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Scanning the Journals

Inorganic Amendments Field Tested

Concerns about availability, cost and the environment have increased the interest in the use of inorganic amendments in designed rootzones for golf greens and sports fields. The two most common inorganic amendments are porous ceramic clay (PCC) and calcined diatomaceous earth (CDE). These materials, when mixed with sand, have been suggested to increase plant-available water and improve cation exchange capacity (CEC) while maintaining high drainage and aeration properties.

Researchers at Iowa State University conducted a field study on a sand based golf putting green. Each treatment included 5% peat by volume and individually 10% of each inorganic amendment. The PCC treatment had 8% higher CEC than the peat control, resulting in a 100% increase in available K, 30% increase in Mg, but a 4% decrease in Ca. The pH of the sand used in the study was over 8.0, so that decrease in Ca would not be considered significant. Interestingly, the water release curves that are a measure of plant available water were not influenced by amendment.

One of the major conclusions of the study was that the inorganic amendments influence CEC and hydraulic properties of the soil differently. From a nutrient management standpoint the selective retention of K vs. Ca could be important as a result of the well-known challenges with maintaining adequate K levels in sand based systems. Still, in the absence of economic information, questions remain regarding the cost-benefit analysis of these inorganic amendments while good, reliable sources of organic amendments are still available.

From: Li, D., Y.K. Joo, N.E. Christians, and D.D. Minner. 2000. Inorganic soil amendment effects on sand-based sports turf media. Crop Sci. 40:1121-1125.

Biocontrol in Shaded Turf

Historically, it has been estimated that 20-25% of all turfgrass is maintained under vegetative or structural shade. The influence of the reduced and altered light on turfgrass growth has received renewed interest in the literature in the last several years. In fact, many of the studies have attempted to characterize the light effects on turf by eliminating the other microenvironmental factors such as humidity and temperature. Still, many turf managers know that the influence of humidity, particularly as it relates to leaf wetness and subsequently to disease incidence, are major aspects of turf adaptation to shaded environments.

Researchers at the University of Nebraska conducted a study to investigate the influence of shaded environments on biological control organisms that could manage turf diseases. Specifically, bacterial agents were applied with a backpack sprayer to shaded turf and populations were monitored. Each of the strains of bacteria increased under shaded environments. The researchers noted the difficulty in maintaining consistent measurements among the studies as a result of the variability of bacterial populations. It was suspected that the overall increase in bacterial populations may be related to reduced UV light penetrating through the shading canopy.

This is a significant contribution to the turfgrass biological control literature as we continue to try and understand the relationship among plants, microbes and the environment. It appears that higher bacterial populations are required for effective biological control, however while environmental factors are critical, there are questions regarding the relationship between plants and microbes that might influence performance.

From: Giesler, L.J., G.Y. Yuen, and G.L. Horst. 2000. Canopy microenvironments and applied bacterial population dynamics in shaded tall fescue. Crop Sci. 40:1325-1332.

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