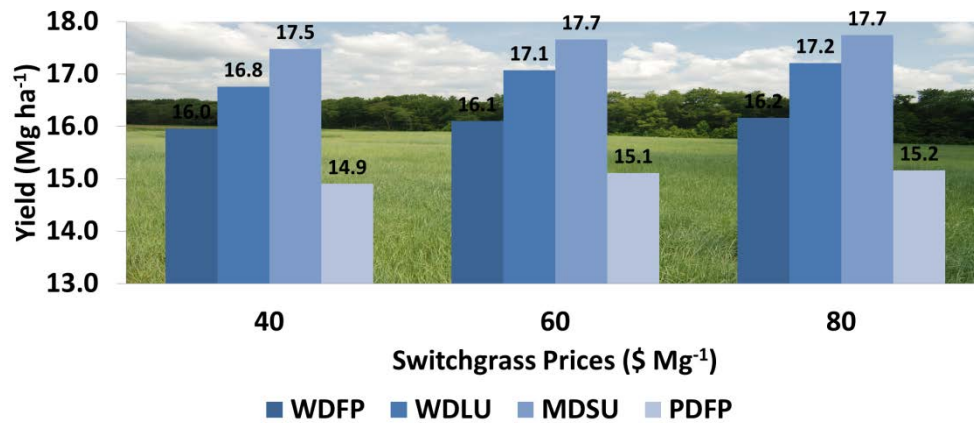


Switchgrass Yield response to nitrogen on four Soil Types in West Tennessee

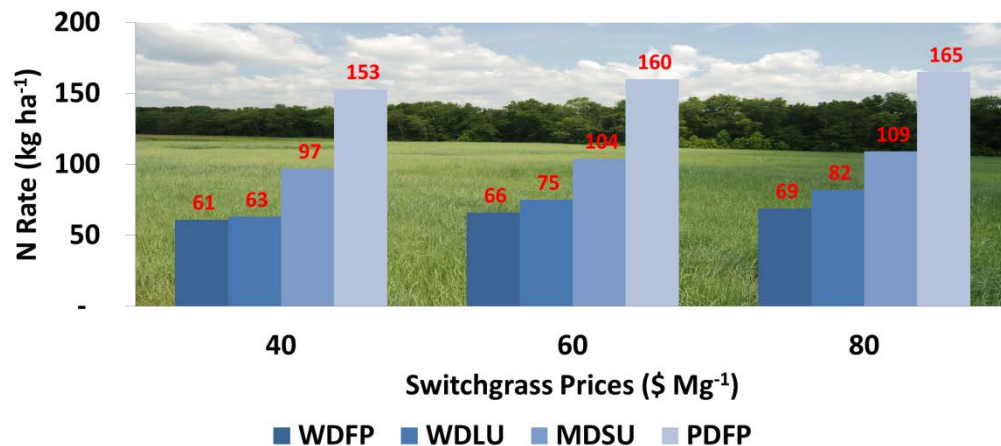
Annual applications of nitrogen (N) fertilizer are needed to produce yields large enough to make growing switchgrass (*Panicum virgatum* L.) for lignocellulosic biomass economically viable, but little attention has been given to determining the N rate that maximizes producers' profits. Several agronomic papers have estimated yield-maximizing N rates for switchgrass and the results have varied depending on spatial and temporal factors (Haque et al. 2009). A few papers have gone beyond estimating yield maximizing N rates and have estimated the profit-maximizing N rates. However, these previous studies have discounted the influence of soil quality and landscape on switchgrass production (Fike et al. 2006), and typically only have three years of data. The objective of this research was to find the profit-maximizing yield with respect to nitrogen and landscape.

The data used in the analysis came from an experiment run in west Tennessee at the Milan Research and Education Center. A randomized complete block experiment with a strip-plot arrangement of treatments and four replications was designed for each landscape. The 'Alamo' cultivar was established in 2004. In 2005, blocks were split into strips for N fertilization at four rates: 0, 67, 134 and 200 kg ha⁻¹. Plots were harvested annually following senescence from 2005-2011. With price of N at 1.30/kg, and switchgrass price at \$60/Mg, on the well drained land you would chose to use 66 kg/ha and get a yield of 16.1 Mg/ ha. While on the on the poorly-drained eroded sloping upland (MDSU) 104

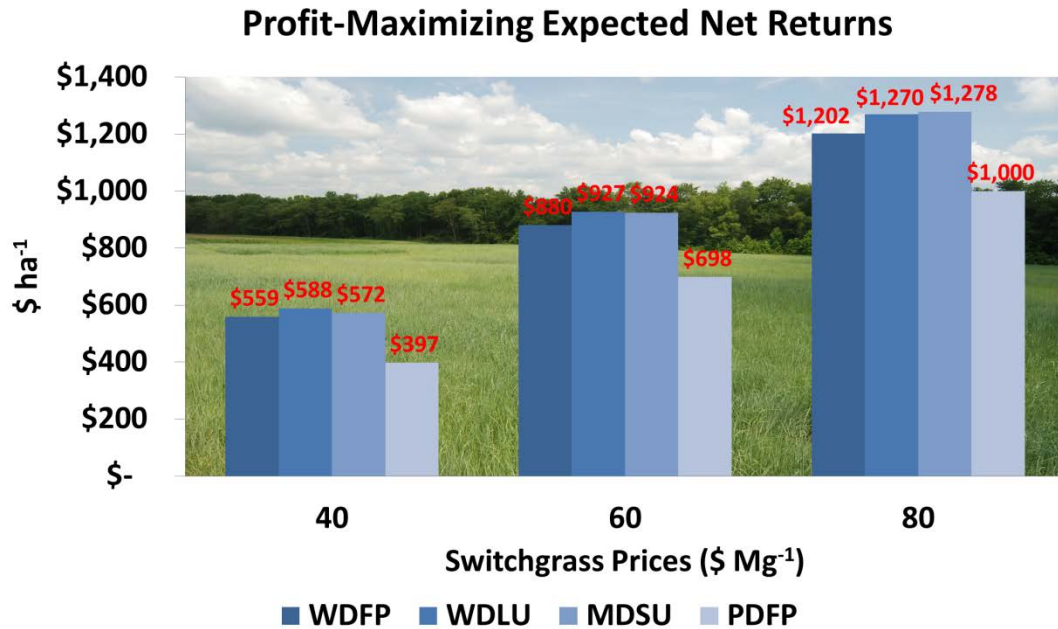
Profit-Maximizing Expected Yields



Profit-Maximizing N Rates



Mg/ha would be applied yielding 17.7 M. g/ha. A net return to fertilizer is estimated to be \$880, \$927, \$924, and \$698 on WDFP, WDLU, MDSU, and PDFP respectively.



It was discovered that yield varied across the four landscapes and that this impacted profit-maximizing N rates, expected yields, and expected net returns. Marginal landscapes produced switchgrass yields comparable to the higher quality landscapes. Still needed is further research to compare the profitability of corn and switchgrass in side-by-side experiments on marginal lands and land well-suited for row crop production.

For additional information see:

[Switchgrass Yield Response to Nitrogen on Four Soil Types in West Tennessee](#)

Citation:

Boyer, Christopher N., Roland K. Roberts, James A. Larson, Burton C. English, Donald D. Tyler, and Vivian Zhou. "Switchgrass Yield response to nitrogen on four Soil Types in West Tennessee", Poster presentation at the Sun Grant Initiative National Conference, 2-5 Oct 2012, New Orleans, LA.