

Results of CLCA-Funded Bio-Retention Study

In the summer of 2006, CLCA awarded a \$6,500 research grant to the Department of Land, Air and Water Resources at the University of California, Davis to fund a study on ways to eliminate dry weather runoff from irrigated residential landscapes before it reaches storm drains. This study furthers CLCA's ongoing research priorities to assist in developing methods of reducing fertilizer and pesticide contamination of surface and underground water and the movement of those chemicals in landscapes.

In this study, two sites were used in field experiments to evaluate the effectiveness of bio-retention infiltration systems in eliminating dry weather runoff from irrigated urban landscapes. Each site was divided into two sections: a "control" section that was unaltered and a "treatment" section that was fitted with a three-foot-deep bio-retention infiltration trench adjacent to the sidewalk or street. The trenches were filled with engineered soil consisting of 75% to 90% stones and 10% to 25% sandy loam soil. The top of the engineered soil was covered with landscape fabric, a layer of native soil, and turfgrass and trees. Water meters were installed at each site to measure runoff.

The bio-retention systems acted as mini-reservoirs to intercept rainfall and store surface runoff underground. The nutrients, metals, fertilizers and pesticides from surface runoff were consumed, degraded, and stabilized through both physical and biologic processes of the systems. Runoff stored in the systems supported vegetation growth and infiltrated into the underneath soil layers.

Dry weather runoff was measured during the 2007 irrigation season. Zero runoff was detected from the treatment sites, even at the highest level of applied irrigation. However, considerable runoff was measured from both control sites even when irrigation times were cut in half.

The study demonstrated that bio-retention systems are effective in reducing dry weather runoff. The study states in its conclusion, "This information could help the landscape industry create and manage irrigated landscapes in ways that protect water quality while maintaining desired levels of beauty and functionality. By better understanding how alternative landscape design and management practices can reduce the flux of fertilizers and pesticides to storm drains, the industry could be a better steward of the state's limited water and green space resources and promote more sustainable urban ecosystem development."

The UC Davis research team was headed by principal investigator Qingfu Xiao, Ph.D., with cooperation from Greg McPherson, Ph.D. of the USDA Forest Service Center for Urban Forest Research. The results of the study were released in October.

This and other CLCA research grants are awarded under the auspices of the association's Environmental Research Funding Program, which is overseen by committee members Frank Niccoli of The Village Gardener, San Carlos; Richard Angelo, CLT of Stay Green, Valencia; Scott McGilvray of Jensen Corporation Landscape Contractors, Cupertino; Donald R. Hodel of UC Cooperative Extension in Los Angeles; Ed Perry of UC Cooperative Extension in Modesto; Dennis Pittenger of UC Riverside; and CLCA Assistant Executive Director Larry Rohlfses.

CLCA typically makes an annual contribution of \$5,000 to the Program's general fund. Additional contributions from individual members make a big difference in CLCA's ability to continue its efforts toward supporting important research such as this, which aids in developing improved standards and best practices for the green industry.

One-hundred percent of all donations are used for scientific research. The Landscape Educational Advancement Foundation,

which administers the funds, does not use any of the money for expenses, nor are the grants allowed to pay for university administration, overhead, or the researchers' salaries. The entire amount of each grant must be used for the research project itself.

Special thanks to all of the very generous members who contributed to the Environmental Research Funding Program in 2007. Ongoing contributions are needed to continue these research efforts, and everyone is invited to participate.

If you would like to make a tax-deductible contribution, please send your check payable to LEAF Research to CLCA, 1491 River Park Dr., #100, Sacramento, CA 95815-4501.

For more information about the program or a copy of the final report for this study, "Effectiveness of Bio-Retention-Infiltration System on Eliminating Dry Weather Runoff from Irrigated Urban Landscape," contact Rohlfses at (800) 448-2522 or larryrohlfses@clca.org.

