

- PLEASE READ AND UNDERSTAND OUR TAKING A GOOD GRAPE SOIL SAMPLE INSTRUCTION SHEET -

Nitrate (N-NO₃ ppm) Petiole - In sap for future growth - effect visible in 10-14 days. Too much too soon reduces fruit set. Changes fast.

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

Phosphate (P-PO₄ 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 %) - Affects water uptake and efficiency - sugar production – enzyme forming - health. High requirement for sugars.

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

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 to Ammonia; synthesis of proteins – especially important in **Grapes**.

PETIOLE (sap) TESTING: A quantitative and qualitative analysis of the nutrients in the sap (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

- 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 sufficient, not so with the micronutrients - Zn - Mn - Fe - Cu - B - Mo, etc. Ca & Mg seldom move very little if at all.
- Low Micros in the sap show the needs for foliar applications and/or soil amendment.
- Foliar Micros on leaf do not show in the sap after having been applied on that leaf.
- New leaves will continue to need Micros until sap supply improves.
- Foliar applications 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 (PO₄) and sometimes Potash, and very seldom test for micronutrients. Nitrogen requirements vary with varieties.

TPSL® also prefers to include Secondary (Ca-Mg-Na) and the Micronutrients. %N and P in leaves are total accumulation.

- ◆ **TOO MUCH NITROGEN** too early reduces up-take of other nutrients and aids disease and bugs. Even heavy fruiting plants can only utilize about 10 lb/ac of actual N per week.
- ◆ Only 20+% of this N is needed during the first 6-8 weeks of growth.
- ◆ **ASK THE PLANT®** and feed WHEN and only WHAT is needed in small increments where possible to soil or foliar.

PHOSPHATE (PO₄) - 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 the 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 scheduled Petiole and Leaf testing with

ASK THE PLANT®

Dealing with Nature in a crop production program is a constant learning experience.