Predicting Nitrogen Content of Turfgrasses Using Digital Image Analysis. (C05-karcher085548-Oral)

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Abstract:

Regular nitrogen applications are required to maintain high quality turfgrass. New methods to monitor the nitrogen level in turfgrass tissue could be beneficial to turfgrass managers in determining proper nitrogen application rates and timings. The objective of this study was to determine whether tissue nitrogen content of creeping bentgrass (Agrostis palustris), bermudagrass (Cynodon dactylon), and zoysiagrass (Zoysia japonica) could be determined through analysis of turfgrass images. Seven nitrogen rate treatments (1, 2, 3, 4, 5, 6, and 7g m-2) were applied to plots 0.6m by 2.5m. Images of each plot were taken with a digital camera in an enclosed container with a standard light source and downloaded to a PC. The average hue, saturation, and brightness values were determined for each plot using image analysis software. Concurrently, tissue samples were collected from each plot and analyzed for tissue nitrogen content. Least squares regression of hue value and tissue nitrogen content resulted in r-square values of 0.87, 0.60, and 0.64 for creeping bentgrass, bermudagrass, and zoysiagrass, respectively.

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