

# Turfgrass tested in shallow green roof substrates

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Green roofs, rooftops covered with vegetation, provide multiple environmental and aesthetic benefits. These "living roofs" are increasing in popularity worldwide. As more cities invest in green roofs, planners are challenged to find plants that can thrive in shallow planting conditions and with minimal maintenance. A new study from researchers in Greece offers recommendations for the use of turfgrass in green roof environments.

Nikolaos Ntoulas, Panayiotis A. Nektarios, and Efthimia Nydrioti from the Department of Crop Science at Agricultural University of Athens published the results of their experiments with Manilagrass in *HortScience*. Author Nikolaos Ntoulas explained that although turfgrasses meet the three requirements of plants recommended for use in urban environments (aesthetics, function, and recreation), these grasses have seldom been evaluated on extensive green roofs due to their high water demands. Ntoulas and colleagues compared the growth of *Zoysia matrella* 'Zeon' in two different substrates. They also investigated the impact of increasing either substrate depth or the amount of irrigation on Manilagrass growth and recovery potential during and after moisture deficit periods. The 2-year outdoor study was conducted on a rooftop at the Laboratory of Floriculture and Landscape Architecture in Athens.

The experiments involved three factors: two substrate types, two substrate depths, and two irrigation regimes replicated five times. "The results showed that, during moisture deficit periods, green turf cover

(GTC), normalized difference vegetation index (NDVI), and leaf relative water content (RWC) were most affected by substrate depth, moderately affected by irrigation regime, and, to a lesser extent, by substrate type," the authors said. "Turfgrass growth and physiological status were best during moisture deficit conditions in the deeper profile (15 cm) using the higher amount of irrigation (6 mm) and the locally mixed substrate."

The scientists concluded that substrate depth was the most significant factor that improved growth and drought resistance of Manilagrass; the deeper substrate resulted in improved drought tolerance when compared with the shallow substrate. "However, because load is a crucial issue on [green roof](#) construction, if substrate depth must be reduced to 7.5 cm, then [irrigation](#) should exceed 6 mm every 3 days to have adequate growth and successfully overcome summer moisture deficit periods," they recommended.

**More information:** [hortsci.ashspublications.org/c ...  
nt/48/7/929.abstract](https://hortsci.ashspublications.org/content/48/7/929.abstract)

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