

## Public Abstract

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Title:Soybean Emergence, Growth, and Development Following Corn Stover Removal

The Energy Independence and Security Act of 2007 mandates the use of 21 billion gallons of biofuel from cellulose or other advanced forms by the year 2022. Corn stover is an attractive choice for cellulosic ethanol production. Understanding how corn stover removal affects soybean emergence and development is essential to developing appropriate management recommendations for both partners in a corn-soybean rotation. The objectives of this study were to determine the effects of corn stover removal on soybean emergence and development, and to determine if cover crops ameliorate any of the possible negative effects to soybean from corn stover removal. Field experiments were conducted near Columbia, Missouri in 2010 and 2011. The effects of two residue removal treatments, three cover crop treatments, and two emergence class treatments were analyzed. Corn stover removal increased the mean daily average soil temperature, but the absence or presence of residue on the soil surface did not affect emergence. Emergence class had a significant effect on the number of days from planting to emergence at nearly every growth stage in both years. Removing residue increased stand density. Residue removal affected seed number and seed weight per plant. Grain weight per plant was significantly higher in the Early emergence class than in the Late emergence class. The results of this study suggest that corn stover can be removed and used for biofuel if residue removal does not exceed recommended rates and if cover crops are used to replace removed residue.