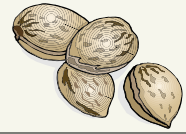


THE COMMUNITY ALLIANCE WITH FAMILY FARMERS
and the COLUSA COUNTY RESOURCE CONSERVATION DISTRICT Present...



THE ALMOND OBSERVER



W I N T E R 2 0 1 1 • I S S U E 5

THE SUNSET OF THE COLUSA ALMOND PROJECT

COLUSA ALMOND PROJECT PARTNERS

- Community Alliance with Family Farmers
- Colusa County Resource Conservation District
- Audubon California—Landowner Stewardship Program
- USDA-Natural Resources Conservation Service
- Larry Walker Associates
- UC Davis Ag GIS Lab

Best Management Practices (BMPs) for Reducing Sediment and Pesticides in Runoff from Colusa County Almond Orchards

In 2006 the idea of creating the Colusa Almond Project came from a committed group of Colusa County almond growers who had participated in CAFF's BIOS program in the late 1990's. Recognizing their need for improved practices, the number of new acres of



Cover Crop in Almond orchard with Crimson Clover in full bloom

almonds in the county and a desire for additional assistance in slowing erosion and sedimentation in their

local waterways, they contacted CAFF and asked about the possibility of doing a project that would benefit almond producers and watersheds in the county. CAFF enlisted the Colusa County Resource Conservation District to facilitate contacting other local almond producers to verify there was sufficient interest in the project to submit a proposal

to the State Water Control Board seeking funding under the Agricultural Water Quality Grant Program. Once interest was confirmed the proposal was submitted to address water quality in runoff from almond orchards along tributaries to the Colusa Basin Drain, which flows into the Sacramento River. The main goal of the project was to reduce the amount of sediment and pesticides in winter runoff from select almond orchards by demonstrating a number of best management practice (BMP) techniques. These BMPs offer practical

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MONITORING RESULTS

The Colusa Almond Project included a monitoring component to evaluate the effectiveness of the installed Best Management Practices (BMPs). General conclusions from the monitoring efforts are as follows:

Results from grab sampling and "real-time" monitoring showed that turbidity and suspended solids concentrations did not vary substantially between upstream and downstream locations during storm events. This indicates that the BMPs implemented on the project sites successfully minimized the addition of excess sediment from the orchard sites.

The results also support the conclusion that the grassy swale and orchard stream BMPs contributed to removal of OP pesticides. Although growers participating in the project did not apply diazinon and chlorpyrifos during the project, these pesticides were detected in some upstream samples. Detected chlorpyrifos concentrations in the grassy swale inflow (0.113 ug/l and 0.027 ug/l) exceeded the Basin Plan objective of 0.015 ug/l. Detected concentrations of diazinon were all below the Basin Plan objective (0.1 µg/l). During one storm event, diazinon and chlorpyrifos were detected in upstream orchard inflow, but were not detected in the downstream orchard outflow below the grassy



swale BMP. No rigorous analysis of removal efficiency can be made given the limited number of detections, but it appears that the grassy swale and orchard stream BMPs did contribute to removal of OP pesticides.

Evidence from sediment sampling also supports removal of pyrethroids by the grassy swale BMP. Pyrethroid pesticides were detected in the grassy swale inflow sample, but were below detection downstream in the grassy swale midpoint sample. At another location, pyrethroids were detected in both the upstream sample (esfenvalerate, fenvalerate, danitol and bifenthrin) and downstream (esfenvalerate, fenvalerate, and bifenthrin) sediment samples. However, the concentrations of pyrethroids were reduced by nearly

50% in the downstream sample. Overall, the results indicate that the BMPs have been effective at two levels: (1) in preventing or minimizing sediment (and associated pesticides) in runoff from the project sites; and (2) trapping and removing pesticides associated with inflows from upstream of the project sites.



SUNSET CONTINUED...

management solutions that are economically viable and compatible with the necessary agricultural operations associated with almond crop production.

Since the project started in 2007, project partners have worked on eight almond orchard sites in Colusa County to install various BMPs such as cover crops, insectary hedgerows, grassed swales and stream bank stabilization techniques. Much of the plant and irrigation installation was completed over the course of thirteen field days by Colusa County high school students through a partnership with the SLEWS Program. Measurements of sediment and Diazinon loads were taken upstream and

downstream before and after project implementation to assess BMP effectiveness. Landowners were informed about orchard management practices that help reduce pesticide use, such as orchard sanitation and sprayer calibration. Outreach to landowners throughout Colusa County was extensive; CAFF and project partners held nine field days on pest and land management techniques and distributed four newsletters to over 300 almond growers over the course

of the project. A BMP Manual for Colusa County Almond Orchards, along with a comprehensive Integrated Pest Management (IPM) packet, was created and will be distributed to hundreds of almond growers and landowners in Colusa and surrounding counties.

CAFF and their project partners are very proud of the work completed



during the Colusa Almond Project. They solidified and built strong partnerships that effectively assisted local producers to address their water quality concerns. During landowner exit interviews, we found that our participating landowners were overwhelmingly pleased with the results of this project. Although a great success, this project faced many challenges along the way. The original project was to last three years, but in December 2008, all grant work was suspended due to a stop work order as

a result of the California budget crisis. During this period CAFF renegotiated the project's funding through the American Recovery and Reinvestment Act of 2009. It was almost ten months before the project could resume and contractors could be paid for work that had been completed prior to the grant freeze. The turnover of multiple project staff at CAFF as well as their other partners was an ongoing obstacle to overcome

throughout the project. Despite these turnovers in staff, the project team remained consistently productive and committed to the project. The Colusa Almond Project will come to an end Spring 2011. CAFF and their partners are confident that the good work completed during this project will serve as a model for future work in the watershed.

CAFF would like to extend a sincere thank

you to all of its project partners, participating landowners and the California State Water Resources Control Board, without whom the success of this project would not have been possible.



LET IT GROW!

Vegetation Improves Water Quality

By Mary Fahey, Colusa County Resource Conservation District

Land use decisions have lasting effects on water quality. One of the goals of the Colusa Almond Project has been to build the capacity of local agriculture and environmental organizations to address water quality issues. As part of this project, Best Management Practices (BMPs) were integrated into several Almond farming operations in the Arbuckle area to improve water quality in orchard runoff. Each of the project sites contains a seasonal creek or stream that carries runoff to the Colusa Basin Drain. The BMPs were put in place with the goal of significantly decreasing contaminants such as sediment and pesticides in orchard runoff.

Most of the Best Management Practices applied during this project included vegetation of some sort. The project integrated cover crops, grassed swales, vegetative filter strips, native shrub plantings and grassed waterways. Simply put, the right vegetation on the land improves water quality.

Let's look at two extremes. First, imagine an almond orchard (adjacent to a seasonal creek) that is sprayed clean. There is no

vegetation throughout the orchard and no vegetation along the creek banks. During a rain event, water sheets off of the orchard floor and into the creek, carrying sediment and accumulated chemicals with it,



and eroding creek banks. There is nothing in place to slow the runoff, provide a pathway for the water to infiltrate into the ground, or filter contaminants.

Now, imagine an orchard that has been planted with cover crops between the rows, natural vegetation is allowed to grow between the orchard and the creek, and a thick stand of native grasses with deep root systems are established along the creek banks. With these BMPs in place, this orchard is set to filter runoff, provide optimal infiltration and stop soil erosion in the orchard and along the creek banks. Added

benefits include groundwater recharge, improved soil health and habitat for beneficial insects and pollinators.

Vegetation is the key difference

in these two scenarios, and a big factor in water quality enhancement. Even if a landowner does not want to deal with the time and expense of planting specific cover crops and grasses, a great deal of benefit can be obtained by just letting natural vegetation grow between orchard rows and along the banks of waterways. A little more mowing and less herbicide use is a great step towards improving water quality in orchard runoff. So, remember...Let It Grow!





PROFILE OF A SITE

Gene Martinez first came to the Colusa County Resource Conservation District (CCRCD) and NRCS in 2000 for assistance in addressing natural resource concerns affecting his almond orchard that borders Elk Creek near the town of Arbuckle. His resource concerns included: erosion, sedimentation, possible flooding, and lack of wildlife. Like many creek sections in the Colusa Basin Watershed, his site had been long denuded of most stream bank vegetation. This lack of cover not only creates a lack of habitat for local fauna, it creates a situation where the stream banks lack stability during high

winter flows. The lack of stability during high flows creates excess erosion and sedimentation on the site, which affects downstream water quality.

CAFF's Colusa Almond Project was an excellent opportunity for Gene to expand his streambank stabilization efforts that began in 2001. The current



work focused on adding additional native plants along the top of the bank and arming the toe of the bank with large rocks inter-planted with willow cuttings.

Members of the project team had the opportunity to chat with Gene during a recent workday at his site. They found him to be very satisfied with the reduction of erosion and sedimentation as a result of this project. He has also enjoyed a return of a variety of wildlife to the area. Gene's efforts to successfully incorporate conservation practices along Elk Creek serves as an outstanding model for adjacent landowners.

LEARN BY DOING - SLEWS PROGRAM IN COLUSA COUNTY

Through the Student and Landowner Education and Watershed Stewardship (SLEWS) program of the Center for Land-Based Learning (CLBL), five classes of high school students planted over 1500 native trees and shrubs along streams in Colusa County as part of the Colusa Almond Project. The students came



from three high schools: Colusa, Maxwell and Pierce. Through a yearlong commitment to their SLEWS project, students learned how native vegetation along streams can provide bank stability, reduce erosion, create habitat for beneficial insects and other wildlife, and reduce the amount of pesticides and herbicides used on farm edges.

However, this was not just a learning exercise. Students were an integral part of the implementation of these native plant hedgerows and streamside plantings. During a total of 13 field trips, students helped with the restoration. Planting trees, shrubs and grasses, installing drip irrigation, and monitoring plant survival, were all activities students accomplished, while also applying classroom science concepts, such as biodiversity, in a real world setting.

Essential to the success of the project were the natural resource professionals



who worked in collaboration with CLBL. Audubon California's Landowner Stewardship Program, the Colusa County Resource Conservation District, the Natural Resources Conservation Service and the Community Alliance with Family Farmers all served as mentors for the high school students at field days. These knowledgeable professionals not only shared their expertise and ensured that the restoration work was completed properly, but also shared their own paths from high school to their careers, providing a window for soon-to-graduate students into what might be their next step after high school.



PROJECT PARTNERS...

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