

STEM *Sims*™

Crop Protection



Crop Protection

**Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.**

Start right now learning about the basics of crop pests and how farmers maintain high yields from their crops. Take the following brief quiz to see how much you already know about farming and keeping crops free from pests. See the bottom of page 4 to check your answers.

1. About what percentage of the world's farm crops are lost to disease and pest damage each year?
 - a. 3%
 - b. 10%
 - c. 30%
 - d. 80%
2. About how many weed seeds are buried in each acre of U.S. cropland?
 - a. 10,000 - 20,000
 - b. 100,000 - 300,000
 - c. 3,000,000 - 5,000,000
 - d. 100,000,000 - 300,000,000
3. U.S. farmers provide 18% of the world's food supply. What percentage of the world's total farmland do they use?
 - a. 10%
 - b. 20%
 - c. 30%
 - d. 40%
4. In the 1970's, U.S. agriculture accounted for 5% of the country's energy use. American agriculture today accounts for about what percentage of the national energy use?
 - a. 1%
 - b. 5%
 - c. 10%
 - d. 20%
5. There are about _____ farms in America, and individuals and family businesses operate _____ of them.
 - a. 1 million; 50%
 - b. 2 million; 99%
 - c. 5 million; 35%
 - d. 10 million; 40%

Garden Friend or Foe?

Not all insects are harmful to crops. Some insects are beneficial, protecting crops by eating insects that feed on the plants. For each image below, state whether the insect is a crop-damaging pest (foe) or if the insect is serving as a protector of the plants (friend).

A



E



B



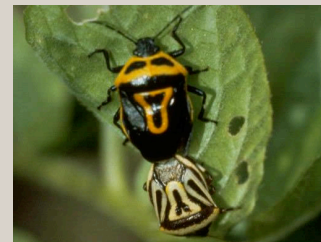
F



C



G



D



H



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More Than One Way to Skin a...Leafminer

Leafminers are common pests found in both home plants and commercial crops. During the larval stage of their life cycle, these pests feed on the insides of leaves. They leave trails (like mine shafts) as they eat the leaf from the inside out. Note the paths made by the leafminer in the image to the right.

Leafminers feed on beans, blackberries, cabbage, lettuce, peppers, and a variety of ornamental flowers, trees, and shrubs. Since a plant's leaves are the primary way for the plant to take in food (through the process of photosynthesis), any damage to this structure greatly reduces the plant's crop yields. The damage could also eventually lead to the death of the plant. Controlling leafminers is high on the priority list of all crop growers.



Soybean leafminer

The application of pesticides (both natural and synthetic) is only one way to kill leafminers and protect the crop. Other methods include:

- picking off and destroying damaged leaves
- covering the ground underneath the plant with a barrier to prevent the larvae from reaching the ground and pupating
- applying organic fertilizer and proper watering so the plant can withstand some leaf loss
- applying the parasitic wasp *Diglyphus isaea* that feeds on the leafminer larvae
- using sticky traps to catch adult leafminers

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STEMsims.com

Answers: Page 2 Answers: 1) c, 2) d, 3) a, 4) a, 5) b. Page 3 Garden Friend or Foe Answers: a) friend - assassin bug, b) friend - minute pirate bug, c) foe - wheat midge, d) friend - syrphid fly, e) foe - Colorado potato beetle, f) foe - locust leaf miner, g) friend - stink bug, h) friend - ground beetle.

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