

Name \_\_\_\_\_

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# The Farmer Cares For the Land

## CHEMICAL PESTICIDES AND FERTILIZERS

In the natural plant cycle, plants take nutrients from the soil and return them when plants die and decompose. When people take plant matter from the soil, they are also removing nutrients. Over time, if the nutrients aren't replaced, the soil can no longer provide enough nutrients for plants to grow. Farmers may replace these nutrients by adding animal manure, growing a legume crop, resting fields, or rotating crops from year to year. These techniques allowed fields to restore nutrients through natural processes.

In the 1920s, farmers began using tractors instead of horses and mules. They began using inorganic nitrogen fertilizers to replace the organic nitrogen the fields had been getting from animal manure. Nitrogen is one of the major nutrients plants need to grow. In the 1940s, farmers learned to use chemicals to kill insects and weeds. Those chemicals helped the world's farmers to produce greater quantities of food and fiber.

Chemicals have caused some problems too. Chemical pesticides can kill other organisms besides the ones for which they are intended. Some of the organisms they kill are useful ones that help crops grow naturally. Chemical fertilizers also cause reactions in the soil, which, over time, can make the soil less desirable for plant growth. Chemicals used in agriculture can also contaminate the water we drink. Sometimes they move through the soil and enter the underground water supply, and sometimes they are carried by rainwater into streams, rivers, and lakes.

Farmers are concerned about these problems. They are trying new methods that will help them grow enough food for all people to eat without damaging their land and water supplies. These methods help farmers use fewer chemicals on their fields. One method is Integrated Pest Management, or IPM. With this method, farmers first find out how many and what kinds of pests they have. Chemical pesticides are not used unless there are enough pests to cause economic crop damage. Environmentally-friendly pesticides and beneficial insects are also a part of the IPM plan.

Another method makes use of a computer installed in the farmer's tractor. The farmer takes soil samples from the fields and has them chemically tested at a laboratory. The computer is connected to a satellite positioning system that uses the soil test results to tell the fertilizer spreader where to place the fertilizer and how much to use.

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|------------|--|
| Problem    |  |
| Solution   |  |
| Cause      |  |
| Effect (s) |  |

Does the solution create another problem? If so, what is it? \_\_\_\_\_

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