



2008 USDA-CSREES National Water Conference  
Sparks, NV

## **Evaluation of Polymers for Controlling Sprinkler Run-off in Vegetables Fields on the Central Coast of California**

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### Abstract Text:

The intensive production of vegetables on the central coast of California requires high inputs of fertilizer and water. Sprinkler induced run-off from vegetable fields often carries sediment and nutrients into surface waters, and has impaired water quality of creeks and rivers draining into the Monterey Bay National Marine Sanctuary. To meet water quality targets set by regulations such as total maximum daily loads (TMDLs) and the conditional agricultural discharge waiver, growers will need to implement management practices that lessen the environmental impacts of agricultural run-off. Because of microbial food safety concerns in the production of leafy greens many vegetable growers have abandoned the use of traditional practices to treat irrigation run-off, such as sediment basins and vegetated ditches. During the past 5 years we evaluated methods of using anionic polyacrylamide polymers to reduce sprinkler-induced erosion, and lessen the impacts of irrigation tail water on surface water quality. Field trials conducted on a range of soil types on the central coast demonstrated that the addition of polyacrylamide to irrigation water at concentrations of 2.5 to 5 ppm reduced suspended sediments in run-off by an average of 90% and total N and total P in run-off by 50% to 70%. The addition of polyacrylamide to irrigation water did not consistently reduce the concentration of soluble nutrients, such as NO<sub>3</sub>-N and ortho-P. Also, the amount of irrigation run-off was not reduced with polyacrylamide. Under overhead sprinklers, polyacrylamide did not have a significant residual effect on the concentration of sediments and nutrients in the run-off water.

### Impact Statement:

Overhead sprinklers are used to irrigate approximately 90% of the vegetable acreage on the central coast of California. Run-off caused by sprinklers transports nutrients and sediments into surface water bodies and has caused significant water quality impairments. We demonstrated that the use of polyacrylamide with sprinklers greatly reduces the load of sediments and nutrients (N and P) carried into surface water by agricultural run-off.