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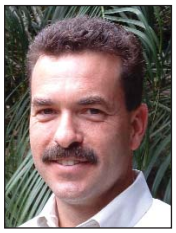
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Reducing Urban Runoff With Smart ET Controllers: Report Review

Urban landscape water use is widely regarded as a major contributor to peak water demands, overdrafting of local aquifers, and nonpoint source water pollution (as a part of urban runoff). Public agencies across the United States are conducting studies to determine the best methods with which to control landscape water applications. A major study conducted by the Municipal Water District of Orange County (MWDOC), Irvine Ranch Water District (IRWD), the National Water Research Institute, with additional funding by the California Environmental Protection Agency, US Bureau of Reclamation/CALFED, California Department of Pesticide Regulation, and the Metropolitan Water District of Southern California, offers substantial support that landscape overwatering and urban runoff can be controlled with a new technology.

The dedicated commercially landscaped, metered sites with an ET controller showed average savings of 472 gpd.

The Residential Runoff Reduction Study was designed with four primary purposes:

- to expand earlier studies of evapotranspiration (ET) pager–signal controller technology that has been used to manage irrigation water for residential homes and larger dedicated landscape areas,
- to evaluate the effectiveness of an education program for customers to enlist their aid in reducing runoff,
- to determine the connection between proper landscape water application and the quantity and quality of dry weather runoff into storm drain systems, and
- to gauge acceptance of the water management technology (ET controllers) and the visual appearance of participant landscapes.

STUDY LOOKS AT FIVE CALIFORNIA NEIGHBORHOODS

The study area included five neighborhoods in Irvine, Calif. The neighborhoods range in size from 350 homes to more than 500 homes with street, park, and homeowner association landscapes. Residents of one neighborhood were educated about environmentally sound landscape management. Residents of another neighborhood received the same educational materials, and their irrigation systems were retrofit (with 112 residential ET controllers and commercial controllers for 4 homeowner association landscapes, 1 park, and 12 city street landscapes). Both the "educated" neighborhood and the "retrofit" neighborhood participants received monthly educational materials by mail with tips for maintaining environmentally sound landscapes. Three neighborhoods with similar residential and commercial landscape settings acted as study controls.

Each neighborhood contained a single point of drainage into the storm drain system. At these respective points, runoff volume and water quality were monitored for each neighborhood.

Data were gathered from the 18-month study and evaluated for water efficiency and savings, dry season runoff changes, and changes in the quality of the dry season runoff water.

Some of the results of the study are summarized in the following paragraphs.

Water efficiency and savings. Water savings from the ET controller group was 41 gpd (155 L/d) per home or approximately 10% of the total house-

hold water use (with a typical landscape size of 0.03 acres [0.012 ha]). The majority of savings occurred during the summer and fall. The educated group saved 26 gpd (98 L/d) or nearly 6% of total water use.

The dedicated commercially landscaped, metered sites (ranging in size from 0.14 acres [0.06 ha] to 1.92 acres [0.78 ha]) with an ET controller showed average savings of 472 gpd (1,787 L/d). The net result was eight times more water savings than with the single-family residential controller, strongly indicating that the larger the landscape the better the savings per controller.

Dry season runoff reduction/savings. The ET controller retrofit neighborhood showed a direct 49% reduction in runoff (calculated from pre- and poststudy data) during the dry season. When the retrofit neighborhood was compared with the control neighborhoods, however, the difference in dry season runoff reduction was 71%. In contrast, direct pre- and poststudy runoff from the educated neighborhood increased 36%. When the educated neighborhood was compared with the control neighborhoods, however, the educated group decreased runoff 21%.

Customer response to the ET controller technology was generally positive, with 72% of the participants indicating that they liked the controllers.

Runoff water quality changes. Although the study gathered large quantities of water quality data and analyzed the samples, in nearly all cases there appeared to be no change in the concentration of constituents in the runoff (quality sampling took place for nutrients, herbicides, pesticides, and bacteria). The study experts concluded that the decrease in the volume of water runoff from the ET controller group did not appear to increase the concentration of pollutants in the runoff. Thus it is probable that a change in total pollutant migration could be achieved by reducing total dry season urban runoff.

Customer acceptance of water management technology. The response to the ET controller technology was generally positive, with 72% of participants indicating that they liked the controllers. This group also found that the controller technology either maintained or improved the appearance of their landscapes. However, 58% of the participants said they would not be willing to pay for a monthly signal or service fee to continue using the ET technology.

The study concluded that there exists a classic win–win opportunity for both the customer and the water agency. Customers receive a desired benefit of a healthy landscape, while the community receives important environmental benefits from conservation and significant reduction of dry season urban runoff.

Numerous studies regarding the use, performance, and benefits of ET controller technologies are being conducted by public agencies. Studies have been or are being conducted by the Los Angeles Department of Water and Power, the University of Nevada Extension at Reno, the University of Nevada Las Vegas, the Santa Clara Valley Water District, and the University of Arizona. The success of studies in Irvine and the West with ET controllers has led to more than $5 million in grant funds in California for the distribution of this technology. Public agency programs to distribute ET controllers to help manage peaking, reduce overall demands on water supplies, reduce runoff, and maintain landscapes during drought are cropping up across the United States.

The technology used in all of these studies was WeatherTRAK from Petaluma, Calif.-based HydroPoint Data Systems Inc. (www.hydropoint.com).

DATA WERE GATHERED FROM THE 18-MONTH STUDY AND EVALUATED FOR WATER EFFICIENCY AND SAVINGS, DRY SEASON RUNOFF CHANGES, AND CHANGES IN THE QUALITY OF THE DRY SEASON RUNOFF WATER.

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