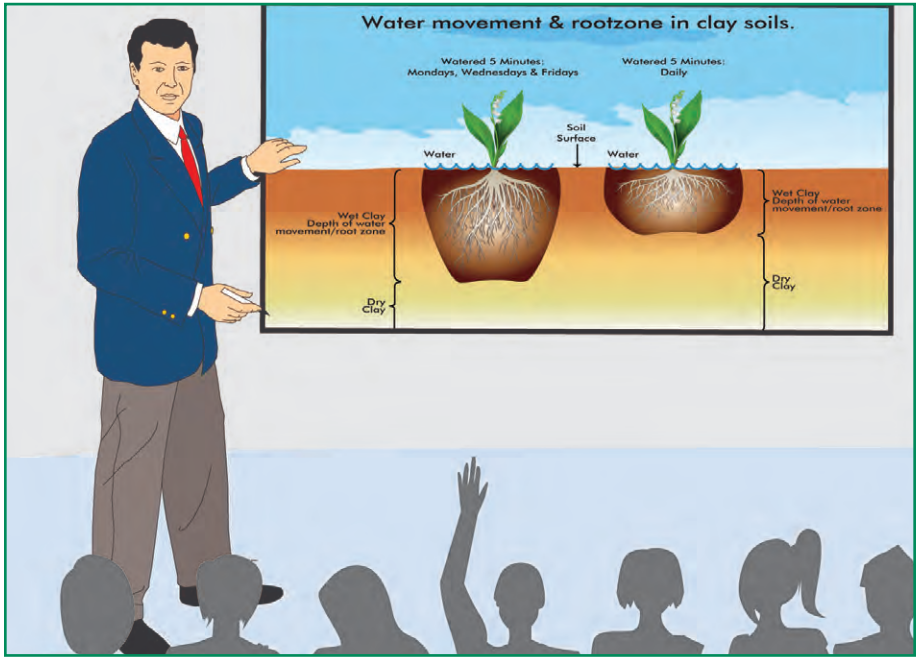
After

6. Aerate lawns when compaction occurs. If possible, topdress with a thin layer of compost or sand. Dethatch or verticut heavily thatching grasses.

7. At a minimum, conduct a monthly inspection to verify system operation and correct deficiencies.

8. Conduct a practical water audit once every 2 to 5 years by a qualified irrigation professional. Review the system components to verify that they meet the original design criteria for efficient operation and uniform distribution of water.





9. Attend water conservation seminars and webinars including Board of Water Supply, Landscape Industry Council of Hawaii, American Society of Landscape Architects, University of Hawaii, EPA Water Sense, and the Irrigation Association. Visit www.landscapehawaii.org for water conservation seminars.

10. Use a licensed maintenance contractor with water conservation expertise.

landscape industry certified

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Hawaii's landscape industry is one of the fastest growing and largest segments of the green industry with an economic impact of over $520 million annually and full time employment of over 11,000 landscape professionals.

Formed in June 1986, the Landscape Industry Council of Hawaii is a state wide alliance representing Hawaii's landscape trade associations: Aloha Arborist Association, American Society of Landscape Architects Hawaii Chapter, Hawaii Association of Nurserymen, Hawaii Island Landscape Association, Hawaii Landscape and Irrigation Contractors, Hawaii Society of Urban Forestry Professionals, Kauai Landscape Industry Council, Maui Association of Landscape Professionals, Professional Grounds Management Society, Big Island Association of Nurserymen, and the Hawaii Professional Gardeners Association.

Online at www.landscapehawaii.org

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