

Chapter 15 Lecture Outline
Soil & Agriculture

Soil

The world's leading environmentalists say:

“Loss of _____ is one of the top _____ most serious
_____ environmental problems today”.

What kind of landscape do you think of when you hear of Iraq, Syria, & Lebanon? _____

- These same areas used to be called the _____ and _____.
- **Fertile** means _____
- The fertile crescent became desert because:
 - _____
 - _____
 - _____

What is topsoil made of?

- _____
- _____
- _____
- _____
- _____

It takes Mother Nature a **LONG** time to make topsoil because:

- 1) Rock _____ erodes into small pieces (_____)
- 2) Plants and animals take a _____ time to die, rot and build up.

How much of Earth's surface is suitable for growing food? _____

Why People Go Hungry

- Some people have _____
- Others _____



Most victims of starvation are _____.

- _____
- _____

Starvation Diseases:

- **Kwashiorkor** is _____
- **Marasmus** is _____

Why do people go hungry?

- 1) _____ Example: _____
- 2) _____ Example: _____
- 3) _____ Example: _____

4) _____

Diseases are caused by the following types of pathogens : _____,

_____, _____

Pathogen = _____

Vector = _____

Examples of vectors: _____

Why we should worry about soil loss.

- _____ of our topsoil has been lost in the last _____ years.
- **Desertification** is _____

- **Salinization** is _____

 - **Irrigation** means _____

Great Dust Bowl – 1930s

- _____
- _____

Global Desertification & Soil Conservation

Causes of Desertification:

- 1) _____
- 2) _____
- 3) _____
- 4) _____

Soil Conservation:

- 1) _____
- 2) _____
- 3) _____
- 4) _____
- 5) _____

Revolutions in agriculture

- 1) People were _____ for millions of years.
- 2) People began _____ 10-12,000 years ago.
- 3) Industrial revolution brings _____
about 200 years ago and became common in the 1920s.

Problems with Pesticides:

- 1) **Beneficial species killed or poisoned**
Examples: _____
- 2) **Exposure** to people in their food and water. Workers exposed on the job.

Examples: _____

3) **Bioaccumulation** – some pesticides have a long life and build up in the food web.

Example: _____

4) **Resistance** is the adaptation of a pest species targeted by a pesticide resulting in the decreased susceptibility to that chemical.

The # of resistant species is _____. Farmers must use more and more pesticide!!!

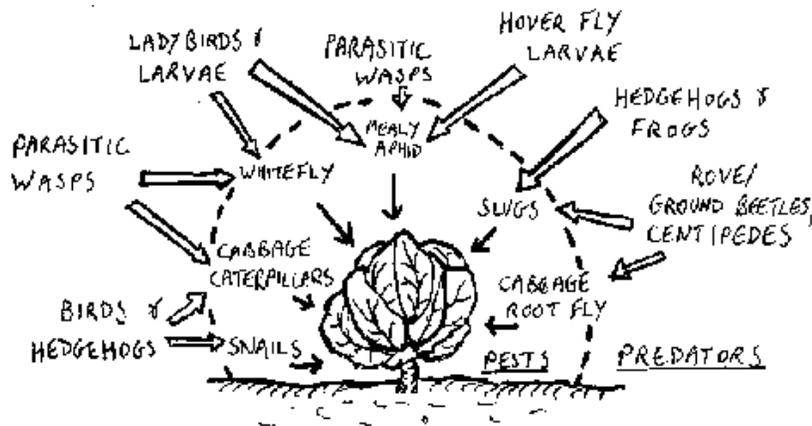
5) **Water pollution** – cancers and _____ in fish.

Endocrine disruptors mimic _____ in the body.

Example: _____

Organic farming involves:

- 1) _____
- 2) _____
- 3) _____
- 4) _____



Biologic Pest Control is _____

Examples

- 1) _____ - _____
- 2) _____ - Spinosad is a natural chemical produced by a soil fungus. Plant oils smother some insects.
- 3) _____ - the natural sex _____ of an organism used to trap or confuse.
- 4) _____ - fruit flies that spread diseases that are very damaging to Florida's citrus industry. Fruit flies are made _____ and then released to mate and reduce the next generation population.

We are now in a **gene revolution** that has allowed scientists to

- 1) _____ desirable genes from unrelated organisms.
- 2) _____ or "turn off" undesirable genes.

3) _____ an existing gene.

Gene Modification

- **GM Food** = _____
- **GMO** = _____
- **Transgenic organism** = _____
- **Franken food** = _____
- Protests and banned in many countries (including most of _____).

Top 10 Most Interesting GM foods:

- 1) _____ – rice that grows with high levels of vitamin _____.
250,000-500,000 children go _____ every year from lack of vitamin A.
70% die within a year.
Gene added from _____
- 2) _____ – produces more _____ to grow _____ faster than wild salmon.
- 3) _____ - has a gene added that interferes with the gene that causes _____ of the cells during ripening.
Can be allowed to ripen _____.
Longer _____.
Gene from an _____
- 4) _____ – can be grown earlier and in more places.
Added a gene from the _____ that produces a protein that acts like _____ in the cell's fluids.
- 5) _____ – add gene added from a wild potato that resists potato _____
- 6) _____ Cotton, canola, soybeans, beats, corn – can tolerate repeated spraying of the _____ Round-up
- 7) _____ – produces a protein that kills any _____ that bites into it.
Gene from the _____ *Bacillus thuringensis*
- 8) _____ - resistant to the _____
- 9) _____ - resistance for peanuts, tomatoes, peppers, watermelon, zucchini and ornamentals.
- 10) _____ - Pigs that produce healthy _____ (Harvard University)
Next is cows (meat & milk), chicken and _____ with Omega₃.