

CURES Celebrates Ten Years

Parry Klassen, Executive Director - Coalition for Urban/Rural Environmental Stewardship

This year, 2007, marks the tenth anniversary for CURES, the Coalition for Urban Rural Environmental Stewardship. In ten years, CURES has grown to an organization reaching thousands of farmers, PCAs and homeowners in California with a message of stewardship for crop protection and pest control products and nutrients.

The original idea for CURES was gelled over lunch between two experts in water and pesticide regulations. They envisioned forming a group that would pursue public and private support to promote stewardship of farm and home pest control products and nutrients. After drafting Len Richardson, editor of *California Farmer* magazine, to be Board Chairman, a Board of Trustees was selected that represented a cross section of agricultural and urban interests.

Ten years later, CURES is well on its way to fulfilling the goals set by its first Board and Chairman. With more than \$2 million in State Water Board grants and another \$250,000 in privately funded projects, CURES is in the midst of a "project boom" that has prompted the non-profit organization to hire two full time employees along with several specialized consultants to assist its Executive Director, Parry Klassen.

A common question is what does CURES actually do? In practice, CURES forms partnerships with other specialists and interested parties to work on solutions to problems impacting ag and urban areas. Most recently, CURES efforts have focused on water quality problems originating from irrigated agriculture and urban areas. CURES relies on two sources of funding for its



The ditch on the left is a vegetated ditch and the ditch on the right is a standard dirt ditch (no vegetation). The velocity of runoff from the alfalfa field is significantly reduced in the vegetated ditch. This alfalfa field and the two ditches were used for a vegetated ditch study and the Landguard studies.

programs and projects: grants from the state agencies; and private funding from commodity groups, ag organizations or pesticide registrants. This funding is used to develop outreach programs and to perform studies assessing the effectiveness of Best Management Practices (BMPs) with potential for protecting surface water. Outreach programs include presentations to growers and PCAs and production and distribution of BMP publications for specific crops or pesticides. Recent BMP efficiency studies have focused on technologies such as Smart Sprayers, vegetative ditches, use of PAM in irrigation water, among others. CURES also uses technology such as an orchard sprayer calibration instrument to assist in edu-

cational efforts for orchard growers.

Watershed Coalition Activities

Since 2003, CURES staff has worked closely with the Central Valley watershed coalitions formed to comply with the Irrigated Lands Program implemented by the Central Valley Water Quality Control Board. A responsibility of watershed coalitions is to provide growers with information on BMPs should farm inputs be causing problems in surface waters. CURES staff assists coalitions in organizing outreach events, developing response plans for pesticide exceedances in waterways and providing BMP publications on specific constituents or issues relevant to growers and



The instrument in the foreground, with hoses connected to each of the nozzles, is used to measure nozzle output efficiency, uniformity on the two sides of the boom, and total output per acre. The results provided by this instrument help the calibration technician to identify and fix or replace clogged nozzles/strainers and worn nozzles, and to size the various nozzles appropriately for the growers needs. The tall standing instrument behind the sprayer represents a model tree and is used to measure the vertical distribution of spray on a tree. The results provided by this instrument help the calibration technician to adjust the nozzles and fins to direct the spray at the tree foliage. These adjustments reduce or eliminate spray prone to drift (applied above the foliage) and/or spray directed at the ground where it can easily runoff into nearby waterways.

PCAs. CURES actively participates with the Sacramento River Water Quality Coalition, led by the Northern California Water Association (NCWA); the West San Joaquin Water Quality Coalition, led by the San Joaquin River Drainage Authority; and the East San Joaquin Water Quality Coalition, which covers the region bordered by the Stanislaus, Tuolumne and Merced Rivers.

Water Quality BMP Publications

A key strength of CURES is its condensed, illustrated publications on water quality BMPs. Over the last two years, CURES has partnered with numerous supporters to publish booklets on water quality BMPs for cotton, grapes and pyrethroids insecticide used on row crops and orchards. A "BMP Handbook," funded through a State Water Control Board grant in the San Joaquin Valley, contains BMP technical bulletins on sediment ponds,

vegetated ditches, polyacrylimides (PAM) and irrigation scheduling.

Watershed Coalition News

The Almond Board of California continues its fourth year of support for CURES to publish Watershed Coalition News, a four-page newsletter covering developments in the Irrigated Lands Program and updates on BMP research. The newsletter is circulated to more than 15,000 growers in the Central Valley and is also webcast to members of watershed coalitions. An "Ask the Expert" column regularly features Water Board staff and Board members answering questions about surface water quality regulations and irrigated agriculture. Three editions are published annually.

High Tech Orchard Calibration Instruments

In 2001, Ken Giles, a well known U.C. Davis engineer specializing in

sprayer technology, notified CURES about an orchard sprayer calibration instrument that was being used in Europe for their sprayer certification program. CURES was convinced that this instrument would be a valuable tool for growers in California. In 2005, the State Water Board funded the purchase of the Austrian-built "Pessl Instrument." for the CURES orchard sprayer calibration program.

CURES project technician Robert McMurry hauls the calibration instrument actually two separate devices, to grower meetings and on-farm clinics across the Sacramento Valley. The instruments feed data to a laptop computer: one device connects to each nozzle on the spray boom to measure sprayer output; the other device is a 12 foot tall simulated tree that collects spray as the equipment is operated and measures the sprayer deposition pattern. McMurry performs the one or two hour tune-up and provides grow-

ers with a computer printout indicating total output per acre, individual nozzle output, uniformity across the spray boom and spray distribution on the tree canopy. The instrument can also help growers customize the spray pattern based on the tree size and shape. On-farm sprayer tune-ups are offered to any orchard grower in the Sacramento Valley.

CURES is working with collaborators in the Sacramento Valley to organize and hold calibration clinics, including the Butte/Yuba/Sutter Watershed Coalition, the County Agricultural Commissioners in Butte, Yuba and Sutter counties, local University of California farm advisors, Resource Conservation Districts, the Yuba-Sutter Farm Bureau and farm input retailers. For information on participating in future calibration clinics, contact Tamara Taliaferro at 530-271-5822 or go to www.curesworks.org and check under "Orchard Sprayer Calibration Clinics" to sign up for an on-farm tune-up.

In Europe when the first sprayer tune-ups were performed with this instrument in the 1990s, sprayer efficiency was improved up to 30%. The calibration instrument is one of several components of a CURES orchard Best Management Practice (BMP) project being funded by a State Water Resources Control Board grant. Other activities include publishing booklets on orchard BMPs, providing funding to plant cover crops and grass filter strips in and around orchards near waterways, and evaluating the efficiency of Smart Sprayer Technology™.

Pyrethroid Stewardship Program

It was not long after a U.C. Berkeley researcher linked pyrethroids

Please turn to page 52



Photo above: All of the irrigation runoff from the alfalfa field is being diverted from the standard ditch (no vegetation) into the vegetated ditch for study purposes.

Photo below: Jim Markle (CURES) and Sheryl Gill (DPR).



CURES, cont. from pg. 30

and sediment toxicity that two pyrethroid registrants, Syngenta and Bayer Crop Science, commissioned CURES to develop a stewardship program for pyrethroid uses in orchards and row crops. In 2005, CURES staff began giving a series of continuing education presentations in the Central Valley and Central Coast describing BMPs for the insecticides in orchards and row crops. Those presentations are continuing in 2007 as are the distribution of two pyrethroid BMP booklets describing the practices. Emphasis in the orchard and row crop publications is on managing spray drift and preventing sediment from moving off site. Sediment transport is a particular focus since pyrethroids are not generally found in water due to their lack of solubility. They also have short persistence in water because they rapidly move into soil and sediment particles or onto plant surfaces. The publication recommends that when pyrethroids or any pesticide or nutrient is applied that growers strive to:

- Avoid drift during pesticide or nutrient applications into nearby waterways.
- Reduce or eliminate sediment movement off the orchard site.
- Reduce or eliminate flows of runoff water carrying dissolved pesticides and nutrients.

Practices that can assist in managing runoff water to minimize or eliminate the impact of off-site movement of sediment include:

- Sediment basins
- Tailwater return systems
- Riser boards or dirt banks that retain winter rain runoff (after dormant sprays are applied) for a period of time to allow sediment to settle out.

The publications are available through Central Valley agricultural commissioners, farm retailers, Central Valley watershed coalitions and CURES.

Enzyme for Pesticide Breakdown

In 2006, CURES was commissioned to assist an Australian company in introducing a water treatment technology with potential to mitigate runoff of pesticides into waterways. The enzyme-based product, Landguard™ OP-A, is used in Australia and Europe to break down organophosphate insecticides, including chlorpyrifos and diazinon, in sheep dips. Orica Pty., the company that developed Landguard, contracted with CURES to perform two studies in a Stanislaus County alfalfa field that showed complete breakdown of Lorsban® (chlorpyrifos) by the enzyme in irrigation water flowing from a field treated with the insecticide. Toxicity tests of water samples taken after the treatment showed no toxicity to water flea or fat head minnow.

BMP Study Examines Costs, Benefits

What is the cost of BMP implementation? As many already know, it can be costly to install and maintain certain BMPs for irrigated crops. That is confirmed by Dennis Wichelns, an agricultural economist with the California Water Institute (CWI) at California State University, Fresno. His economic study was managed by CURES and funded by the State Water Resources Control Board and the California Bay-Delta Authority (CALFED). In his report, Wichelns noted that increased costs can be offset by BMP benefits including saving high value

water and avoiding the cost of compliance with environmental regulations. The Orestimba Creek Watershed Agricultural Water Quality Pilot Program includes three economic studies of BMPs by Wichelns plus installation cost and maintenance compilations for irrigation recirculation systems, sediment ponds, vegetated ditches, use of PAM in irrigation water and low pressure irrigation systems. Researchers from CWI interviewed growers in western Stanislaus County and examined relevant research from other regions of California to come up with the cost information. Also produced in the project is a publication entitled *Grower Handbook: Management Practices for Protecting Water Quality* that was distributed to landowners in the study area.

Orchard and Field Crop BMP Studies

A common theme in the grants pursued by CURES through the State Water Resources Control Board is partnering with an institution to perform studies on various BMP practices. CURES has in the works or completed six such studies:

Tree See Technology in Orchard Sprayers

Just how much less pesticide is deposited on the ground in dormant sprays when Smart Sprayer technology is used for the application? That is a question C.S.U. Chico researcher David Brown set out to answer. A mature dried plum orchard in Sutter County with distinct gaps between trees was selected for the study. The results were dramatic: a 39% reduction in applied pesticide with the Smart Sprayer compared to a conventional sprayer.

Spray deposit on the orchard floor was reduced by 54%. Concentrations of diazinon in runoff from the treated areas were also reduced by 44%. Brown reported that “the results strongly document the environmental and economic benefits provided by target-sensing spray technology in orchards.”

New Methods to Determine Sprayer Performance.

Is there an easier way to determine tree coverage by an orchard sprayer? Ken Giles and Dave Downey, UC Davis agricultural engineers, set out to look at different ways to answer that question with a State Water Board grant managed by CURES. Two options were identified for field use that can assist growers in evaluating spray applications. Surround WP (Englehard Corp., Iselin, NJ), is a wettable powder that can be applied during spray applications. The material leaves a thin white film on crop surfaces and gives immediate visual indication about sprayer coverage and application techniques. Another device evaluated is a GFP-meter (Optosciences, Hudson, NH). This hand-held optical fluorometer can be used with a variety of dyes (rhodamine and fluorescein) and can be configured for specific dyes (for example BSF). The meter uses a probe to measure concentrations on plants immediately after an application. Both products are commercially available and can provide quick feedback for growers on application coverage, ground deposition and potential drift.

BMP Studies in the Works or Results Pending

CURES is coordinating additional BMP studies for protecting water quality, working in conjunction with

scientists from the University of Pacific and California Department of Pesticide Regulation. The studies:

- Evaluate the effectiveness of vegetative ditches for removing pyrethroids in drainage water from alfalfa and tomatoes;
- Evaluate the effectiveness of a constructed wetland (which receives irrigation drainage water) in removing OP pesticides and sediment;
- Evaluate the effectiveness of PAM in row crops to remove chlorpyrifos and pyrethroids from irrigation drain water;
- Evaluate the effect of resident vegetation in almonds to mitigate dormant orchard runoff of pyrethroids and OP insecticides.

CURES Fundraising Campaign

As part of our 10 year anniversary, CURES has undertaken a fundraising campaign. Resources are needed to continue pursuing grants and developing projects with collaborators who partner with us to refine and promote BMPs for agriculture and urban audiences. New issues are emerging now, especially in the water quality arena: watershed coalitions in agricultural areas must now sample for nutrients and dozens of additional pesticides. Pressure is also mounting on urban uses of pest control products widely applied to control ants, spiders and termites. CURES is already involved in these issues and intends to continue working proactively on solutions. Our approach in promoting stewardship of these important inputs: keep the message simple and practical. CURES publications and audiovisual presentations relay condensed information about Best Management Practices (BMPs) for these farm and urban

inputs using clear illustrations, check lists and expert contacts. We continue to work with local, trusted entities to get that message to our target audiences. CURES’ philosophy is that growers, crop advisors and pest control professionals can use smart management and stewardship practices to address growing concerns about pesticides, fertilizers and the environment. Contact us at www.curesworks.org if you are interested in supporting our organization. 🌱

