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Stephen Batchelder
1534 Rose Street
Crockett, CA 94525

RE: Ohlone College, Newark

Dear Steve and Molly,

The Surface samples are moderately alkaline with pH values of 7.68 and 7.91. The salinity of the surface samples are modest with an average value of 1.48 millimho/cm. #1 has moderate nitrogen and potassium with modest phosphorus. #2 has low nitrogen, modest potassium and moderate phosphorus. Both Surface samples should be sufficient with micronutrients. Magnesium is elevated slightly in the samples. Sodium is elevated with SAR (sodium adsorption ratio) values of around 4.4. Chloride is elevated with an average value of around 300 parts per million.

The Subsoil samples are highly alkaline with an average pH of 8.17. Sample #3 has a high salinity at 3.76 millimho/cm. The salinity of #4 is moderate at 1.40 millimho/cm. Both samples have low nitrogen, with modest phosphorus and potassium. Sample #3 also has modest manganese and zinc. Sample #4 has elevated chloride at 260 parts per million, elevated sodium with an SAR of 5.8. and high boron at 1 part per million. Sample #3 has very high sodium with an SAR of 18.7 with very high chloride at 820 parts per million. Sample #3 has very high boron at 4 parts per million. Limestone is present in Sample #3 which induces iron deficiency in acid loving plants.

Recommendations

Sample #3 has very high sodium, chloride and boron and should be preleached if plants are to be used are not tolerant to excessive sodium, chloride and boron. High sodium also decreases soil percolation, soil porosity and restricts leaching.

General soil preparation for turf, ground cover and shrub areas. Broadcast the following materials uniformly. The rates are per 1,000 square feet. Incorporate them homogeneously 6 inches deep:

Potassium sulfate (0-0-50) – 6 pounds
Triple superphosphate (0-45-0) – 4 pounds
agricultural gypsum – 30 pounds for #1, #2 and #4; 50 pounds for #3
organic soil amendment – as needed, sufficient for about 3% to 6% organic matter on a dry weight basis

For the preparation of backfill mix for container plants and boxed trees, homogeneously blend the following materials into excavated soil. Rates are expressed per cubic yard:

Potassium sulfate (0-0-50) – 1/4 pound

Triple superphosphate (0-45-0) – 1/4 pound

agricultural gypsum – 1.5 pounds #1, #2 and #4; 2.5 pounds for #3

good quality soil amendment - about 15% by volume depending on the material

If smaller plants are to be used and the roots will not contact the deeper soil, irrigate deeply to lower the sodium, boron and chloride in the subsoil. If larger plants are to be used preleach the soil to lower the excessive boron, chloride and sodium. Lower the boron to less than 1 part per million. Lower the chloride to less than 150 parts per million. Lower the SAR to less than 4.0. After leaching apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet.

Organic soil amendment

1. Humus material shall have an acid-soluble ash content of no less than 6% and no more than 20%. The organic matter content shall be at least 50% on a dry weight basis.
2. The pH of the material shall be between 6 and 7.5.
3. The salt content shall be less than 10 millimho/cm @ 25° C. (ECe less than 10) in a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 50%.
6. Calcium carbonate shall not be present if to be applied on alkaline soils.
7. Types of acceptable products are composts, manures, mushroom composts, straw, alfalfa, peat mosses etc. low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
8. Composted wood products are conditionally acceptable [stable humus must be present]. Wood based products are not acceptable which are based on red wood or cedar.
9. Sludge-based materials are not acceptable.
10. Carbon:nitrogen ratio is less than 25:1.
11. The compost shall be aerobic without malodorous presence of decomposition products.
12. The maximum particle size shall be 0.5 inch, 80% or more shall pass a No. 4 screen.

Maximum total permissible pollutant concentrations in amendment in parts per million on a dry weight basis:

arsenic	20	copper	150	selenium	30
cadmium	15	lead	100	silver	10
chromium	100	mercury	10	vanadium	200
cobalt	50	molybdenum	20	zinc	200
		nickel	100		

For site maintenance, apply ammonium sulfate (21-0-0) at 5 pounds per 1,000 square feet about once per quarter. Add gypsum as needed to control the sodium in the subsoils. Monitor the site with periodic soil testing. Adjust the maintenance program as needed.

Correct iron deficiency if it develops with Becker Underwood Sprint 138 Fe or other FeEDDHA chelated iron.

Sincerely,

John S. Wallace
JSW:n