Class Starters & Enders

Making the Most of Instructional Time
Five Minute Lessons

Class Starters and Enders help utilize the last minutes of class when a lesson ends but there is not enough time to start another, or for an interest approach at the beginning of class. Mini-lessons correlate to GPS in the programs areas below.

Don't Mess with Texas – Cytoplasm!

Program Areas: Agriculture, Business, Marketing, Biotechnology

Instructions: Read the material and make notes of important points, answer the questions, and be ready to discuss this topic.

Creating Hybrid Corn

Farmers practiced biotechnology since they first bred plants and animals for specific characteristics. Technology available today dramatically speeds up the process, making biotechnology big business in agriculture. One of the oldest applications of biotechnology is **hybrid** corn breeding, which began in earnest in the 1930s. Hybrid corn is cross-pollinated for a specific purpose. Although hundreds of **commercial varieties** of hybrid corn exist, it is likely the varieties are genetically similar.

Being too genetically similar means entire fields of crops can be lost if a disease – such as this Southern Corn Leaf Blight – infects just one plant.

Though corn has both male and female parts – the **tassel** and **ear**, respectively – scientists eventually discovered a way to make corn **sterile**. A gene that alters the complex chemical balance in the plant's **cytoplasm** produced a substance called "male-sterile cytoplasm." Because it originated in a Texas corn plant, it was called **Texas cytoplasm** or T cytoplasm. T cytoplasm was bred into almost all American corn varieties. Because hybrid corn produced with T cytoplasm was considerably less expensive to produce, it was in 85 percent of the corn planted in the country by 1970.

Corn Gets Sick Too

In 1970, a type of fungus called ***Bipolairs maydis*** struck America and destroyed 15 percent of the corn crop. The fungus caused a disease called Southern Corn Leaf Blight. Corn plants containing T cytoplasm were essentially identical to each other – they all had a similar genetic makeup and were therefore all susceptible to the *Bipolaris* fungus, which affected only those plants containing the male-sterile cytoplasm.

Environmental conditions in 1970 were extremely favorable to the fungus, allowing it to reproduce and spread rapidly. Wind carried the fungus **spores** from plant to plant. The loss of over one-billon bushels of corn cost American farmers approximately $1 billion.

Susceptibility to Disease

Genetic uniformity makes an epidemic more probable. Despite the seemingly hundreds of different varieties available for nearly every kind of plant today, many of these varieties are genetically similar.

Some people fear genetic engineering could cause problems because of this – they fear a similar episode to the blight could happen again and ruin our food supply. The government is also concerned with the possibility. **Gene banks** are being developed, new government policy and regulations are being put into place, and scientists are creating new ways to analyze plants' genetic makeup without making companies disclose the **germplasm** they use in their products.

Review

1. What is hybrid corn?
2. How can corn become sterile?
3. Where did T cytoplasm get its name?
4. What disease devastated the corn crop in 1970?
5. Why is the public concerned about hybrid corn?

Language Connection

Define the following terms

Bipolaris maydis	Germplasm
Commercial Varieties	Hybrid
Cytoplasm	Sterile
Ear	Spores
Gene Banks	Tassel

Texas Cytoplasm

History Connection

Research and write a paragraph about another plant-related disease which caused a lot of damage to the food supply. Discuss these as a class and describe how they could be prevented.

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