

SCIENCE 10 - Lesson 16

STUDENT LEARNING TARGET

WHAT AM I GOING TO LEARN?	HOW WILL I SHOW WHAT I KNOW?	HOW WILL I KNOW HOW WELL I AM DOING – WHAT ARE MY LOOK-FORS?
<p>I AM GOING TO LEARN ABOUT:</p> <p>1. PESTICIDES AND THEIR EFFECTS IN THE ECOSYSTEM</p> <p><u>WHY:</u></p> <p>1. TO HAVE AN UNDERSTANDING OF THE EFFECTS OF PESTICIDES</p>	<p>I WILL USE A PENCIL AND PAPER TO COMPLETE ANSWERS TO THE QUESTIONS ASKED AND /OR RESPOND ORALLY TO THE TEACHER</p>	<p>1. I HAVE ANSWERED THE QUESTIONS IN ASSIGNMENT 16.</p>



Figure 2

Stem rust, a fungus, is a consumer. In a wheatfield it is also a pest.



Figure 3

Aphids suck sap from the leaves and soft stems of plants.

PESTICIDES

❖ **PESTICIDES ARE CHEMICALS DESIGNED TO KILL PESTS.**

❖ **A PEST IS AN ORGANISM THAT PEOPLE CONSIDER HARMFUL OR INCONVENIENT SUCH AS WEEDS, INSECTS, FUNGI, AND RODENTS.**

❖ **SECOND-GENERATION PESTICIDES ARE CHEMICALS MADE IN A LABORATORY, SUCH AS DDT.**

❖ **PESTICIDES CAN BE GROUPED INTO 4 CATEGORIES:**

1) INSECTICIDE

2) HERBICIDE

3) FUNGICIDE

4) BACTERICIDES

❖ **SOME PESTICIDES DECOMPOSE FAIRLY RAPIDLY, BUT OTHERS STAY IN THE ECOSYSTEM FOR MANY YEARS.**

❖ **PESTICIDES THAT CONTAIN CHLORINE, SUCH AS DDT AND DIELDRIN, ARE SOLUBLE IN FAT BUT NOT IN WATER.**

- ❖ AS A RESULT, THESE TOXINS CANNOT BE RELEASED IN URINE OR SWEAT, SO THEY ACCUMULATE IN THE FATTY TISSUES OF ANIMALS.
- ❖ WHEN THERE IS A SMALL AMOUNT OF THE PESTICIDE IN THE ENVIRONMENT, IT WILL ENTER THE BODIES OF ANIMALS THAT ARE LOW IN THE FOOD CHAIN.
- ❖ AT EACH STAGE OF THE FOOD CHAIN THE CONCENTRATION BECOMES GREATER.
- ❖ THE HIGHER THE TROPHIC LEVEL, THE GREATER THE CONCENTRATION OF TOXINS.
- ❖ THIS PROCESS IS REFERRED TO AS BIOAMPLIFICATION.
- ❖ HUMANS ARE SUBJECT TO BIOAMPLIFICATION

- ❖ **INSECTICIDES HAVE A MUCH GREATER EFFECT ON HUMANS**
- ❖ **ANYONE WHO LIVED NEAR AREAS SPRAYED BY DDT OR ATE CROPS OR ANIMALS FROM THESE AREAS HAD HIGH LEVELS OF DDT IN THEM**
- ❖ **DDT WAS BANNED IN CANADA IN 1971**
- ❖ **DDT STILL AFFECTS MIGRATORY BIRDS LIKE CANADA GEESE, MALLARD DUCKS, AND PEREGRINE FALCONS**
- ❖ **DDT AFFECTS FISH LIVING IN ATLANTIC AND PACIFIC WATERS WHO ALSO MIGRATE UP AND DOWN THE COAST.**
- ❖ **NEWER CHEMICAL PESTICIDES WHICH ARE WATER SOLUBLE AND AFFECT THE NERVOUS SYSTEM ARE SOMEWHAT SAFER**

- ❖ **HOWEVER, MODERN CHEMICAL PESTICIDES NEED TO BE APPLIED MORE OFTEN AND THEY ARE NOT SELECTIVE**

- ❖ **AFTER SEVERAL GENERATIONS OF THIS SELECTION PROCESS, MOST OF THE INSECTS CARRY GENES THAT WILL HELP THEM SURVIVE AN APPLICATION OF THE PESTICIDE.**

- ❖ **3 THINGS THAT HAVE CONTRIBUTED TO THE BALD EAGLE BECOMING ENDANGERED:**
 - 1) DESTRUCTION OF LARGE TREES USED FOR NESTING**
 - 2) HUNTING**
 - 3) INDUSTRIALIZATION AND SUBSEQUENT RELEASE OF TOXINS INTO THE ECOSYSTEM**

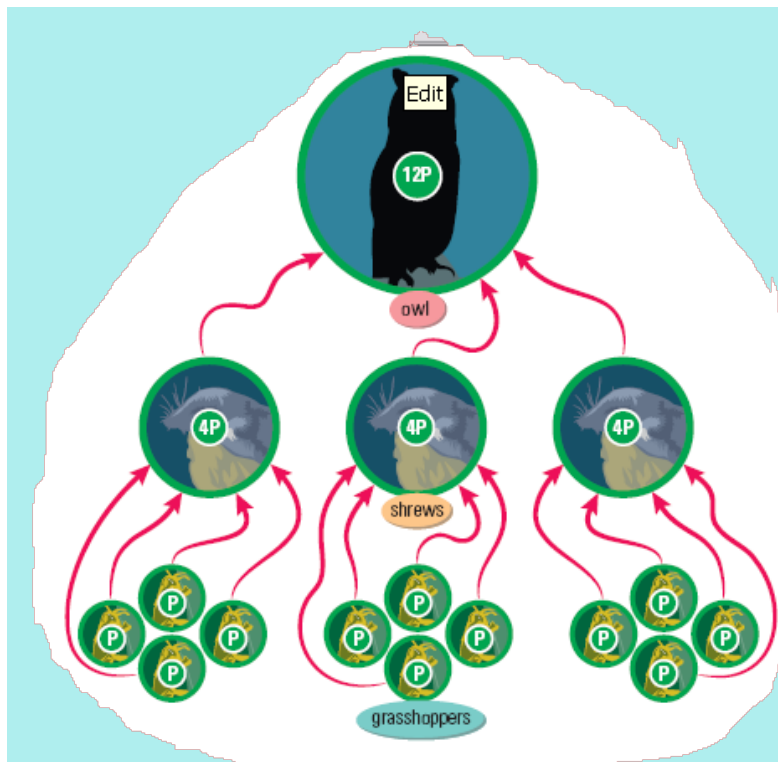


Figure 4

Bioamplification. The concentration of a fat-soluble pesticide (P) increases as you move up a food chain. The pesticide is present in only small concentrations in grasshoppers (primary consumers), higher concentrations in shrews (secondary consumers), and much higher concentration in owls (tertiary consumers). The greater the number of trophic levels, the greater the amplification in the top level.

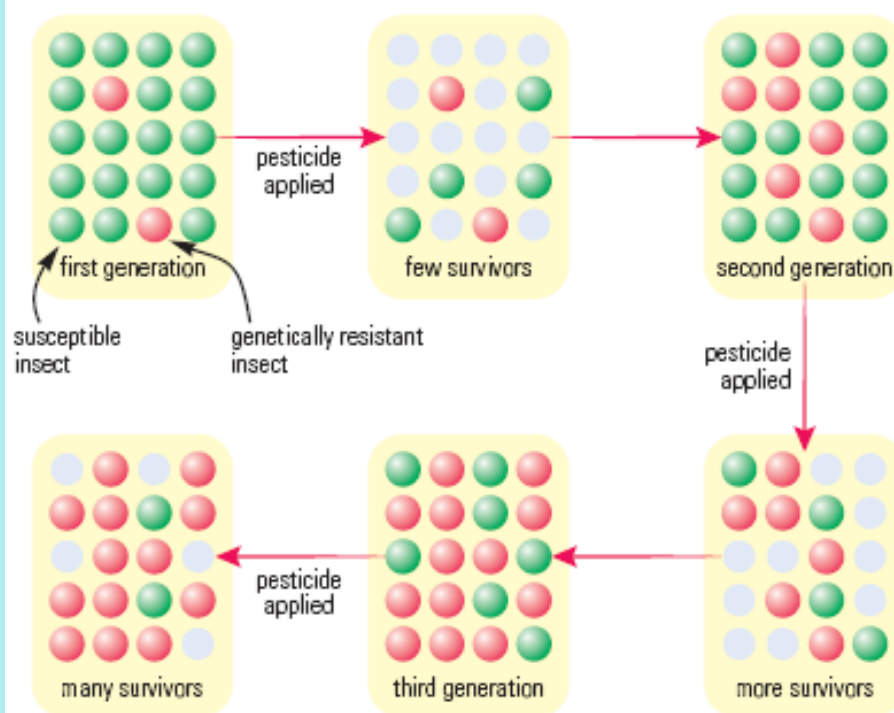


Figure 5

Continued applications of the same pesticide allow insects to gradually become resistant. Each application kills most of the susceptible insects, but not those that have genes that protect them from the insecticide.

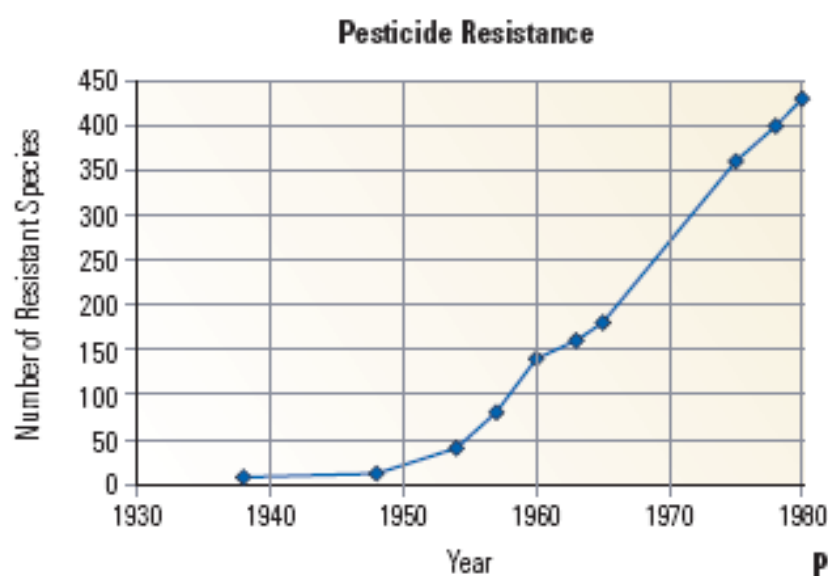


Figure 6

The number of insects resistant to at least one pesticide has increased rapidly.

Pesticide Use in Atlantic Canada

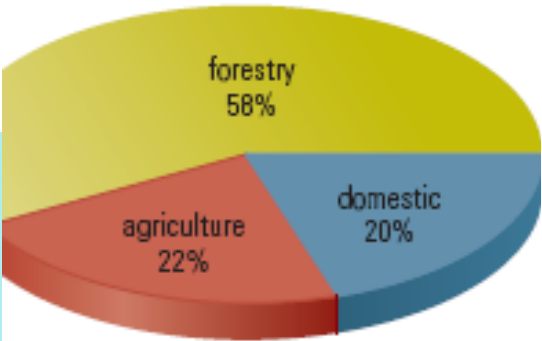



Figure 8

The influence of the spruce budworm spraying campaign is shown in the amount of pesticides used in forestry.

PESTICIDES

SCIENCE 10 ASSIGNMENT 16

1. What are pesticides?
2. Name the 4 categories of pesticides.
3. Explain why pesticides can be dangerous to organisms other than ones they are intended to kill?
4. What is bioamplification?
5. Watch the video "[How Safe are Pesticides Really?](#)"

List the pros and cons for using pesticides.



How Safe are Pesticides Really?