Do You Need More Calcium?

Surveying the turf industry these days there appears to be a renewed interest in applying calcium. Many turf managers believe that supplemental calcium is required on sand-based rootzones with low cation exchange capacity (CEC) or because calcium might not be soluble. Others justify calcium applications from soil testing that utilizes the base cation saturation method of interpreting soil test results. In either case there is limited data to support widespread calcium use.

Iowa State University researchers conducted an experiment on creeping bentgrass (L-93) growing on a calcareous sand green (defined as having 1-40% free carbonates, pH 7.3 to 8.5). It has been suggested that while this green is calcareous, the calcium is not available and growing turf would benefit from calcium applications. To address this recommendation, four pounds of calcium per 1000 sq. ft. were applied at various frequencies and via $CaCO_3$, $CaSO_4$, $Ca(NO_3)$, and Nutri-Cal liquid calcium chelate. The turf and soil were sampled to determine the Ca and other nutrient levels.

Results of this study indicated that regardless of the source or scheduling of Ca applications, there were no effects on tissue Ca levels. In addition, the researchers observed no effect on the tissue content of any other nutrient, except for an 11% increase in Mg with $CaSO_4$ in one year. Finally, while there are well known Ca-P interactions associated with high pH the researchers observed no Ca-P interaction in this study.

One important aspect of this study was the issue of proper soil nutrient extractant for soil testing purposes. If your soils are highly calcareous then any use of the ammonium acetate method with result in errors in recommendations. Based on several recently published studies in turf and vegetables the increased use of Ca does not appear to be beneficial.

From: St. John, R.A., N.E. Christians and H.G. Taber. 2003. Supplemental calcium applications to creeping bentgrass established on calcareous sand. Crop Sci. 43:967-972.

Turf Reinforcement for Safety

Increased traffic on sports fields has increased the need for improved drainage. The immediate response to improving drainage has been the advent of sand-based athletic fields modeled after putting green construction. However, a significant and often overlooked distinction is the stability requirement for traction and safety on sports fields that is not required on putting greens. Still, little is known about what would enhance stability and what the increased stability would do to other soil properties, notably drainage and hardness.

Penn State University researchers Andy McNitt and Pete Landschoot investigated the use of several types of reinforcing materials on field hardness and soil physical properties. They tested DuPont shredded carpet, Netlon, Nike Reuse-a-shoe (lights and heavies), Turfgrids, and Sportgrass. Inclusion amounts in sand based systems were based on current industry standards.

Surface hardness and soil bulk density were found to be correlated in the 2 years of the study. The carpet fibers and the ground up sneakers reduced bulk density (less compacted) while the turfgrids and netlon consistently increased bulk density (more compacted). In general, as turfgrass wear increased, the treatments that lowered soil bulk density usually showed smaller increases in surface hardness.

The researchers concluded that Netlon, Turfgrids and Sportgrass under traffic resulted in higher surface hardness values than what would be considered unacceptable for safety. What this study did not investigate was the common practice of including small amounts of soil or fine particles into a sand rootzone. This would be a interesting complement to this current study.

From: McNitt, A.S. and P.J. Landschoot. 2003. Effects of soil reinforcing materials on the surface hardness, soil bulk density and water content of a sand root zone. Crop Sci. 43:957-966.

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Scanning the Journals

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Carpet fibers and ground up sneakers reduced bulk density (less compacted) while Turfgrids and Netlon increased bulk density (more compacted). Generally, as turfgrass wear increased, treatments that lowered bulk density showed smaller increases in surface hardness.