



# Fundamental for Life: Soil, Crop, & Environmental Sciences

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## 236-6 Leaf Photosynthesis of Panicum Spp. Grasses As Determined by Level of Insertion, Portion of the Leaf Blade, and Light Intensity.

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Henry Gonzalez Convention Center, Hall C, Street Level



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The efficiency with which tropical forage grasses (C4 metabolism) can use radiation and convert it into photoassimilates has long been recognized. This, however, is dependent on the photosynthetic rates of individual leaves and the patterns of canopy light interception. Detailed descriptions of these basic processes, including those involving the physiology of carbon assimilation in tropical forages and their responses to the environment are still scarce for many tropical genera, including Panicum spp. The objective of this study was to identify and define carbon uptake patterns on three leaf categories and on three leaf blade portions of Panicum spp grasses (Massai and Tobiata), in response to irradiance levels. Maximum leaf photosynthesis rates were measured, and light response curves were fit to increasing levels of irradiance for five Panicum spp. genotypes (Tobiata, Mombaça, Tanzânia, Atlas and Massai). Leaf photosynthesis was affected by leaf category on tiller and leaf blade portion. Among leaf categories, higher photosynthesis rate ( $20.6 \mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ) was measured on the youngest fully expanded leaf, followed by the mature leaf and by the expanding leaf. Middle, and apical leaf sections had the highest photosynthesis rates ( $24.2$  and  $26.3 \mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ , respectively). Tobiata had highest photosynthesis rate ( $33.5 \mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ) while Massai had the lowest ( $20.3 \mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$ ). The two grasses had similar light curve parameters ( $P=0.7502$  for maximum photosynthesis and  $P=0.6458$  for quantum efficiency), indicating similar photosynthetic responses to light intensity across genotypes. Photosynthetic responses of Panicum grasses change with category and portion of the leaf blade, with highest photosynthesis rates measured on the middle portion of the youngest fully expanded leaf.

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