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TECHNICAL BULLETIN

USING GRIGG DISPLACE® 12% CALCIUM TO TREAT SODIUM AFFECTED SOILS

Calcium is one of six macronutrients required for healthy turfgrass. Beyond the nutritional importance of calcium, it influences soil physical and chemical properties. Many types of calcium formulations are available to turfgrass managers. Some are relatively insoluble in water, making it difficult to get uniform distribution and placement of calcium to the soil profile.

GRIGG Displace contains 12% complexed calcium and is combined with a proprietary soil wetting agent, which enhances calcium penetration into the rootzone. Displace is ideal for treating soil, specifically the rhizosphere, with plant available calcium. It also physically substitutes and/or displaces calcium for sodium on soil colloids and allows sodium to be leached out of the root zone.

GRIGG Displace is designed for fast and uniform treatment of mild to moderate sodium affected soils. Soils containing an excessive amount of sodium relative to calcium, magnesium, potassium and hydrogen ions have the potential to become unproductive and unresponsive to acceptable turf quality. A severe sodic condition destroys soil structure, and sodium accumulation in plant tissues negatively affects osmotic potential, disturbs cell membrane integrity, and eventually leads to toxicity and death.

Where high sodium exists, soluble calcium treatments work to stabilize the soil, and strengthen cell membranes among additional nutritional benefits. An important factor in effectively replacing sodium with calcium on soil colloids is to introduce a soluble formulation of calcium. For example, soluble calcium added to soils with water high in carbonates and bicarbonates will reduce the risk of calcium precipitating to form insoluble lime (CaCO_3) a reaction that forms a 'crust' at the surface and limits water infiltration.

**For a distributor near you contact:
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When you use GRIGG Displace, the calcium is protected to a certain degree, from precipitation in the water and/or soil solution and the soil surfactant enables uniform penetration in the root zone. GRIGG Displace is a unique combination of readily available calcium and soil surfactant formulated to rapidly release sodium from the soil and add calcium for improved soil structure and water infiltration.

The calcium in GRIGG Displace will remain in solution and react directly with the soil to displace sodium ions. The specially formulated surfactant enhances product infiltration and facilitates uniform placement of calcium throughout the soil profile for optimal efficacy when dealing with high sodium issues. GRIGG Displace is a convenient and easy to use formulation with effective field use.

GRIGG Displace is an excellent tool for treating hydrophobic soil or localized dry spots. Displace is also an effective tool for treating bicarbonate issues, such as surface sealing and crust formation. It can also improve water penetration and enhance wetting of these difficult to manage soil conditions. GRIGG Displace has the capacity to improve soil structure for better root growth, nutrient uptake, water infiltration, soil oxygenation and overall turf vigor.

Most golf course putting greens, especially those maintained on a sand based rootzone, are often maintained under stress. Supplying adequate and bio-available calcium to the soil and subsequently to plants will be beneficial in your turf management program. The best way to maintain adequate and consistent levels of calcium in the plant is by regular foliar applications of GRIGG Proven Foliar® nutrient, GRIGG Sili-Kal B™ (8-0-4 +10% Calcium) and routine applications of GRIGG Displace to the rootzone.