Hot off the press:
Sign up to receive weekly alerts from the best Ag publication in California
Enter your e-mail ×
Welcome back **eric.brennan@ars.usda.gov** Logout

Growers offered suggestions on capturing rain runoff

Issue Date: October 7, 2015
By Bob Johnson

Researchers on the groundwater research project included, from left, Eric Brennan, U.S. Department of Agriculture research horticulturist; Richard Smith, University of California Cooperative Extension farm advisor in Salinas; Karen Lowell, USDA Natural Resources Conservation Service agronomist; and Tamara Voss, Monterey County Water Resources Agency groundwater hydrologist. Photo/Bob Johnson

The expected El Niño rains this winter could be an opportunity to recharge the Salinas Valley groundwater system, especially on the east side of the valley, which is largely replenished by stormwater rather than the river and reservoirs.

Experts say steps taken by growers before the rains come could go a long way toward determining how much of the water infiltrates to the underground basin and how much runs off the fields and eventually into the Pacific Ocean.

IRRIGATION

"Given the prospect of a strong El Niño this coming winter, it seems prudent to plan to capture as much of the

Hot off the press:
Sign up to receive weekly alerts from the best Ag publication in California
Enter your e-mail ×

The researchers who produced a report on how growers can improve stormwater infiltration included, in addition to Smith, UCCE farm advisors Michael Cahn and Mark Bolda, UC Davis soils specialist Toby O'Geen, USDA research horticulturist Eric Brennan, USDA Natural Resources Conservation Service agronomist Karen Lowell, and Monterey County Water Resources Agency hydrologist Tamara Voss.

The entire study on steps to improve groundwater recharge during the expected storms this winter can be read online (http://cemonterey.ucanr.edu/files/219694.pdf), but the detailed suggestions can be boiled down to a basic strategy.

"The key message is slow it, spread it, sink it," Lowell said, and there are many ways to help do that.

Gypsum can improve the structure of soils that crust, which are widespread on the East Side. Deep tillage can increase stormwater infiltration, particularly in fields with Antioch-series soils. Buffer strips and retention ponds can prevent rainwater from running off the field entirely.

But the simplest way to help more rainwater move down through the soil to replenish the underground basin may be to plant a cover crop to reduce runoff, and terminate it before it grows large enough to need substantial amounts of water.

Smith and Cahn did a detailed study of five years of water runoff and infiltration in one area of a field planted in a low-residue cover crop terminated after just 60 days, a second planted with a full-term cover crop, and a third section left fallow.

"The cover crop and its residue reduced runoff on a Chualar loam soil where our studies were conducted," Smith said. "We observed that 47.2 percent of the rainfall ran off of the field in the bare fallow treatment, compared with only 2.3 percent runoff in the rye and 9.2 percent in the winter dormant triticale. The rye cover crop increased the amount of water that infiltrated into the soil by one-third of an acre-foot over the bare fallow treatment."

The key to this strategy is terminating the cover crop early, because when Smith and Cahn looked at full-term cover crops in their trial, they found that even less water percolated into the ground than in a fallow field.

Terminating the cover crop early in organic fields during the rainy season can be tricky because there are fewer herbicides, but it can be done.

"Low-residue cover crops can also be used in organic fields as long as they can be killed before they produce too much biomass," according to Brennan. "Grass cover crops, including cereals, are not recommended, because they are difficult to kill with tillage. Organic herbicides work better on young plants and are weak on grasses."

This system can be challenging in strawberry fields after they have been planted in the late fall or early winter, because only the furrow bottoms can be planted to a cover crop, and rainwater can run quickly off the plastic mulch.

It may be helpful in these fields to plant an unusually dense cover crop in the furrows, or to have underground outlets and sediment basins to capture the water before it leaves the field, the researchers said.

Leaving fields flat, or unlisted, until shortly before planting in the spring may also help infiltration by slowing down saturation of the furrows, they said.

Vegetated ditches and sediment basins and traps can capture stormwater before it leaves the field entirely.

Half the water reaching the entire underground basin used to irrigate the Salinas Valley comes from rivers and

Hot off the press:
Sign up to receive weekly alerts from the best Ag publication in California
Enter your e-mail ×

As the underground water level drops, shallower wells may produce less water, suck more sand, require more service or have to be replaced entirely by deeper wells.

If the groundwater drops below sea level, ocean water moves farther into the underground system, leaving more growers with water too salty to grow a good crop.

(Bob Johnson is a reporter in Santa Cruz. He may be contacted at bjohn11135@aol.com.)

Permission for use is granted, however, credit must be made to the California Farm Bureau Federation when reprinting this item.