

Chlorpyrifos and *Ceriodaphnia* Toxicity Exceedances in Walker Creek Eliminated

Water quality in Walker Creek, a small waterway in Glenn County, California, is monitored to satisfy requirements of the Central Valley Water Board's Waste Discharge Requirements for Growers within the Sacramento River Watershed that are Members of a Third-party Group (Order R5-2014-0030-R1). Between August 2007 and July 2009, exceedances of the water quality objectives for chlorpyrifos and toxicity to *Ceriodaphnia dubia* triggered the implementation of a management plan (under prior Order R5-2009-0875) to reduce constituent concentrations to acceptable levels. Actions taken by the Colusa Glenn Subwatershed Program (who monitors the waterway), Sacramento Valley Water Quality Coalition (the Third-party Group representing growers in the drainage), and growers to address the exceedances were successful and, in January 2014, completion of the management plan was approved by the Central Valley Water Board's Executive Officer.

This program demonstrates the effectiveness of intensive outreach coupled with management practice implementation to protect water quality in watersheds with irrigated agriculture.

– Pamela Creedon, Central Valley Water Board Executive Officer

Problem

Exceedances of the water quality objective for chlorpyrifos occurred in August and September 2007 and July 2009 in Walker Creek. Significant toxicity to *Ceriodaphnia dubia* coincided with the September 2007 chlorpyrifos exceedance. The August 2007 and December 2009 samples were not toxic to *Ceriodaphnia*.



Figure 1: Micro irrigation in almond orchard. Photograph from USDA, Bay Delta Initiative Walker Creek, July 2015.

The chlorpyrifos exceedances triggered the requirement that a management plan be implemented in the Walker Creek drainage under Monitoring and Reporting Program Order R5-2009-0875 to reduce chlorpyrifos concentrations to acceptable levels.

Project Highlights

The management plan for chlorpyrifos and *Ceriodaphnia* toxicity in Walker Creek was supported by technical and financial assistance provided by the Natural Resources Conservation Service (NRCS). The management plan outlined several actions that would be taken to address the exceedances. These actions included:

- Outreach to growers and stakeholders to inform them that exceedances had occurred and increase awareness of the requirements of the Irrigated Lands Regulatory Program (ILRP).
- Survey growers to determine what management practices were in use.
- Use grant funding awarded through the NRCS Agricultural Water Enhancement Program (AWEP) and Bay-Delta Initiative to fund the implementation of additional management practices.
- Hold workshops to educate growers about additional management practices that could be implemented to reduce the potential for chlorpyrifos discharges to surface water.

Growers converted approximately 618 acres of farmland from flood irrigation to micro irrigation in 2011 and 2012.



Figure 2: Growers attend outreach workshops.
Photograph from the Sacramento Valley Water Quality Coalition.

Growers' investment in best management practices that protect water quality was funded in part through "cost-share funding" (50-75 percent) through the NRCS AWEF and Bay-Delta Initiative. The grant funding had supported conversion of 109 acres to micro irrigation when the Sacramento Valley Water Quality Coalition requested that the management plan be approved for completion. Additional acreage was also committed for conversion at that time.

Results

After implementation of the management plan, no further exceedances of the water quality objectives for chlorpyrifos or *Ceriodaphnia* toxicity in Walker Creek occurred (as of the 24 January 2014 approval of management plan completion). "This program demonstrates the effectiveness of intensive outreach coupled with management practice implementation to protect water quality in watersheds with irrigated agriculture," said Pamela Creedon, Executive Officer of the Central Valley Water Board, in her approval of management plan completion for Walker Creek.

For Additional Information:

Bay Delta Initiative, Walker Creek

http://glenncountyrwd.org/wp-content/uploads/2015/03/CGSP_NRCS_WalkerCreekSuccess.pdf