The Regional Feedstock Partnership is a collaborative effort between the Sun Grant Initiative (through Land Grant Universities), the US Department of Energy, and the US Department of Agriculture. One segment of this partnership is the field-scale evaluation of switchgrass (Panicum virgatum L.) in diverse sites across the USA. Switchgrass was planted (11.2 kg PLS ha$^{-1}$) in replicated plots in NY, OK, SD, and VA in 2008 and in IA in 2009. Planting occurred in AL in 2010 following unsuccessful attempts in 2008 and 2009. Adapted switchgrass cultivars were selected for each location and baseline soil samples collected before planting. Nitrogen fertilizer (0, 56, and 112 kg N ha$^{-1}$) was applied each spring beginning the year after planting, and switchgrass was harvested once annually after senescence. Establishment, management, and harvest operations were completed using field-scale equipment. Switchgrass production ranged from 2 to 11.5 Mg ha$^{-1}$ across locations and years. With the exception of the IA location, yields were lowest the year after planting. Yield increased with 56 kg N ha$^{-1}$ at SD and VA but did not increase further at the high N rate. There was no effect of N at OK or IA, and a negative response at NY. Initial soil N levels were lowest in SD and VA (significant N response) and highest at the other three locations (no N response). These results demonstrate the importance of proper N management in order to reduce unnecessary expense and potential environmental impacts of switchgrass grown for bioenergy across the USA.