Washington State Department of Agriculture

Natural Resources Assessment Section

2015 Tenmile Creek Crayfish Kill

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About us:

The goal of the Natural Resources Assessment Section (NRAS) at the Washington State Department of Agriculture (WSDA) is to protect water quality and aquatic systems while maintaining agricultural productivity. Since 2003, NRAS has conducted an annual monitoring program, for pesticides in surface waters across the state. In addition to the annual pesticide monitoring program, NRAS also conducts research projects, collects pesticide use data and maps agricultural lands statewide. For the benefit of the agriculture industry and water quality, these activities provide the best possible data for decision makers.

Crayfish kill 2015 Tenmile Creek:

During the week of June 22, 2015 NRAS was notified of a crayfish kill (Figure 1) on Tenmile Creek, southwest of the bridge crossing on West Hemmi Road in Whatcom County(Figure 2). NRAS staff collected streambed sediment samples at three separate locations in the area. Each sample was analyzed for pyrethroid type pesticides. The staff also acquired previously collected and preserved crayfish for tissue pesticide residue analysis.

Figure 1. Photo of dead crayfish in Tenmile Creek, June 2015

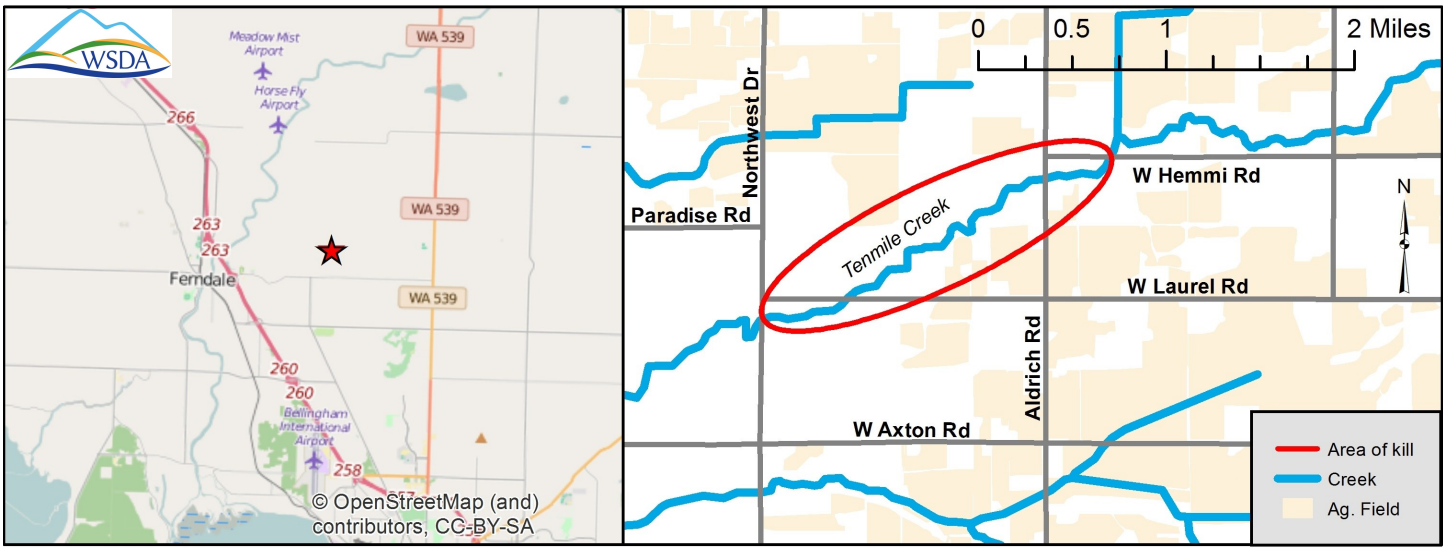

Figure 2. Crayfish kill incident map.

Results:

Table 1. Sediment sample results and LOC analysis.

Sample	Bifenthrin Times above LOC	Cypermethrin Times above LOC
1	2.5	8.1
2	2.2	10.8
3	3.8	82

LOC: Level of Concern. Calculated using the hazard quotient method, and a safety factor.

Streambed sediment samples taken from three sites within the crayfish kill incident area had significant detections of two pesticides, bifenthrin and zeta-cypermethrin (hereafter referred to as cypermethrin). Each detection was compared to a Level of Concern (LOC) to assess whether or not these levels of bifenthrin and cypermethrin had the potential to harm non-target organisms in the creek [1]. Any concentration that meets or exceeds the LOC indicates a high risk of acute toxicity to non-target organisms. Every sample tested contained concentrations well over the LOC for both compounds. Table 1 displays how much each sample exceeded the LOC. For example, the concentration of cypermethrin for Sample 3 was 82 times above the LOC. The crayfish tissue residue analysis results indicate that cypermethrin was present in the tissue of the crayfish.

Based on these results, it is very likely that the crayfish kill was primarily caused by these compounds in the stream. Incidents such as these are recorded and may prompt label changes when a pesticide is re-registered. If an accidental spill is reported and associated with the incident, the cause of the incident would be attributed to the spill and not the labeled use for that pesticide.

Example products that contain bifenthrin and/or cypermethrin[2]:

- Bifenture®
- Brigade® 2EC and Brigade® WSB
- Hero® and Hero® EW
- Mustang® Maxx
- Sniper®
- Triple Crown™

Recommendations:

- Read and follow the pesticide label directions. Bifenthrin and cypermethrin are highly toxic to aquatic organisms and fish.
- Pay close attention to the sections of the label on water quality and environmental protection and how those directions pertain to the farm and application planning and methods. In particular, review the Environmental Hazard, Storage and Disposal, Buffer Zone, Spray Drift, and Application sections of the label.
- Implement structural controls, such as vegetative buffers between crop and water bodies.
- Choose application times and weather conditions that avoid overspray and drift.
- Mix and load according to label directions and avoid conducting this work near surface water and wellheads or drinking water sources.
- Report any spills to the Department of Ecology, NW Regional Office, 1-425-649-7000.
- Report any pesticide misuse to the WSDA, Pesticide Compliance, 1-877-301-4555.

For more information about NRAS please visit: www.agr.wa.gov/pestfert/natresources/

References:

[1] US EPA,"Technical Overview of Ecological Risk Assessment: Risk Characterization," 30-Sep-2015.[Online].Available: http:// www.epa.gov/pesticide-science-and-assessing-pesticide-risks/technical-overview-ecological-risk-assessment-risk.[Accessed:12-22-15].

[2] Puyallup Research and Extension Center, "Pesticide Information Center Online(PICOL) Databases," Washington State University. [Online]. Available: http://picol.cahe.wsu.edu/LabelTolerance.html. [Accessed: 15-Dec-2015].