



Analysis Report For:				Copy To:		
Robert G Smith 485 Orchard Rd Schellsburg PA 15559						
LAB ID:	SAMPLE ID:	REPORT DATE:	DATE SAMPLED	SAMPLE TYPE	INTENDED USE	COUNTY
W04014	OTCF Well	3/15/2011	3/5/2011	Irrigation Water	Nursery	Philadelphia

WATER ANALYSIS
Irrigation Water Report (WH02)

Analysis	Result	Units	Normal Range	Upper Limit
pH	6.2	-	6.0 to 7.5	-
Total Alkalinity as CaCO ₃	43.9	mg/L	80 - 100	-
Bicarbonates (HCO ₃)	53.5	mg/L	80 - 100	-
Carbonates (CO ₃)	0.0	mg/L	-	-
Hardness as CaCO ₃	262.7	mg/L	< 150	-
Electrical Conductivity (EC)	0.90	mmhos/cm	-	3 - 5
Total Dissolved Solids (TDS)	575.0	mg/L	-	-
Fertilizer-Nitrogen (N)	5.41	mg/L	50 - 150	-
Nitrate-Nitrogen (NO ₃ -N)	4.42	mg/L	50 - 100	-
Ammonium-Nitrogen (NH ₄ -N)	< 0.99	mg/L	0 - 75	100
Phosphorus (P)	< 0.03	mg/L	10 - 50	-
Potassium (K)	6.93	mg/L	< 200	-
Calcium (Ca)	60.71	mg/L	> 150	-
Magnesium	26.98	mg/L	20 - 60	-
Iron (Fe)	< 0.10	mg/L	2 - 5	5 - 20
Manganese(Mn)	0.12	mg/L	0.3 - 1.0	10
Zinc (Zn)	< 0.01	mg/L	-	-
Copper (Cu)	< 0.01	mg/L	0.01 - 1	10
Boron (B)	< 0.01	mg/L	0.3 - 0.5	1
Molybdenum (Mo)	< 0.010	mg/L	0.06 - 0.1	5 - 10
Sulfur (S)	19.7	mg/L	< 60	-
Chloride (Cl)	199.40	mg/L	0 - 30	30
Sodium (Na)	67.23	mg/L	-	30
Sodium Adsorbtion Ratio (SAR)	1.80	-	-	-

Comments

pH: Optimum range for most crops is between 6 and 7.5. Low pH (less than 5.5) may result in toxicity of minor nutrients like iron and manganese and is usually found in combination with low alkalinity. Correct low pH problems by switching to a basic fertilizer or liming the growing medium. High pH (>7.5) may result in minor nutrient deficiency and is usually found in combination with high alkalinity. High pH problems can be corrected by acid injection or in some cases by using an acid fertilizer.

TOTAL ALKALINITY: The desirable range for total alkalinity is 80 to 100 mg/L. Low alkalinity water may lead to low pH when used with acid fertilizers. High alkalinity may lead to elevated media pH resulting in induced iron deficiency.

CONDUCTIVITY: The conductivity of typical clean water is 0 to 0.6 mmhos/cm. Conductivity of fertigation solutions varies with the fertilizer concentration and salt, but should not exceed 3 to 5 mmhos/cm.

FERTILIZER NITROGEN: The acceptable range for fertilizer nitrogen for most crops is 50 to 150. The ratio of nitrate-nitrogen to ammonium nitrogen should be increased to at least 75:25 in cool weather (fall, winter, and early spring) to avoid ammonium toxicity in sensitive crops.

NITRATE-NITROGEN: The drinking water standard for nitrate-nitrogen is 10 mg/L. Typical values for clean water are 0.3 to 5 mg/L. Discharged waste water from greenhouses or nurseries entering surface waters or streams should meet or exceed the drinking water standard. The acceptable range for fertigation of most crops is 50 to 150 mg/L.

AMMONIUM-NITROGEN: The ammonium-N concentration in typical clean water ranges from 0 to 2 mg/L. The typical fertigation range is 0 to 75 mg/L. See comments, above, for fertilizer nitrogen. Toxicity in sensitive plants may occur when ammonium is used in fall, winter, or early spring. Toxicity symptoms include stunting, root death, leaf yellowing and distortion of growing points. Correct by switching to nitrate fertilizer.

PHOSPHORUS: Waste water to be discharged to surface waters should be as low as possible (less than 1 mg/L is desirable) to reduce environmental impact.

IRON: Excess iron may cause toxicity in sensitive species when growing medium pH is less than 6.5 to 7.0. Induced deficiency may occur in sensitive species if pH is greater than 7.0 to 7.5.

BORON: Boron toxicity may occur if irrigation water or fertigation solution exceeds 0.5 to 1.0 mg/L, particularly with long-term slow-growing crops.

CHLORIDE: Chloride in excess of 30 mg/L may cause toxicity in sensitive plants.

SODIUM: Sodium in excess of 30 mg/L may cause toxicity in sensitive plants, particularly in recirculating irrigation systems.