



FACTS & FIGURES: CURRENT-USE PESTICIDES

CURRENT-USE PESTICIDES OVERVIEW

- Geographically widespread in the estuary
- Transported from yards, gardens, agricultural fields, and horticultural sites in stormwater or irrigation runoff
- Dissolve in water, tend not to bioaccumulate in organisms
- Toxic to salmon prey, sublethal effects on salmon behavior and health
- Effects can be additive or synergistic (more than the sum of the parts)
- Multiple impacts on humans, including hormone disruption and cancer
- Used widely for home or industrial purposes

WHAT ARE CURRENT-USE PESTICIDES?

Organophosphate, carbamate, triazine, pyrethroids, and urea pesticides are commonly used in agriculture and horticulture and on lawns and gardens. They are water-soluble and are readily taken up by organisms. Water-soluble pesticides can be broken down into more benign components and tend to have shorter term, more acute health effects than bioaccumulative toxics.

Lindane, known also as gamma-hexachlorocyclohexane or γ -HCH, is an organochlorine pesticide that currently is used to control wood-inhabiting beetles and to treat people for fleas, lice, and scabies. Lindane recently was banned for use in agriculture because it is a suspected carcinogen, but pharmaceutical use is still allowed. Lindane is moderately water soluble and can accumulate in sediment.

Other commonly known pesticides:

- **Organophosphates:** diazinon, chlorpyrifos, CIAT, ethoprop, malathion, 1-naphthol
- **Carbamates:** carbaryl, carbofuran, EPTC
- **Triazines:** atrazine, prometon, simazine
- **Ureas:** diuron, 3,4-dichloroaniline

IMPACTS ON FISH & WILDLIFE & THE ENVIRONMENT

Exposure to current-use pesticides has sublethal effects on salmon behavior, interfering with predator avoidance, altering homing and migration, and reducing egg fertilization. Health effects include reduced olfactory function, impaired growth, and suppressed immune function.

In a recent study, concentrations of current-use pesticides in the water column of the Columbia River estuary were below those associated with health effects in juvenile salmon.

Pesticides also are toxic to salmon prey. In many cases, they were specifically designed to kill or impair the growth of insects.

When several pesticides occur together in the environment, their effects can be additive. Effects also can be synergistic, such that the impacts of the mixture are greater than would be predicted based on the sum of the pesticides present.

IMPACTS ON HUMAN HEALTH

Pesticide exposure can impact human health in a multitude of ways:

- Neurological functioning: memory loss, loss of coordination, reduced speed of response to stimuli, reduced visual ability, altered or uncontrollable mood and general behavior and reduced motor skills.
- Asthma
- Allergies and hypersensitivity
- Cancer
- Hormone disruption
- Reproductive difficulties and fetal development complications

Children are impacted disproportionately due to their small size and their rapidly growing organs and ongoing development, which make them more susceptible to pesticide infiltration.

SOURCES OF EXPOSURE

Pesticides in current use typically enter the environment through irrigation and agricultural runoff and stormwater runoff from urban and suburban areas. In the Columbia River estuary, juvenile salmon are exposed to current-use pesticides through river water. The timing of pesticide detections during the rainy season suggests that stormwater plays an important role in transporting these toxic contaminants to the estuary, and the number of detections in the lower Willamette River points to the Willamette as a significant contributor of pesticides to the estuary.

CURRENT-USE PESTICIDES IN THE ESTUARY

Current-use pesticides and their breakdown products have been found in river water at sites throughout the Columbia River estuary, from just below Bonneville Dam to the river's mouth near Astoria. In a recent study, the most frequently detected pesticides were atrazine, simazine, and metolachlor, followed by CIAT, EPTC, DCPA, and diuron. Detections were most frequent in the lower Willamette River, which receives both agricultural and urban/industrial runoff.

References

Lower Columbia River Estuary Partnership. 2007. *Lower Columbia River and Estuary Ecosystem Monitoring: Water Quality and Salmon Sampling Report*.

Lah, Katarina. www.toxipedia.org/display/toxipedia/Effects+of+Pesticides+on+Human+Health. May 6, 2011.