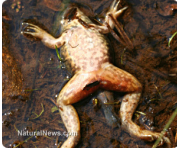


# Deadly Herbicides



Chauntelle Williams  
April 22, 2014  
Cwilli97@utk.edu

---

---

---

---

---

---

---

---

## Introduction

- Weedkillers are commonly used in home gardens around the world.
- Rick Relyea conducted an experiment to test the effects of the brand Roundup on Amphibians. (1)

---

---

---

---

---

---

---

---

## Introduction

- The use of glyphosate in the United States has grown in the last few decades from 17<sup>th</sup> most common pesticide/ herbicide to the second most common. (2)



---

---

---

---

---

---

---

---

### Killing How?

- The amphibians can be effected two ways to the herbicides, which are acute and chronic.
- Acute equals death, however, chronic toxicity cause other damages to the organism. (3)

---

---

---

---

---

---

---

### Evidence?!

- Many studies, mainly conducted by Rick Relyea, have shown that herbicides effect the growth and mortality of amphibians.
- Another study on Wood Frogs has shown that herbicides decrease immune response as well. (4)

---

---

---

---

---

---

---

### Evidence?!

- However, since there are still new formulations of herbicides being produced there is not information about each type. (6)
- Rick Relyea focuses mainly on brands like roundup that are a glyphosate with POEA.

---

---

---

---

---

---

---

### Importance

- These herbicides are helpful for maintaining our native plant biodiversity but at the same time it is killing our amphibian diversity to high levels. (5)
- If this continues then many species will not be able to recover and will be eradicated.

---

---

---

---

---

---

---

### Atrazine and Frogs

#### Interesting Effects of Atrazine on Male frogs

- <https://www.youtube.com/watch?v=KtzMXsttX84>

---

---

---

---

---

---

---

### References

- (1) Emery, Chris. 2005. Herbicide harms amphibians. *Frontiers In Ecology and the Environment*. 3:298.
- (2) Relyea, Rick A. 2005. The lethal impact of Roundup on aquatic and terrestrial amphibians. *Ecological Applications* 15:1118-1124.
- (3) King, Jeffery J. and R Steven Wagner. 2010. Toxic effects of the herbicide Roundup Regular on pacific northwestern amphibians. *Northwestern Naturalist* 91:318-324.

---

---

---

---

---

---

---

### References

- (4) Gahl, Megan K., Bruce D. Pauli and Jeff E. Houlahan. 2011. Effects of chytrid fungus and a glyphosate-based herbicide on survival and growth of wood frogs (*Lithobates sylvaticus*). *Ecological Applications* 21:2521-2529.
- (5) Brodman, Robert, W. Dan Newman, Kristin Laurie, Sarah Osterfeld and Nicole Lenzo. 2010. Interaction of an aquatic herbicide and predatory salamander density on wetland communities. *Journal of Herpetology* 44:69-92.

---

---

---

---

---

---

---

### References

- Blaustein, Andrew R., J.M. Romansic, J. M. Kiesecker, and A. C. Hatch. Ultraviolet Radiation, Toxic Chemicals, and Amphibian Population Declines. *Diversity and Distributions* 9:123-140.

---

---

---

---

---

---

---