

Pesticide Safety & Toxicity

Pesticides:

Chemicals to control unwanted forms of life - Pests

- **Insecticides**

Nurseries

Seed Orchards

Plantations

- **Fungicides**

Nurseries

Plantations

- **Herbicides**

Nurseries

Plantations

- **Repellents**

Worker use

Animal use



"I WANT A SPRAY THAT KILLS EVERYTHING BUT ISN'T DANGEROUS."

Pesticide Toxicity

Toxicity - measure of ability of a chemical to injure /kill

Exposure - contact with chemical

Hazard - degree of exposure & toxicity level

LD₅₀ - lethal dose to kill 50% of test animals

Pesticide Toxicity

Acute toxicity - injury/death from one exposure

Chronic toxicity - injury/death after long-term exposure

Oral toxicity - injury/death from swallowing chemical

Dermal toxicity - injury/death from exposure to skin

Pesticide Toxicity

PPM (parts per million) - 1 oz in
62,500 lbs or 1 tbs in 3,906 gal

PPB (parts per billion) - 1000 times less
than ppm - 1 tbs in 3,906,000 gal

Half-life - time for 1/2 of initial
concentration to be degraded

Volatility - ability of a liquid to evaporate

Toxicity Categories

Category	Signal Word	Oral LD₅₀ (mg/kg)	Lethal oral dose
I	Danger	< 50	Taste - tsp
II	Warning	50-500	Tsp – oz
III	Caution	500-5000	Oz – pt
IV	Caution	> 5000	> pt

Pesticide Toxicity

- **Toxicity decreases when mixed (diluted) with water**
- **1 gallon of pesticide in 1 gallon of water is 50% less toxic**
- **1 gallon of pesticide in 20 gallons of water is 95% less toxic**

Relative Toxicity:

Are all substances toxic?

YES!

- All are toxic to some quantifiable degree
- Sugar has an LD₅₀ of 30,000 mg/kg
- Ethanol has an LD₅₀ of only 13,700 mg/kg
- Even water has a recognized LD₅₀ of slightly greater than 80,000 mg/kg

Primary Routes of Exposure to Pesticides

**There are three primary routes by which
organisms are exposed to pesticides**

Oral

Inhalation

Dermal

Toxicities of Forest Pesticides

Trade Name	Acute oral		Signal Word
	LD ₅₀ mg/kg	Category	
AAtrex 4L	1075	III	Caution
Accord	>5000	IV	Caution
Arsenal	>5000	IV	Caution
Garlon 4	1338	III	Caution
Tordon	2598	III	Caution
Velpar L	6887	IV	Caution

Toxicities of other Products

Name	Acute oral LD₅₀ mg/kg	Category	Signal Word
Gasoline	150	II	-
Caffeine	200	II	-
Asprin	1240	III	-
Baking Soda	3500	III	-
Table Salt	3000	III	-

Oral & Dermal Toxicity

Undiluted Product

Trade Name	Oral LD₅₀ fluid ounces	Category	Dermal LD₅₀ fluid ounces
Caffeine	0.21	Extreme	N/A
Lindane	2	Moderate	11
Sevin	2	Moderate	3
Asprin	3.5	Moderate	N/A
2,4-D	3.7	Moderate	4
Garlon	7	Moderate	11

Oral & Dermal Toxicity

Undiluted Product

Trade Name	Oral LD₅₀ fluid ounces	Category	Dermal LD₅₀ fluid ounces
Tordon 101	8	Moderate	7
Table Salt	9	Moderate	N/A
Oust	14	Slight	14
Roundup	15	Slight	14
Velpar L	20	Slight	15

Relative Acute Toxicity

- **Garlon 4**
 - 1,581 mg/kg
 - Rainbow trout 0.74 mg/L
 - Bluegill 0.87 mg/L
- **Garlon 3A**
 - 2,574 mg/kg
 - Rainbow trout 117 mg/L
 - Bluegill 148 mg/L
- **Roundup, Glypro Plus**
 - >5,000 mg/kg
 - Rainbow trout 8.2 mg/L
 - Bluegill 5.8 mg/L
- **Accord, Rodeo**
 - >5,000 mg/kg
 - Rainbow trout >1,000 mg/L
 - Bluegill >1,000 mg/L

The Pesticide Label

Read 4 Times!

- **Before Buying the Pesticide**
- **Before Preparing the Material for Use**
- **Before Mixing & Applying**
- **Before Storing or Disposing the Pesticide**

Forest Service Pesticide Fact Sheets

<http://infoventures.com/>

Environmental Health Pesticide Fact Sheets

<http://infoventures.com/e-hlth/pesticide/pest-fac.html>