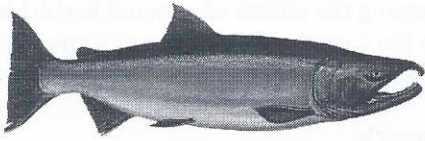


Salmon Safe Weed Control

April 5, 2018 by Garden Green: www.gardengreen.webs.com



Methods and Products to Use	Products to Avoid
Black Plastic – double layer laid over gravel driveways for a couple of weeks in spring or summer	Preen® Weed Preventer containing Trifluralin
Boiling Water poured on weeds in sidewalk cracks. Best if a hot sunny day.	Preen® Weed Preventer Plus Plant Food containing Trifluralin
Concern® Weed Prevention Plus®* (Corn Gluten Meal)	Spectracide® Weed and Grass Killer (Diquat, Fluazifop-P-butyl, Dicamba)
Flame Weeders for patios, paths, and emerging weeds prior to planting your veggies.	Ace Green Turf Ready to Spray Weed & Feed Concentrate (2,4-D, Mecoprop-p, Dichloroprop-p)
Goats and Sheep can be hired to eat blackberries, ivy, holly, etc.	Ace Ready to Spray Concentrate Lawn Weed Killer (2,4-D, Mecoprop-p, Dicamba)
Grow a Multi-Layered garden which will shade out some weeds	Ace Spot Weed Killer Ready to Use (2,4-D, Mecoprop-p, Dicamba)
Hand Weeding tools. Have salesperson show you their latest and most effective; long handled hori-hori, etc.	Bayer Advanced Season Long Weed Control for Lawns (2,4-D, Isoxaben, Mecoprop-p)
Hire Teenagers to hand weed	Ortho Weed B Gon Max® Weed Killer for Lawns (Mecoprop-p, 2,4-D, Dicamba)
Mulch: Bark, wood chips, other mulch, especially over a thick layer of cardboard (called sheet mulching)	Ortho Weed B Gon® Weed Killer for Lawns (Dimethylamine salt of 2,4-D acid, Dimethylamine salt of Mecoprop-p Acid, Dicamba acid)
Preen® Organic Vegetable Garden Weed Preventer (Corn Gluten Meal)	Scotts® Liquid Turf Builder® with Plus2 Weed Control (2,4-D, Mecoprop-p, Dichloroprop-p)
Vinegar Spray on seedlings and new growth	Scotts® Turf Builder Weed and Feed (2,4-D, Mecoprop-p)
Water deeply but infrequently , if your soil is at least 4 inches deep	Scotts® Turf Builder® Winterguard with PLUS2 Weed Control (2,4-D, Mecoprop-p)
Water with drip irrigation to stop watering weeds	All other products containing 2,4-D

Research on Trifluralin, 2,4-D, and Salmon



Trifluralin – the Active ingredient in Pre-Emergent Herbicide ‘Preen’ and others

On May 31, 2012, NOAA Fisheries issued a final biological opinion addressing the effects of selected herbicides on Pacific salmonids. “We concluded that trifluralin [is] likely to jeopardize the continued existence of some listed Pacific salmonids....” Chinook, Chum, Coho, Sockeye, and Steelhead were the salmonids studied, in many locations.

Here is how fish were affected by tiny quantities of trifluralin, in the research:

- Reduced the number of eggs spawned
- Decreased the hatching success of juveniles
- Decreases in hatching success became more pronounced with longer exposure time.
- Loss of equilibrium, sluggishness, and darkened areas
- Fish length was reduced
- 95.3% of fish were classified as abnormal in a second study. Lethargy was the most common abnormality

“In summary, we believe there is a sufficient body of information to conclude that trifluralin exposed caused vertebral deformities in fish, that those effects can occur at concentrations between 1.7 micrograms/Liter and 5.7 micrograms/Liter (Hoberg, 2006), that effects are not limited to larval fish, and that exposure durations need only be 16 – 72 hours. Vertebral deformities in fish can affect silhouette (shape), causing reductions in swimming ability, which in turn affects ability to escape predators and/or capture prey. Other effects may also occur as a secondary result of the vertebral deformities, including disruption of the nervous system due to spinal impingement and pituitary enlargement due to liberation of bone calcium.”

To put this quantity in perspective, it is less than a teaspoon of trifluralin in an Olympic swimming pool of water (660 gallons)

Source: National Marine Fisheries Service Endangered Species Act Section 7 Consultation Final Biological Opinion Environmental Protection Agency Registration of Pesticides Oryzalin, Pendimethalin, Trifluralin May 31, 2012.

2,4-D, in Weed and Feed On June 30, 2011, the National Marine Fisheries Service (NMFS) issued a final biological opinion addressing the effects of 2,4-D on listed Pacific salmonids. NMFS's conclusions are that: pesticide products containing **2,4-D** are likely to jeopardize the continued existence of all distinct populations of listed Pacific salmonids and adversely modify designated critical habitat for some of the populations.

Table 129.. Summary of assessment endpoints and effect concentrations

Assessment Endpoint	Evidence of adverse responses (yes/no)	Concentration range of observed effect or concentrations tested showing absence of effect (µg/L) (µg ae/L)	Degree of confidence in effects (low, moderate, high)
2,4-D (amines/salts)			
Fish:			
-survival (LC ₅₀)	yes	162,000-2,244,000	high
-growth (LOAEC)	yes	45,100	moderate
-reproduction (LOAEC)	yes	45,100	moderate
-swimming	-	-	-
-olfactory-mediated behaviors (acid)	yes	100,000	high
-endocrine disruption	-	-	-
-cellular damage/carcinogenicity	yes	1,000	moderate
Habitat:			
-prey survival (LC ₅₀) (acid)	yes	4,970	high
-primary productivity	yes	3,880-156,500	high
-submerged and emergent vegetation (LOAEC)	yes	299-480	high
-riparian vegetation (EC ₂₅)	yes	0.003-0.273 lb ae/A	
2,4-D (esters)			
Fish:			
-survival (LC ₅₀)	yes	450-14,500	high
-growth (LOAEC)	yes	145	moderate
-reproduction (LOAEC)	yes	145	moderate
-swimming	-	-	-
-olfactory-mediated behaviors	-	-	-
-endocrine disruption	yes	300	moderate
-cellular damage/carcinogenicity	-	-	-
Habitat:			
-prey survival (LC ₅₀)	yes	3,400	high
-primary productivity (LOAEC)	yes	66-17,140	high
-submerged and emergent vegetation (LOAEC)	yes	330-397	high
-riparian vegetation (EC ₂₅)	yes	0.02-0.218 lb ae/A	moderate

Source: National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Opinion Environmental Protection Agency Registration of Pesticides 2,4-D, Triclopyr BEE, Diuron, Linuron, Captan, and Chlorothalonil