

Corn stover as a biofuel

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Corn stover is one of several feedstocks being considered as a biofuel. Although corn stalks currently are not harvested routinely, the huge amount of biomass produced annually makes corn a potential commercial biofuel. Removal of crop residue from the field needs to balance against preventing soil erosion, maintaining soil organic matter levels, and preserving or enhancing productivity. After corn stover is fermented to produce ethanol, the remaining residue is about 70% lignin. Lignin decomposes slowly, which can help stabilize soil structure. One use of fermentation by-product would be as a soil amendment, thereby minimizing some of the negative impacts of stover removal on soil structure. Laboratory studies show that by-product of stover fermentation increased microbial biomass and soluble C by 20% compared to soil with out amendment. In the severely eroded soil, humic acid concentration ($r^2=0.84$, $p<0.0001$) and aggregate stability ($r^2= 0.35$, $p< 0.001$) increased linearly with increased fermentation by-product concentration. Thus, laboratory results suggest that this fermentation by-product has potential as a soil amendment. Returning by-product to the field may slow the loss of soil organic matter caused by removing corn stover. Careful management of stover removal (avoiding eroded or erosion prone areas) and selective placement of the by-product could contribute to a sustainable use of corn stover for ethanol production.