Calcium

A Major Player With Returns Above and Below

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We all know how critical the correct nutrients within the soil and turfgrass are for turf survival during the more stressful periods of time. Calcium is one of the nutrients to help with this task. Its nutrient-carrying capabilities within the turfgrass are critical. Its responsibility within the soil is major. Then why do we not see it added to fertility programs more? Let's go over some of the major proven facts of Calcium, before we try to answer this.

Calcium Improves Soil Structure In Heavy Clay Soils

Calcium is used to flocculate the clays in the soil. Flocculation is the process where smaller clay particles are broken up and then held together in fewer but larger particles. These particles allow more air space between them which means more air and water movement down through the root system. Better infiltration and conductivity results in less water on the surface which may help minimize algae problems.

Calcium Helps Plants Absorb Nutrients Better

In a simplified manner, Calcium is a nutrient carrier in both the soil and the turfgrass tissue. In the soil it helps control the water movement and conductivity which means it can deliver more nutrients from the soil solution. In the turfgrass, Calcium helps regulate water and nutrient uptake by the roots and the movement throughout the plant. Calcium aids cell division and cell wall formation and is critical for respiration during high heat and humidity periods. A large Calcium deficiency *within the turfgrass* could result in poor root development and little response to nitrogen or iron applications. Also, high nitrogen applications in the spring or fall can lead to wilt if the Calcium *within the turfgrass* is below its target range.

Calcium Helps Bind Organic Matter to Clay

The value of organics is increased when Calcium levels in the soil are correct. Microbial populations favor a correct Ca: Mg ratio (1). Imbalances of Calcium and Magnesium can permit organic residues to decay into alcohol, a sterilant to bacteria, and also into formaldehyde, a preservative of cell tissue. In soil tests, this is exactly what is happening when we see high levels of organics and low levels of *available* Calcium. A minimal resonse to organic fertilizer inputs can be seen in these situations.

Calcium Can Decrease Sodium Content in Soil

Because Calcium is divalent (double positive charge), and atomic weight of the Calcium molecule being 40 and sodium being 23 with a single charge, sodium can be replaced on the soil colloid by Calcium. The sodium is then ionized in the soil solution, which then can be flushed.

Here are some of the findings we have seen after completing many soil reports in the Upper Midwest:

- Calcium levels in the sand-based greens are usually 70-90% base saturation. This usually means calcareous sand was used in the construction.
- Old push-up greens usually show a 55-70% base saturation of Calcium.

Which one of these is better for **Calcium availability?**

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Calcium—

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It may be difficult to say until you do a soil test called "Water Soluble Paste Extraction." This test takes a sample of your soil, and adds either distilled water, or even better, your irrigation water. The soil solution is then sucked from it and analyzed for nutrients in the soil. Unless Gypsum, Limestone, Dolomitic or a liquid Calcium source has been applied, we typically see a low level of available Calcium. When the available Calcium reaches its target range and is in balance with other nutrients, the result on the turfgrass and soil is very significant. Disease, algae, thatch, LDSA, watering and color uniformity can be greatly affected.

Some Available Calcium Sources

Gypsum. Usually around 22% Calcium and 16% sulfur. Most widely used. Does not significantly effect pH. Check sulfur levels in the soil before application.

Limestone. Usually around 36% Calcium. Can raise pH.

Dolomite. Usually around 21% Calcium and 10% magnesium. Can raise pH. Check magnesium levels in the soil before application. *(The above three products are usually in granular form but liquids are available.)*

Liquid Calcium. Usually around 8% Calcium. Immediately available to the turfgrass.

The answer to why we don't see Calcium used more often is in the above mentioned products. The granular Calcium products thatwere available years ago took a long time to break down in the soil and were messy during application. Many times the results were not seen until the next year. How many times have we seen limestone used to make something on a course or athletic field and then the next spring the grass was greener where the limestone was applied?

New granular products are sold today where the availability of the Calcium is significantly improved. Now some manufacturers pulverize the gypsum or limestone and then bind the powder with an organic water soluble binder into very small beads. Upon application to the turf, and after the first watering, the product disperses into the soil. The exposed surface area of the Calcium is greatly enhanced over the old chunks and rocks of older products. More surface area means a faster break down into the soil. There are no powder clouds drifting around during the application and no big bumps on the greens or tees. No powder means no loss of product to the wind and no foot marks.

Liquid Calcium applications are very fast in delivering the available Calcium to the turfgrass when applied correctly. Don't let the low application rates fool you. The liquid Calcium products are usually complexed for foliar uptake or chelated for staying in the soil solution for uptake by the turfgrass roots. Since most liquid Calcium products can only contain a maximum of approximately 8% total Calcium, the addition of bulk granular Calcium to the soil might be required per a soil report.

Calcium has been building and strengthening our bones for many years, now try it on your turfgrass. It will like it and, in return, strengthen you.

References: (1) Eco Farm, C.J. Fenzau.

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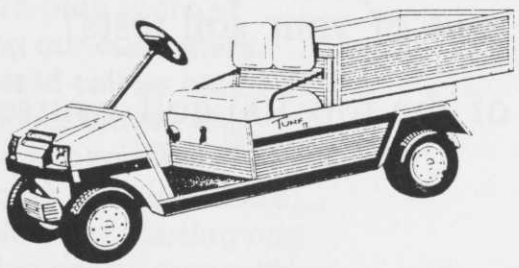

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