Physiological Ecology of Turfgrass: Response to Light and Other Factors

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The Growing Importance of Turfgrass in Ecological Research

Urbanization is one of the most rapid land-cover changes occurring worldwide. For the first time in human history more people live in cities than in rural environments. Ecologists are now focusing their attention on understanding the vegetation, animals, and biogeochemical cycles occurring in these urban environments. Studies from urban systems provide novel locations to test ecological theories but more importantly provide opportunities to provide information relevant to the most common location of human-ecological interactions.

A key component of urban landscapes is turfgrass. In southern California, recent estimates have suggested 41% of the urbanized lands are covered with turfgrass. Throughout the United States turfgrass is the predominant crop species. Ecologists are curious about how this expanse of turf affects a variety of processes. How much water is required by this vegetation? How much carbon is stored in turf? How much nutrients are leached from turf? How sensitive is turf to altered management activities? How likely are invasive species associated with turf plantings? How much greenhouse gas emissions (including CO_2, methane, and NO_x) generated by turf fields? In native regions, ecologists are often concerned with identifying the causes for why species are located where they are. This interest is also evident in urban ecological research – why do people plant turf where they do? How do they make decisions between different turf varieties and how do they select alternatives to turf? Clearly, there is a growing interest in ecological science in developing a better understanding of turfgrass both from fundamental biochemical cycling to the choices leading to turf planting.

Ecologists have also become interested in identifying sustainable solutions in achieving societal needs. Recent research activities have addressed methods for quantitatively assessing the production of ecosystem services and the cost of this production. A growing sub-discipline of ecology addresses these problems by estimating the economic and non-economic role different ecosystems have for different segments of society. How can the balancing benefits between aesthetics and recreation with the large costs associated with the high water demand of turfgrass be best evaluated? Certainly the "correct" balance will differ between various stakeholders. How can improved ecological knowledge help achieve sustainable solutions that work for the diversity of views?

Our research will address many of these questions while at the same time studying turfgrass responses and adaptation to sunlight and shade.