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# Efficacy of Settlement Ponds for Reducing Pyrethroid Runoff in Almond Orchards

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**Project No.:** 08-WATER4-Klassen

**Project Leader:** Parry Klassen  
Coalition for Urban Rural Environmental Stewardship  
531-D North Alta Ave  
Dinuba, Ca 93618-3203  
(559) 646-2224  
pklassen@unwiredbb.com

**Co-Investigator:** James Markle  
Coalition for Urban Rural Environmental Stewardship  
531-D North Alta Ave  
Dinuba, CA 93618-3203  
(559) 646-2224  
jcmarkle@sbcglobal.net

## **Objectives:**

This study is designed to investigate the effectiveness of the use of sediment basins for reducing pyrethroid loading in drainage water from almond orchards in the Central Valley of California.

Pyrethroids are typically applied to the orchards as either a winter dormant spray or as an in-season spray to control various pests. Pyrethroids attach to soil particles and can be washed into waterways with rain erosion. To reduce erosion, the grower may apply polyacrylamide (PAM) at each runoff event. Growers have indicated that without the use of PAM, the sediment pond will quickly fill up with sediment and they would have to excavate the pond and have the land re-graded on a periodic basis.

The study plans to test two Best Management Practices (BMP) scenarios:

- The use of sediment ponds alone (no PAM)
- The use of sediment ponds in combination with PAM

Runoff samples will be analyzed for pyrethroid residues and total suspended solids (TSS). Flow rates and volumes will be carefully monitored to relate sedimentation rate to flow.

## **Interpretive Summary:**

Previous research indicates that both sediment basins and polyacrylamide can play effective roles in the reduction of sediment and pesticide runoff from agricultural fields.

If sediment basins are designed correctly, they may trap up to 70-80% of the sediment that flows into them (see California Stormwater BMP Handbook, 2003). Compounds that are highly hydrophobic such as the organochlorine pesticides, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), and pyrethroids bind readily to the sediment and are rapidly removed from the runoff stream as the sediment is removed. This study will support Coalition for Urban Rural Environmental Stewardship (CURES) continuing outreach activities in the San Joaquin watershed.