



California Rice

It's in our Nature

Pyrethroid Monitoring at Upper Colusa Basin Drain and Sacramento Slough

Pyrethroids are synthetic insecticides that disrupt insect nervous systems. In California rice production, the pyrethroids used are primarily lambda-cyhalothrin (e.g. Warrior, Lambda-cy, etc.), used in approximately 35-40% of total acres in 2022-2024, and minor use of s-cypermethrin (e.g. Mustang). Lambda-cyhalothrin is effective in control of rice water weevil, and mostly effective as incidental use for tadpole shrimp. Recent studies from UC Davis indicate it has poor to no control of rice seed midge and armyworm. Other products, including diflufenzuron (e.g. Dimlin) and clothianidin (e.g. Belay), have efficacy in control of rice water weevil and incidental use for tadpole shrimp also. Lambda-cyhalothrin is persistent in sediment but degrades rapidly in water and sunlight. Product labels require a 7-day water hold and have a warning indicating toxicity to fish and aquatic organisms. The low cost and efficacy of lambda-cyhalothrin make it an important tool of the Integrated Pest Management toolbox for the rice industry.

In 2019, the Central Valley Regional Water Quality Control Board (CVRWQCB) approved an amendment to the Basin Plan to include new requirements for the control of pyrethroid pesticide discharges. This Basin Plan Amendment (BPA) and total maximum daily load for the Control of Pyrethroid Discharges (Pyrethroid BPA) established a conditional prohibition of discharge, along with monitoring requirements, for agricultural dischargers of pyrethroids. For rice, monitoring and reporting requirements to comply with the Pyrethroid BPA were added into the Rice WDR Order.

The California Rice Commission (CRC) conducted baseline sampling at each of the 4 core monitoring sites under the Rice WDR in 2021-2023. The results indicated more than one acute/chronic pyrethroid trigger and toxicity event for water at the Upper Colusa Basin Drain (CBD5) location and for sediment at the Sacramento Slough (SSB) location. These results required a Surface Water Quality Management Plan – Pyrethroids to be submitted to (and was approved by) the CVRWQCB to continue monitoring at these two locations, conduct education and outreach, and require growers in the subbasins to annually report pyrethroid use data to the CRC.

Monitoring results in 2023 and 2024 each had at least two sample events in May/early June with detections above the acute/chronic pyrethroid trigger and toxicity survival at CBD5. To encourage compliance in the CBD5 subbasin, the CRC is currently meeting with growers, applicators, PCA's, and County Agricultural Commissioner's offices to gather information and evaluate next steps. In addition, the CRC is conducting additional field specific monitoring.

Failure to meet to the pyrethroid monitoring objectives at CBD5 and SSB could result in further potential measures to gain compliance, such as expanded monitoring, NOIs before applications, increased inspections, limited acreage application, or in extreme cases expulsion of farms from the coalition that are in gross violation of label requirements and Rice WDR conditions.