

Persuasive
Text

THE BATTLE AGAINST PESTS



by Linda Bennett

Mc
Graw
Hill

PAIRED
READ

Making an Organic Garden

STRATEGIES & SKILLS

Comprehension

Strategy: Reread

Skill: Author's Point of View

Vocabulary Strategy

Greek Roots

Vocabulary

advancements, agriculture,
characteristics, concerns,
disagreed, inherit, prevalent,
resistance

Content Standards

Science

Life Science

Word Count: 971**

Photography Credit: Photo by Scott Bauer/USDA.

**The total word count is based on words in the running text and headings only. Numerals and words in captions, labels, diagrams, charts, and sidebars are not included.



Essential Question

In what ways can advances in science be helpful or harmful?

THE BATTLE AGAINST PESTS

by Linda Bennett

Chapter 1

Controlling Pests 2

Chapter 2

A Chemical Miracle 5

Chapter 3

Protecting the Environment 8

Chapter 4

Safe Food for the Future 11

Respond to Reading 15

PAIRED READ

Making an Organic Garden . . 16

Glossary/Index 19

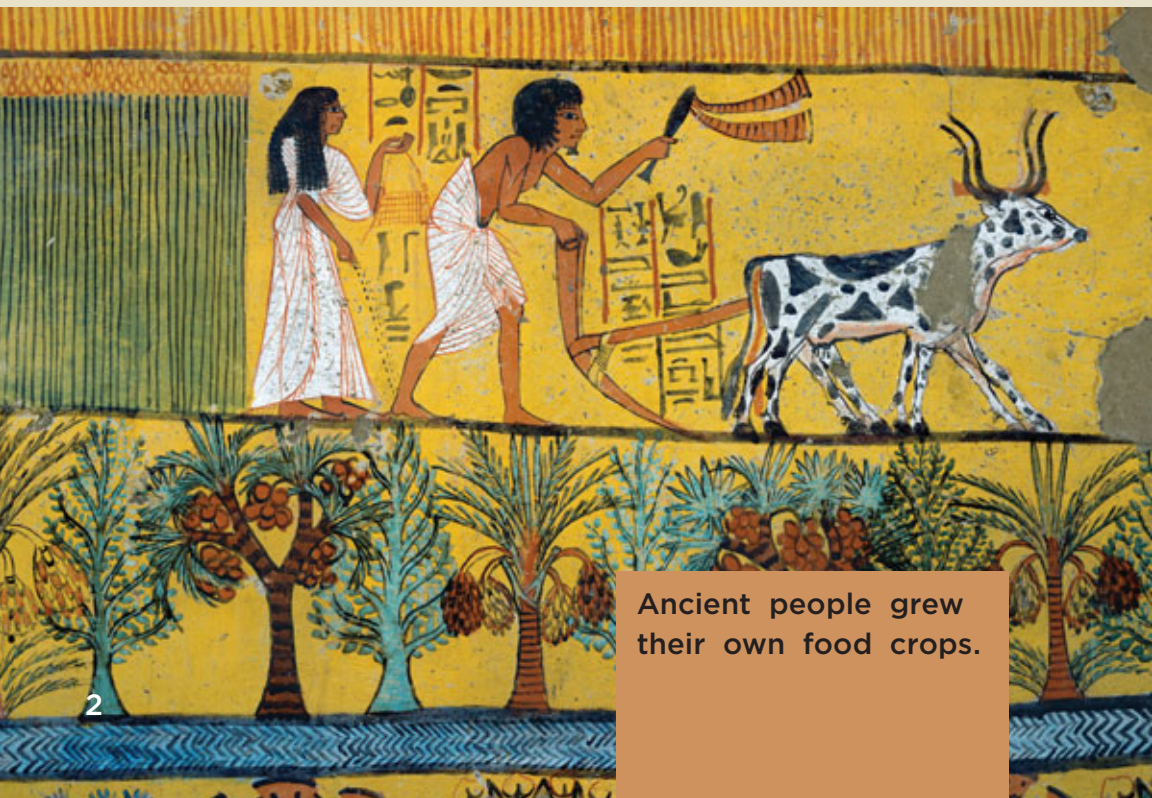
STEM Focus on Science 20

CHAPTER 1

CONTROLLING PESTS

Around 10,000 years ago, people began to grow crops. Since that time, they have had to cope with pests. Insects, weeds and diseases have attacked the crops.

People used different ways of keeping pests away. In ancient Greece, people sprayed their homes with sulfur to get rid of insects. In China, people used arsenic to keep garden pests away.



Ancient people grew their own food crops.

At times, there were outbreaks of pests that were very destructive. In the thirteenth century in Egypt, swarms of locusts ate and destroyed the crops.

In 1845 in Ireland, the potato crops got a disease called potato blight. The potatoes rotted in the ground. The potato blight caused a **famine**. Around 1 million people died.



Potatoes with blight have a terrible smell.

One method to help keep pests away is crop rotation. Rotating, or moving, crops into different fields each year allows the soil to rest. Diseases don't build up in the soil as easily.

Scientists have also created pesticides to deal with pests. Pesticides are chemicals that kill pests. So how did modern pesticides develop and how well do they work?

STOP AND CHECK

How have people controlled pests?

Farmers spray pesticides to protect their crops.



CHAPTER 2

A CHEMICAL MIRACLE

In 1939, scientists discovered that a chemical called DDT killed insects. An insect pest called the Colorado potato beetle died when it was sprayed with DDT.

Scientists also learned that DDT kills lice. Lice were prevalent among American soldiers during World War II (1939-1945). The lice spread a disease called typhus. By killing lice, DDT helped keep typhus from spreading.

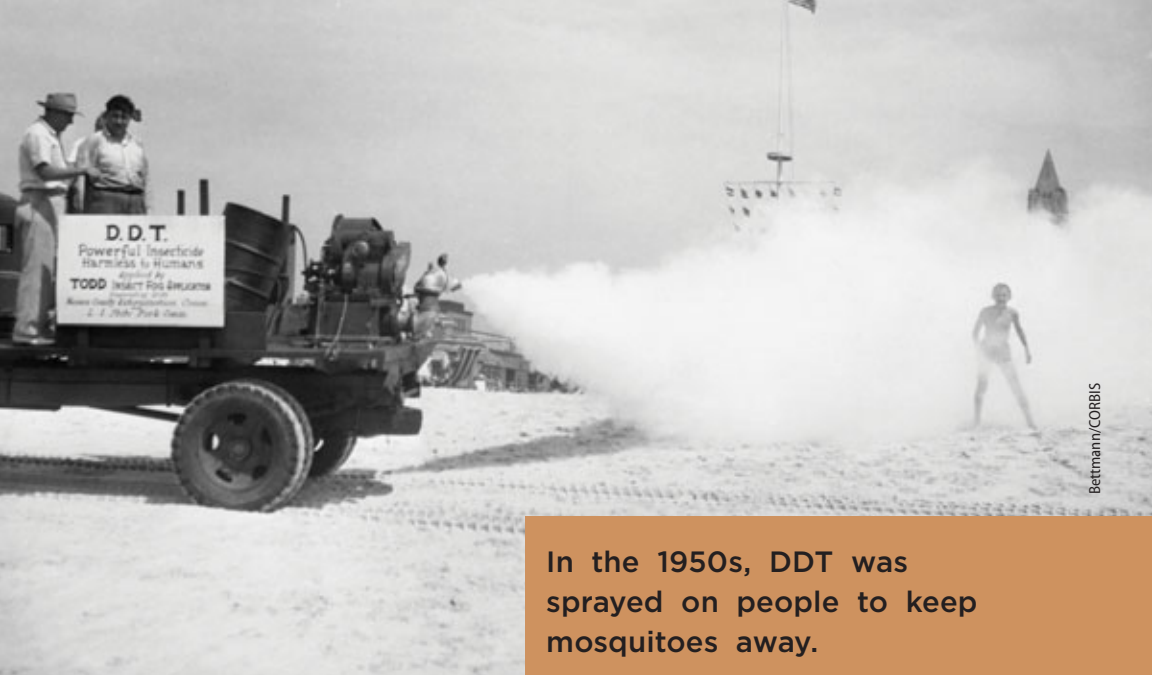
DDT could kill hundreds of different insects. People thought DDT would win the war against insects that destroy food and spread disease.



The Colorado potato beetle eats potato plants.

How Do Pesticides Work?

All living things are controlled by their nervous systems. Pesticides paralyze an insect's nervous system. The insect can't move or breathe, and it dies.



Bettmann/CORBIS

In the 1950s, DDT was sprayed on people to keep mosquitoes away.

Scientists wanted to make other pesticides to protect crops against pests and diseases. They were able to make advancements. They made herbicides to kill weeds. Scientists also developed crops that had resistance to herbicides. When farmers sprayed herbicides, the weeds died but the crops didn't.

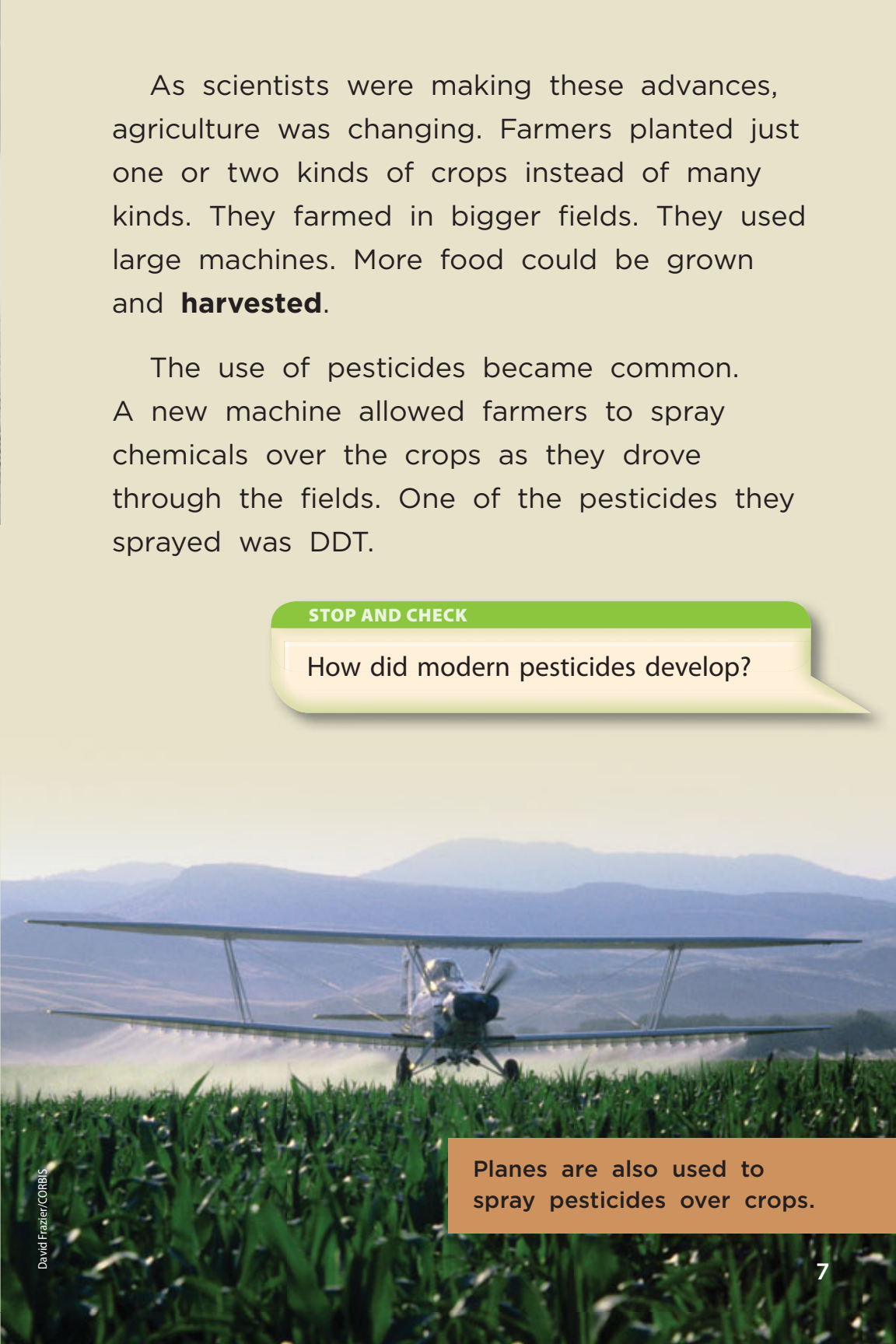
Insecticides were developed to kill insect pests. These insecticides weren't poisonous to useful insects, such as bees, which help pollinate flowers.

As scientists were making these advances, agriculture was changing. Farmers planted just one or two kinds of crops instead of many kinds. They farmed in bigger fields. They used large machines. More food could be grown and **harvested**.

The use of pesticides became common. A new machine allowed farmers to spray chemicals over the crops as they drove through the fields. One of the pesticides they sprayed was DDT.

STOP AND CHECK

How did modern pesticides develop?

A biplane is flying low over a lush green cornfield, releasing a fine mist of pesticides. The background shows rolling hills under a clear sky.

Planes are also used to spray pesticides over crops.

CHAPTER 3

PROTECTING THE ENVIRONMENT

Some people disagreed with the use of pesticides. They thought poisonous chemicals stayed on the food they ate.

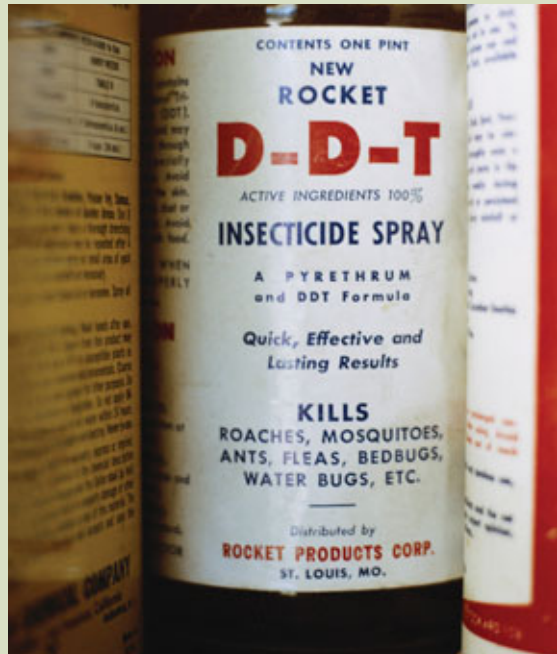
In 1962, Rachel Carson wrote a book called *Silent Spring*. Carson described how DDT harmed animals, birds, and people.

Carson explained that DDT stays in the environment for a long time after being used just once. She showed how it builds up in animals and how it enters the **food web**. Carson also explained that DDT kills all insects, even the ones that are good for the environment.

After *Silent Spring* was published, many people protested the use of DDT.

Carson's work changed people's ideas about pesticides. People began wondering which pesticides were dangerous.

Carson's work led to the Environmental Protection Agency (EPA) being set up in 1970. The EPA protects our natural environment. In 1972, the EPA banned DDT from being used in the United States.



DDT was used to kill many kinds of insect pests.

The EPA continues to study pesticides. It makes sure that pesticides don't harm people or the environment.

Environmental **activists** still worry about the dangers of pesticides. They make people aware of their concerns.

STOP AND CHECK

Why did some people become concerned about pesticides?

Spraying Apples

In 1986, scientists discovered that a pesticide called Alar caused cancer in rats. Alar was sprayed on apple trees. Many people stopped buying apples and apple juice. They worried that their children might get cancer. Some farmers began growing apples without using pesticides. The EPA banned Alar in 1989.



Many people became involved in the fight against pesticide use.

CHAPTER 4

SAFE FOOD FOR THE FUTURE

Scientists are helping farmers find safe ways to protect crops. One way is to grow plants with new characteristics.

Scientists develop

plants that aren't affected by some diseases. Young plants inherit this resistance from the parent plants. Future crops will be safe from disease, too.

Biologists also look for helpful insects.

A tiny wasp helps control an insect called the corn borer. The wasp lays its eggs in corn borer eggs. This kills the corn borer eggs.

Scientists also develop natural pesticides that don't kill insects with poison. Natural pesticides keep insects away from a plant. They also wash off easily and don't stay in the soil.

Organic farms use natural pesticides.



Some chrysanthemums naturally keep insects away.

The Pro-pesticide View

Farmers can use only pesticides that the government says are safe. If you eat fruit grown in an orchard where pesticides are used, the fruit will be free of bugs or disease.

Pesticides keep pests from destroying crops. Pesticides stop tragedies like the Irish potato famine from happening again.

Pesticides are a cheap and easy way to protect our food resources. They make sure that we have enough food.



An apple that has been sprayed with pesticides will be free of bugs.

The Anti-pesticide View

Organic farmers use crop rotation to help control insect pests. They use natural pesticides that don't harm crops or the soil. Organic farmers also try to attract helpful insects to their farms.

Organic food is healthier than food grown with pesticides. Organic food is totally natural and safe.

Organic farms are also safer and healthier places for workers than non-organic farms. Workers don't breathe in poisonous sprays. Using pesticides is bad for our health and bad for the environment.



Organic farms grow lots of different crops.

The population of the world is growing every day. We need to produce enough food for everyone. Farmers need to protect their crops from pests. We also need a food supply that is safe to eat.

We have to balance these important needs without harming the environment. Farmers, scientists, and communities can work together and make a healthy future for all of us.

STOP AND CHECK

How do people protect crops without using chemical pesticides?



Image 100/Jupiterimages/Getty Images

Respond to Reading

Summarize

Summarize the helpful and harmful scientific advancements in *The Battle Against Pests*. Details from your graphic organizer may help.

Details
↓
Point of View

Text Evidence

1. How can you tell that the text in the sidebars on pages 12 and 13 is persuasive? **GENRE**
2. What is the author's point of view in *The Battle Against Pests*? How can you tell when the author's arguments are facts and when they are opinions? Give an example of each from the text.
AUTHOR'S POINT OF VIEW
3. Look at the word *biologists* on page 11. It contains the Greek root *bio*. Use what you know about the root to figure out what the word means. **GREEK ROOTS**
4. Write about how the book *Silent Spring* influenced people's views of pesticides. Use details from the text in your writing. **WRITE ABOUT READING**



Compare Texts

Read about how organic gardening deals with garden pests.

MAKING an ORGANIC GARDEN

PREPARING YOUR GARDEN

Organic gardeners use natural ways to keep their gardens healthy. Follow these steps to make an organic garden.

1. Mark out a small garden using string or stones.
2. Next, dig up the soil. Take out weeds. Look for earthworms. They dig tunnels in the soil. These allow air and water to reach a plant's roots.
3. Finally, mix in some compost. You can make compost using fallen leaves, grass clippings, and vegetable peelings.

An earthworm's droppings can be used in compost.



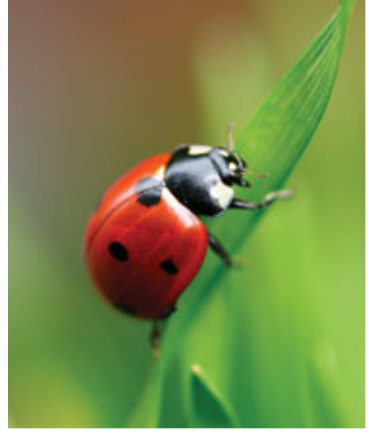
PLANTING YOUR GARDEN

Now you are ready to plant. If you are sowing seeds, use organic ones. If you are planting seedlings, choose organic plants. Leave enough space between the plants.

Choose some plants to repel insect pests. Garlic drives away the Japanese beetle. Cilantro repels aphids and white flies.

Some plants attract helpful insects. Aphids feed on the leaves of plants. Insects such as ladybugs feed on aphids. This keeps the plant pest free.

Ladybugs keep plants free from aphids.



TAKING CARE OF YOUR GARDEN

Weed your garden often. Pull out the whole weed. The weed will grow back if some of the root is left behind.

You can make natural sprays to drive harmful pests away. Spraying salt and warm water repels caterpillars and cabbage worms.

Organic gardening is fun and good for the planet too.



Growing vegetables is a fun activity.

Ariel Skelley/Blend Images/Getty Images



Make Connections

How does growing an organic garden avoid the use of harmful pesticides? **ESSENTIAL QUESTION**

Compare the techniques used in growing commercial crops with organic gardening. **TEXT TO TEXT**

Glossary

activists (*AK-ti-vists*) people who are involved in political action (**page 10**)

famine (*FA-muhn*) an extreme shortage of food (**page 3**)

food web (*fewd web*) the system of living things in an environment that depend on each other for food (**page 8**)

harvested (*HAHR-vis-tid*) gathered in a crop when it is ready (**page 7**)

organic (*awr-GA-nik*) ways of growing things not using chemicals (**page 11**)

Index

anti-pesticide view, 13

crop rotation, 4, 13

DDT, 5–9

Environmental Protection Agency (EPA), 9, 10

natural pesticides, 11, 13, 18

organic gardening, 11, 13, 16–18

pro-pesticide view, 12

Silent Spring, 8

Focus on Science

Purpose To show how pesticides can have both positive and negative consequences

Procedure

- Step 1** With a partner, research a pesticide that is used today.
.....
- Step 2** Make a list in two columns. List the benefits of using this pesticide in one column. List the arguments against its use in the other column.
.....
- Step 3** Talk with your partner. What are the arguments for using your pesticide? What are the arguments against using your pesticide? Use persuasive verbs that show how you feel about each argument.
.....
- Step 4** Present your pesticide to the class. How does it work? Where and how is it used?

Conclusion After researching the arguments for and against using the pesticide, which do you agree with?

Literature Circles

Nonfiction

Thinkmark

The Topic

What is *The Battle Against Pests* mostly about?

Text Structure

What are three things you learned about the impact of pesticide use?

Vocabulary

What new words did you learn in the text?
What helped you understand what they mean?

Author's Purpose

Why do you think the author wrote *The Battle Against Pests*?

Conclusions

What conclusions can you make about the difference between facts and opinions? In what sources are you most likely to find facts? In what sources are you most likely to find opinions?