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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					



- lands

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

### 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

#### **BY: DEREJE MEGERESSA**