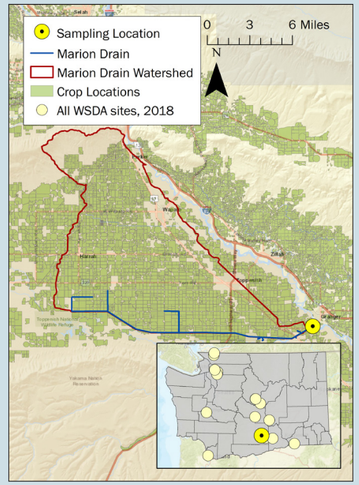
Marion Drain

Summary of 2018 Surface Water Monitoring Program Results | **November 2019**



The Washington State Department of Agriculture (WSDA) routinely monitors surface water throughout the state for the presence of pesticides. The monitoring is done between March and September, the typical season for pesticide use, and includes checking general water quality conditions and streamflow. State and federal agencies use this data to evaluate water quality and make exposure assessments for pesticides registered for use in Washington State. In 2018, WSDA monitored 16 sites in Washington, two of them in Yakima County.

Washington State Department of Agriculture

Natural Resources Assessment Section

Watershed and site information

Sampling history: 2003 - present

Watershed area: 82,400 acres (~129 square miles)

Area in agricultural use: 57,200 acres (~69% of total watershed acreage)

Main crops: Hops, field corn, apples, mint, and wheat

Fish habitat: Fall Chinook salmon, coho salmon, and summer steelhead (SalmonScape: apps.wdfw.wa.gov/salmonscape/)

Sampling dates: 29 sampling visits, March 12 – Nov. 5

Water testing:

- WSDA tested for 144 current and legacy chemicals (50 insecticides, 54 herbicides, 20 fungicides, 15 pesticide degradates, 2 synergists, 1 antimicrobial, 1 insect repellent, and 1 wood preservative).
- Samples were analyzed at Manchester Environmental Lab, Port Orchard, Washington.
- WSDA compares detected pesticide concentrations to WSDA assessment criteria, which are half of state and federal water quality criteria. Each pesticide has its own assessment criteria, based on its toxicity to aquatic animals, insects, and plants.
- WSDA identifies Pesticides of Concern (POCs) as current-use pesticides that have been found somewhere in the state above WSDA's assessment criteria in recent years.

Notes:

- Marion Drain is an 18-mile long irrigation ditch that releases into the Yakima River.

Results and Conclusions

- There were 509 total pesticide detections in Marion Drain from 5 different use categories: 20 types of herbicides, 8 fungicides, 12 insecticides, 5 degradates, and 2 other pesticide-related chemicals. This substantial increase from 2017 is largely due to new equipment at the lab and does not necessarily reflect an increase in pesticide use.
- Of the total pesticide detections, 17 were above WSDA's assessment criteria.
- The POCs chlorpyrifos, clothianidin, diazinon, diuron, fipronil, imidacloprid, malathion, metolachlor, pyridaben, and thiamethoxam were detected.
- All detections of imidacloprid at this site were higher than WSDA's assessment criteria.
- Imidacloprid has also been detected in previous years at concentrations known to negatively affect aquatic life.

Recommendations

- **Make use of natural protections**
  - Use buffers, filter strips, sediment basins, ground cover, and setbacks.
- **Be informed**
  - Read and follow pesticide label directions, and be familiar with active ingredients.
  - Plan applications using the weather forecast to reduce the chances of drift or runoff.
  - Review WSDA's POCs and choose less-toxic pesticides when possible.
- **Care for your equipment and products**
  - Calibrate, maintain, and inspect application equipment regularly.
  - Properly dispose of all unneeded pesticides. Visit agr.wa.gov/wastepesticide to learn about waste pesticide collection events.

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The calendar below shows the concentration in µg/L and date sampled of each WSDA POC. This calendar does not include all the pesticides WSDA found during the growing season. Detected concentrations that exceed WSDA's assessment criteria have a higher potential to cause harm to aquatic ecosystems. The "–" signifies a sample or measurement that was not collected or could not be analyzed.

Washington State's Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations

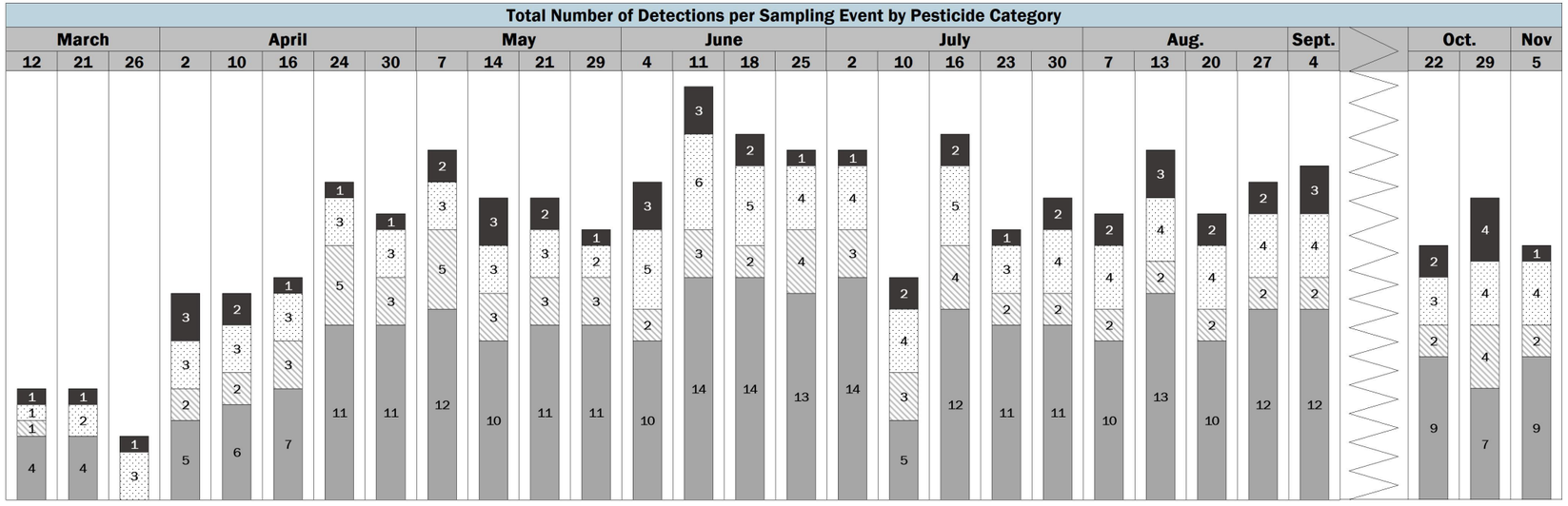
Month		March			April					May				June				July					Aug.				Sept.	Oct.		Nov
Day of the Month	Use*	12	21	26	2	10	16	24	30	7	14	21	29	4	11	18	25	2	10	16	23	30	7	13	20	27	4	22	29	5
Chlorpyrifos	I		0.005		0.027		0.005	0.003	0.002	0.007	0.002	0.002	0.015	0.005	0.003	0.002	0.004	0.002		0.002											
Clothianidin	I	0.014	0.036	0.035	0.017	0.015	0.009	0.008	0.009	0.008	0.008	0.010	0.013	0.008	0.016	0.030	0.025	0.023	0.025	0.029	0.020	0.022	0.024	0.018	0.019	0.018	0.020	0.033	0.033	0.032
Diazinon	I																						0.004			0.002				
Diuron	H				0.013	0.016	0.011	0.042	0.033	0.027	0.011	0.011	0.014	0.008	0.021	0.016	0.007	0.009	0.011	0.008	0.004	0.004	0.004	0.003	0.003		0.003			0.003
Fipronil	I					0.002																								
Imidacloprid	I														0.005												0.008			
Malathion	I													0.005					0.005	0.003										
Metolachlor	H							0.002	0.002			0.001				0.001														
Pyridaben	I																									0.003				
Thiamethoxam	I			0.009										0.005	0.013	0.025	0.012	0.011	0.008	0.010	0.011	0.012	0.011	0.009	0.011	0.014	0.025	0.050	0.047	0.040
Total suspended solids (mg/L)		7.0	8.0	7.0	20.0	31.0	35.0	4.0	3.0	8.0	4.0	5.0	1.0	7.0	5.0	5.0	3.0	3.0	2.0	3.0	3.0	4.0	5.0	6.0	16.0	10.0	5.0	3.0	5.0	2.0
Streamflow (cubic ft/sec)		146.30	143.10	144.84	234.80	–	–	35.54	24.54	31.47	41.24	51.44	18.60	25.91	37.28	34.54	26.61	18.66	21.07	21.63	24.21	30.22	41.73	44.24	–	70.86	41.30	20.69	17.08	14.64
Precipitation (total in/week)		0	0.03	0.09	0	0.52	0.38	0	0	–	–	0.03	0.04	0.02	0.16	0.09	0.05	0	0.01	0.01	0.03	0.03	0.01	0.01	0.14	0	0.01	0	0.34	0.03

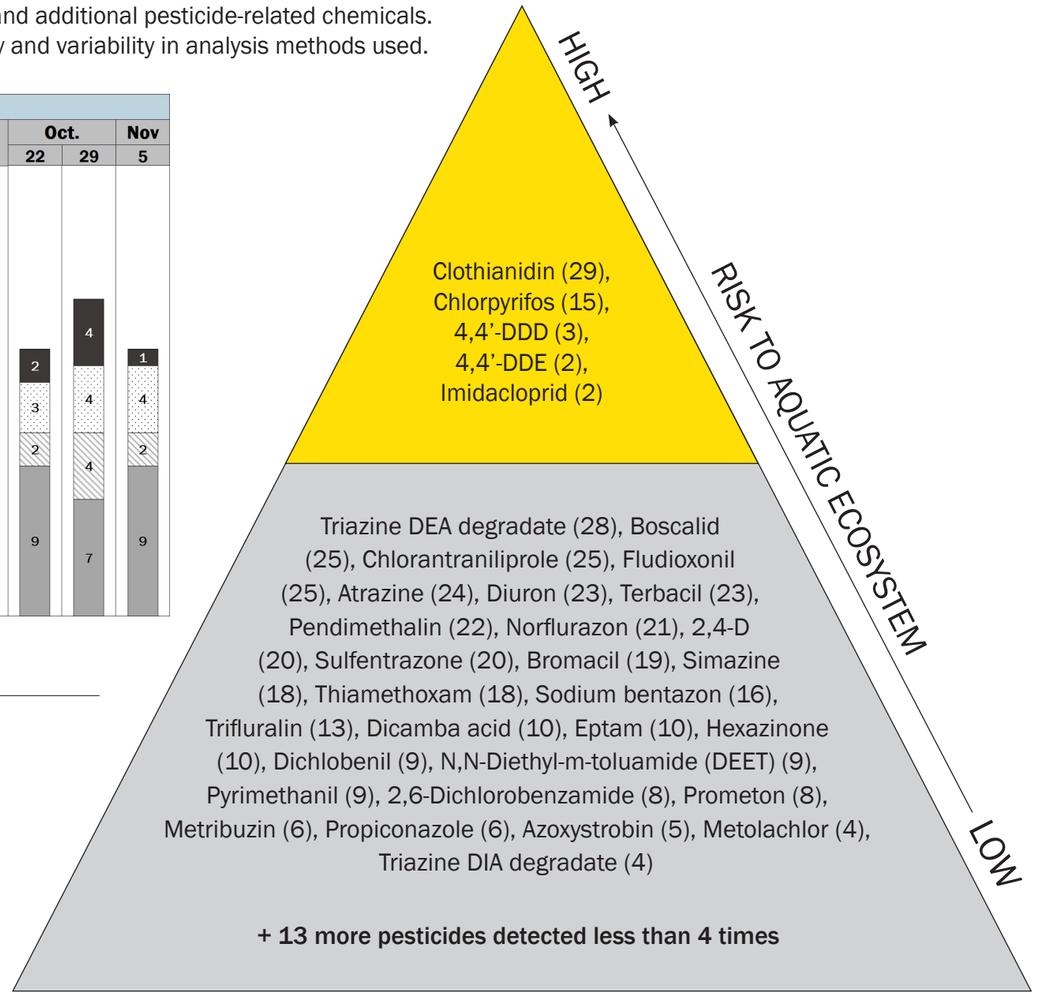
Exceeds Assessment Criteria Below Assessment Criteria

(H: Herbicide, I: Insecticide)*

The graph below shows the total number of detections per sampling visit in each pesticide category. The category 'other' includes degradates and additional pesticide-related chemicals. Note that the number of detections between categories cannot be directly compared due to the different number of chemicals in each category and variability in analysis methods used.

Total Number of Detections per Sampling Event by Pesticide Category





In the triangle to the right, pesticides in the top section have one or more detections above WSDA assessment criteria. The total number of detections for each pesticide is in parentheses after the name, with more frequently detected pesticides listed first in each section.

Please see agr.wa.gov/AgScience for more information.