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## The Effect of Urban Insecticide Use on Water Quality

Recent research by scientists from the WSU Puyallup Salmon Toxicology Program and NOAA-Seattle has shown that certain pesticides or pesticide mixtures, at environmentally realistic concentrations, have a significant negative impact on salmon health.

### *Why is this information relevant to me?*

When we talk about water quality, what we are really interested in is its safety for human consumption and its ability to support ecosystems. The two largest aquatic ecosystems in Washington State are the Columbia River Basin and the Puget Sound, although concern over water quality extends to more than just these two systems.

One of the indicator species we use to monitor the health of ecosystems is salmon. Right now, there is an emerging concern about the long-term future of salmon populations throughout the state, and particularly within Puget Sound. The issue of pesticides in these waters is just one possible reason for declining salmon populations.

The studies mentioned above focus on the effects of very low concentrations of insecticides on the survival rates, brain neurochemistry and behavior of salmon. Additional studies on the effects of these insecticide mixtures on salmon food chains are also underway. Studies of this kind provide valuable information about long-term survival potential of salmon populations, rather than specific individual fish.

### *How do these insecticides get into the water?*

Insecticides do not always stay where they are applied. Sometimes spray applications result in formation of aerosols-- tiny droplets that remain suspended in the atmosphere. This "spray drift" moves and can settle quite a distance from the initial application site. Sometimes rain or sprinkler irrigation carries insecticide residues down storm drains or causes it to seep into groundwater.

Although the pesticides of concern (i.e. malathion, chlorpyrifos and diazinon) were historically registered for use in both agricultural and urban settings, it's urban uses that are currently raising red flags. Chlorpyrifos and diazinon products were voluntarily cancelled in 2000, but some homeowner product is still being used as indicated by "how-do-I-apply" questions on electronic bulletin boards. Products containing malathion are currently registered for homeowner use.

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Hundreds of thousands of backyard settings ring Puget Sound through its interconnected watersheds. In a single year these insecticides might be applied to any number of widely dispersed individual urban locations, but eventually they make their way to water bodies that collectively discharge to Puget Sound. Even if the toxic contribution of each location is small, when they collect in Puget Sound the overall effect can be serious, both because of higher concentrations and because mixtures of these insecticides are acting synergistically—a case where they are more toxic as a mixture than as separate chemicals.

*What can individual homeowners do?*

Every action across a connected watershed is additive. Do your part to keep insecticides and other pesticides out of water. This means determining which combination of pest management activities and chemical choices best fit your situation in light of these new findings. If you chose to use pesticides, carefully read the label and follow instructions exactly. Avoid the temptation to use more than labeled rates.

If you are currently using malathion, chlorpyrifos or diazinon insecticides in your home landscape, please look for other options. Your local Extension office or Master Gardener program can provide assistance with determining which options are right for you.

*Additional WSU Pest Management Resources:*

HortSense fact sheet (<http://pep.wsu.edu/hortsense/> )

PestSense fact sheets (<http://pep.wsu.edu/pestsense/> )

(EB1744) Your Yard and Water Quality: Simple Things Gardeners Can Do To Prevent Water Contamination ( <http://cru.cahe.wsu.edu/CEPublications/eb1744/eb1744.html> )

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<http://entomology.wsu.edu/profiles/WSU%20Salmon%20Toxicology%20Lab.pdf>

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