Changing Corn Traits

Read how three practices influence the traits corn plants inherit.

8.LS4.5 "Gather and synthesize information about the practices that have changed the way humans influence the inheritance of desired traits in organisms."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline each practice people use to influence inherited traits in corn. Circle the words that explain how each practice affects what new plants may inherit.

From Field to Seed

1. On a farm, caterpillars can ruin a corn harvest by eating leaves before the ears mature. Farmers have long used selective breeding to increase useful inherited traits. They save seeds from corn plants that suffer less insect damage, then grow those seeds and repeat the choice over many generations. Some offspring inherit traits that help them survive, but others do not. This method works with variation already present in the corn plants. It can take many growing seasons to make a trait common.

2. Farmers can also control which corn plants produce seeds together. They move pollen from a plant with one useful trait to the silks of another plant with a different useful trait. This controlled cross gives offspring a chance to inherit traits from both parents. For example, a grower might cross a plant with less insect damage with one that makes larger ears. The grower then tests the offspring and saves seeds from plants showing both traits. Crossing combines existing traits, but it cannot guarantee that every offspring will show them.

3. Genetic engineering offers another way to influence inheritance. Scientists added a gene from a soil bacterium known as Bt to some corn plants. That gene lets the corn make a protein that harms certain insect pests when they eat it. Seeds from engineered plants can pass the added gene to new plants. Unlike selection or crossing, this practice can introduce a gene from an organism that is not corn. It does not stop every insect pest, so farmers still monitor fields and use other ways to manage insects.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does saving seeds from corn plants with less insect damage influence the traits of future plants?

2. How could a controlled cross help a grower develop corn with both less insect damage and larger ears? Why must the grower test the offspring?

3. How did genetic engineering change what some corn plants could pass to their offspring?

4. Which practices in the passage use traits already found in corn, and which practice can introduce a gene from another organism?

3 YOUR TURN

Your own words

Some bean plants resist leaf fungus, while others grow many pods. Write four sentences describing how you would use a controlled cross and selective breeding to develop plants with both traits, and explain what offspring may inherit.

ANSWER KEY

Changing Corn Traits

GRADE 8 · 8.LS4.5

PART 1 · READ AND MARK

Underline each practice people use to influence inherited traits in corn. Circle the words that explain how each practice affects what new plants may inherit. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does saving seeds from corn plants with less insect damage influence the traits of future plants?	**Farmers grow seeds from plants with less damage and repeat the choice. Over generations, inherited traits that help plants survive insect damage may become more common.**
2	How could a controlled cross help a grower develop corn with both less insect damage and larger ears? Why must the grower test the offspring?	**The grower moves pollen between plants with those different traits, giving offspring a chance to inherit both. Testing is needed because not every offspring will show both traits.**
3	How did genetic engineering change what some corn plants could pass to their offspring?	**Scientists added a gene from a soil bacterium to some corn plants. Seeds from those plants can pass the added gene to new plants.**
4	Which practices in the passage use traits already found in corn, and which practice can introduce a gene from another organism?	**Selective breeding and controlled crossing use traits already present in corn plants. Genetic engineering can introduce a gene from another organism.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would use pollen from a bean plant that resists leaf fungus to pollinate a bean plant that grows many pods. Their seeds could inherit traits from both parents, but not every new plant will show both. I would grow those seeds and save seeds only from offspring that resist fungus and grow many pods. Repeating that selection over generations could make both traits more common in the bean plants.

Accept plans that cross parents with the two different traits, then select offspring showing both traits for future breeding. Students should not claim that every offspring will inherit or show both traits.