Biofuel Energy Development: Impacts on Prairie Wetlands and Grasslands





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NAWCC and NAWMP PC Meeting
July 17, 2007

Goal: Keep Habitat Intact

- Most importantly, it provides nesting and brood-rearing habitat
- Predator communities more favorable
- Wetland protection afforded
- Basis for ranching economy sustained

Agricultural Pressures on Wildlife Habitat

- Global food markets
- Commodity subsidies, including risk mgmt
- Improved crop tolerance to drought
- Alternative uses for crops – biofuels
- Immediate biofuel threat to wildlife habitats is large-scale conversion to corn

Focus: Potential Impacts of Biofuel Industry

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Corn Ethanol

- 127 plants in operation in the U. S.
- 82 under construction; dozens in various stages of planning
- 12.2 billion gallon/yr. capacity
- 6.2 billion gallons projected in 2007
- 92.9 million acres planted in 2007
  - 19% more than in 2006
  - Most acres since 1944
- Increased demand leading to higher profitability for row crop farmers ($4/bushel corn)
- Increased conversion pressure on native grasslands and CRP






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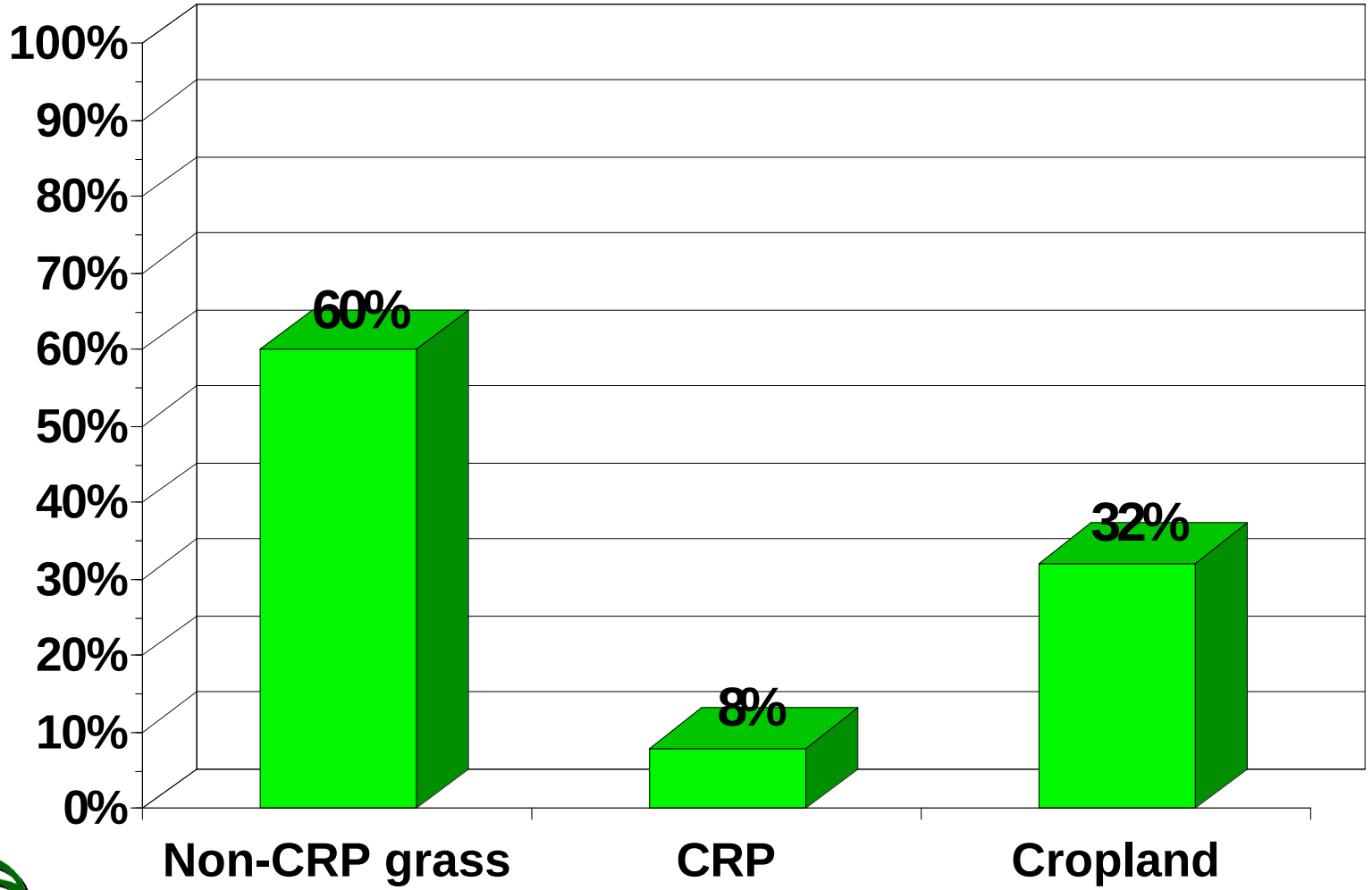
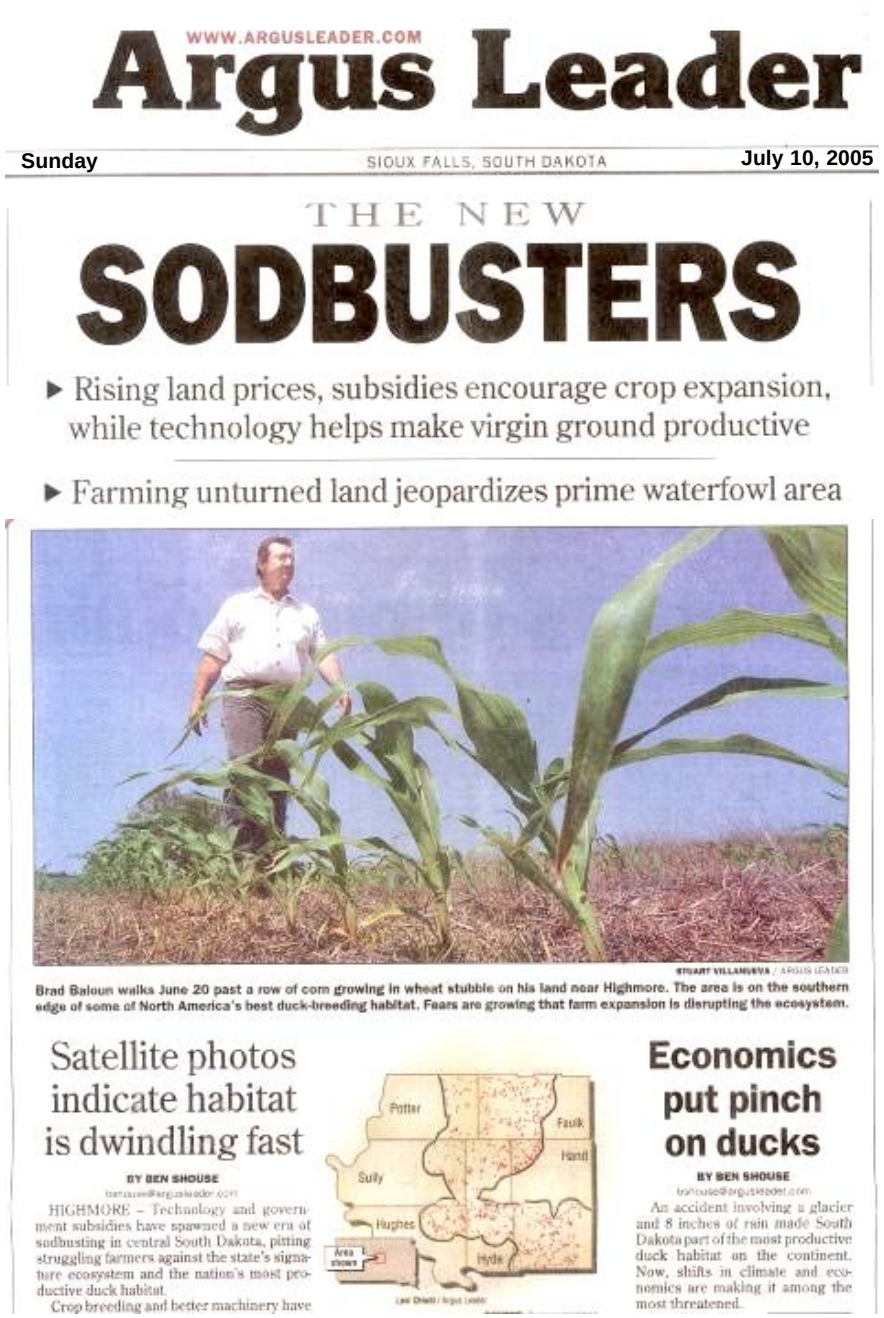
% of remaining 5.9 million acres of unprotected wetlands in the PPR of the Dakotas that are located in cropland, CRP and Non-CRP grassland





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Argus Leader

Sunday SIOUX FALLS, SOUTH DAKOTA July 10, 2005

THE NEW

SODBUSTERS

▶ Rising land prices, subsidies encourage crop expansion, while technology helps make virgin ground productive

▶ Farming unturned land jeopardizes prime waterfowl area

STUART VILLANUEVA / ARGUS LEADER

Brad Balous walks June 20 past a row of corn growing in wheat stubble on his land near Highmore. The area is on the southern edge of some of North America's best duck-breeding habitat. Fears are growing that farm expansion is disrupting the ecosystem.

Satellite photos indicate habitat is dwindling fast

BY BEN SHOUSE

HIGHMORE – Technology and government subsidies have spawned a new era of sodbusting in central South Dakota, pitting struggling farmers against the state's signature ecosystem and the nation's most productive duck habitat.

Crop breeding and better machinery have

Potter Faulk Hand Sully Hughes Hyde Area shown

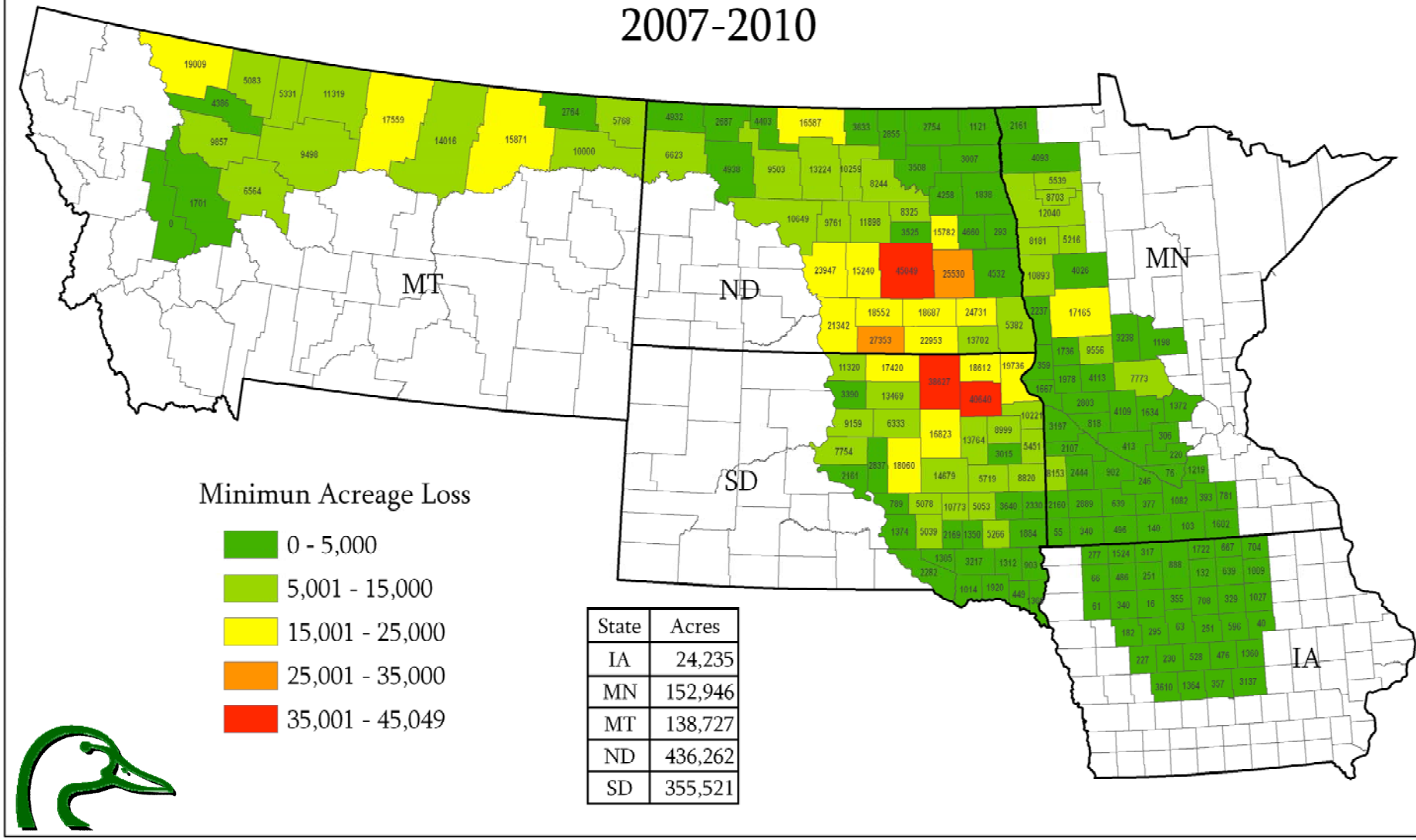
Economics put pinch on ducks

BY BEN SHOUSE

An accident involving a glacier and 8 inches of rain made South Dakota part of the most productive duck habitat on the continent. Now, shifts in climate and economics are making it among the most threatened.

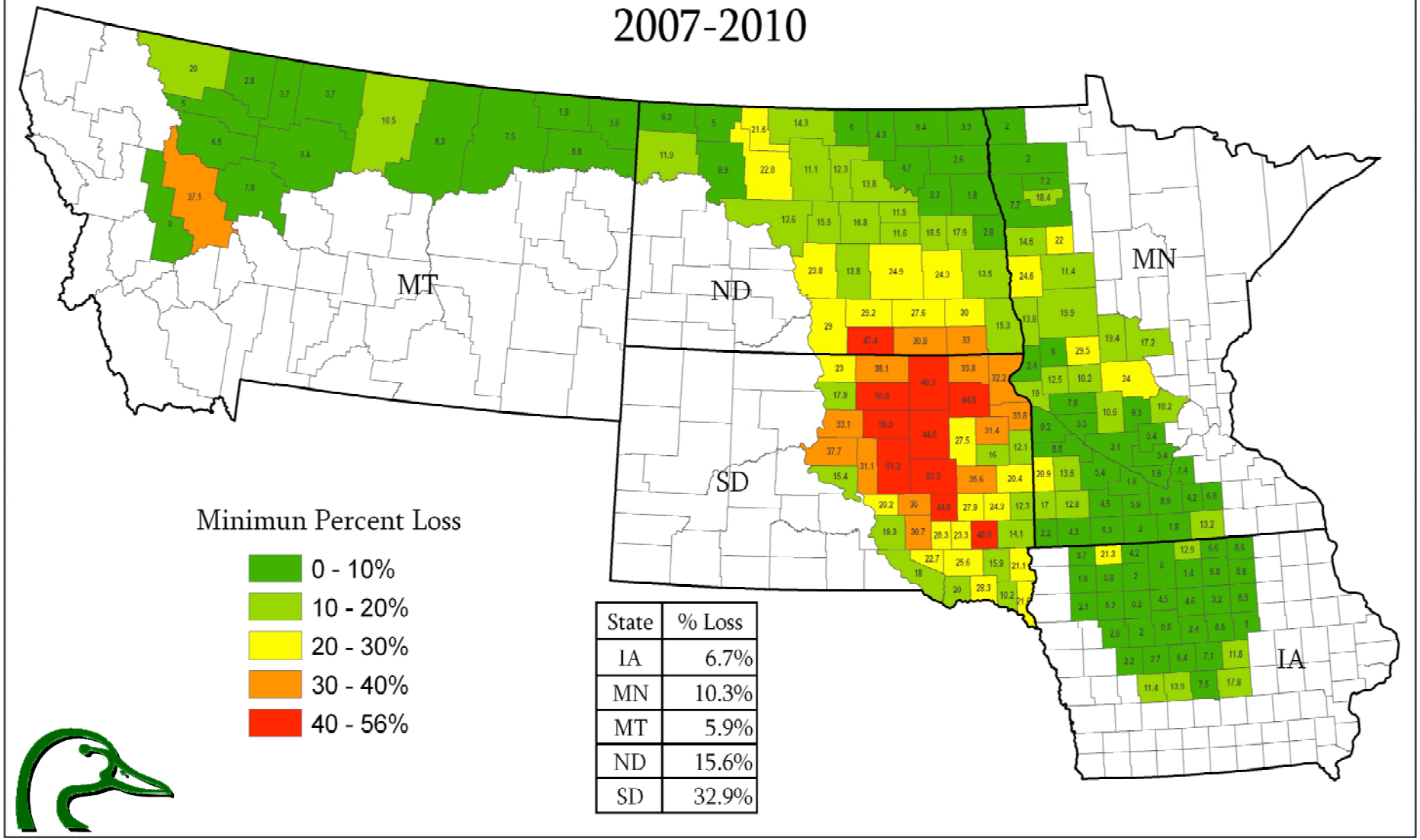
- **FSA data shows that 400,000+ acres have been converted in the Dakotas and Montana from 2002-2006**
- **DU documented annual loss rates as high as 2% in some SD counties**
- **loss of half of the remaining 21 million acres in the next 34 years**
- **25,000 fewer ducks in the fall flight with each 1% decrease in native prairie**
- **Congressional Research Service (CRS) report for Congress "Land Conversion in the Northern Plains", April 5, 2007 (www.ducks.org/crsreport)**
- **Governmental Accounting Office (GAO) report for Congress, July 2007 (www.ducks.org)**

Minimum Loss of CRP Acres Across the Prairie Pothole Region 2007-2010



State	Acres
IA	24,235
MN	152,946
MT	138,727
ND	436,262
SD	355,521

Minimum Percentage Loss of CRP Acres Across the Prairie Pothole Region 2007-2010



State	% Loss
IA	6.7%
MN	10.3%
MT	5.9%
ND	15.6%
SD	32.9%

Perennial Energy Crops

- Opportunity for establishing extensive stands of grass in place of cropland.
- Lower risk alternative than annual crops in an increasingly variable climate for producers.
- Less annual inputs = more profitability for producers and better for environment
- Carbon sequestration – better than no-till systems.
- Risk of replacing CRP and native grassland with dedicated low diversity energy “crop”.

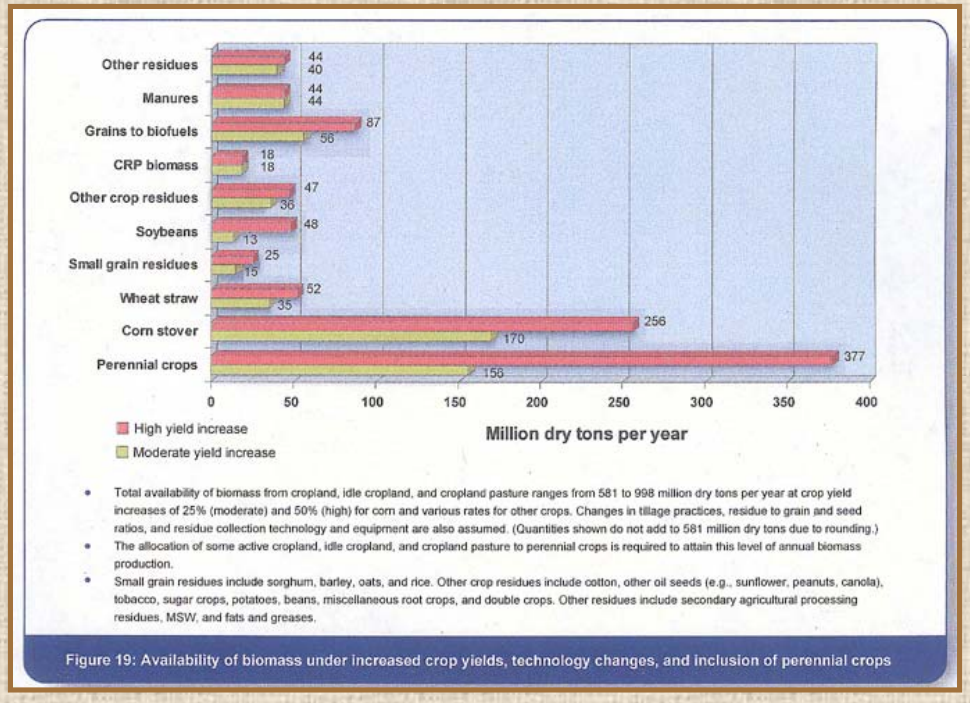




CRP is a Target

Sen. Conrad's BOLD Energy Act 2006

Section 312. USE OF NATIVE GRASSES ON CONSERVATION RESERVE LAND FOR BIOMASS HARVESTING



Source: USDA/DOE, "Billion Ton Study"





Biofuels and CRP

- Premature to conclude that CRP land is a source for biofuels production
- CRP acres not concentrated around bio-refineries
- CRP acres made up of many different mixtures
- CRP is vital forage source during drought emergencies
- Establishment of dedicated energy crops is much better on existing cropland with regular herbicide treatments
- Compromises the wildlife purpose of CRP





Biofuels and Waterfowl

- Conversion of native prairie and/or CRP to corn or monotypic stands of switchgrass equals a net loss.
- Planting switchgrass on existing cropland is value added.
- Mixed-species stands are better than monotypic stands, however:
  - technology not yet available for enzymatic process
  - gasification and pyrolysis technologies can handle mixtures, but transportation fuels are not the focus
  - these technologies also open up native habitats and CRP to large-scale annual harvest
    - not a good thing for early nesters like pintails and mallards.
- Water consumption is also a large concern





Ethanol Production and Water Use

- Corn ethanol production (50 Mill/Gal/Yr plant)
  - Growing corn
    - 118 gallons H_2O/lb. of corn grown
    - 21 lbs. of corn/gallon of ethanol
    - 1 gallon ethanol = 2,478 gallons of H_2O
    - 123.9 billion gallons of H_2O/yr or 380,178 acre-feet/yr.
  - Corn conversion
  - 5.8 gallons H_2O/gallon ethanol for conversion of starch to ethanol
  - 290 million gallons of water/year or 890 acre-feet/yr.
  - TOTAL WATER USE = 381,068 acre-feet/yr.





Ethanol Production and Water Use

- Cellulosic ethanol production (50 Mill/Gal/Yr plant = 1,712 tons/day)
  - Growing native grasses
    - Little irrigation needed.
  - Enzymatic cellulose conversion
    - 12.5 gallons H_2O/gallon ethanol
  - 625 million gallons of water/year or 1,918 acre-feet/yr.
  - TOTAL WATER USE = 1,918 acre-feet/yr.





What can we do to prevent the train wreck for waterfowl?

- Farm and Energy policy in the 2007 Farm Bill and beyond
- "Sodsaver" provision is crucial – 2007 FB may be our last chance!
- Increase our perpetual protection efforts!
- Reauthorize and maintain the Conservation Reserve Program
- Strive for a separate "Biomass Reserve Program" to accommodate the next generation biofuels
  - Takes conversion and harvest pressure off of native prairie and CRP
  - Keys for waterfowl: harvest timing, stubble heights

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