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IMPACT OF BIOFUEL DEMAND ON ACREAGE ALLOCATION AND ITS IMPLICATION ON LAND USE IN THE
GREAT PLAINS

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IMPACT OF BIOFUEL DEMAND ON ACREAGE ALLOCATION AND ITS IMPLICATIONS ON LAND USE



Background

- According to the USDA Regional Road Map, 43.3% of the 20 billion gallons of advanced biofuels will be produced in the central east region
- It will open new markets for biomass products of corn, switch grass and others and creates an incentive to expand area allotted to energy crops
- Examining producers' response to prices and the historical relationship between prices and acreage allocations is necessary
- But, little research has been done on how changes in crop price or return would affect acreage allocation in Nebraska state

Motivation & significance

- To estimate acreage response elasticities for crops being produced in the state
- The study is important as change in acreage allocation affects carbon sequestrations, emission level and creates competition between food and fuel

Data and Methods

- Data used for estimation were annual observations for the period 1980 to 2009
- Duality framework –multi-output profit function
- Normalized quadratic profit function specification

Results and Discussion

SUR Estimates: Acreage response elasticities

	ACNT	AWHT	ASBT	ALFT	AHAY
Own price	0.1214	0.1512	0.3487	0.3939	0.0373

ACNT= Area of Corn; AWHT=Area of Wheat
ASBT=Area of Soybeans; ALFT=Area of Alfalfa ; AHAY=Area of Hay



- All own and cross price acreage elasticities are inelastic.
- At least in the short run acreage allocation of crops is not very price responsive
- Own cross price elasticities verifies competition between the crops for land
- Corn has own price acreage elasticities of 0.12,(doubling the price of corn increase the area allotted to corn by about 12 percent .
- Similar percentage change in price of wheat and soybeans increase area allotted to the respective crops by 15 and 35 percent.
- Hay is the least price responsive compared to all other crops
- Additional land needed for crop production comes from pasture and other lands

Conclusion

- Our result demonstrates how divergence in crop prices alters crop mix and creates an incentive to use pasture and marginal lands
- If CHP plants substitute fossil fuel with biomass such as corn Stover it would certainly affect crop mix and land use in the state
- We noticed that the amount of pasture land diverted to crop production varies with the crop

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