FIGURE 2

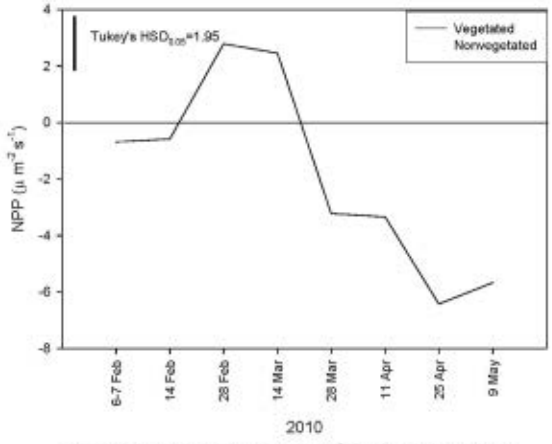

Figure 2: Net Primary Productivity (NPP) ($\mu m^{-2} s^{-1}$) as affected by vegetation and date over the course of the 16-week establishment study. Readings taken at two-week intervals after first month.

FIGURE 3

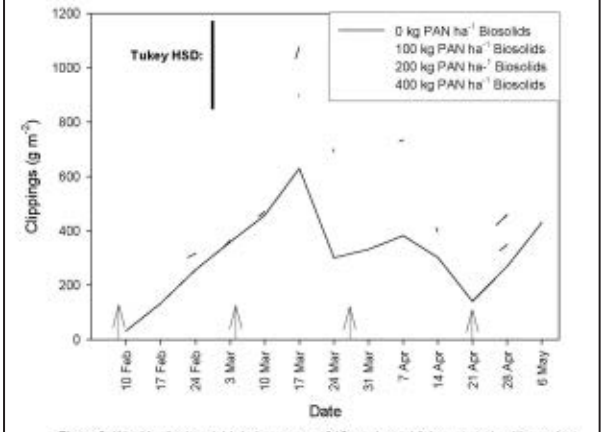

Figure 3: Weekly clipping yield during course of 16-week establishment study with preplant biosolids application rates of 0, 100, 200, and 400 kg Plant Available Nitrogen (PAN) ha^{-1}. Arrows indicate leaching events (dotted arrow) or fertilization with urea at 50 kg PAN ha^{-1} (solid arrow). Statistically significant day*treatment interaction ($P<0.0000$). Tukey's HSD=330.

high biosolids rate on a few days (Figure 1).

GPP was affected by both vegetation and date. GPP rate increased during the time of rapid growth relatively early in the study and decreased about midway through the study possibly due to supraoptimal temperatures for Kentucky bluegrass (data not shown).

Net Primary Productivity (NPP) was affected by vegetation and date. NPP increased as vegetative cover developed for several weeks following germination (Figure 2).

NPP declined as the plants matured and temperatures increased above optimum for Kentucky bluegrass. Clipping yield was highly dynamic, peaking after N-fertilization events and tending to decline after thorough watering events. The period of high growth during the weeks of February 14 through March 14 when NPP was positive is evident in the clipping yield during those same dates by continued increases in clipping weights each week. The high rate consistently produced more clippings than the other treatments, and was statistically different on a few separate dates, but that was primarily between the control and high rate (Figure 3).

Turf quality increased for all treatments through mid-April; however, at this time, powdery mildew development greatly decreased the quality of the high biosolids rate while the other treatments saw continued increases in quality (data not shown).

Biosolids amendments to sod fields increased pre-plant Rd; increased post-plant Rd in some instances; increased clipping yield; and increased quality until disease pressure was too high. NPP was not affected by biosolids but declined once turf began to mature and as temperatures increased above optimal, indicating there may be conditions under which turfgrass systems may serve as a source of CO_2 emissions. The conclusion of whether or not turfgrass or a turfgrass system amended with biosolids is really sequestering an ecologically important quantity of C cannot be answered by gas-exchange data alone and would need supporting data on C content of the soil, plant tissue and dissolved organic C in leachate. Sample analysis of all these factors is in progress with this 2010 study as well as a 2011 run of the study to examine year to year differences.

Sabrina Ruis is a Master's Degree student in Horticulture at the University of Wisconsin-Madison. She studies with Dr. John Stier in the Department of Horticulture and Dr. Doug Soldat in the Department of Soil Science at the University of Wisconsin-Madison. Reach her at ruis@wisc.edu.

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