Solving Sodium Problems

" Agronomic solutions for the golf course "

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Salt affected turfgrass sites.

Increases in Na create a host for Na accumulation in soil and wate management challenges in maintain essential in managing salt levels. Sc turf quality on a golf course. and water testing can reveal nutrien imbalances and deficiencies in Ca, K

High sodium degrades soil structure Mg , NO_3 , Mn, S, P and reveal the s stroying larger soil pores (macro po dium hazard of the irrigation water leaving smaller pores to dominate t soil. Destruction of soil pore space curs as soil particles disperse under levels in solution with a focus on ke sodium conditions. A reduction in n elements calcium and potassium in t pore space negatively impacts soi soil is critical in managing excessive ter infiltration rates, percolation sodium. Having soluble calcium ava drainage. These Altered physical pro in the soil, combined with proper wat ties result in decreased carbon diox management techniques will aide in evolution, and lower oxygen concen removal of sodium from the root zo tions which will impact photosynth and plant health.

Physiological plant responses triggered as a result of excessive sodium include; increase wilting , desiccati injury, reduced turgor, decrease in hormone (cytokinin) synthesis in roots, and an increase in plant respiration Many of these plant physiological responses make the turfgrass more prone to diseases, stress, and wear.

Developing a monitoring strat

Soil tests results with higher base saturation levels of Na when compa to potassium indicate a high proba of accumulation of sodium in plant tissue. High Na depresses K up take, requi salt effected sites to have greater quantities of potassium available. Maintaining a ratio of 2.6 : 1 ppm of K : Na will encourage potassium uptake over sodium. Adequate solu potassium will reduce sodium accumulation in plant tissue.

Water management also plays a role in management of sodium level Light frequent irrigation causes seri build up of salts near the surface. This build up can lead to ion toxicities, e cially in summer months when evapotranspiration rates are at their highest. Salt accumulation must be managed so levels do not build in the root zone, and capillary rise does no bring salts from below the root zone back up into the root zone from the lack of flushing or improper watering practices.

Critical issues:

- Water deep and infrequent. Calculate leaching requirement for your site to flush salts from root zone. Use wetting agent to aide flushing of salts.
- Maintain soluble potassium and calcium levels in soil. Keep potassium ppm ratio higher than sodium.
- Monitor sodium hazard through frequent water and soil tests.

Use of Calphlex and TriCal in managing sodium pro

Lime, gypsum, and sulfur may not be enough to have an immediate impact on Na accumulation. If sodium is coming from poor quality irrigation water , Na is being continuou added. Lime ($CaCO_3$) has a low solubility rate and may not supply enough soluble Ca to replace the Na. Having sufficient available calcium keeps soil surface permeable by flocculating soil colloids, thus creating pore space.

Floratine ***Trical*** liquid calcium adds immediate soil Ca that's soluble. ***Calphlex*** extends effectiveness of Ca in soil by using a unique chelating proces that solublizes Ca, and helps flush salts from root zone. ***Maxiplex*** humic acid aids in buffering sodium effects. ***Pervade*** aids in water movemen in poor draining soils. ***FG 20 and Turgor*** add foliar potassium and silica to counter high Na tissue levels. ***ProteSyn*** and **Per 4 max** increases stress tolerance, building of new cells, and roots

Floratine Program

Soil Applications

Tri Cal : 1 gal per acre
Maxiplex : 2 gal per acre
Calphlex : determine by formula
Pervade : 2 oz per Msf

Foliar Applications

FG20 : 2—4 oz per Msf
Per 4 Max : 2 oz per Msf
ProteSyn : 2-3 oz per Msf
Turgor : 4-6 oz per Msf

*** Do not tank mix Maxiplex w Trical or Calphlex.**