Calcium silicate by-product utilization in turfgrass systems

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ABSTRACT
An American icon, the turfgrass lawn serves recreational, aesthetic, and decorative purpose wherever properly managed. Turfgrass culture requires timely mowing, fertilization and irrigation practices. Industry analysts agree a commonly overlooked task among practitioners is proactive soil management, especially with respect to soil chemistry. Numerous agricultural field assessments have reported soil Si depletion in shallow depths of intensively managed systems. These reports confirm uptake of Si by plant roots and support recommendations for silicon fertilization. Considering inadequate soil Ca levels limit root growth due to the high Ca-requirements of meristematic tissue in lengthening roots, calcium silicate appears better suited than potassium- or sodium-silicate products for optimizing plant health and stress tolerance.

Lastly, while all liming agents neutralize exchangeable acidity, resulting products of these chemical reactions comprise only CO\textsubscript{2} or H\textsubscript{2}O. Calcium silicate liming agents are unique in that a mineral product, silicic acid, results from acid neutralization. Once absorbed by plant roots and deposited in cell walls, silicic acid has been reported to elicit wear tolerance and/or resistance to pathogens.

Our research objective was to comprehensively-demonstrate turfgrass-specific benefits unique to silicon provided in applications of Excellerator\textsuperscript{TM} calcium silicate, and to develop soil test recommendations for turfgrass systems, employing a perennial ryegrass fairway/athletic field, a creeping bentgrass fairway, and a creeping bentgrass/annual bluegrass cohabited putting green. While limited, consistent benefits of soil amendment by calcium silicate will be described.