Natural Resource Issues in China: Wind and Water Erosion

2006 Agricultural Outlook Forum

Washington D.C.

Mark Majerus

USDA-NRCS Plant Materials Program

Wind Erosion Across North China



Wind and Water Erosion Inner Mongolia





Yellow River- Central Inner Mongolia

Reported soil loss of 109-642 tons/acre off of cropland over winter months

Reported soil loss of 220-1,700 tons/acre from grasslands plowed for crops

Institute of Desert Research-Lanzhou (1997)





In 1994 Central Government required that all cropland lost to development be offset with new cropland.



Resulted in 22% increase in cropland in Inner Mongolia alone. Often on marginal land.



Historically

herding with overnight corraling and some native hay harvest







Years of Year-Round Grazing is Taking its Toll





Removal & confinement of all grazing animals Ordos Plateau

- Total confinement of livestock
- Limited forage available
- Pruning of willow trees—each family so many hectares
- Quality of cashmere wool diminishing
- Five year trial period



1993-free-roaming animals



Stabilization of Sand Dunes East Edge of Gobi Desert



- 3 meter poles buried 1 meter
- Cottonwood/willow
- Watered 2-3 times during growing season
- Japanese volunteers each year



Shrub & Tree Establishment on Highly Erodable Areas-Mostly by Hand







Caragana Ceretoides Kochia Artemisia



sea buckthorn

Relocation of herder to Dairies

Small (usually brick) house (\$5,000 value) 2 dairy cows (with potential to buy up to 3 more) Communal milking barn Communal grazing land and native hayland





Got Milk ?



Eastern Inner Mongolia Xilinhot—Hailar—Huhehot

Animal reduction- from 2 million to 1 million 2002-2004

Major 'Drink Milk' campaign throughout China

Controlled Grazing Systems

 All grazing restricted April through June

Up to 8 paddocks

 One paddock save for winter use only

 Strictly enforced by District Manager









Haying of native grass stands where grazing is restricted or controlled



Peas/Oats for forage

Guyan Farm

Seed Production Trials Potential for forage and grazing









Potato Production for McDonalds Danish equipment

China Agriculture-In process of upgrading equipment







Seed cleaning facility



New greenhouse & tissue culture lab



Grassland Research Institute-Huhehot, Inner Mongolia

2 Truax Drills (made in USA)

2 Brillion Drills (made in USA)

John Deere Combine-(made in NE China)

seed cleaning equipment (built in Huhehot)

Irrigation sprinklers (made in Canada)



Experimental Center for Forage Seed Production Demonstration-Inner Mongolia 20,000,000 Yuan investment Agropyron mongolicum Elymus sibiricus

Medicago sativa

Seed production utilizing center pivot irrigation



Testing of U.S./Canadian forage cultivars





USDA-NRCS Plant Materials Centers Bridger, Montana Bismarck, North Dakota Aberdeen, Idaho USDA-ARS Forage & Range Research Logan, Utah





Serving the northern great plains and Intermountain basin

In cooperation with Soil & Water Conservation Districts

Scientist Exchange with Grassland Research Institute (GRI)

Chinese Academy of Agricultural Sciences (CAAS)



Gu Anlin At Bridger PMC for one year (4/89–4/90)

To learn USDA-NRCS Plant Materials Program approach to developing native plants for conservation use

Leader on ARS/NRCS seed collection trip to Himalayan Highlands (Tibetan Plateau) (2001)



Initiated Plant Materials Trials 1991 U.S. and China Cultivars







In cooperation with Grassland Research Institute Huhehot-cropland Zhaohe-semi-arid steppe Dalad Qi-sandy Linhe-saline irrigated



Dr. Mao Peisheng

China Agricultural University-Beijing

Professor and Director Forage Seed Lab

6 month exchange at Bridger PMC to learn about seed production and U.S. seed industry (5/04-10/04)

Conducted Seed Moisture/Harvest Readiness Study while at PMC







Tours of PMC and conservation practices in Montana & Wyoming for Chinese and Mongolian scientist and government officials

Lectures to graduate students at China Agriculture University-Beijing and Inner Mongolia Agriculture University-Huhehot



Dr. Tumenjargal Dagvanamdal Mongolian Agricultural University Ulaanbaatar, Outer Mongolia Professor of Botany & Medicinal Plants

Etheridge Seed Farm-Powell, WY



5 month exchange to:

USDA-NRCS Plant Materials Centers (Bridger, MT-Aberdeen, ID)

USDA-FS Shrub Lab, Provo, UT

USDA Plant Introduction Station, Pullman, WA

USDA-ARS Forage & Range Research, Logan, UT

To study seed production, cleaning, and storage techniques

Sponsored by Green-Gold Project (Swiss government)

2005-two scientists to US (seed production/grazing management)

2006-08 up to six graduate students to western U.S. universities



Abandoned Cropland

Conservation Issues in Mongolia

weeds

Pristine Natural Resource that need protection



Overgrazing near villages



5 years of drought and hard winters

high concentrations of animals



Research Institute of Animal Husbandry Mongolia Agriculture University-Ulaanbaatar, Mongolia Seed Collections-1994, 1996, 1998 (USDA-ARS Germplasm Collection Fund/Foreign Agriculture Service) Plant Evaluation-2000-2004, Turgen, Batsumber, Buyant (PL-480) Seed Increase-2005 Bornuur (Wheat Monitization-US Embasssy)



Turgen Site-Irrigated 733 accessions, 164 species

Batsumber Site-Dryland 773 accessions, 178 species



Initial Evaluation

PL-480 Food for Progress Grant through U.S. Embassy 2000-2004

Research Institute of Animal Husbandry— Mongolian Agricultural University



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МОНГОЛ ОРНЫ МАЛЫН ТЭЖЭЭЛИЙН УРГАМАЛ

FORAGE PLANTS IN MONGOLIA

Dr. Jigjidsuren-Project Leader

Research Institute of Animal Husbandry



Turgen Site

The Approach to Solving Erosion Problems in China/Mongolia



develop paddock grazing



collecting and testing native forage and reclamation species





evaluating species for potential forage & seed production

consulting with USDA scientists

