



# **Finding End Use Opportunities for Hemp Fiber:** **Erosion Control R&D Project Update**

*Riley Gordon, PE - AURI Principal Engineer*



# About AURI

- To foster long-term economic benefit through development of new value-added uses for agricultural products





# AURI Locations

## Crookston

510 County Road 71  
Crookston, MN 56716

**800.279.5010**

## Marshall

1501 State St.  
Marshall, MN 56258

**507.537.7440**

## St. Paul

1475 Gortner Ave.  
St. Paul, MN 55108

**651.624.6055**

## Waseca

PO Box 251  
Waseca, MN 56093

**507.835.8990**

# Offices



# Clients



# AURI Focus Areas

## Food

Grain: oils, powders, hemp hearts

## Bio-based Products

Stalks: various fiber  
and hurd applications

## Coproducts

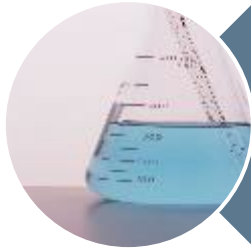
Several byproducts resulting from  
processing hemp

## Renewable Energy

Hemp Biofuels



# AURI's Services



Applied Research and  
Development



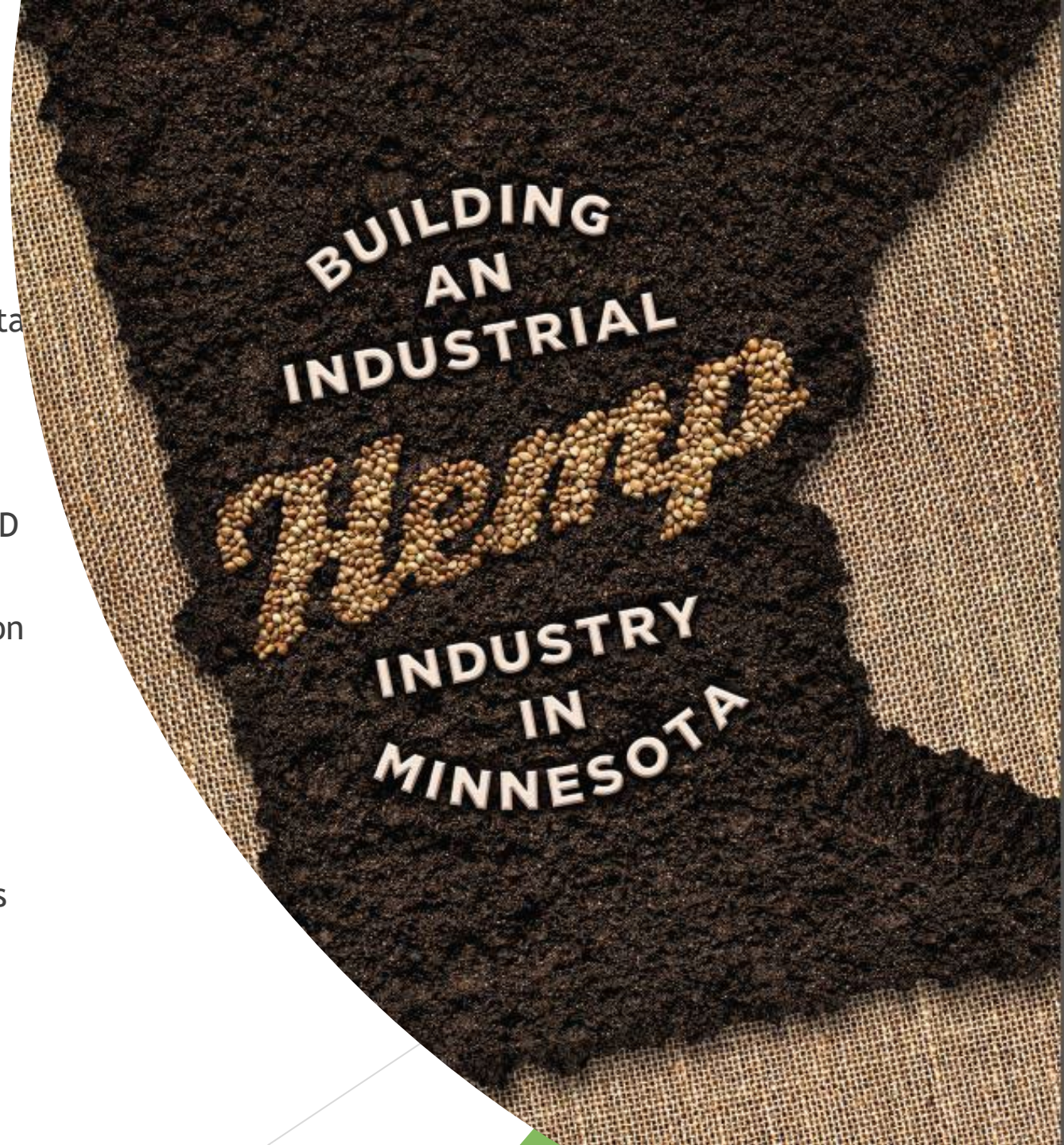
Hands-on Scientific  
Assistance



Innovation  
Networking

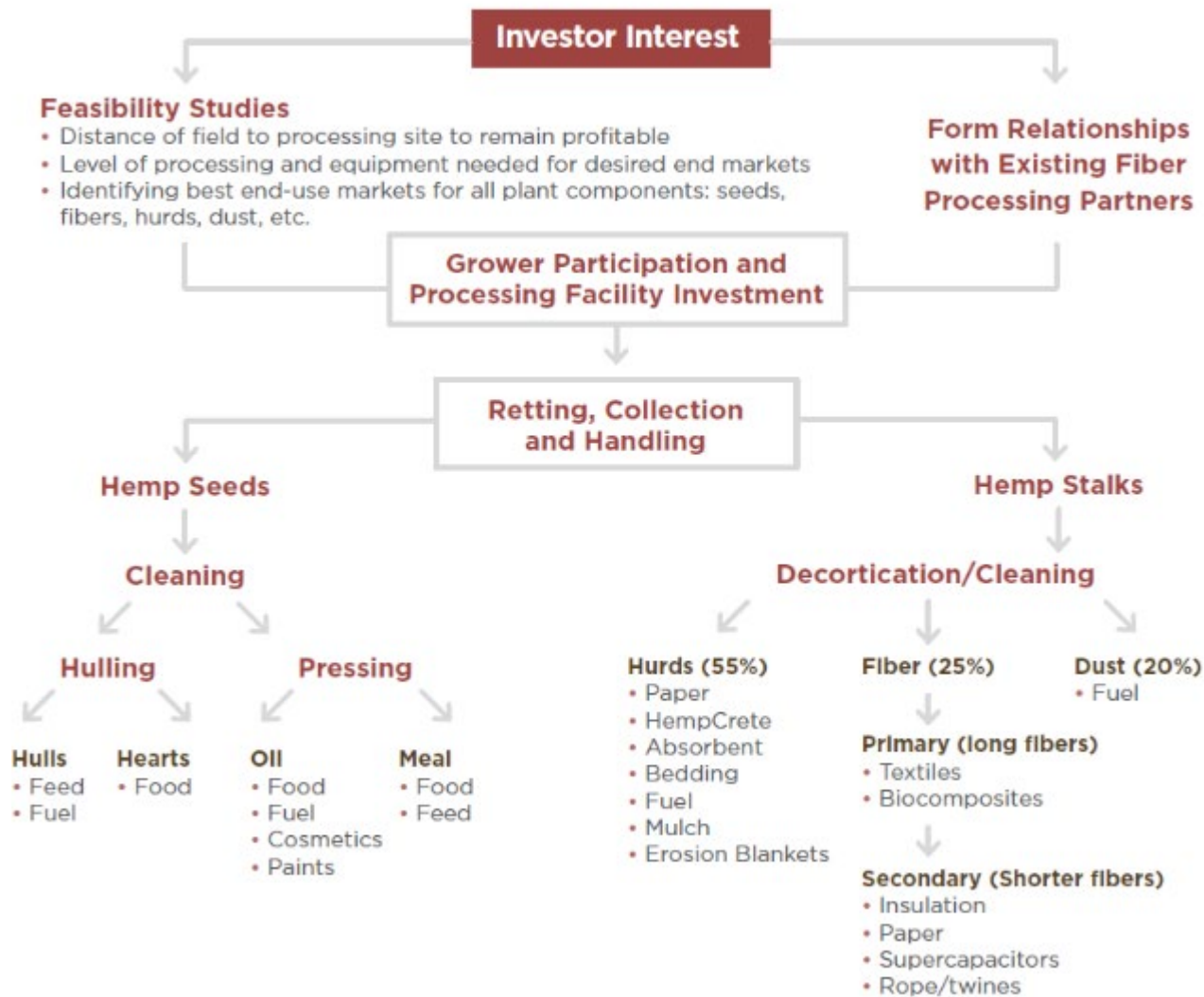
# Hemp Initiative

- ▶ Objectives:
- ▶ Focus on developing a hemp value-chain for Minnesota and the Midwest.
  1. Work closely with producers and processors identifying industry needs.
  2. Hemp value chains in Food, Feed, Fuel, Fiber & CBD
  3. Analysis of CBD oil, hemp seed meal, hemp flower and hemp fiber for quality control and identification of new uses (fuel, feed, fiber).
  4. Identification of hemp-based markets.
  5. Identify state-of-the industry for processing and coproduct approval for feed.
  6. Release public report with findings of opportunities and hurdles for the hemp industry in MN.





# Hemp Fiber - Domestic End-Markets Need Development!





Research Partners  
And Supporters:



# Reducing Plastic Pollution with Biodegradable Erosion Control Products

## Soil and Erosion Control Product Opportunity Space in MN

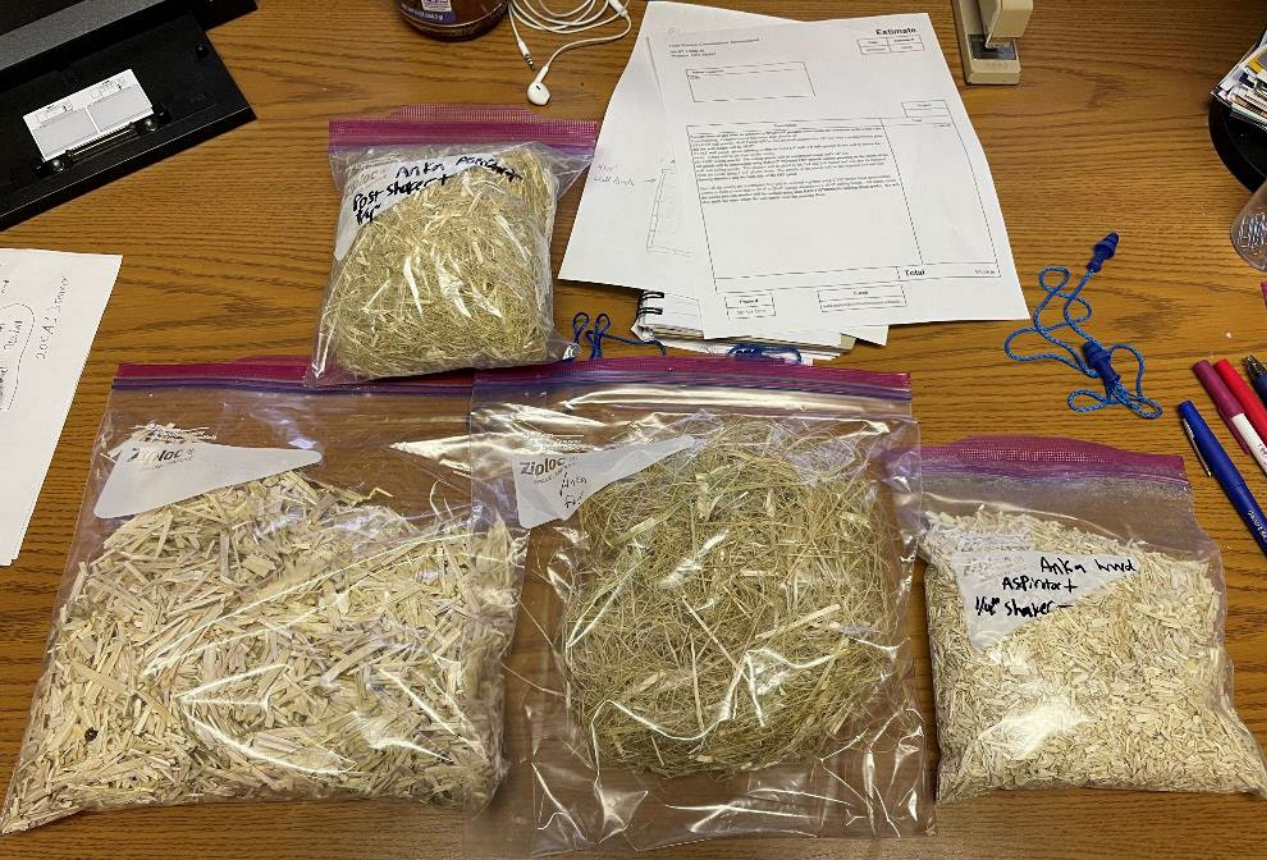
- Erosion control blanket (all types): 1,558,000 square yards/year
- Hydraulic Erosion control applications (all types): 1,180,000 pounds/year
- Silt fence (all types): 287,000 linear feet/year
- Sediment control logs (all types): 441,000 linear feet/year
- \$30.1 million spent each year on erosion control products on local and state roads



## Outcomes:

- Technical Development of Erosion Control Product prototypes utilizing Industrial Hemp as a replacement for plastic components
- Complete lab and field testing required to evaluate that various prototype products meet or exceed current specifications, allowing MnDOT and other agencies the option to source these biodegradable products for wide scale adoption in MN





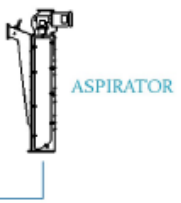
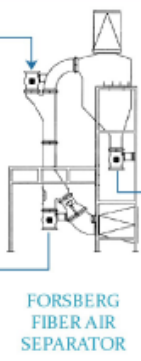
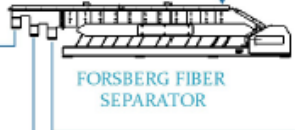
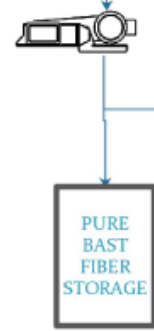
# AURI Decorticator at Waseca Lab



# AG PROCESSING SOLUTIONS AND FORSBERGS TEAM UP TO SEPARATE FIBER & HURD



DE-LUMPER





# HAYBUSTER®











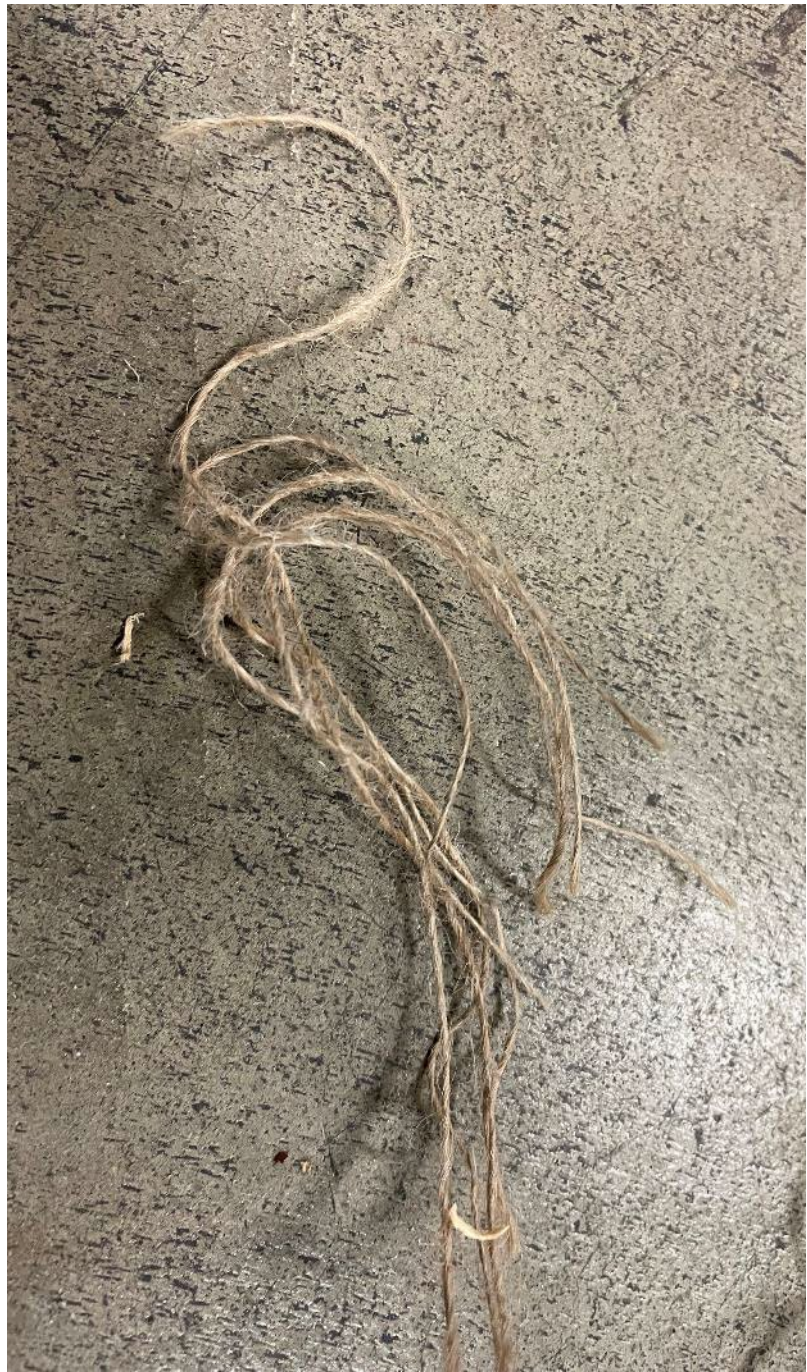






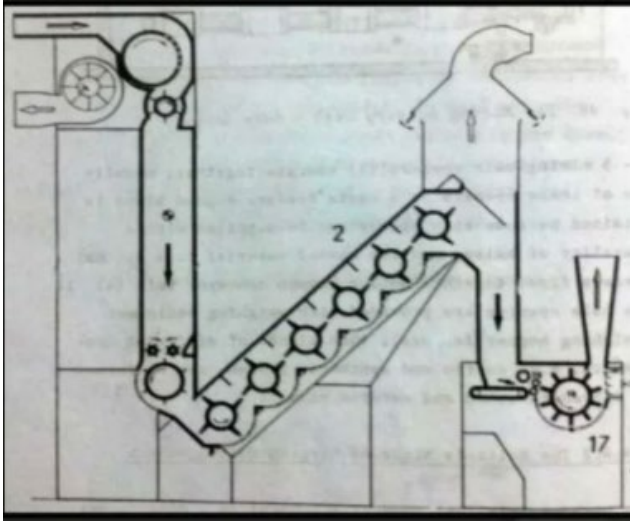








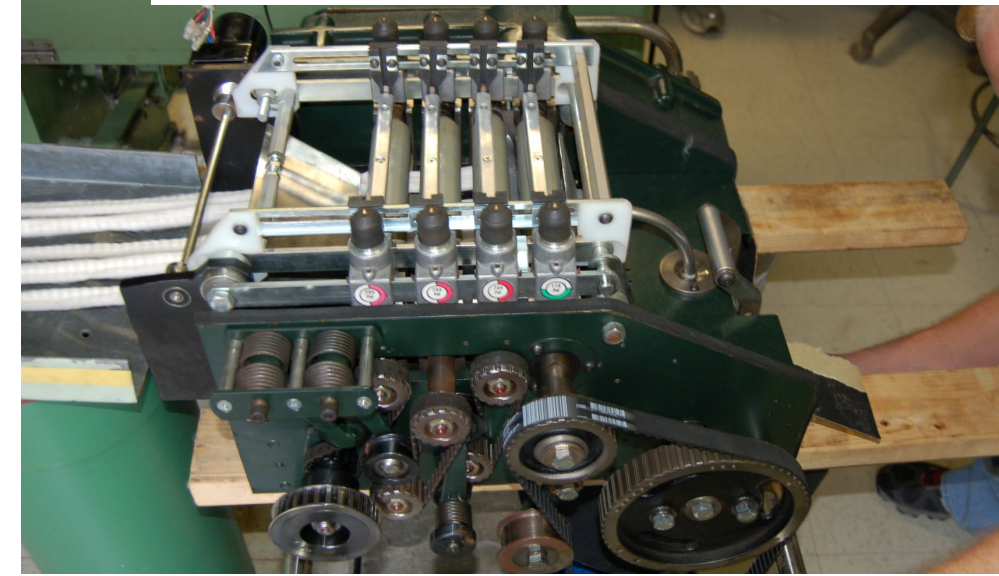
# Cleaning, Opening and Refining Hemp Fiber



## Carding Hemp Fiber









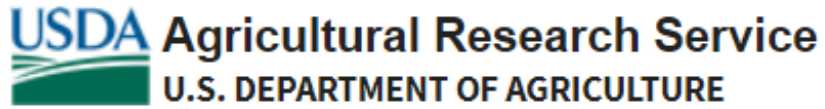


Rach-Al-Paca  
Fiber Processing



# High Level Economics - End Markets for Hurd Needs to be part of the equation

- Coconut Coir being sourced for roughly \$0.25/lb today (delivered)
- One ton of hemp stalks makes roughly 500lb fiber
- \$125/ton stalks = \$500/ton of marketable clean fiber (\$0.25/lb) (raw material cost not including processing, shipping/handling, etc.) = \$62.50/large round bale. \*\*Not what the Farmer would get paid!
- Need to prove some technical performance value beyond coconut for hemp as erosion product fill to be commercially viable??
- OR leave significant hurd in material in order to bring usable tonnage up and reduce processing costs
  - If we leave 1/3<sup>rd</sup> of a stalks hurd in the fiber (45% effective hurd content in finished fiber), one ton of stalks makes 900lb of unclean fiber, stalk cost can increase to \$225/ton (\$112.50/bale) to meet \$.25/lb raw material cost, etc., etc,
- OR find end markets for hurd! At \$0.50/lb for an animal bedding or hempcrete market, stalks can go to \$725/ton or \$362.50/bale with \$0.25/lb fiber (again without processing/shipping taken into account)
- Jute netting being sourced for \$.12/SY, we will be exploring cost of production for hemp netting to see if it can compete, will be a challenge







**ENVIRONMENT  
AND NATURAL RESOURCES  
TRUST FUND**

Big thanks to the Legislative-Citizen  
Commission on Minnesota Resources (LCCMR)!

**Questions, comments or ideas regarding Industrial Hemp in Minnesota, or Erosion Control R&D project are welcome.**



**Riley Gordon**  
**Rgordon@auri.org**  
**218.281.7600 Ext.130**