Innovation Showcase: Sustainably Managing Your Corn Stover Harvests

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USDA/ISU Report: Corn Stover Nutrient Removal Estimates for Central Iowa

Benefits of corn stover harvesting:
• Provide cellulosic bioenergy feedstock
• Minimize subsequent residue-management problems, such as:
  – Nutrient immobilization
  – Cool-wet soils
  – Poor soil-seed contact
USDA/ISU Report: Corn Stover Nutrient Removal Estimates for Central Iowa

Key macronutrients to be monitored:
- Nitrogen
- Phosphorus
- Potassium*
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**Observed Macronutrient Removal Rates**
One Ton/Acre Harvest

<table>
<thead>
<tr>
<th>Macronutrient</th>
<th>Nitrogen</th>
<th>Phosphorus</th>
<th>Potassium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lbs./Ton Removal</td>
<td>14</td>
<td>1.4</td>
<td>16</td>
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Good cornfield candidates for sustainable stover harvest exhibit the following:

● Slopes of less than 3 percent
● Consistent grain yields of >175 bu/acre
● Good nutrient-management plans with soil-test records of at least pH, P and K levels
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Recommendations for 1 ton/acre corn stover biomass harvests:

● Use current grain-based Nitrogen and Phosphorus fertilizer application rates

● Soil test to verify that grain-based fertilizer rate for Potassium meets sustainability needs

● Incorporate effects of cover crops, manure, diverse crop rotations in future biomass feedstock studies
Conclusion:

“Successful deployment of cellulosic bioenergy production operations such as the POET-DSM ‘Project Liberty’ program near Emmetsburg, Iowa, can strengthen rural economies, help ensure energy security, and reduce greenhouse gas (GHG) emissions without contributing to soil degradation – another global challenge.”

— Douglas L. Karlen, Ph.D.
USDA-Agricultural Research Service
U.S. Biomass Availability

Source: DOE Billion Ton update
Plants coming on line.......

Source: E2