

AMBIENT MONITORING REPORT

Date: October 28, 2014

1. Study highlights:

- Study Number: 282
- Title: Surface Water Monitoring for Pesticides in Agricultural Areas of California, 2013
- Author: Xin Deng

- Study Area: County: Monterey, San Luis Obispo, Santa Barbara, San Joaquin, Merced, Imperial, Riverside
 Waterbody/ Watershed: Salinas River, Old Salinas River, San Joaquin River, Santa Maria River, New River, Alamo River, Colorado River, Salton Sea (details see Appendix II. Table 1)

- Monitoring Area Type: Ag Urban Forested Mixed Other

- Water body type: Storm drain outfall Creek River Pond Lake
 Drainage ditch Other: [Click here to enter describe other](#)

- Objectives: Determine the number of pesticide detections, the detection frequency, and compare pesticide concentrations to the lowest US EPA aquatic life benchmarks for water samples collected in agricultural areas of California

- Sampling period: March, 2013 – October, 2013

- Pesticides monitored: Chlorpyrifos, Diazinon, Dimethoate, Malathion, Methidathion, Methomyl, Methoxyfenozide, Tebufenozide, Imidacloprid, Bifenthrin, λ-cyhalothrin, Cyfluthrin, Cypermethrin, Fenvalerate, Permethrin, Bensulide, Benfluralin, Ethalfluralin, Oryzalin, Pendimethalin, Prodiamine, Trifluralin, Oxyfluorfen, Chlorothalonil

- Major findings: For insecticides, imidacloprid, methomyl and methoxyfenozide had greater than 50% detection frequencies in the study. Chlorpyrifos, bifenthrin, λ-cyhalothrin and permethrin had 26-42 % detection frequencies. Diazinon, dimethoate, malathion and cypermethrin had 11-19% detection frequencies. The rest of them had 0-3% detection frequencies. Bifenthrin, λ-cyhalothrin and permethrin had the highest exceedance frequencies of 31-42% above the lowest OPP benchmarks (BM). Chlorpyrifos, malathion, methomyl and imidacloprid had the exceedance frequencies of 14-22% above their respective lowest BMs. The rest of the insecticides had 0-5% exceedance frequencies.

For herbicides and fungicides, bensulide had the highest detection frequency of 55%, followed by pendimethalin, oxyfluorfen and trifluralin with the detection frequencies from 18-39%. The rest of them had no detection. Pendimethalin and oxyfluorfen were the two chemicals that had one and two samples with concentrations above their lowest BMs, respectively.

2. Pesticide detection frequencies and exceedances:

Table 1. Pesticides Analyzed in Water. Raw Monitoring Data in Appendix III

| Pesticide | Number of samples | Reporting limit ($\mu\text{g/L}$) | Number of detections | Detection frequency (%) | Lowest USEPA OPP benchmark (BM) ($\mu\text{g/L}$) | Number of BM exceedances | BM exceedance frequency (%) |
|------------------------|-------------------|-------------------------------------|----------------------|-------------------------|---|--------------------------|-----------------------------|
| Chlorpyrifos | 84 | 0.01 | 22 | 26 | 0.04 | 12 | 14 |
| Diazinon | 50 | 0.01 | 6 | 12 | 0.105 | 2 | 4 |
| Dimethoate | 84 | 0.04 | 14 | 17 | 0.5 | 4 | 5 |
| Malathion | 84 | 0.02 | 16 | 19 | 0.035 | 12 | 14 |
| Methidathion | 84 | 0.05 | 0 | 0 | 0.66 | 0 | 0 |
| Methomyl | 18 | 0.05 | 10 | 56 | 0.7 | 4 | 22 |
| Methoxyfenozide | 18 | 0.05 | 9 | 50 | 6.3 | 0 | 0 |
| Tebufenozide | 18 | 0.05 | 0 | 0 | 4.3 | 0 | 0 |
| Imidacloprid | 51 | 0.05 | 43 | 84 | 1.05 | 9 | 18 |
| Bifenthrin | 36 | 0.001 | 15 | 42 | 0.0013 | 15 | 42 |
| λ -cyhalothrin | 36 | 0.002 | 11 | 31 | 0.002 | 11 | 31 |
| Cyfluthrin | 36 | 0.002 | 1 | 3 | 0.0074 | 0 | 0 |
| Cypermethrin | 36 | 0.005 | 4 | 11 | 0.069 | 0 | 0 |
| Fenvalerate | 36 | 0.005 | 0 | 0 | 0.017 | 0 | 0 |
| Permethrin | 36 | 0.002 | 13 | 36 | 0.0014 | 13 | 36 |
| Bensulide | 51 | 0.04 | 28 | 55 | 290 | 0 | 0 |
| Benfluralin | 28 | 0.05 | 0 | 0 | 1.9 | 0 | 0 |
| Ethalfuralin | 28 | 0.05 | 0 | 0 | 0.4 | 0 | 0 |
| Oryzalin | 28 | 0.05 | 0 | 0 | 15.4 | 0 | 0 |
| Pendimethalin | 28 | 0.05 | 11 | 39 | 5.2 | 1 | 4 |
| Prodiamine | 28 | 0.05 | 0 | 0 | 1.5 | 0 | 0 |
| Trifluralin | 28 | 0.05 | 5 | 18 | 1.14 | 0 | 0 |
| Oxyfluorfen | 28 | 0.05 | 10 | 36 | 0.29 | 2 | 7 |
| Chlorothalonil | 51 | 0.05 | 0 | 0 | 0.6 | 0 | 0 |

List of Tables in Appendices

Appendix I. Study 282 Protocol: Surface Water Monitoring for Pesticides in Agricultural Areas of California, 2013. <http://www.cdpr.ca.gov/docs/emon/pubs/protocol/study282protocol.pdf>

Appendix II. Sampling Sites, Water Quality Data, and Aquatic Life Benchmarks

Table 1. Sampling Site Information for Study 282

Table 2. Water Quality Data for Study 282

Table 3. US EPA Aquatic Life Benchmarks for Analytes in Study 282: Lowest Benchmark Values and Test Types. http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm

Appendix III. Raw Monitoring Data for Study 282

Appendix IV. Analytical Laboratory QA/QC Data

Table 1. Report Limit and Method Detection Limit for Study 282

Table 2. Blind Spikes for Study 282

Table 3. Matrix Spikes - Ogranophosphate Screen for Study 282

Table 4. Matrix Spikes - Diazinon Screen for Study 282

Table 5. Matrix Spikes - Methomyl Screen for Study 282

Table 6. Matrix Spikes - Imidacloprid Screen for Study 282

Table 7. Matrix Spikes - Bensulide Screen for Study 282

Table 8. Matrix Spikes - Chlorothalonil Screen for Study 282

Table 9. Matrix Spikes - Diacylhydrazines Screen for Study 282

Table 10. Matrix Spikes - Dinitroanilines + Oxyfluorfen Screen for Study 282

Table 11. Matrix Spikes - Pyrethroids Screen for Study 282

Appendix V. Analytical Methods for Study 282