

Agricultural and Environmental Systems: Career Field Technical Content Standards Document, 2008;
Secondary Level Science Environmental Science

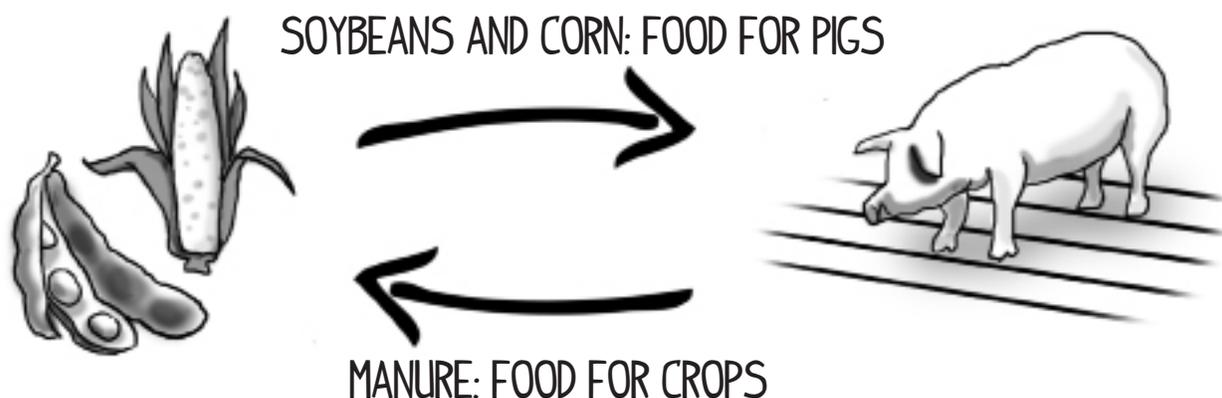
- Ecosystems
 - 5.3.1 Explain and illustrate basic ecological principles and cycles (e.g. nitrogen cycle, food web, energy pyramid)
 - 5.3.4 Model positive environmental practices for sustainability of resources
- Contaminants
 - 5.4.1 Determine types, sources and impact of natural and man-made contaminants (e.g. manure; wastewater; soil; agricultural, residential and industrial chemicals)
 - 5.4.2 Explain and implement programs and policies related to contaminants
 - level 1 Determine the presence of contaminants and follow reporting procedures
 - level 2 Assess affected area, determine the source and type of contaminant and respond appropriately

Solid Waste and Renewable Resource Management

- 5.10.1 Collect, analyze and treat waste materials (e.g. mortalities, manure, garbage)
- 5.10.5 Describe and monitor solid waste disposal procedures (e.g. landfills, lagoon, run-off)
- 5.10.6 Describe and implement waste management methods (e.g. composting facility, waste incineration, recycling)
- 5.10.7 Explain control processes and potential use for waste byproducts (e.g. landfill gas, sludge, manure, methane)
- 5.10.8 Describe standard operational techniques and identify design requirements for specific purposes (e.g. landfill, lagoon, leachate, treatment)
- Plant Science
 - 7.1.1 Compare and contrast organic and inorganic sources of macronutrients and micronutrients
 - 7.1.8 Calculate nutrient requirements and select nutrient sources and additives for optimum economic return
 - 7.1.9 Select application methods, determine time of application, and apply nutrients

GOLD UNDER THE BARN

Pork producers are committed to protecting the environment and conserving the natural resources for future generations. Today's pork production operations capture, treat and recycle the valuable nutrients produced in manure so they can be used as a natural source of fertilizer.



This environmental cycle illustrates one of the basic ecological principles that students should be able to explain and illustrate. Other cycles such as the water, oxygen, nitrogen cycles, the food web and the energy pyramid are important to the understanding of environmental issues.

ACTIVITIES

- Create another drawing that explains the water cycle, nitrogen cycle, oxygen cycle, or carbon cycle. Check out <http://www.ucar.edu/learn/1.htm> at the University Corporation for Atmospheric Research.
- Read about Environmental Stewardship at <http://www.ohiopork.org/ShowVideo.aspx?channel=1&videoid=64>

Create a one paragraph summary called *The Scoop*.

Farmers think biologically and ecologically. What is best for the environment, the water, the air and the soil? Brian Watkins set up a manure management system paying special attention to its impact on water quality, air quality, and how to be a good neighbor.

What is Manure Management? What issues are involved?

- collecting the manure, wastewater, runoff, and silage leachate
- transferring manure into a storage structure
- storing manure until land is available for application
- biological treatment of manure (composting or aerobic/anaerobic processes)
- hauling manure to the application site
- utilization of the nutrients by the growing crops

Manure management systems that work have the following characteristics:

- provide safe working conditions
- provide good animal health
- minimize and prevent air and water pollution
- minimize the impact on family and neighbor living areas
- control insects and pests
- meet economic needs