

CRP to Ethanol

(Conservation Reserve Program)

Collaborators

Mario Biondini: NDSU Natural Resource Sciences
 Larry Cihacek: NDSU Soil Science
 Carolyn Grygiel: NDSU Natural Resource Sciences
 Won Koo: NDSU Agribusiness and Applied Economics
 Scott Pryor: NDSU Agricultural and Biosystems Engineering
 Kris Ringwall: NDSU Dickinson Research Extension Center



Issues

- Preserve and enhance the original objectives of the CRP program: "the restoration and permanence of prairie ecosystems, the protection of their long term productivity and the enhancement of wildlife habitats"
- Conversion technology must be robust to handle a variable feedstock supply with minimal variation in processing parameters or ethanol yield
- The need for a careful assessment of the long-term economic feasibility of producing cellulosic ethanol from CRP biomass, particularly transportation issues

Multifunction Biomass Production for Ethanol from High diversity CRP Grasslands

Objective 1

Develop grassland restoration and management strategies to increase plant diversity, stability, C sequestration, and biomass production for ethanol while maintaining the CRP program objectives.

Objective 2

Determine the C sequestration potential of current CRP as well as restored High diversity CRP.

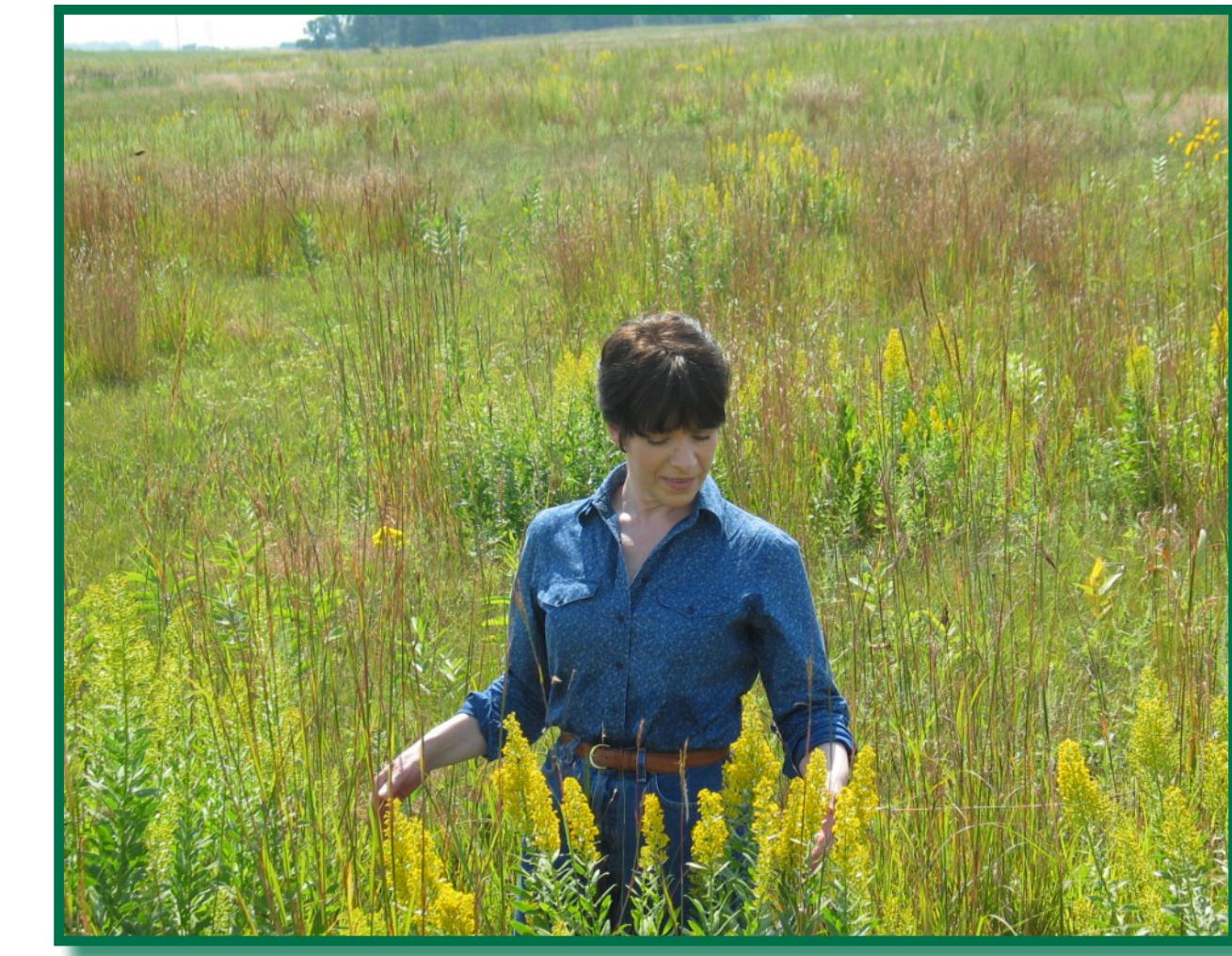
Objective 3

Determine the optimal storage locations and capacities to minimize transportation and storage costs from subdivided CRP regions to centrally located cellulosic ethanol processing plants.

Objective 4

Construct a user-oriented model for the planning, economical and ecological assessments of HCRP-ethanol projects.

Species used



Grasses

Agropyron cristatum
Agropyron spicatum
Andropogon gerardii
Bouteloua curtipendula
Bouteloua gracilis
Bromus inermis
Calamovilfa longifolia
Elymus canadensis
Hordeum jubatum
Koeleria cristata
Panicum virgatum
Poa pratensis
Schizachyrium scoparium
Sorghastrum nutans
Sporobolus cryptandrus
Stipa comata
Stipa viridula

Brief Background

- CRP grasslands consist of perennial plants adapted to the climate and require limited maintenance
- Generate minimal production and transportation-related greenhouse gas fluxes
- Nationally 14 million ha in CRP - 53% in Great Plains and central corn belt with 1.4 million ha in North Dakota.
- Average biomass yield of 4.8 Mg.ha⁻¹.yr⁻¹ (range 2.4-8.4)
- Potentially can generate 1,550 L.yr⁻¹ of ethanol per ha.

