


**Insecticides:
the killers of
amphibians**
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WFS 433 Amphibians

Overview

- o what is an insecticide?
- o the impacts on amphibian life.
 - o Direct
 - o Indirect
- o importance?
- o conclusion




Insecticide: What is it?

Insecticide are chemicals used to control insect populations by attacking the insects nervous system or their growth regulators.

Where are they used? EVERYWHERE.

Application Process?



EPA. 2014. Insecticides. http://www.epa.gov/caddis/ssr_ins_int.html.

Killing Factors: what insecticides do to amphibians

- Small in size at development
- Hatch at earlier developmental stages
- Gaps in feeding (roughly a couple of days) later in development
- Paralysis
- Mortality
- Endocrine Disruption
- Reduced mass and SVL
- Delayed development
- Swelling and discoloration of body parts
- Reduced survival

Berrill et al., 2009, Boone et al., 2004 and 2009, Fauril et al., 2009, Sparring and Fellers, 2010, Retved, 2005.

How do these factors, in turn affect the species as a whole?


Increase in predation of affected individuals or populations

Decline in genetics transfer

Increase in competition between species

Decline in population numbers

Die-off and decline across the board





Changes in land, moving towards agriculture.

Insecticides initial testing before product release.

Amphibians have highly permeable skin.

Easy contact to insecticides.

Importance

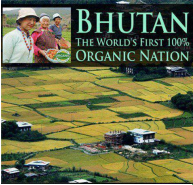
Bruhl et al., 2013

Extras


Light at the end of the tunnel

Bhutan

The world's first 100% organic farm



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Questions?
