Name: _____

CASE

Activity 7.1.2 Fertilizing Right

Purpose

Agriculturalists use many sustainable practices to conserve the environment. One area of focus is nutrient management. Fertilization is an important component of raising crops and producing food efficiently. Proper fertilization practices can improve agricultural production while minimizing the impact to the environment.

The primary nutrients needed by plants are nitrogen (N), phosphorus (P) and potassium (K). Different plants need different amounts of the primary nutrients. The N-P-K ratio for a product describes the percentage of each primary nutrient found in the fertilizer. A typical N-P-K ratio for a lawn could be 11-3-3. This means the fertilizer is 11% nitrogen, 3% phosphorus, and 3% potassium by weight.

Producers are encouraged to utilize best management practices that optimize the efficiency of fertilizer use. The "4R" nutrient stewardship approach encourages the use of the **right fertilizer source** at the **right rate** at the **right time** in the **right place**. The right source of fertilizer is one that is easily used by the target crop or one that is easily converted to compounds easily used. Since the most appropriate fertilizer depends on application method, management goals and costs, there may be several possible sources. Rate of application should be selected so that the nutrient supply is appropriate for the crop requirements. Fertilizer applications should be timed so the nutrients are available when crop demand is high. The right place to apply fertilizer is where the crop can access the nutrients effectively.

How does practicing nutrient stewardship benefit agricultural producers? What challenges do implementing these practices pose?

Materials

Per student:

- Computer with Internet access
- Pencil
- *NRE Notebook*

Procedure

For this activity you will determine proper fertilizer use for your area and how practicing nutrient stewardship can improve agriculture while preserving the environment. Record your findings in on *Activity 7.1.2 Student Worksheet*.

1. Select an agricultural crop produced in your area.
2. Research what types of fertilizers are used on the crop you have selected. Select one that contains the right source for your crop to research in greater detail.
3. Determine how each of the 4R's can be applied to this crop and record your findings in Table 1 of *Activity 7.1.2 Student Worksheet*.

4. Discuss the benefits, challenges and environmental impacts of fertilizer use on the crop and local environment in Table 2 of *Activity 7.1.2 Student Worksheet*. For example, if you are using a foliar or leaf application, what are the benefits, challenges, and possible environmental effects of that practice?

Conclusion

1. What might keep producers from using nutrient stewardship practices with their crops?

5. How does implementing nutrient stewardship benefit the environment?

6. What additional stewardship practices may also benefit the environment when used in conjunction with the 4R's of nutrient stewardship?

Activity 7.1.2 Student Worksheet

Table 1. ***4R's of fertilizing***

Crop and Location of fields	Gardner, Il — Sweet Corn
Source (Inorganic or organic, N-P-K ratio, other information)	46-0-0
Application Rate (Pounds/1000 sq ft, pounds/acre, ounces/acre, etc.)	1/2 pounds / 100 sq feet
Time (When and how often?)	Post-planting - after emergence
Place (Ex. Side dressing, top dressing, foliar spray, etc.)	Side dressing — 6 inches from field

Table 2. ***Benefits, Challenges, and Environmental Impacts of 4R's***

	Benefits	**Challenges**	**Environmental Impact**
Source	- healthy plants - environmental resources	- limited	- excess may pollute
Time	- planning/organization	- bad weather pushes it back - slow growth/emergence	- if there is too much runoff what will it affect?
Rate	- precision	- running the machinery and precision tools	- too much will run off - too little won't help the crops
Place	- not as much waste	- bad weather pushes it back - accessibility of field	- is the field close to a water source?