



# Lower Minnesota River Xcel Biomass Energy Project

Dean Current

UMN – CINRAM - Dept. of Forest Resources

**Buffer Strip Meeting**

University of Minnesota

Tuesday, April 1, 2008



# Prior Efforts

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- n CSREES - Improving Water Quality and Hydrologic Stability of the MN River through Perennial Cropping Systems
- n LCMR 1&2 - 3rd Crops and Native Perennials for Water Quality
- n Research Project to Develop the Greater Blue Earth River Basin Turbidity TMDL's



## Prior efforts (cont.)

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- n Watershed and Stream Channel Modifications to impact Suspended Sediment, Turbidity and Nutrients
- n BERBI – Rural Advantage
- n Research on Perennials - Markets
  - n Identifying bio-products
  - n Identifying markets to drive adoption



# How do we promote native perennial systems that .....

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- n Provide an acceptable income to landowners;
- n Provide environmental benefits (water quality, habitat, carbon sequestration);
- n Provide feedstocks for renewable energy; and
- n Enhance rural vitality

# Lowering the Cost of Bio-energy Feedstocks while Providing Environmental Services

- n Xcel Renewable Development Fund
- n Goal: Develop an efficient system for the production, pre-processing and delivery of biomass feedstocks for energy production that minimizes feedstock cost for energy facilities while maximizing landowner income and the environmental benefits of biomass production



# Partners

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- n Rural Advantage
- n Koda Energy
  - n Rahr Malting
  - n Shakopee Mdewakanton Sioux Community
- n Minnesota Dept. of Nat. Resources (DNR)
- n Inst. for Agric. and Trade Policy (IATP)
- n The University of Minnesota



# Objective 1

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- n Establish and research cultural practices, and
- n Estimate costs and potential savings for
  - n establishment,
  - n management,
  - n pre-processing and
  - n transport of perennial biomass feedstocks from field to energy facility

## Objective 2

Estimate potential benefits from targeted perennial biomass feedstock plantings

- n energy,
- n wildlife,
- n water quality,
- n carbon and
- n soil health



## Objective 3

- n Value environmental benefits for potential payments to landowners who provide environmental commodities
  - n Carbon credits
  - n Water quality credits
  - n Wildlife habitat





## Objective 4

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- n Complete an integrated assessment of ecological services markets currently being used and develop an integrated ecological services payment package
  - n Bio-fuel payment
  - n +Carbon credit payment
  - n +Water quality credit payment
  - n + other?

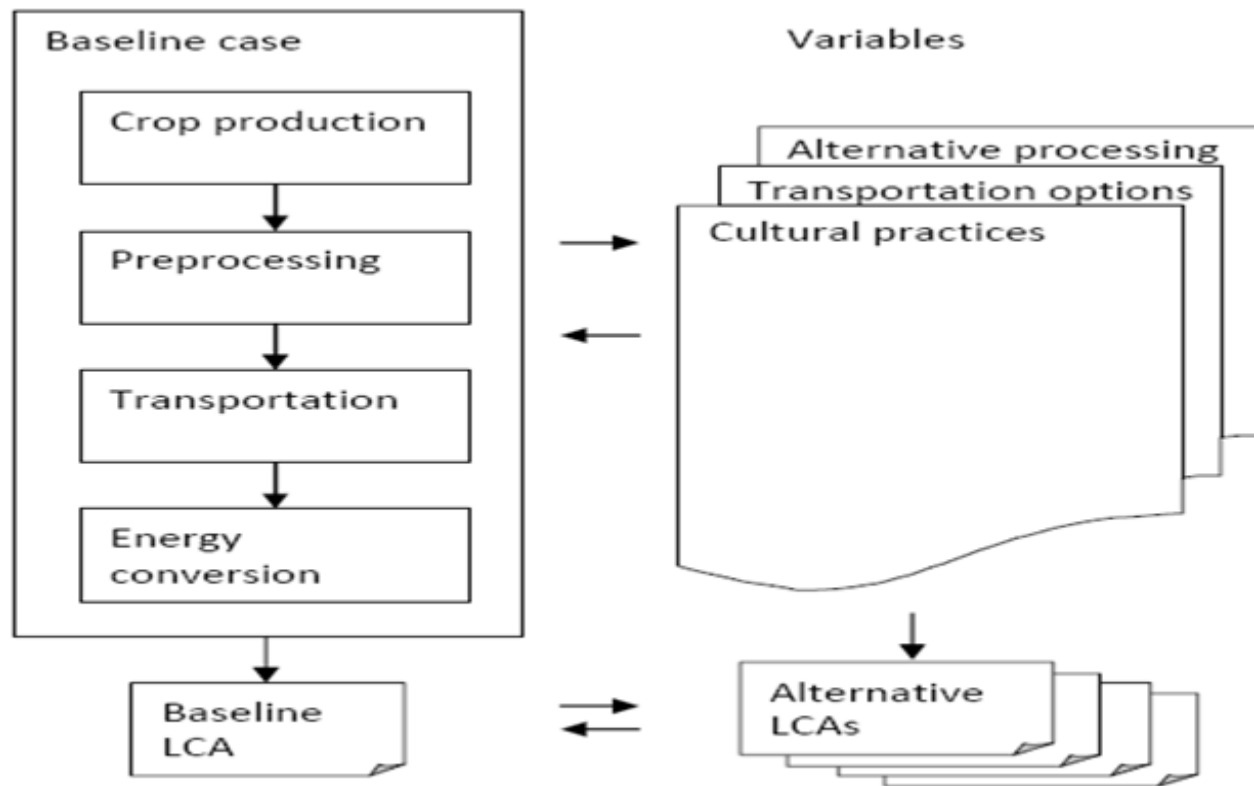


## Objective 5

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- n Develop a model for the production, pre-processing and delivery of perennial biomass feedstocks to energy facilities; and ....
- n Perform a life-cycle assessment of the system from field to facility.

# Life Cycle Analysis



**Parametric LCA framework for evaluation of alternative practices in biomass-based energy production system**



# How can bio-fuel/bio-product options enhance buffers?

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- n Floodplain plantings
- n Extending buffers beyond riparian zone
- n Providing a market to drive adoption
  - n Koda energy
  - n RIM – CE
  - n Aveda Corporation

But, we need a sustained research effort to make this work

# Questions?



Photo courtesy of  
USDA NRCS

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Thank you!