

KEY CONCEPTS SUMMARY



Some ecosystems, such as farms and cities, are designed, created, and maintained by humans.

- Human-engineered landscapes are replacing many of Earth's natural ecosystems. (4.1)
- Engineered ecosystems have lower biodiversity and have more uniform abiotic features than natural ecosystems. (4.1)
- Most of Canada's crop and livestock species are non-native species. (4.1)



Pesticides are used to reduce yield losses from pests, but there are ecological costs associated with them.

- Pesticides may kill non-target species and may cause air and water pollution. (4.5)
- Pesticide resistance is increasing. (4.5)
- Farming practices such as organic farming and integrated pest management reduce pesticide use. (4.5)



Agricultural practices alter natural biogeochemical cycles.

- Soil ecosystems have highly complex and diverse food webs. (4.2)
- Natural fertilizers cause fewer ecological problems than synthetic fertilizers. (4.2)
- Soil compaction limits water flow and harms plants by reducing oxygen and nutrient availability. (4.2)



Some pesticides and other toxins bioaccumulate in individuals and biomagnify in food webs.

- Bioaccumulation is the concentration of a pesticide or toxin in the body of an organism. (4.5)
- Bioamplification is the increase in concentration of a pesticide or toxin as it moves higher up the food chain. (4.5)
- Most natural and recently developed synthetic pesticides do not accumulate in food chains. (4.5)



Agricultural practices alter water cycles.

- Water may be added to soil via irrigation or removed from soil through drainage systems. (4.2)
- Irrigation and drainage alter the water cycle. (4.2)
- No-tillage farming, crop rotation, and crop selection reduce the impacts of agriculture on soil ecosystems. (4.2)



Urban ecosystems are dependent on surrounding ecosystems to provide food and materials for urban inhabitants.

- The ecological footprint of a city reaches well beyond its boundaries. (4.6, 4.7)
- Urban ecosystems are dependent on surrounding ecosystems for food, water, and other materials. (4.7)
- Urban ecosystems can provide environmental benefits by reducing space, energy, and resource consumption. (4.7)
- There are many ways of enhancing urban living spaces and reducing their negative impacts on the environment. (4.7)

WHAT DO YOU THINK NOW?

You thought about the following statements at the beginning of the chapter. You may have encountered these ideas in school, at home, or in the world around you. Not all of the following statements are true. Consider them again and decide whether you agree or disagree with each one.



- 1** Agricultural practices closely resemble naturally occurring ecosystem processes.
Agree/disagree?



- 4** Many of the plants and animals farmed in Ontario are native species.
Agree/disagree?



- 2** Organic farming has benefits for the environment.
Agree/disagree?



- 5** The actions of people who live in cities have little impact on wilderness environments.
Agree/disagree?



- 3** Pesticides are needed to control pests.
Agree/disagree?



- 6** We can use as many resources as we like because we can recycle or reuse them.
Agree/disagree?

How have your answers changed since then?
What new understanding do you have?

Vocabulary

agroecosystem (p. 119)
monoculture (p. 121)
pest (p. 121)
natural fertilizer (p. 124)
synthetic fertilizer (p. 124)
leaching (p. 125)
pesticide (p. 133)
broad-spectrum pesticide (p. 133)
narrow-spectrum pesticide (p. 133)
bioaccumulation (p. 136)
bioamplification (p. 136)
organic farming (p. 139)
integrated pest management (IPM) (p. 140)

BIG Ideas

- ✓ Ecosystems are dynamic and have the ability to respond to change, within limits, while maintaining their ecological balance.
- ✓ People have the responsibility to regulate their impact on the sustainability of ecosystems in order to preserve them for future generations.