Agricultural modelers have estimated that switchgrass and other prairie grasses can be more profitable than conventional crops on approximately 16.9 million ha of cropland within the United States, the majority of which is considered to be marginal for crop production or is contracted to the Conservation Reserve Program (CRP). Much of this land is spread throughout the North American tallgrass prairie region. Prior to agricultural production, tallgrass prairies were dominated by grasses such as big bluestem, switchgrass, and indiangrass in xeric and mesic settings and prairie cordgrass in hydric prairies. Due to their biomass yield potential, as well as their adaptability to marginal land, these grasses may play an important role in cropping systems comprised of dedicated perennial energy crops in a variety of landscapes. Selecting the appropriate species will be a key factor for maximizing biomass production and environmental benefits for each landscape.

Dramatic improvements in technology are needed to reconfigure agriculture practices and land use to effectively meet the global demand for both food and bioenergy feedstocks. Moreover, doing so will also offer advantages in reducing greenhouse-gas emissions, enhancing landscape biodiversity, as well as improving soil and water quality. In this project, we are selecting the best native-grass species and genetic resources, improving genetics of these grasses through conventional and genomic technologies, and developing agronomic management systems for various landscapes and environments with a goal of maximizing cropping system sustainability.