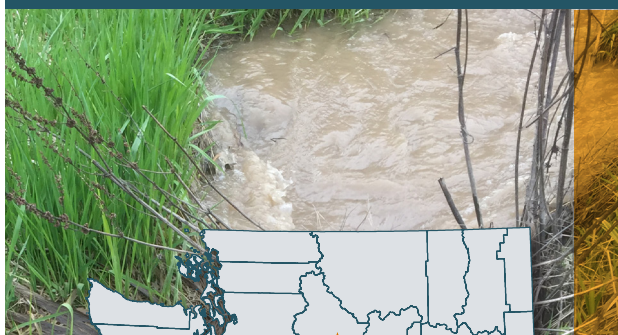


# Brender Creek

APRIL 2023

## Summary of 2021 Surface Water Monitoring Program Results



**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 33 unique chemicals detected with a total of 264 detections in Brender Creek.
  - Of these, 93 detections were above WSDA assessment criteria. Roughly 60% (58 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 8 and 18 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



#### Carbaryl — Insecticide

- *Common trade name:* Carbaryl
- *Example use within watershed:* orchard, residential
- The European Union has banned the use of carbaryl.
- This chemical was also detected in nine other monitored watersheds.

#### Chlorpyrifos — Insecticide

- *Common trade names:* Lorsban, Pilot, Vesper
- *Example use within watershed:* orchard
- 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.
- This chemical was also detected in 11 other monitored watersheds and a POC in all but one of them.

#### Gamma-Cyhalothrin — Insecticide

- *Common trade names:* Declare, Scion
- *Example uses within watershed:* orchard, residential
- This chemical was also a watershed POC in one other monitored watershed.

#### Imidacloprid — Insecticide

- *Common trade names:* Admire Pro, Gaucho, Merit
- *Example uses within watershed:* orchards, outside buildings, residential
- This chemical was also detected in 13 other monitored watersheds and a POC in 10 of them.

#### Malathion — Insecticide

- *Common trade names:* Malathion, Fyfanon
- *Example uses within watershed:* orchard, pasture
- A streamside no-spray buffer zone is required in Washington for malathion to protect threatened and endangered Pacific salmon and steelhead.
- This chemical was also detected in seven other monitored watersheds and a POC in three of them.

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

In 2021, Washington State Department of Agriculture (WSDA) monitored 18 sites in Washington. Brender 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 and summer steelhead trout (SalmonScape: [apps.wdfw.wa.gov/salmonscape](https://apps.wdfw.wa.gov/salmonscape))

### Sampling dates:

23 weeks, March 23 – August 24

### Water testing:

Samples were tested for 156 current and legacy chemicals (59 insecticides, 47 herbicides, 23 fungicides, 17 pesticide degradates, 6 legacy chemicals, 2 synergists, 1 antimicrobial, and 1 insect repellent).



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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. The “-” identifies data that could not be collected or analyzed. Detected concentrations that exceed WSDA’s assessment criteria have a higher potential to cause harm to aquatic ecosystems.

[ I: Insecticide ]  
 exceeds assessment criteria    
 below assessment criteria  

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.



### Recommendations:

#### 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 leaves 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.

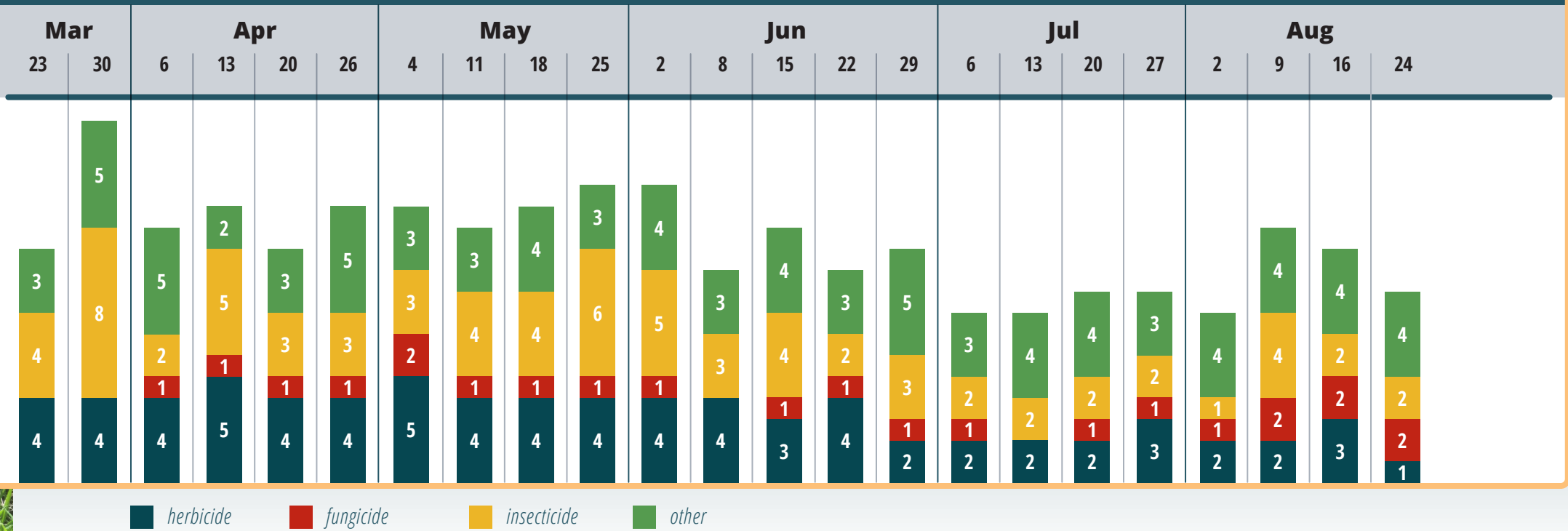
#### Care for your equipment and products

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

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

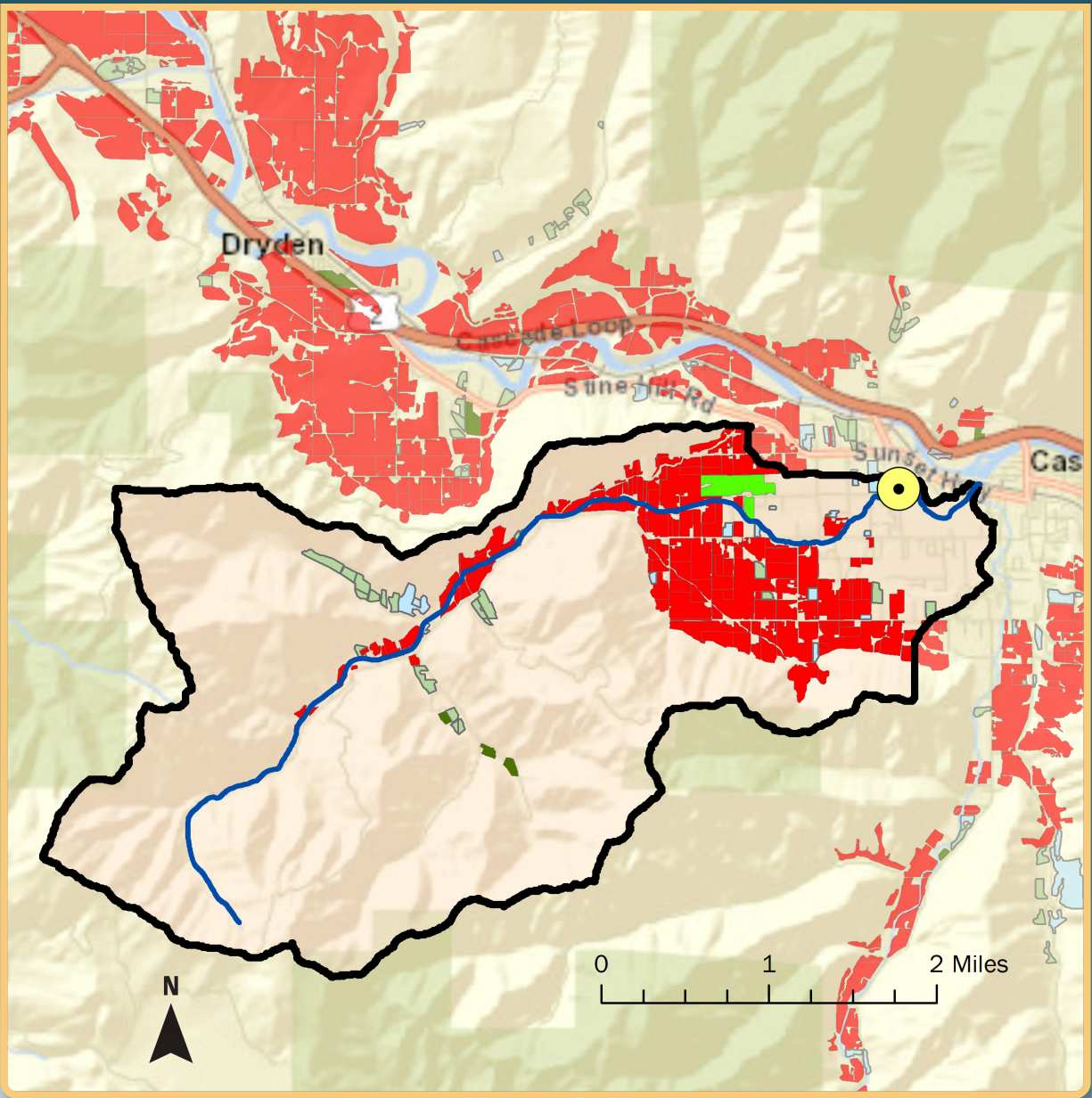
Month Day of the Month ▶	Use*	Mar		Apr				May				Jun					Jul				Aug			
		23	30	6	13	20	26	4	11	18	25	2	8	15	22	29	6	13	20	27	2	9	16	24
Carbaryl	I							1.390	0.005	0.003	0.004													
Chlorpyrifos	I	0.002	0.113	0.039	0.013	0.010	0.065	0.015	0.013	0.010	0.009	0.007	0.005	0.007	0.006	0.006	0.005	0.005	0.005	0.005	0.005	0.004	0.004	
gamma-Cyhalothrin	I		0.016		0.002						0.002			0.002										
Imidacloprid	I																				0.012	0.007		
Malathion	I	0.008	2.280	0.018	0.005		0.014		0.006		0.004	0.004												
Suspended sediment conc. (mg/L)		-	-	-	-	6	44	32	21	29	31	91	130	68	34	31	25	6	9	33	38	30	23	33
Streamflow (cubic ft/sec)		1.7	2.0	1.9	1.6	1.6	5.4	2.0	4.1	3.3	4.9	3.1	1.1	7.0	3.6	2.3	-	0.4	1.2	3.8	-	3.1	1.4	5.2
Precipitation (total in/week)		0.10	0.38	0	0.04	0	0.05	0	0	0	0.35	0.01	0.03	0.22	0	0	0	0.01	0	0	0.04	0.01	0	0.30

### Total Number of Detections per Sampling Event by Pesticide Category



Please see [agr.wa.gov/AgScience](http://agr.wa.gov/AgScience) for more information.





Brender Creek crop groupings	acres
Other	38
Hay / Silage	9
Pasture	64
Orchard	774
Turfgrass	35

● Sampling Location  
 — Brender Creek  
 □ Brender Watershed

Total Agriculture 920 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>