

Cellulosic Ethanol Potential of Feedstocks Grown on Marginal Lands

Background/objective

Cultivation of perennial grasses on marginal farm lands has been recommended as a means of increasing overall biomass crop yields. However, the relationship between land quality and ethanol yield from biomass crops is poorly understood. This study is the first to provide empirical data on ethanol yield from biomass grasses grown on abiotically stressed land.

Approach

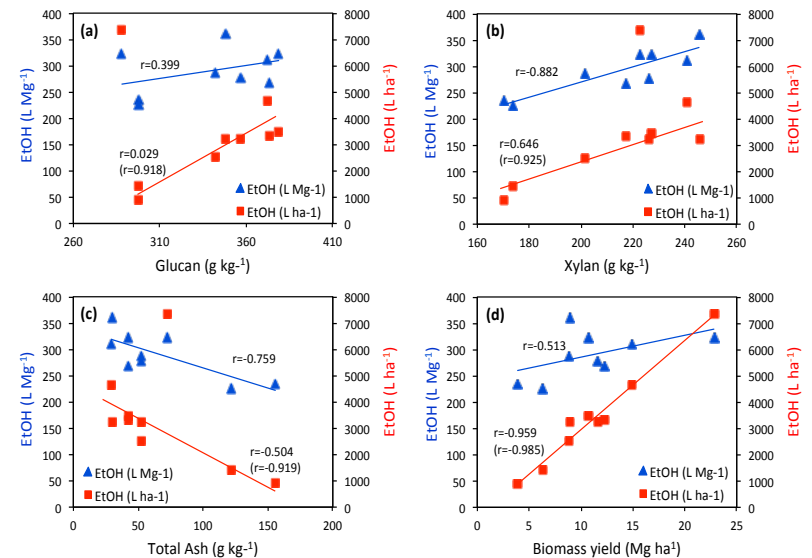
- ❖ Prairie cordgrass and Kanlow switchgrass were cultivated on either saline-irrigated, waterlogged, or saline soils.
- ❖ Biomass was analyzed for composition and ethanol yield.

Results

- ❖ Biomass composition and ethanol yield varied with field conditions. Saline-irrigated crops had the lowest ethanol yield due to increased ash and decreased carbohydrate content.
- ❖ Ethanol production from marginal lands was comparable to that reported for optimal lands.
- ❖ Both total biomass yield and xylan content were positively correlated with ethanol production per hectare.

Significance

- ❖ This is the first assessment of the relationship among marginal land characteristics, biomass composition, and ethanol yield for biomass feedstock grasses.
- ❖ This study can be a basis for understanding the influence of land quality on other types of biomass feedstock grasses.



Correlations of ethanol productions with glucan (a), xylan (b), total ash (c), and biomass yield (d)