Nutrients for healthy plant growth are divided into three categories: primary, secondary and micronutrients. Nitrogen (N), phosphorus (P) and potassium (K) are primary nutrients which are needed in fairly large quantities compared to the other nutrients. Calcium (Ca), magnesium (Mg), and sulfur (S) are secondary nutrients which are required by the plant in lesser quantities but are still essential for good plant growth. Zinc (Zn), boron (B), and manganese (Mn) are micronutrients which are required by some plants in very small amounts. We have no established levels for Copper (Cu) and Sodium (Na). Most secondary and micronutrient deficiencies are easily corrected by keeping the soil at the optimum pH value.

The soil test rating levels for these nutrients (except for nitrogen) are defined as follows:

- **Low**: The soil nutrient level is deficient and an application of this element will result in a significant yield/growth increase. A high application rate is needed to 1) meet the crop/plant requirement, 2) compensate for soil interaction, and 3) build the soil reserves.
- **Medium**: The soil nutrient level is adequate for moderate yields/growth, but a yield/growth response can be expected about 50% of the time from an application of this nutrient.
- **Sufficient**: The soil nutrient level is in that range adequate to meet the crop/plant requirement as well as that needed for consistently high yields/growth. A maintenance application rate is recommended to compensate for crop/plant removal.
- **High**: The soil nutrient can adversely affect yield/growth and product quality, and a further increase could lead to plant nutrient element imbalances. Therefore, no addition of this element is recommended unless needed to compensate for high crop removal.
- **Excessive**: The soil nutrient level will adversely affect plant yield, create nutrient element deficiencies due to imbalances, and can lead to potential ecological damage to the surrounding environment.

**Nitrogen**: Available nitrogen is taken up by plant roots in the form of nitrate (NO3-) and ammonium (NH4-). Nitrogen testing is not routinely recommended because the levels of available nitrogen are variable due to its mobility in the soil. The available forms of nitrogen are very water soluble and move rapidly through the soil profile with rainfall and irrigation. This causes the amount in the root zone to fluctuate over time. Nitrogen recommendations are based on the requirements of the particular crops/plants you are growing.