

# AGRICULTURE AND THE ENVIRONMENT – AN INTERDEPENDENCE

**LEVEL:** 9-12

**SUBJECTS:**  
Science, Social Studies,  
Language Arts,  
Consumer Education

**VOCABULARY:**  
Interdependent,  
stewardship, natural  
resources, conservation,  
low-input sustainable  
agriculture, conservation  
tillage, fertility,  
herbicide, insecticide,  
fertilizer, integrated pest  
management (IPM),  
non-point source water  
pollutants

**LEARNING GOAL:** Students shall develop their abilities to apply core concepts and principles from science, mathematics, social studies, arts and humanities, practical living studies and vocational studies to what they will encounter in life.

## MATERIALS

Publications of Extension Services, soil conservation, Kentucky Department of Water, Wildlife and Forestry, USDA.

## BACKGROUND

Within the next 40-80 years, depending on projected population growth, world food production must be increased by at least as much as was achieved during 12,000 years since the beginning of agriculture. This population explosion, double in the next 50 years, has the potential of placing increased demands upon the earth's resources. At the same time, a healthy environment is needed to support adequate food production. These two requirements, production of an adequate food supply for an increasing population and protection of the environment, demonstrate the principle of **interdependence** – a partnership of land and people.

Farmers who are sensitive to the environment use sound **stewardship** practices. Land stewardship is the planned, deliberate use of **conservation** techniques to save and/or renew **natural resources** of soil, water, air, sunlight and minerals. Examples of these conservation techniques include: early planting, pest control, good soil fertility and

## OBJECTIVE

The student will:

-define interdependence as the principle applies to agriculture and the environment.

-become familiar with a variety of conservation terms.

-research a specific issue involving both the environment and agriculture.

-make classroom presentations based on their research findings.

-develop strategies for safeguarding the environment.

## CONCEPTUAL AREA

Awareness and appreciation – survival is dependent upon how well people manage natural resources.

Decisions – responsible human decisions are necessary to maintain food and natural resources.

conservation tillage. Early planting of crops not only results in increased yields, but also provides a cover crop to protect soil from eroding during spring rains and shades out weeds so there is less competition for sunlight, soil nutrients and water. In recent years, many farmers have been practicing **low-input sustainable agriculture (LISA)** – farming in a way that conserves and replaces natural resources, protects the environment, and helps farmers earn a profit. Crops are carefully monitored through an integrated pest management system (IPM) to gauge when and how much herbicide (weed killer), insecticides (insect killers) and fertilizer (plant nutrients) should be applied in producing a specific crop. **Conservation tillage** is the practice of leaving stalk residues on the ground surface after the harvest to protect the soil from erosion while increasing soil **fertility** through vegetative decay.

Agriculture and the environment are interdependent in the area of water quality. Rural America is faced with one of the most complicated issues of the century in management of water resources. Water pollution stems from **non-point sources** such as mining, forestry operations, construction sites and agriculture. Pollutants from farms include sediment (soil), nutrients and pesticides. The goal is to reduce the frequency of non-point source pollutants from reaching surface and ground water through reduced tillage, strip-cropping and animal waste management systems.

Farmers provide food and habitat for 75% of the nation's wildlife. Preservation of wildlife habitat is encouraged by leaving field stubble for food, grassy covers for winter shelter and open access to manmade waterways and ponds.

This decade is already being characterized as one of increased environmental awareness. Coupled with attention to the environment is an equal concern for food safety. Consumers cannot expect an abundant, low-cost food supply without a production-oriented agriculture. This process involves selective use of herbicides, insecticides, fertilizer and animal drugs. Consumers must understand that the methods used to raise food are safe, but that there are relative risks in every part of life.

## **PROCEDURE**

1. To begin this unit, have students develop a class definition for interdependence as a connection which is mutually beneficial and necessary for both parties. They will be able to draw upon their own life experiences to find examples of interdependent relationships as with family, friends, social/religious groups or athletic teams. To make the association of agriculture to the environment, define agriculture as the industry which provides food, fiber and shelter by utilizing resources from the environment. Farming to minimize the impact on the environment is known as **stewardship**.

2. List the areas where agriculture and the environment are interdependent: soil conservation, water quality and conservation, food safety, wildlife protection, integrated pest management, wetlands. Assign students to research these areas to find examples of situations where farmers are practicing conservation in the local area. Students could interview farmers about conservation plans developed for their farms. Other sources of local information could be the agriculture extension agent, vocational

agriculture teachers, district soil conservation offices, Kentucky Departments of Water, Wildlife, or Forestry, county and state Farm Bureau offices, agriculture reporters for radio or television.

3. Have students resent their findings before the class and provide opportunities for students having the same assignment, such as water quality, to compare and contrast what they have learned about farming and the environment.

4. Conclude the unit by having students develop some recommendations for safeguarding the environment based on what they have learned from their research.

### **RESOURCES**

Background information for this lesson was taken from: Farm Facts, American Farm Bureau; "Agriculture Cares – A Growing Partnership with Our Environment," United States Department of Agriculture; and "Farmers and Ranchers: Feeding People, Protecting the Environment," American Farm Bureau News, November 1992.

### **EVALUATION**

Student understanding and application of the concepts contained in this lesson can be evaluated by the content and scope of students' presentations. In particular, students will be able to summarize knowledge gained from interviews and research and apply this information by developing strategies for creative, positive interaction between agriculture and environmental interests.

