PROACTIVE MONITORING OF IRRIGATION WATER, SOIL, AND PLANT TISSUE FOR PLATINUM TE™

Irrigation Water

1. **Collect samples from a sprinkler on the front 9 holes, one from a sprinkler on the back 9 holes, and from the irrigation lake near the intake or wet well. Submit for salinity and nutrient analysis (not drinking water standards).**
2. **If particulates or fines are potentially a limitation because of high concentrations, send two water samples to:**

   Spectrex Corporation
   493 Seaport Court, Suite 105
   Redwood, CA 94063
   Phone: 800-822-3940
   Website: www.spectrex.com

   Once the data returns, you can send those data to rduncan4612@gmail.com for additional calculations that are specific to your golf course.

Soil Samples

Greens sands or sand to be used for capping fairways, tees, and roughs:

1. **Submit for a complete physical analysis that includes saturated hydraulic conductivity (infiltration/percolation rate), specific sand sizes, and sand + silt + clay fractions; total + air + capillary porosity; % moisture retention.**

RDuncan4612@gmail.com P: +1 706.845.0148

2. **Submit for the normal soil fertility testing, including base saturation information.**
3. **Submit for saturated paste extract total salinity impact testing, using the specific site irrigation water or distilled water for extraction.**

<u>Greens, Tees and Fairways</u>

1. **Collect 0-3 inch (0-75 mm) and 3-6 inch (75-150 mm) samples, bulked from similar selected greens or tees or fairways.**
2. **Submit for normal soil fertility testing, including base saturation information.**
3. **Submit for saturated paste extract total salinity impact testing, using the specific site irrigation water for extraction (future salinity program management adjustments) or distilled water (provides current total salinity impact).**

<u>Plant Tissue</u>

1. **Collect clippings from greens, tees, and fairways immediately after mowing.**
2. **Bulk similar areas (greens from front 9 or greens from back 9, for example; good and problem greens).**
3. **Dry the samples; place in paper bag and send to the laboratory for wet chemistry/spectrophotometric or ICP testing.**
4. **Submit for normal nutritional testing and include the salt ions/ compounds (Na, Mg, S, Cl).**
5. **For any areas that are not performing at the level of expectation (poor grass density; disease prone areas for example), collect clippings from that area as an individual sample to contrast with clippings from other areas.**

Paspalum plant tissue analyses sufficiency concentrations

2.00-3.00% N	**50-500 ppm Fe**
0.30-0.60% P	**20-250 ppm Zn**
2.00-4.00% K	**50-300 ppm Mn**
0.20-1.50% Ca	**5-50 ppm Cu**
0.20-0.60% Mg	**5-60 ppm B**
0.20-0.60% S	**0.50-1.0% Mo**

CRITICAL SOIL/WATER/TISSUE DATA POINTS AND INTERACTIONS

Nutrients in soil and water data cannot be compared on a ppm or mg/L basis because of differences in molecular weight. You can compare percentages without converting to meq/L. The following basic guidelines should help in interpreting and assessing the data. Contact me (rduncan4612@gmail.com) if you need clarification or if something is confusing.

To convert ppm to meq/L:	
Ca divide by 20	**bicarbonates divide by 61**
Mg divide by 12.2	**sulfates divide by 48**
Na divide by 23	**chlorides divide by 35.4**

Recommended testing procedures: should be conducted monthly for soil and tissue sampling. Water quality should be tested every 3-4 months. For soils, request both the normal soil fertility test plus the saturated paste extract (SPE) salinity test that uses your irrigation water or distilled water for water extraction and provides the level of nutrients in soil solution. For the tissue tests, collect clippings and sun-dry; place in a paper bag and send to the laboratory for testing using the 'wet chemistry'/spectrophotometric or ICP method for actual measurement of all nutrients. Do not analyze using Near Infrared Reflectance (NIR) for tissue testing.

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BASIC CRITICAL CONCENTRATIONS OR DATA

Normal Soil Fertility Test: expectations with any salinity in the water and soil
Soil Base Saturation: 65-85% Ca
10-20% Mg
2-7% K
<5% Na for fairways and tees; <3% for greens

Normal recommended soil pH 5.5-8.0 for all grasses; above 8.0, nutrient availability changes, especially micronutrients and you need to shift to liquid sources and apply more frequently despite what your soil fertility test is telling you. Check tissue tests (spectrophotometric/wet chemistry or ICP analysis) to see what the Platinum TE has actually absorbed.

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If a written data assessment is needed with recommendations, send the data to:

R.R. Duncan, PhD.
Email: rduncan4612@gmail.com