Core 4 Principle #2: Crop Nutrient Management

Nutrients are essential to all plant and animal life. Agricultural crops generally obtain their nutrients through roots or leaves, from the soil, water, and atmosphere. Sixteen elements have been identified as being essential to plant growth:

- Carbon (C)
- Hydrogen (H)
- Oxygen (O)
- Nitrogen (N)
- Phosphorus (P)
- Potassium (K)
- Sulfur (S)
- Calcium (Ca)
- Magnesium (Mg)
- Iron (Fe)
- Copper (Cu)
- Zinc (Zn)
- Manganese (Mn)
- Molybdenum (Mo)
- Chlorine (Cl)
- Boron (B)

Carbon, hydrogen, and oxygen are not mineral nutrients, but are the products of photosynthesis. N, P, K, S, Ca, and Mg, are considered macronutrients, because they are needed in relatively large amounts and must often be added to the soil for optimum crop production. The others - Fe, Cu, Zn, Mn, Mo, Cl, and B, are considered micronutrients, because they are needed only in minute amounts and are usually (though not always) present in the soil in ample quantities for crop production (Figure 16).

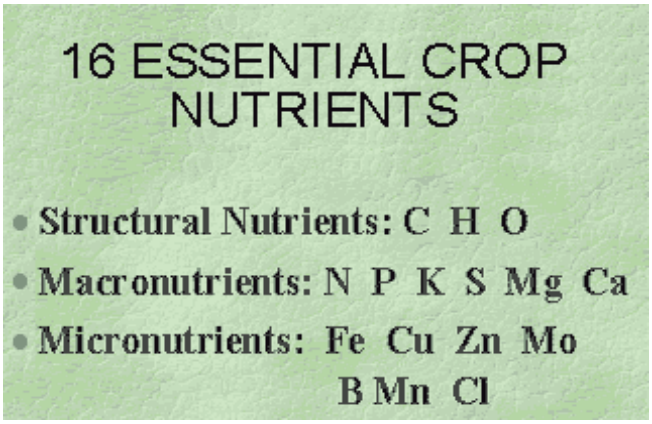

Figure 16

The practice of crop nutrient management serves four major functions:

1. It supplies essential nutrients to soils and plants so that adequate food, forage and fiber can be produced.
2. It provides for efficient and effective use of scarce nutrient resources so that these resources are not wasted.
3. It minimizes environmental degradation caused by excessive nutrients in the environment, especially in waterbodies that receive runoff from fertilized fields and other agricultural lands.
4. It helps maintain or improve the physical, chemical, and biological condition of the soil.

Proper nutrient management economizes the natural process of nutrient cycling to optimize crop growth and minimize environmental impacts.