Perennial Herbaceous Biomass Crops

Gregg Johnson, Donald Wyse, Craig Sheaffer, University of Minnesota

Perennial herbaceous crops have been proposed as renewable bioenergy sources. Cellulosic biomass has potential for conversion to a range of products including ethanol, biobutanol, and plastics. Field research was conducted for four years in southern Minnesota at Waseca, Lamberton, and St. Paul to determine the range in biomass productivity. All grasses were annually fertilized with 100 lbs/ac of nitrogen. All species produced a significant amount of biomass when harvested once in the fall (Table 1). Miscanthus and prairie cordgrass were among the highest yielding crops while big bluestem was among the lowest. The native plant polyculture which was a mixture of native grasses and legumes had intermediate yields.

Table 1. Total 4-year yields of crops harvested once in late-fall in a biomass production system. Results are averaged for three sites.

Crop	Yield *(tons/ac)*
Bonilla big bluestem	9.5
Sioux blue indiangrass	8.5
Miscanthus x giganteus	19.8
Red River prairie cordgrass	17.4
Sunburst switchgrass	15.0
Native plant polyculture	11.0