The influence of soil carbon dioxide on turfgrass performance: field observations from California and Illinois golf course greens. (C05-stowell003543-Poster)

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Abstract:

Low levels of soil oxygen have long been associated with turfgrass declines and black layer. Due to the interrelationship between O2 and the metabolite carbon dioxide (CO2) in soil, variation in CO2 spans values from about 0.03% CO2 at 21% O2 in air up to about 3% CO2 at 18% O2 in soils under healthy turf. Higher levels of CO2 have been associated with turfgrass decline even though O2 has not been depleted. CO2 is more easily monitored and provides a greater span of values within the healthy range of turf rootzone conditions compared to O2. This greater span of values provides a more reliable indicator of a decline in rootzone gas quality. Turfgrass management practices, such as venting using 1/4 inch solid tines, use of the Hydroject(TM), and the use the Soil Air(TM) gas suction system were effective methods for reducing soil CO2 levels rapidly. Discussion will include observations of soil gas composition in rootzones constructed to USGA specification and root zones amended with inorganic and organic products. Rootzones constructed with organic amendments reported significantly higher soil CO2 values compared to USGA specification sands and sands amended with inorganic materials.

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