Texas Plant & Soil Lab

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Serving The World From The Rio Grande Valley.

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Plant Nutrient Analysis Guide Sheet

Nitrate (N-NO_3 ppm) **Petiole** - In sap for future growth - effect visible in 10 - 14 days. Too much too soon reduces fruit set and induces stress. Levels can change rapidly in the plant and the soil.

Nitrogen (N %) **Leaf** – Component of proteins, chlorophyll, nucleic acid.

Phosphate (P-PO_4 ppm) **Petiole** - In sap for future use - reflects present root activity. Can be increased with Humus + PGR's + Microbes.

Phosphorous (P %) **Leaf** – Energy transfer; metabolism, nucleic acid, nucleoproteins.

Potassium (K %) - Affect water uptake & efficiency - sugar production – enzyme forming - health. High requirement for sugars.

Sodium (Na %) - Low is best - with a trace essential.

Calcium (Ca %) - Cell walls - nitrate utilization - roots - leaves - fruit set for pollination & development.

Magnesium (Mg %) - Chlorophyll - photosynthesis - P metabolism - respiration.

Sulfur (S %) – Constituent of proteins; involved with respiration and nodule formation.

Zinc (Zn ppm) - Plant growth stimulator - enzymes - metabolic reaction – transformation & regulation of carbohydrates.

Iron (Fe ppm) - Respiration - chlorophyll formation - oxygen carrier - energy.

Manganese (Mn ppm) - Enzyme activation - photosynthesis - maturity - P & Ca.

Copper (Cu ppm) - Chlorophyll formation - catalyzes plant functions - energy.

Boron (B ppm) - Nitrate uptake - calcium utilization - pollination and sugar transport.

Molybdenum (Mo ppm) – Nitrate reduction; fixation of atmospheric nitrogen by legumes and synthesis of proteins.

PETIOLE (sap) TESTING: A quantitative and qualitative analysis of the nutrients in the sap (the plant's "blood stream") flow from the roots to the leaves where photosynthesis occurs to manufacture the complex components known as photosynthates (mainly carbohydrates, sugars.)

FOR FUTURE PLANT DEVELOPMENT -

a. Foliar applications of nutrients have little or no immediate effect on the sap as they stay in the leaves to aid plant functions. Micronutrients do not translocate like N-P-K which can transfer from old to new leaves when sap supply is deficient. The micronutrients - Zn - Mn - Fe - Cu - B - Mo, etc. do not move - and Ca & Mg move very little, if at all.
b. Low Micros in the sap show the needs for foliar applications and/or soil amendment.
c. Foliar Micros on leaf do not show in the sap when applied on that leaf.
d. New leaves will continue to need Micros until sap supply improves.
e. Weekly foliar will be needed every 5-10 days (PLANTS FEED EVERY DAY) !

NITROGEN - Most Petiole Programs by other labs are only NITRATE MONITORING tests with Phosphate (PO_4) and sometimes Potash, and very seldom test for micronutrients. **TPSL® prefers to also include Ca – Mg – Na and the major Micronutrients.** %N & P in leaves are cumulative over the growing season. TOO MUCH NITROGEN too early induces rapid vegetative growth, reduces up-take of other nutrients and aids disease and bugs because of stress. Even heavy fruiting plants can only utilize about 10 lb/ac of actual N per week. Only about 20% of this N is needed during the first 6-8 weeks of growth - more for grain. ***ASK THE PLANT***® and feed WHEN and only WHAT is needed in small increments where possible to soil or foliar.

PHOSPHATE (PO_4) - In the sap shows root activity, P is mostly taken-up by young root hairs near growing tip of roots. Slower old roots up-take shows senescence, or cut-out, is occurring.

- Roots can be stimulated with humus products, multi-hormones, biologicals, enzymes, etc.
- P availability is helped by chemistry of P, S, Ca, and other natural materials
- Sudden changes in P up-take can be result of new root growth interruptions caused by too much or too little water and/or lack of P, cultivator blight, compaction, nematodes, disease, etc.

Plants eat and drink every day – Maximum Economic Yield requires regular testing in a crop logging program.
Dealing with Nature in growing plants is a constant learning experience.