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Spotlight Story

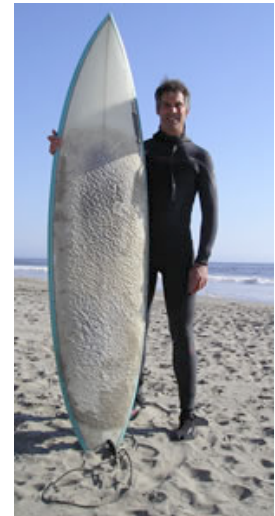
Surfing makes Monterey County farm advisor's water quality concerns personal

Among scientists, UC Cooperative Extension farm advisor Michael Cahn has a unique perspective of the water in California's Monterey Bay. He sees it from the crest of gnarly waves, rides its radical tubes and tastes it with every wipe out.

That's what makes his job so important to him. When he's not surfing, Cahn works with farmers to improve the quality of water that runs off Monterey County farms and into one of the world's most beautiful and diverse marine ecosystems, the federally protected Monterey Bay National Marine Sanctuary.

Monterey County, the state's third largest agricultural producer with more than 230,000 acres of farmland according to the California Department of Conservation, is recognized as the Salad Bowl of the World. In 2004, agricultural production was valued at nearly \$3.5 billion, more than 40 percent of Monterey County's total economy.

Cahn's effort to ensure that the county's immense and intensive agricultural industry will have minimal impact on the quality of water in nearby Monterey Bay is getting widespread attention.



UC Cooperative Extension farm advisor Michael Cahn.

Cahn consults with Jean-Michel Cousteau

Recently, Cahn was asked to review a section of a coffee table book being produced in conjunction with "America's Underwater Treasures," a two-part PBS special by Jean-Michel Cousteau (son of famed underwater explorer Jacques Cousteau) to be aired in fall 2006. Cahn served as a consultant for the TV program and referred producers to his research cooperator and fellow surfer Ian Greene, a researcher at Golden State Bulb, a Salinas wholesale producer of colored calla lily and begonia tubers. Greene was interviewed by Jacques Cousteau's grandson Fabian Cousteau.

"I told him it was a trip," Greene said. "I grew up watching your grandfather's shows. To think I am walking here with Jacques' grandson."

Greene took the film producer to a part of the farm that adjoins the Elkhorn Slough. They talked about controlling erosion, mitigating runoff, using safer chemicals and fertilizers.

"Fabian asked, 'What's in this for you?'" Greene said. "I told him it was our decision to use reduced-risk chemicals. Our company is diligently following state and federal water quality regulations. But most importantly, I'm a surfer. This slough runs right off into Monterey Bay. That's my playground.

"We are very concerned about the impact we have on the ocean and it means a lot to this company and the people who live here."

Calculating crop coefficients tied with increased irrigation efficiency

Cahn has worked closely with Greene to ensure the operation applies irrigation water as efficiently as possible. The company wished to use weather data provided by the Department of Water Resources to determine the crop's water needs, however the system requires a "crop coefficient" to convert the reference evapotranspiration data found online to a number that is usable on the farm.

"We have crop coefficients available for major commodities – tomatoes, rice, wheat and corn. But on the coast, farmers are growing specialty crops and they don't have the coefficients," Cahn said.

Cahn took infrared photos at the Golden State Bulb Farm from the top of a pole to get a bird's-eye view of the crop. Then standard photos were taken from the ground. By comparing the plants from the two perspectives, growers can more accurately estimate the size of the plants and how much of the ground they cover at any given time just by looking at them. Those factors help farmers estimate the crop coefficient and allow them to water more efficiently.

"If you use too much water, it leads to runoff," Cahn said.

Polymers can help clean up runoff water in the Salinas Valley

UC Cooperative Extension scientists have devised and are sharing with farmers a number of other practices for reducing runoff and cleaning up irrigation and storm water that runs off coastal farms -- such as drip irrigation, the use of cover crops and cutting back on pesticides. Another option Cahn has under study on the east side of the Salinas Valley is the injection of polymers into irrigation water.

Polyacrylamide (PAM) is a polymer that can stabilize soil and prevent erosion. Most research on the substance has been conducted in furrow irrigation systems by adding polymer in dry or liquid form to irrigation water. Cahn wanted to know whether PAM could be used in sprinkler irrigation systems like those commonly found on Monterey County farms without gumming up sprinkler heads, valves and other equipment.

"We learned that you have to inject it into the water at very low concentrations and it has to be in the water for the whole irrigation at about 2.5 to 5 parts per million," he said. "That requires only a pound or less per acre, which costs just a few dollars per acre."

He demonstrated that the small amount of the polymer applied through sprinkler systems dramatically reduced the sediment levels in irrigation runoff and cut back on total phosphorus and nitrogen in the water that did run off. The polymers themselves do not pose problems. They dissolved readily in water and didn't harm the irrigation equipment. Also, the polymers break down within two weeks from UV light exposure.

Cahn also worked closely with another surfing farmer, John Weisz of Reiter Berry Farms, the principal producer for a national raspberry distributor. Because research on raspberries has been minimal, scientists and farmers weren't sure exactly how much water was needed for raspberry production. In addition to helping determine the crop coefficient for raspberries, Cahn worked with two Reiter Berry growers to conduct nine irrigation trials with different water application rates.

"Growers had been using three or four acre-feet of water per season in raspberries, but we found that water application could be as low as 18 acre-inches and still optimize yield," Cahn said. "That's a big savings in water and it translates to less leaching of nitrate away from the plant roots and, likely, less making its way into local waterways that lead to the ocean."

The efforts of scientists and farmers to ensure that clean water flows into Central California oceans are aimed at not only maintaining the remarkably productive coastal environment, with its countless mammals, seabirds, fish and invertebrates. Their work should enable free-spirited ocean lovers of many future generations to experience the thrill of gliding on a crashing wave toward the exquisite Monterey Bay shore.

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Feature Story Archive