Potting Media Report

F2: Full Nutrients

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Date Received: 02/04/2019	
Report date: 02/08/2019	
Report Approved by: ZM	QC Approved by: LS

Sample Info:
Received by: IA
Sample Name: Garden
Lab ID: 1000 pf2

Analysis Type	Result	Optimal Range
pH	6.3	6 - 7
Electrical Conductivity * *EC* (dS/m)	1.97	2 - 4
Bulk Density (g/cm ^{3})	0.30	0.25-0.75
Soluble Plant Available Macronutrients		
Analyte Type in ppm	Result	Optimal Range (ppm)
Calcium (Ca)	118	80 - 400
Magnesium (Mg)	44	30-70
Potassium (K)	223	60-200
Sodium (Na)	147	0 - 80
Nitrate (NO_3^--N)	60	70 - 200
Phosphate (PO_4^{3-}-P)	12	15 - 25
Micronutrients		
Analyte Type in ppm	Result	Optimal Range (ppm)
Zinc (Zn)	4	5 - 30
Manganese (Mn)	2	5 - 30
Copper (Cu)	0.2	0.5 - 1.5
Iron (Fe)	45	15 - 40
Boron (B)	0.4	0.7 - 2.5
Chloride (Cl^-)	152	<45
Total Plant Available Macronutrients		
Analyte Type in ppm	Result	Optimal Range (ppm)
Calcium (Ca)	[redacted]	2000-4000
Magnesium (Mg)		100-500
Potassium (K)		150-800
Sodium (Na)		See ESP
Calculated Percent Exchangeable Cations		
How Calcium, Magnesium, Sodium, and Potassium relate to each other. These will add up to 100%. By increasing one, others will decrease. If the percentages differ greatly from the given optimal ranges see comments for further instruction.		
Analyte Type in Percent	Result	Optimal Range (%)
Calcium (Ca)	22	45
Magnesium (Mg)	8	9
Potassium (K)	42	38
Sodium (Na)	28	<5
Calculated Calcium to Magnesium Ratio		
Analyte Type	Result	Optimal Ratio
Ca:Mg	1.6	>3
Calculated Salinity & Lime Requirement		
Analysis Type	Result	Optimal Range
SAR (sodium absorption ratio)	[redacted]	<13
ESP (exchangeable sodium percent)		<15%
Lime Req* lbs/100ft ^{3}		Calcium Carbonate to raise pH

*Lime Requirement is reported as 100% $CaCO_3$ to a pH of 6.5 - Compare to the % $CaCO_3$ in your liming product to determine application rate.

ND - No Detection - This means there was not a detected amount of this substance in your sample.

Results at a Glance:
See Page 2 for complete Interpretations & Recommendations
Acceptable EC
Low End of Optimal Calcium
High Potassium
Moderately High Sodium
Low Nitrate
Low Phosphate
Very Low Zn
Very Low Manganese
Low Copper
High Iron
Very Low Boron
Very High Chloride
Low Ca:Mg Ratio

The reported lime application rate is intended to raise pH to 6.5, HOWEVER a soil can only process 5lb/100 sq-ft (10lb/100 cubic-ft) of liming agent per application. Applications that are larger than 5lb/100Ft2 should be split with one half applied now and the half at the end of the season before planting a cover crop.

For further details about your report give us a call to discuss a consultation. You can also check out our website at www.imperialanalytics.com for more information, helpful hints and disclaimers.

Interpretations & Recommendations:	
Acceptable EC	Will increase when you amend. A low EC is indicative of nutrient deficient soil.
Low End of Optimal Calcium	While visual deficiency symptoms are not likely to be present, an application of a calcium amendment will likely be beneficial to plant growth. If soil pH is low, lime or oyster shell can be used. If soil pH is within range, use gypsum or other amendment that will not increase soil pH.
High Potassium	Soil with higher than optimal potassium can interfere with plant uptake of calcium and magnesium. High potassium levels also increase the soil EC, especially when the source is potassium chloride. Recommend to reduce potassium inputs until soil has decreased to optimal range.
Moderately High Sodium	Salt impacts are probably minimal at this level, but some varieties are more sensitive to sodium than others. Regular thorough watering should decrease this level - no need to flush unless plant issues are evident. Be aware that marine-based inputs and dairy manure compost likely contain sodium. Avoid inorganic fertilizers than include sodium. Consider flushing soil between crop cycles. A weak nutrient solution containing potassium, calcium, and magnesium is more effective at leaching and replacing sodium than plain water.
Low Nitrate	Nitrate is lower than ideal. This can be easily mitigated with light feedings of fish hyrolysate or a similarly balanced product. Nitrate levels should be increased before the next planting using compost, chicken manure, fish, N-heavy guano, alfalfa meal or other nitrogen rich amendment. Depending on where your crop is in its growth cycle, nitrate may become too low, as it is needed at low levels into flower. You may need to boost N in late flower, but this can be easily mitigated with light feedings of fish hyrolysate or similarly balanced product.
Low Phosphate	If your crop is near or in the flowering cycle, you need to add a soluble form of phosphorus (a high-P guano, marine product or liquid bone meal). If you have a full season crop or are still in veg, amend the soil with an amendment contain phosphorus (guano, bone meal, or other P-heavy source). Low levels of P will decrease plant root growth and subsequent health and will also decrease yields. Healthy soil biology will also assist in increasing phosphorus availibility.
Very Low Zn	Soil with less than 5 ppm zinc should have a zinc source applied to the soil before the growing season or are likely to exhibit zinc deficiencies. Plants with visual deficiency symptoms should have a foliar application of chelated zinc applied and also a zinc source (glacial rock dust or basalt) should be applied to the soil.
Very Low Manganese	Visual deficiency symptoms are very likely at this range. Lack of manganese in the soil leads to reduced root and shoot growth. This can lead to nitrogen and phosphorus accumulations in plant tissue which may increase likelihood of root and leaf disease. Many common crops are sensitive to manganese deficiencies. Use a trace mineral additive (rock dust) if levels are low prior to planting or apply a readily available micronutrient product during production to raise plant available micronutrient level to correct visible deficiencies.
Low Copper	Copper can be supplied by most composts, manures, and trace mineral additives (glacial rock dust). If copper deficiency symptoms are present apply a micronutrient blend foliarly.
High Iron	This is common in native mineral soils and should not be a problem unless the pH decreases. Iron uptake increases as pH lowers, so iron toxicities can be an issue in systems with pH below 6.0.
Very Low Boron	The boron level is very low in this soil. While needed in minimal amounts, boron is essential for proper growth. Soils with this level of boron are likely to experience visual symptoms is boron is not applied. Most trace mineral additives (glacial rock dust), liquid micronutrient products, and composts contain boron. If deficiency symptoms are present, apply boron foliarly.
Very High Chloride	Very high levels of chloride can lead to toxicity. The source of high chloride can be your water source, manure and manure composts, and marine based amendments. If you are not adding marine product or manures, check you fertilizer labels for chloride compounds and omit them. Inorganic liquid fertilizers often contain chloride compounds (i.e. potassium chloride). Otherwise, test your water source. Flushing can help remove chloride, but test water to make sure you are not adding more chloride from the water source.
Low Ca:Mg Ratio	There is not enough calcium in the soil when compared to magnesium levels. If soil pH is low, calcium concentrations can be increased using lime or oyster shell, but avoid using dolomite (contains magnesium). If pH is acceptable, gypsum can be added to supply calcium without changing pH.