

## Issues with Pesticides

Pesticides have helped to

1. reduce crop damage by pests
2. increase food production
3. reduce disease (transmitted by biting insects: malaria spread by mosquitos)

**BUT...**

Pesticides often sprayed onto fields & some carried away by wind. These now pollute soil, air & water and affect non-target species.

### Issue #1: Non-Target Species

- broad spectrum pesticides kill beneficial organisms too!

example: Broad spectrum insecticide might kill a predatory insect that EATS the pest. (nature's pest control is gone).  
Now...MORE insecticide is needed.

example: broad-spectrum insecticide might kill honey-bees which are needed to pollinate crops. This can result in less productive crops!

### Issue #2: Bioamplification

- a serious side effect of pesticide use is bioaccumulation

Bioaccumulation - when the pesticide (toxin) does not get eliminated by the body- it stays in the body. The **more** you eat of toxin, the **more accumulates** in the body.

Bioamplification - This occurs because toxin is fat-soluble not water-soluble.  
(we eliminate water waste).

With toxin stored in fats of organisms, it gets passed along to any consumer.

Consumers eat many organisms. 'So the **concentration** of the toxin increases up food chain- it **amplifies!**'

Bioamplification = increased concentration of a toxin as you move up a food chain.

Sketch out Figure 3 - page 137

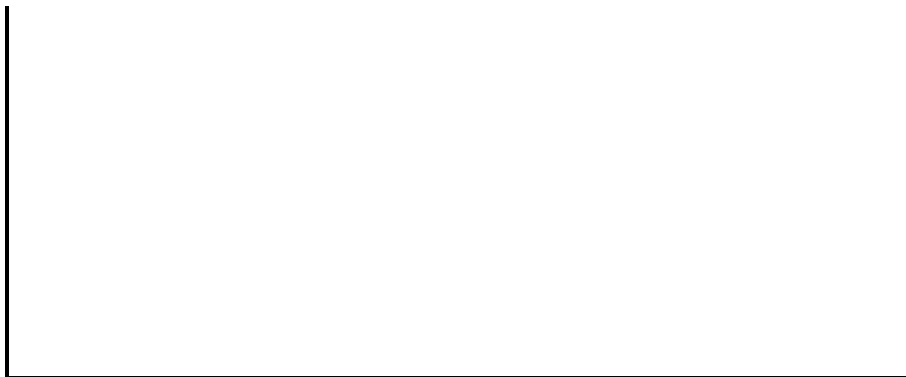
Note: ppm = parts per million ( it is a way to measure concentration.

- Rachel Carson - wrote important book: Silent Spring - spokesperson for environment
- Worrisome chemicals: - DDT - mercury (Arctic animals) - PCB (in plastics)

Issue #3: Pesticide Resistance

- continued exposure to a pesticide results in a resistance to it.

ie: toxin no longer works! (pg. 139 - sketch this graph: Note the years that resistance begins for insects and plants)



**Option?** Organic Farming

- No pesticides!
- some crop loss (pests)
- But offset this with higher prices

Organic Farmers do try to limit damage by pests; they just don't use chemicals to do it.

Complete the chart found on page #140. These are some methods organic farmers use.

Method	Description
Biological Control	
Altered Timing	
Crop Rotation & Mixed Planting	
Baiting Pests	