TEXAS PLANT & SOIL LAB

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SOIL ANALYSIS REPORT

(*We may endorse products that we know can be effective - We identify needs with recommendations*)

SOIL-WATER-PLANT ANALYSIS

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Next Step Produce **Newburg, MD / Rice** **5/4/2015**
#26401-02

RECOMMENDATIONS: *assume this soil sample is REPRESENTATIVE of the soil in the ROOT ZONE from the MAJORITY of the area tested. Rates are for MAXIMUM ECONOMIC YIELDS using all BEST MANAGEMENT PRACTICES. ADJUST for your field conditions & yield goal* by **CONFERRING with your Consultant and/or Local Supplier for products that can supply these generic recommendations for your plants & soils needs,** as we have no knowledge of products or suppliers available in your area.

FERTILIZER GUIDELINES

Crop:	Rice	**Yield Goal:**	7000 lbs/ac	**Rec Units:**	Lbs/ac

Gypsum	Lime	N	P_2O_5	K_2O	Mg	S	Zn	Fe	Mn	Cu	B
500-1000		47-83	59-68	45-120	5-6		5-15		10-20	10-15	1

***Interpretations and Recommendations*:**

RICE 7000 lbs/ac ï Nutrient uptake is about 112 N - 60 P_2O_5 - 148 K_2O - 14 Mg - 12 S. Efficiency of applied fertilizer recovery by first crop ranges from 60-80% of N ï 15-30% of P_2O_5 ï 55-70% of K_2O.

ORGANIC MATTER the available humus fraction (slow release nitrogen) is the foundation of any soil fertility or plant nutrition program. Our tests measure only the humic (well decomposed - available) portion. To build O.M. is a long-term process. Use manure, composts, humates and other humus products for fast results in the soil-building program. Supplemental products such as Organic Formulas, humic/lignin products, soil inoculants, compost teas, fish products, vegetable meals, etc should also be beneficial.

Build and maintain humus (slo-release N supply) with composts, humates, humus products, vegetable meals, fish products and/or soil inoculants for better tilth and nutrient supply. (Granular Humates can be blended with dry fertilizer and there is an activated humate for faster release.)

CALCIUM is the most important mineral as a building block for healthy soils, plants and animals; even acid loving plants also need a supply. TPSL®'s unique Daubney Extraction (CO_2) that mimics the plants extraction method, plus the water soluble calcium is the best way to evaluate actual plant available calcium. High calcium soils may have low availability (H_2O Ca). Calcium is essential for biological activity, especially with legumes. Soluble calcium (H_2O) is needed to leach harmful salts.

CALCIUM (H_2O Ca - Available): Apply up to 500 lb/ac (12 lbs/1000 sq.ft. or 1 ½ lbs/100 sq.ft.) in the bed or 1000 lb/ac (23 lbs/1000 sq.ft. or 2 ½ lbs/100 sq.ft.) broadcast of a high quality finely ground Gypsum for an available source of calcium that has little effect on pH. Improve effectiveness with regular use of Sulfur, humus and soil inoculants.

SOLUBILIZE Ca and Mg to the available form with acidification from regular sulfur use and/or biologically (feed microbes with humus products and molasses) more available (H_2O Ca) should be beneficial. Carboxyls and lignosulfates aid Calcium availability.

ORGANIC RICE requires a lot of N plus other nutrients. First step is to rebuild Humus ï a flooded soil presents many challenges.

NITROGEN: Apply 47 to 83 lbs/ac of actual Nitrogen in split applications.

NITROGEN/ ORGANIC ï sources are limited; boost with quickly available sources such as fish products, vegetable meals, organic formulas, compost teas, soil inoculants, etc. as needed.

The best way to tell when and how much more N and/or other nutrients are needed is to use regular petiole (sap or leaf) tests - most crops respond to foliar N if needed.

PHOSPHATE: Apply 59 to 68 lbs/ac of P_2O_5 in split applications. - **PHOSPHATE:** (Natural/ Organic) Work into soil or broadcast at least 600-1000 lb/ac (14-23 lbs/1000 sq.ft. or 1 ½ - 2 ½ lbs/100 sq.ft.) of a finely ground rock Phosphate, mix 20% as much fine Sulfur for natural acidification to help release P and other nutrients; should last for several years when enough is used. Apply in band on alkaline soils. A good livestock compost, chicken litter or Guano can also supply P.

Humic Substances such as Humic acid with the P can increase uptake, Soil inoculants (conditioners) might also be beneficial.

Soil Inoculants (of naturally occurring beneficial soil microorganisms) may aid the uptake of plant nutrients.

POTASH: Apply as much K_2O as N as many crops including grasses use more K_2O than N and will mine the subsoils, then yields and quality decline.

POTASH: Apply 45 to 120 lbs/ac of K_2O in split applications.
Many crops can mine the subsoil POTASH for a time, then yields, quality and health decline.

POTASH improves the over all health of the plants and with moisture stress helps to get better water use efficiency for better quality and yield.

POTASH: build reserves with rock minerals 500-700 lbs/ac (11-16 lbs/1000 sq.ft. or 1 ï 1 ½ lbs/100 sq.ft.): greensand, lava, granite dust, etc. Also, commercial red 0-0-60 can be a mined natural mineral an economical source to correct major deficiencies.

POTASH and MAGNESIUM: (Natural/ Organic) apply up to 400 lb/ac (10 lbs/1000 sq.ft. or 1 lb/100 sq.ft.) of Langebenite (K-Mag 0-0-22/ 11 Mg/ 22 S). In addition, other approved materials such as rock dust, granite dust, greensand, etc. to build Potash reserves. Also, regular red 0-0-60 can be a mined natural Mineral.

MICRONUTRIENTS: Refer to Soil Analysis Fertilizer Guidelines for specific recommendations.

MICRONUTRIENTS: Plant Analysis is the best way to determine when and how much micronutrients are needed and they can be applied foliar or in the water and soil.

SOIL INOCULANTS - Activators (in the absence of adequate soil humus or in sterile conditions) of SOIL INOCULANTS / COMPOST TEAS containing naturally occurring beneficial soil micro-organisms and/or enzymes, hormones, polymers, wetting agents and Carboxyls may improve nutrient uptake and the soilôs physical condition (tilth) for better plant performance, possibly disease resistance and salt leaching. Feeding microbes with humic substances, carbohydrates, and other organic materials aid soil tilth and releases soil nutrients while helping some bacteria fix atmospheric N. [A combination of products may be best ï follow product labels on your own test plots for the most effective products.]

Soil microbes need food (humates/humus etc.) and energy (sugars and/or proteins) molasses or fish products among many.

CALLS are welcomed for clarification of LAB Reports. However, when due to numerous and lengthy matters over 10-15 minutes, we must charge our clients a consulting fee of $80.00 an hour in 30 minute increments. Without lab work the fee is $150.00 per hour. ***Please track your time in 30 minute increments and send check payable to Texas Plant and Soil Lab***. As with CPAs, lawyers, Drs and other professionals TPSL® is not subsidized by sales or public funds so our time must produce income so we can keep current in soil fertility and plant nutrition to aid our clientsô return on Investments in inputs which produce Maximum Economic Yields and Quality.

INTERPRETATIONS **TESTS SHOW AVAILABLE NUTRIENTS - RATINGS CALIBRATED BY PLANT ANALYSIS, see guide sheet.**

Soil Status ï Two standard topsoil analysis with micronutrients for Rice.

Textures ï **Both:** Sandy with fast internal drainage, very low water holding capacity and cation exchange capacity about (3-8).

Total Soluble Salts – (TSS) ï (*can cause a major tilth problem, usually Sodium (Na) is the major culprit of the toxic big 3 (Na, NO_3 & K). Is the Na soluble? Is it attached to the soil particle? Sodium must be solubilized so it can leach through the soil profile with good internal drainage (tilth). This requires adequate soluble Ca for a low Na/Ca ratio.*) ï **Both:** Tests very favorably low.

Sodium (Na) – (*high Na can interfere with nutrient uptake and should be managed for leaching*) ï **Both:** Tests favorably low.

Calcium (Ca) – (*adequate soluble (H_2O) Ca is needed for available nutrients and good soil physical condition*) ï **#2:** Tests very low; should be added as Quality Limestone. Sulfur improves the availability of Calcium by making it soluble. **#1:** Reserves (CO_2 Ca) test low with good pH. Gypsum (a good neutral source of Calcium and Sulfur) should be applied. Calcium Nitrate (Ca NO_3) can also be a good source of available Calcium and Nitrogen for some crops, other than organic. **Both:** Soluble Calcium (available H_2O Ca) needs increasing. Use acidification or other soil conditioners such as humus and microbial products.

Magnesium (Mg) – Both: Levels test very low, more is needed.

Organic Matter – (O.M.) – (*Humus fraction - slow release N at reasonably good levels is the foundation of any good soil fertility - plant nutrition program. This test determines only the Humic (well- decomposed and available) portion.*) ï **Both:** Tests favorable low-medium; continue to build for best results and better tilth (condition). REBUILDING O.M. **rapidly** requires more than just the first step of good crop rotations and minimum tillage! TO BUILD O.M. is a long term process of crop rotations with high residue crops, PLUS mulching or incorporating green manure soil building cover crops of fibrous rooted high vegetative volume such as forage crops of sorghum-Sudan types, small grains, etc. Legumes when possible are beneficial. Turnip or other root crops are also good soil builders. WHERE POSSIBLE, the use of composts and/or manures, along with humates, can be the fastest sources. Soil inoculants (conditioners) may also be beneficial on most soils. Tillage accelerates carbon decomposition.

pH – *(pH should not be used as an absolute recommendation as it is a very nebulous dynamic measurement at best---too many factors influence a soil test pH measurement for it to be a reliable representation of the natural soil pH in the field that affects plant root growth.* ***TPSL®*** *measures and evaluates Ca levels four different ways.)* ï **Both:** Tests near neutral ï be sure soluble (available H_2O) Calcium and Magnesium are adequate ï good range for most crops.

Nitrogen (N) – (as Nitrate - NO_3) ï (T*he most essential nutrient. Too much too early can be as harmful as too little too late. Feed plants as they show need –* ***TPSL®****'s exclusive* ***Ask the Plant®*** *program allows nutritional corrections to be dynamically made as the plants' needs change to achieve maximum genetic potential.*) ï **#2:** Some residual; but test is low ï needs more readily available N. **#1:** Fair residual ï tests medium; should be enough to get plants started unless there is leaching from rains or irrigation.

Phosphorus (P) - (as Phosphate – (Phosphorus Pentoxide) – P_2O_5) ï (*Along with Ca, it is the backbone of all plants and animals. It is especially important at germination and root formation as P in the sap of plants indicates root activity for future growth and production*) ï **Both:** Tests very low ï shows little or no residual, need to build reserves.

Potassium (K) – (as Potash – K_2O) ï (*The quality element of cell walls for cold and drought tolerance and vital enzyme functions.*) ï **Both:** Tests very low availability; needs good rates. Most plants use as much K_2O as N and feed on the subsoil.

Micronutrients – Varies from low to high.

Respectfully Submitted
Noel Garcia, CCA
Certified Crop Adviser