Brender Creek

APRIL 2024

Summary of 2022 Surface Water Monitoring Program Results

In 2022, Washington State Department of Agriculture (WSDA) monitored 17 sites in Washington. Brender Creek was one of three monitoring sites located in Chelan County.

Samples were analyzed at the Manchester Environmental Lab, Port Orchard, Wash.

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.

Site information:

Years sampled: 2007 – present

Fish habitat: Spring Chinook salmon; summer steelhead and rainbow trout (SalmonScape: apps.wdfw.wa.gov/salmonscape)

Sampling dates: 23 weeks; March 22 – August 30

Water testing:
Samples were tested for 137 current and legacy chemicals (48 insecticides, 42 herbicides, 21 fungicides, 18 pesticide degradates, 5 legacy chemicals, 1 antimicrobial, 1 insect repellent, and 1 synergist).

Products listed are for descriptive purposes only and do not imply endorsement by the author or the Department of Agriculture.

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DDT was widely used in orchard production until it was banned in the U.S. in 1972. It is still detected in the Brender Creek watershed due to the pesticide's strong soil binding abilities, combined with soil erosion into the adjacent stream.

Results:

- There were 35 unique chemicals detected with a total of 232 detections in Brender Creek.
  - Of these, 83 detections were above WSDA assessment criteria. Roughly 80% (66 detections) of exceeding detections were from DDT and its degradates.
- When multiple pesticides are detected simultaneously, the harmful effects can combine; multiple pesticides were detected every week Brender Creek was sampled. Between 6 and 20 pesticides were detected at each sampling visit.
- WSDA identifies some pesticides as Pesticides of Concern (POC) when they have been detected above WSDA's assessment criteria and above established detection frequencies.

Watershed-specific POCs in Brender Creek:

ICONS FOR ENVIRONMENTAL HAZARDS LISTED ON PESTICIDE LABELS

potential for spray drift | potential for runoff | potential to leach into groundwater | highly toxic to bees | toxic to aquatic invertebrates | toxic to fish | toxic to birds | toxic to mammals

Carbaryl — *Insecticide*

- *Common trade name:* Carbaryl
- *Example use within watershed:* orchard, residential
- The European Union has banned the use of carbaryl.
- This is the only site where this checmical was a POC.

Chlorpyrifos — *Insecticide*

- *Common trade names:* Lorsban, Pilot, Vesper
- *Example use within watershed:* golf course, ornamental, turf
- As of early 2022, chlorpyrifos has been banned for use on food and feed commodities. It can still be applied to registered non-food commodities.
- Also detected in five other monitored watersheds and a POC in four of them.

Gamma-Cyhalothrin — *Insecticide*

- *Common trade names:* Declare, Scion
- *Example uses within watershed:* orchard, residential
- Also detected in six other watersheds and a POC in all of them.

Imidacloprid — *Insecticide*

- *Common trade names:* Admire Pro, Gaucho, Merit
- *Example uses within watershed:* orchards, outside buildings, residential
- Also detected in nine other monitored watersheds and a POC in all of them.

Malathion — *Insecticide*

- *Common trade names:* Malathion, Fyfanon
- *Example uses within watershed:* orchard, pasture
- Also detected in six other monitored watersheds and a POC in three of them.

Tolfenpyrad — *Insecticide and Fungicide*

- *Common trade names:* Torac, Bexar
- *Example uses within watershed:* orchard, market crops
- This chemical was a POC in one other monitored watershed.

AGR PUB 102-615 (R/4/24)

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The calendar at right shows the concentration in µg/L and date sampled of each watershed POC detected. 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. Carbaryl was not detected in 2022, however, it was still considered a watershed POC because of its exceeding detections in recent years at this site.

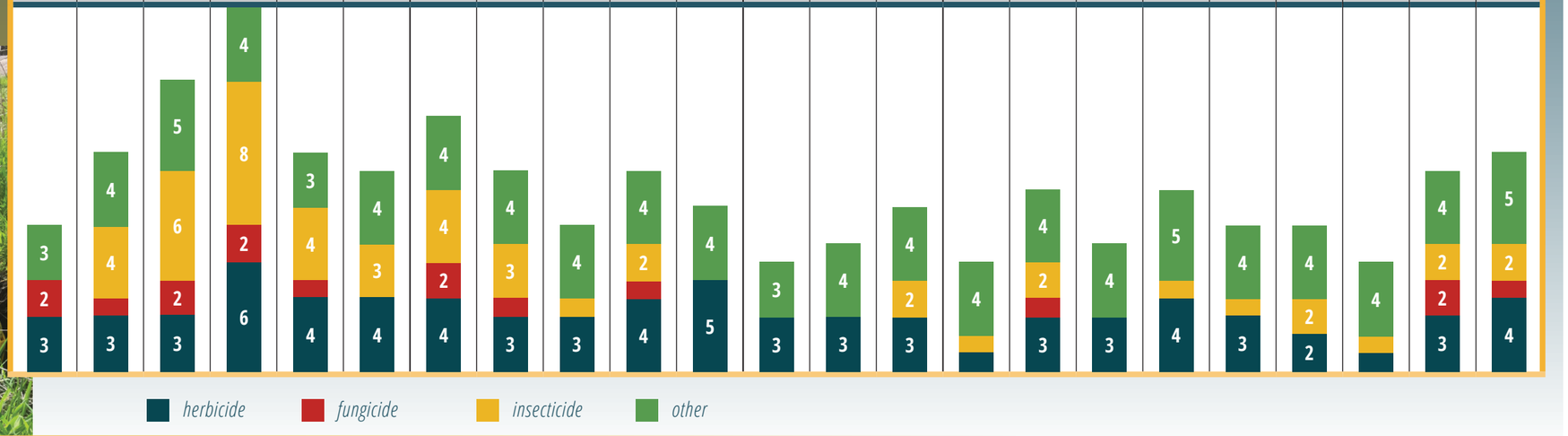
[*I: Insecticide*]
exceeds assessment criteria
below assessment criteria

Watershed Pesticides of Concern Detected and their Corresponding Sampling Dates and Concentrations

Month ▸		Mar		Apr				May					Jun			Jul				Aug				
Day of the Month ▸	Use*	22	29	5	12	19	26	3	10	17	24	31	7	14	28	6	12	19	26	2	9	16	23	30
Chlorpyrifos	I				0.002	0.002	0.001	0.001																
gamma-Cyhalothrin	I		0.005	0.002	0.002										0.001	<0.001								
Imidacloprid	I																			0.015	0.010		0.161	0.100
Malathion	I		0.183	0.011	0.041	0.004		0.010																
Tolfenpyrad	I				0.039				0.047		0.050													
Suspended sediment concentration *(mg/L)*		5	6	4	6	4	3	22	14	12	22	10	23	18	27	29	31	46	94	30	39	38	73	22
Streamflow *(cubic ft/sec)*		1.2	1.0	1.0	0.9	1.0	0.8	5.4	7.1	7.1	5.9	2.2	9.1	4.6	3.4	4.5	2.7	2.6	1.4	2.4	1.7	3.1	2.1	1.5
Precipitation *(total in/week)*		0.02	0.00	0.27	0.05	0.67	0.10	0.36	0.04	0.32	0.14	0.01	0.86	0.23	0.00	0.12	0.14	0.00	0.00	0.00	0.00	0.03	0.00	0.00

The graph at right shows the total number of detections per sampling visit in each pesticide category. The category 'other' includes legacy, 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



Recommendations:

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

Make use of natural protections

- Use buffers, filter strips, sediment basins, ground cover, and setbacks.
- Maintain vegetation along creeks and take care during spring time applications before vegetation along streams leafs out.

Be informed

- Read and follow pesticide label directions.
- Check the weather forecast to reduce the chances of drift or runoff.
- Review WSDA's Pesticides of Concern and choose less-toxic pesticides when possible.

Care for your equipment and products

- Calibrate, maintain, and inspect application equipment.
- Properly dispose of all unneeded pesticides. Visit agr.wa.gov/wastepesticide to learn about waste pesticide collection events.

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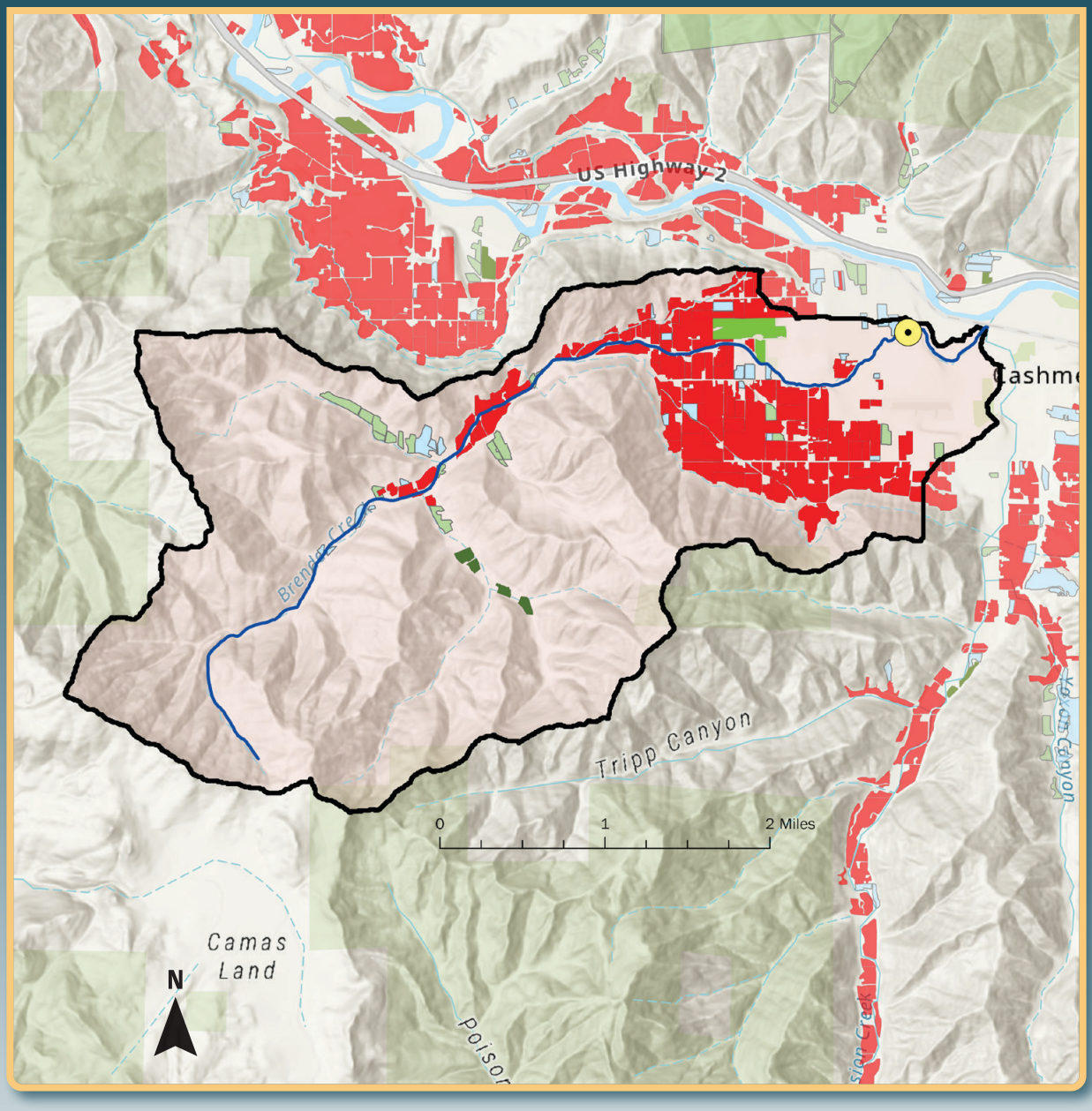

Brender Creek crop groupings	acres
Hay / Silage	14
Pasture	60
Orchard	746
Turfgrass	35
Other	55

- Sampling Location
- Brender Creek
- Brender Watershed

Total Agriculture	910	acres
Total Non-Agriculture	5,954	acres
Watershed Total	**6,864**	acres

To view mapped crop groups at the field scale, download the WSDA Agricultural Land Use data or view the interactive web map here: https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use