It is imperative to retain the nutrients where they can be most efficiently used by the plant. This is generally in the soil where roots are or will soon grow to. Environmental influences, like rainfall, wind, and gravity tend to move nutrients away from the root zone. The forces of wind and water erosion should be managed to minimize the movement of nutrient-enriched soil particles from leaving the field. Improving soil surface structure and promoting greater infiltration will reduce runoff and the loss of soluble nutrient forms.

Management of irrigation water and continuation of plant growth during the high rainfall/low evapotranspiration periods will modify the amount of soil moisture capable of carrying nutrients below the root zone. Soil type affects leaching potential, so management of nutrients by soil type is also important. In summary, to protect the environment from excess nutrients, both the source of nutrients and the transport must be properly managed.

A wide variety of assessment tools are available to nutrient managers (Figure 24). Assessment tools generally fall into one of two categories:

1. Tools to assess the agronomic needs of a crop
2. Tools that assess environmental risk associated with nutrient applications

Figure 24

Properly using one or both of these types of tools can significantly improve nutrient management decisions.

- **Agronomic needs assessment tools** provide information on the status of crops, soils, and soil amendments (Figure 25). They help the nutrient management planner develop a more accurate nutrient budget to determine the amount and type of nutrients actually required by the soil-plant system.

  Agronomic needs assessment tools include the following (Sample techniques for these tests should follow Extension Service guidelines):

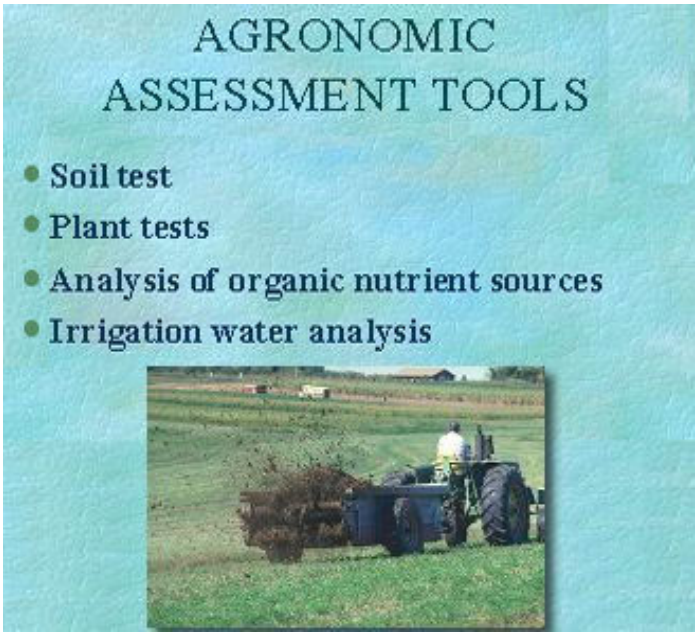

Figure 25