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## **UC Davis offers water-saving wisdom**

by *Ron Sullivan, Joe Eaton*

**Relevance: This article discusses a recent event held at the UC Davis arboretum, entitled "Global Climate Change and Your Backyard." The event focused on water conservation techniques, useful not only in saving water but also in limiting contamination of the local watershed. Quoted are Diane Patak, Loren Oki and Cheryl Sullivan.**

At a conference convened by **UC Davis'** new California Center for Urban Horticulture, we learned a few things we hadn't known even after all these years of working the tree-hugger beat and passing along the bad news about the state of the ecosphere.

Oddly, we also had a good time. UC Davis knows how to throw a garden party. Kudos to the arboretum and the student catering service there: The food was great. They'd even arranged a sequence of nice breezy days to talk about global warming without having to suffer much from it.

They called the event Global Climate Change and Your Backyard. It was a good mix of compelling science and practical advice, centering on how we can adapt our gardening to a warmer and potentially drier world, and what bits we might contribute to not making it worse.

As East Bay Municipal Utility District customers, we're attuned to water use issues. Dragging buckets and siphoning from jugs to water the potted plants gets old fast, and realizing how little water we're actually using can make the annoyance worse.

We're thinking in terms of gallons, while most of California's water goes to users who think in terms of acre-feet: 325,851.4 gallons at once. But the current reality is that EBMUD doesn't get that water, so we must do what we can to keep from going dry - and going broke paying the water bill, never mind the actual impact.

We knew that poor garden-irrigation practices aren't just wasteful; they can contaminate the local watershed with runoff, even contribute to greenhouse gas emissions. No kidding: Diane Pataki, of the departments of earth system science and ecology and evolutionary biology at UC Irvine, showed us a study in which plots of fescue were warmed by heat lamps to simulate climate change. Nitrous oxide emissions were highest in warmer plots with higher soil moisture. Nitrous oxide exists in much smaller quantities than carbon dioxide but is about 300 times as potent as a greenhouse gas.

Also, "At the end of the experiment, the warm plots were totally dominated by warm season weeds," Pataki said. At least for crabgrass and Bermuda grass, the future looks bright.

But there are ways of designing and planting to reduce residential runoff.

Loren Oki of UC Davis focused on landscape use and urban runoff. Poorly chosen and maintained irrigation systems are water wasters, contributing to what Oki called "urban drool." Look at the wet pavement next to an irrigated planting to see what he means.

Beyond that, runoff from lawns and gardens introduces pesticides to city creeks. Samples from Arcade Creek in Sacramento County, in a built-up area nowhere near agricultural land, showed high concentrations of the now-banned pesticide diazinon and its pyrethroid successors.

Oki plans to replicate at Davis another UC Irvine project comparing runoff from three model single-family homes, one with "typical" landscaping (trees in turf, lots of concrete, standard spray heads with automatic timers) with two "low impact" variations (drought-tolerant plants, hydrozoned planting, drip irrigation for trees and shrubs, evapotranspiration-based irrigation controllers). His group also samples actual homes in Sacramento County and works with master gardeners to promote low-impact irrigation.

His recommendations for homeowners: Apply water to meet, but not exceed, plant demand and at a rate that the soil can absorb. "The application rate must match the infiltration rate," Oki said. "The slower the rate, the more absorption and the less runoff." New technologies - "smart"

irrigation controllers, satellite-based weather stations - can also reduce waste.

Landscape architect Cheryl Sullivan emphasized low-impact development techniques that address runoff problems. In developed conditions, she said that surface runoff accounts for 30 percent of annual rainfall (in natural conditions, less than 1 percent.) Grassy swales and rain gardens can capture and filter 90 percent of urban runoff, removing significant amounts of pollution.

"The goal of a residential rain garden," she explained, "is to collect surface water runoff off the roof and driveway and channel it into a depressed area that will hold the water for 24 to 48 hours. It's not a pond, so there are no insect issues."

According to Sullivan, Seattle and Portland, Ore., have embraced the rain garden concept. One 2,000-square-foot school garden in Portland captures runoff from a whole acre. A Seattle pilot helped make water going into Puget Sound clean enough for federal standards.

Sullivan echoed Oki's advice about irrigation efficiency, noting that some water agencies are giving rebates for users who switch to new equipment, and talked about larger-scale fixes like pervious concrete. We'll be revisiting some of her ideas for sustainable home landscapes in future columns.

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