Insights for Improved Participation in the Delivery of Corn Stover to Cellulosic Ethanol Plants

American-Made BioEnergy from Field to Refinery: Feedstock Logistics
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Background and Motivations

- CenUSA Bioenergy – USDA NIFA AFRI competitive grant, “Sustainable Production and Distribution of Bioenergy for the Central USA” (#2011-68005-30411)

- Availability does not equal supply
The Case of Stover

- Two collection mechanisms
  - Processor collection
  - Producer delivery

- Planned for 25-mile radius, but in some cases 50+ miles from the plant to source feedstocks

- Processors must pay producers same price for feedstock

- Participation rates significantly lower than feedstock availability suggested

- Processors are accepting a very large radius in lieu of higher prices, and this is optimal.
Simulations of collection mechanisms

- Supplier delivery or processor collection
- Reservation-value pricing

100% participation
Transportation makes the marginal cost curve steep.
The mandate is met with ag residue IF supply is 100%.

Given participation factors, meeting the mandate will allow the use of higher-cost feedstocks.

Source: Parker, Nathan. Modeling Future Biofuel Supply Chains using Spatially Explicit Infrastructure Optimization
Institute of Transportation Studies, University of California, Davis, 2011.
A Solution

- Differentiating suppliers will enhance collection efficiencies and system welfare.

- Pricing stover on land characteristics should provide a solution to current large draw areas. Factors might include:
  - Carbon content
  - Availability of animal manure
  - Rotation
  - Operation size

- Hedonic model to estimate value or demand relative to factors
THANK YOU.

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