



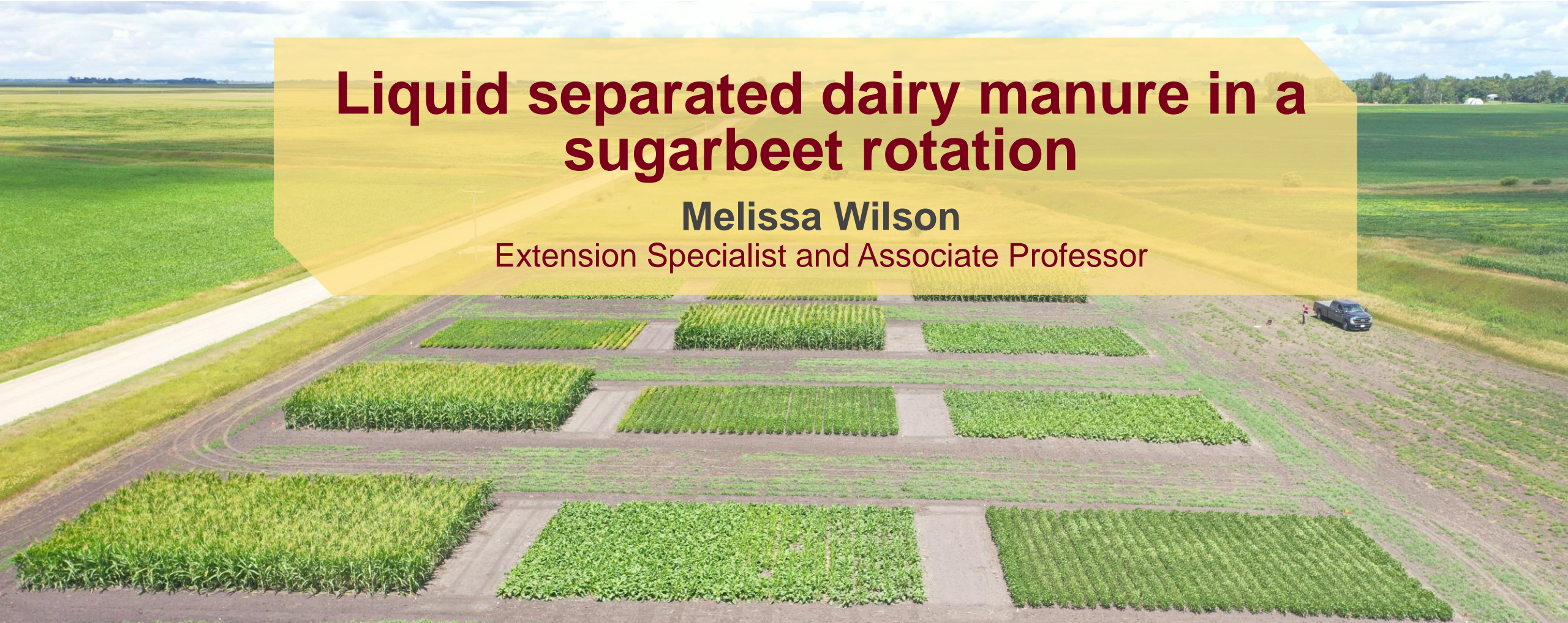
UNIVERSITY OF MINNESOTA EXTENSION

Driven to Discover<sup>SM</sup>

# Liquid separated dairy manure in a sugarbeet rotation

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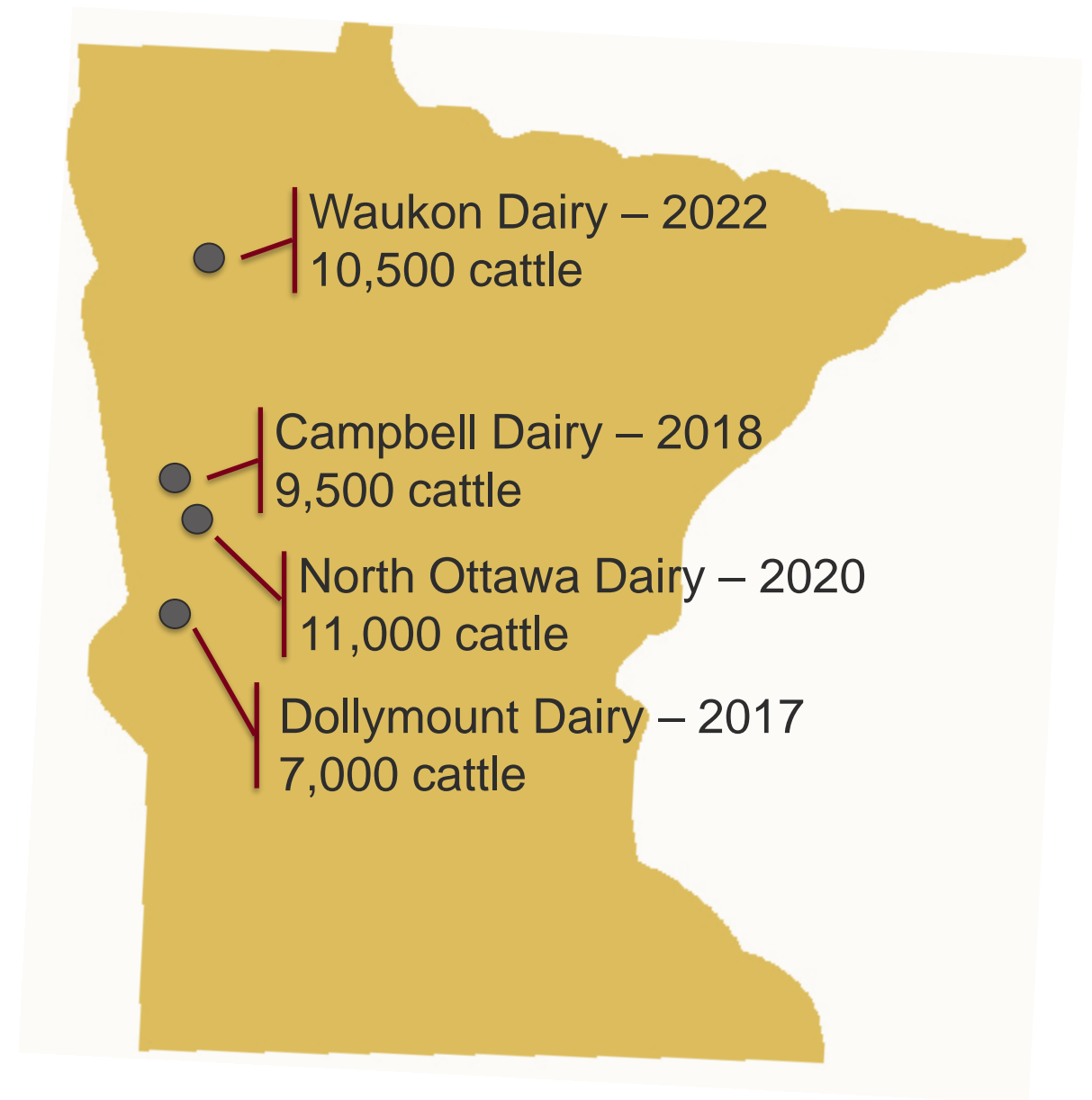


**MAKING A DIFFERENCE IN MINNESOTA: ENVIRONMENT + FOOD & AGRICULTURE + COMMUNITIES + FAMILIES + YOUTH**



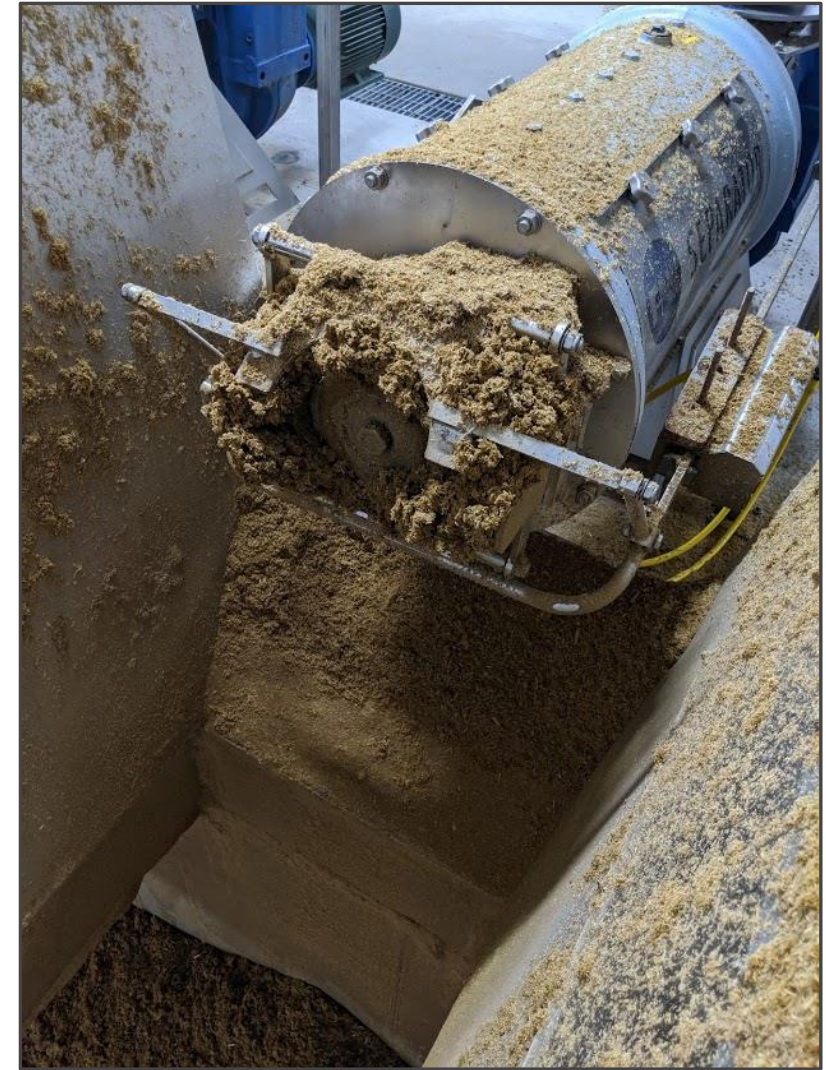
# Background

- New, large dairies are moving to northwestern Minnesota into sugarbeet growing regions



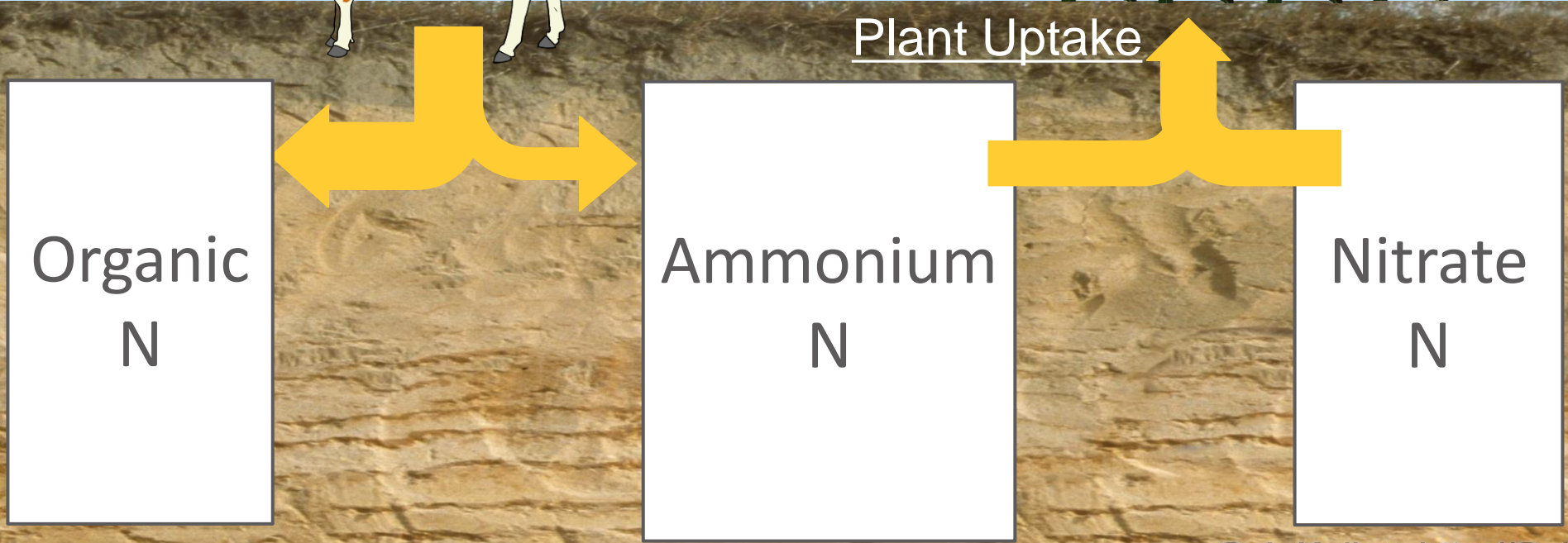
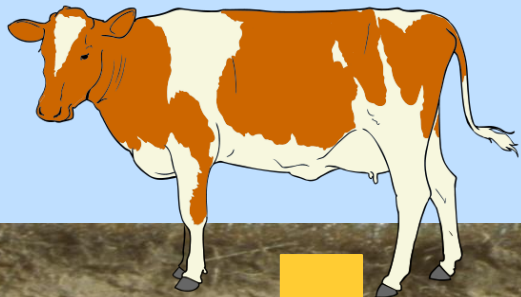
# Bringing new\* manure tech

- Liquid solid separation is being used so that solids can replace bedding



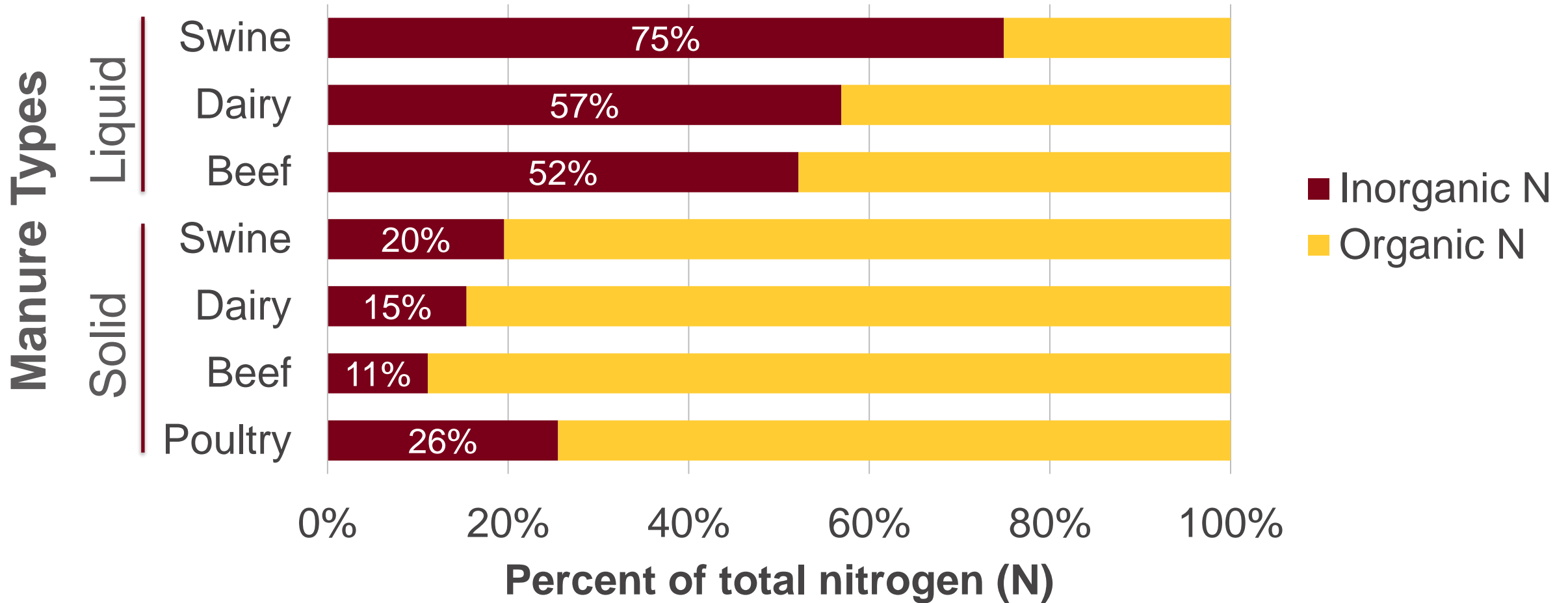


# Nitrogen Cycling



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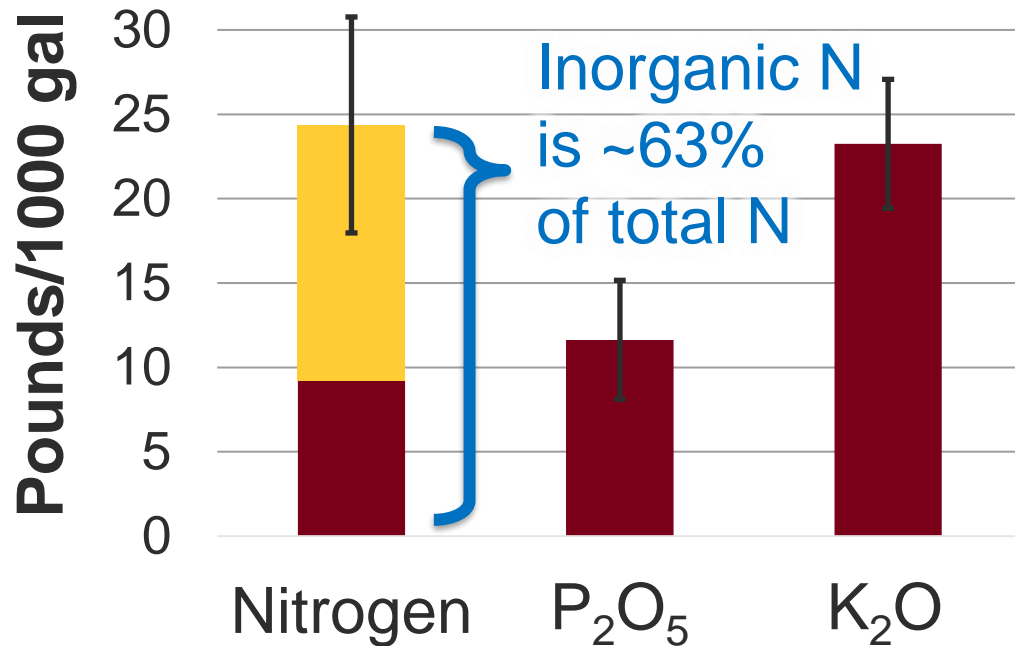
# Manure nitrogen distribution



# Dairy manure from two of the large dairies

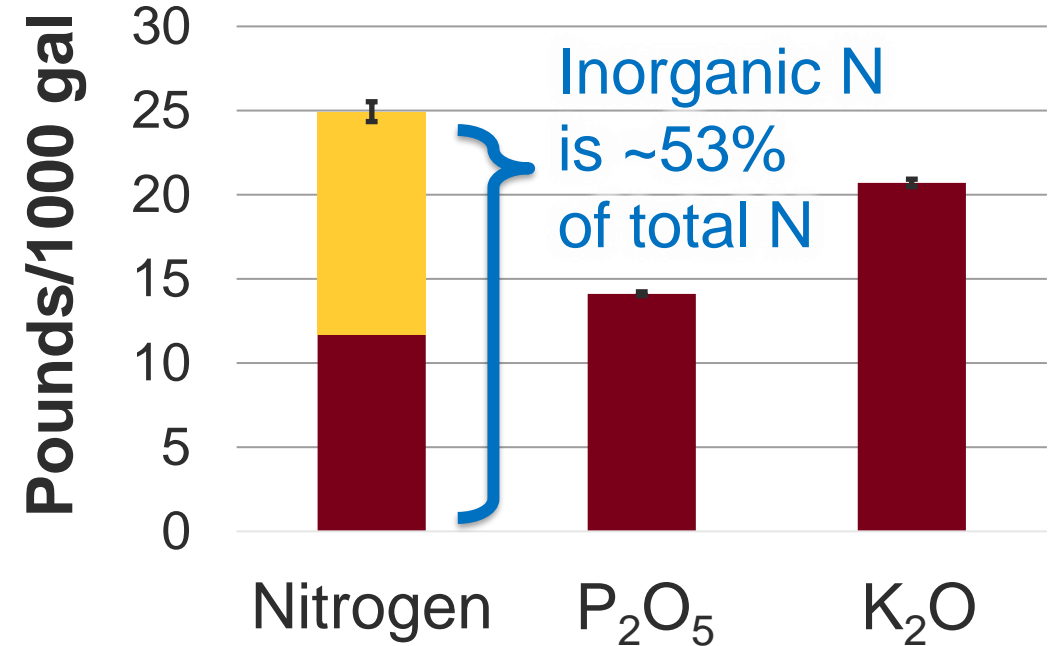
## Louriston Liquid Separated

Moisture = 96.4%



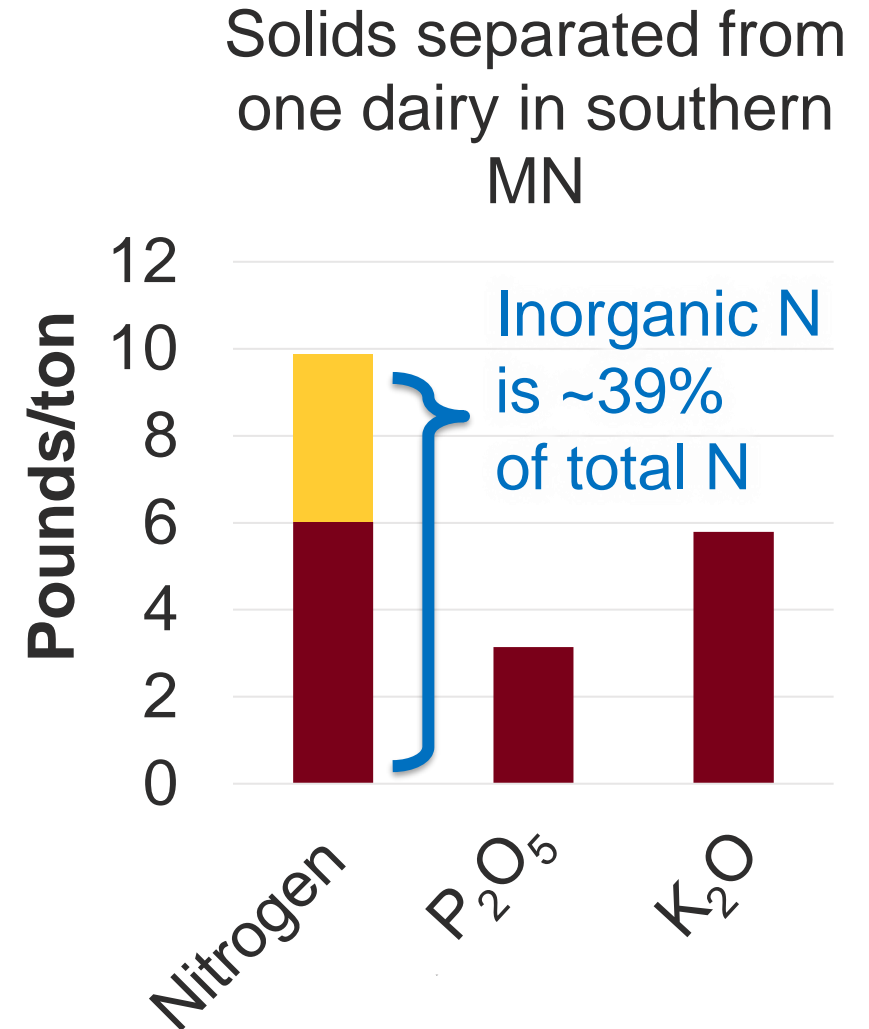
## Campbell Liquid separated

Moisture = 95.7%



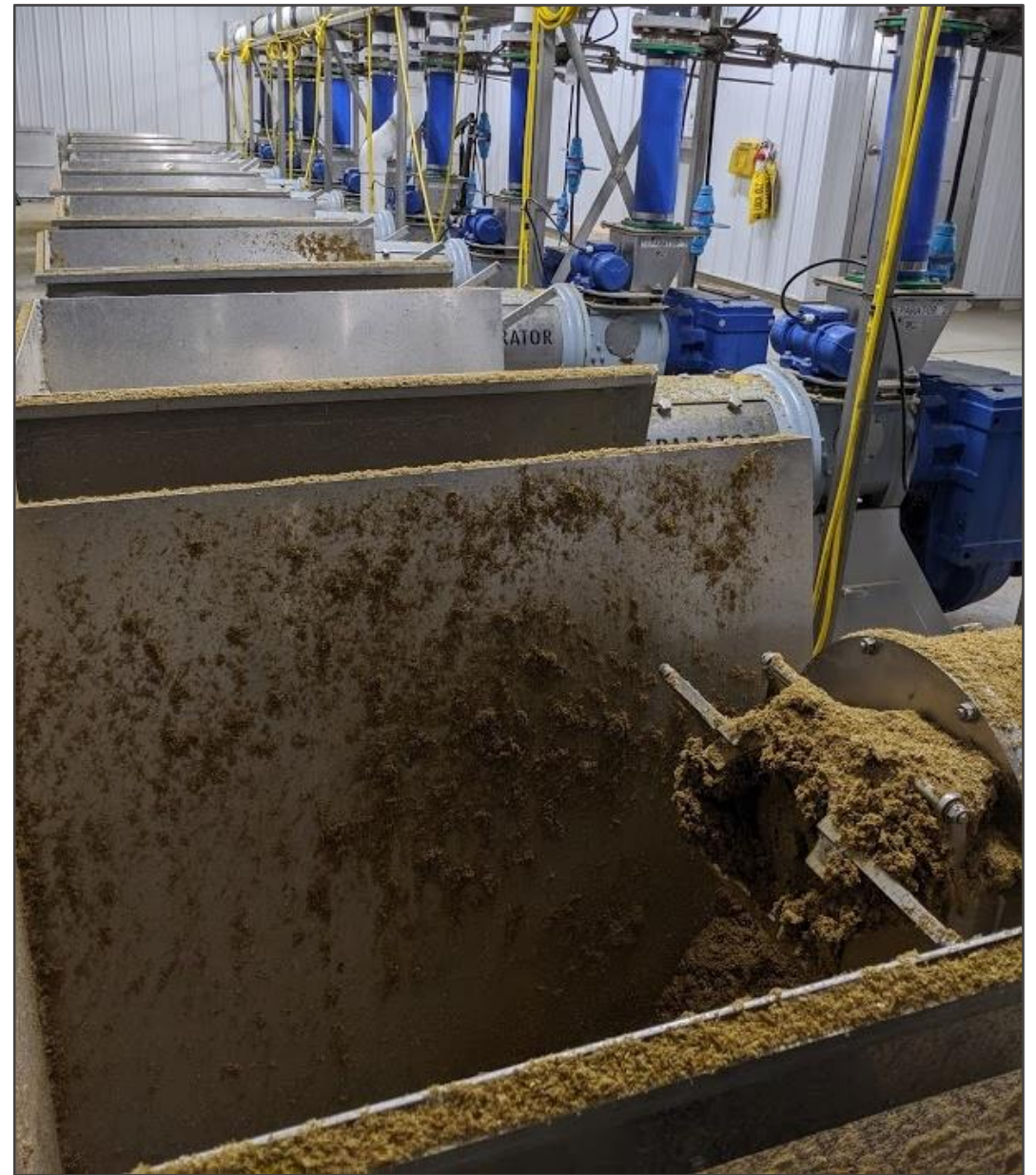
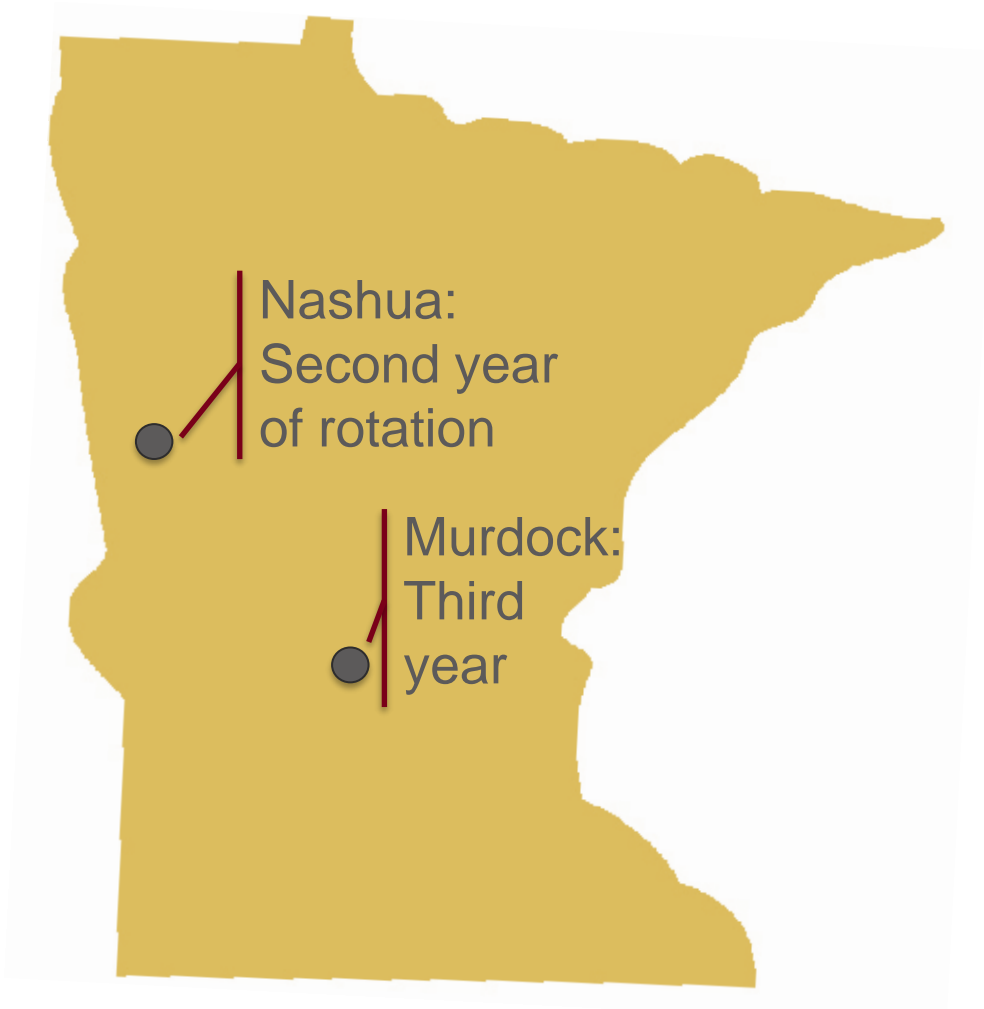
# Take home messages

- Incorporation will be key if using these manures to get most out of the N value
  - Ammonium concentration was a bit higher in liquid separated manure
  - Ammonium may be higher than expected for a “solid” manure in separated solids
- P concentrations are a bit lower in liquid separated manure
- K concentrations are about the same





# 2022 Study locations





# Plot setup – Nutrient management



- First year
  - Manure applied fall before study started
    - High rate was ~15,000 gal/ac
    - Low rate was ~10,000 gal/ac
    - Control: Spring fertilizer
- Second and third year
  - Fertilizer only, taking credit for manure N and soil test P and K as appropriate



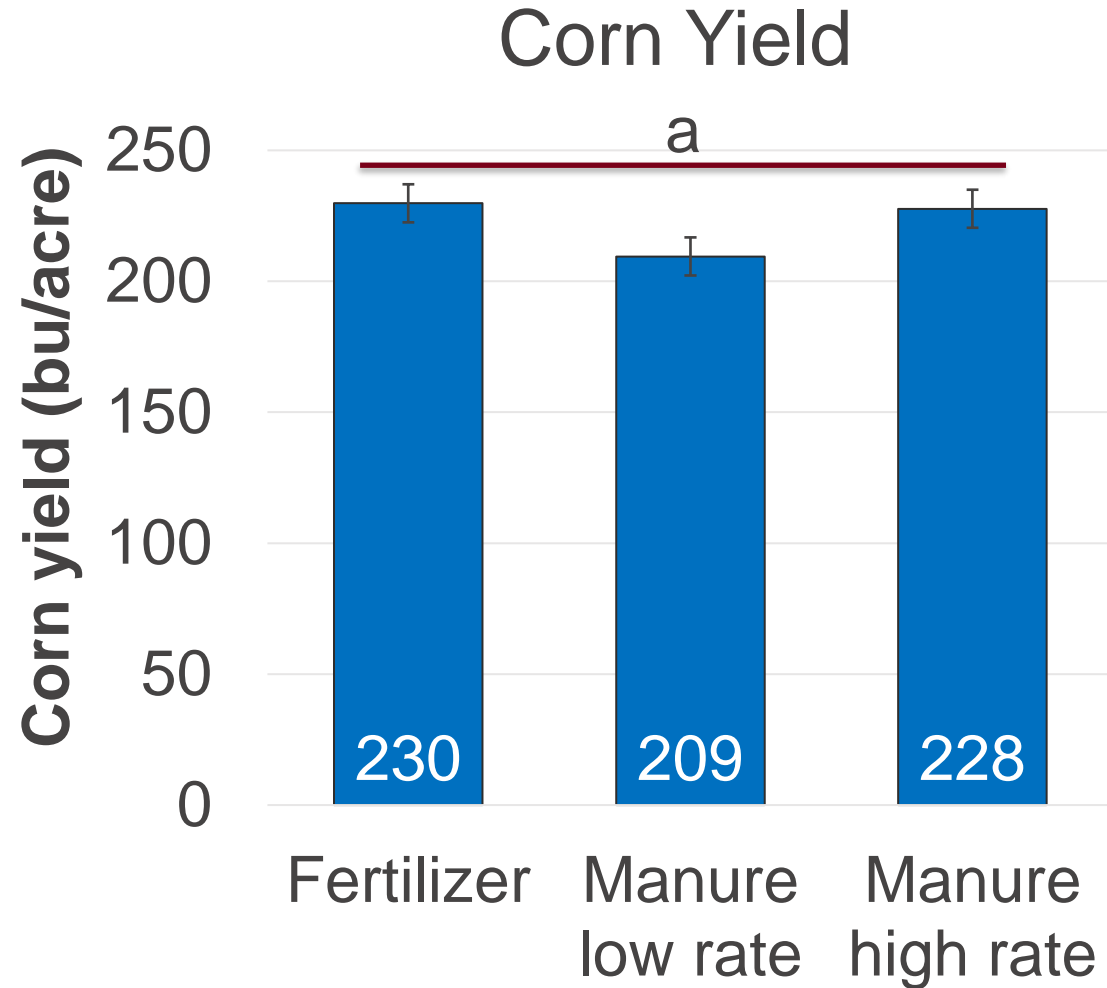
# Plot setup – Crop rotation

- Three crops – all represented each year of study
  - Sugarbeet, soybean, corn
- 4 replications of each crop

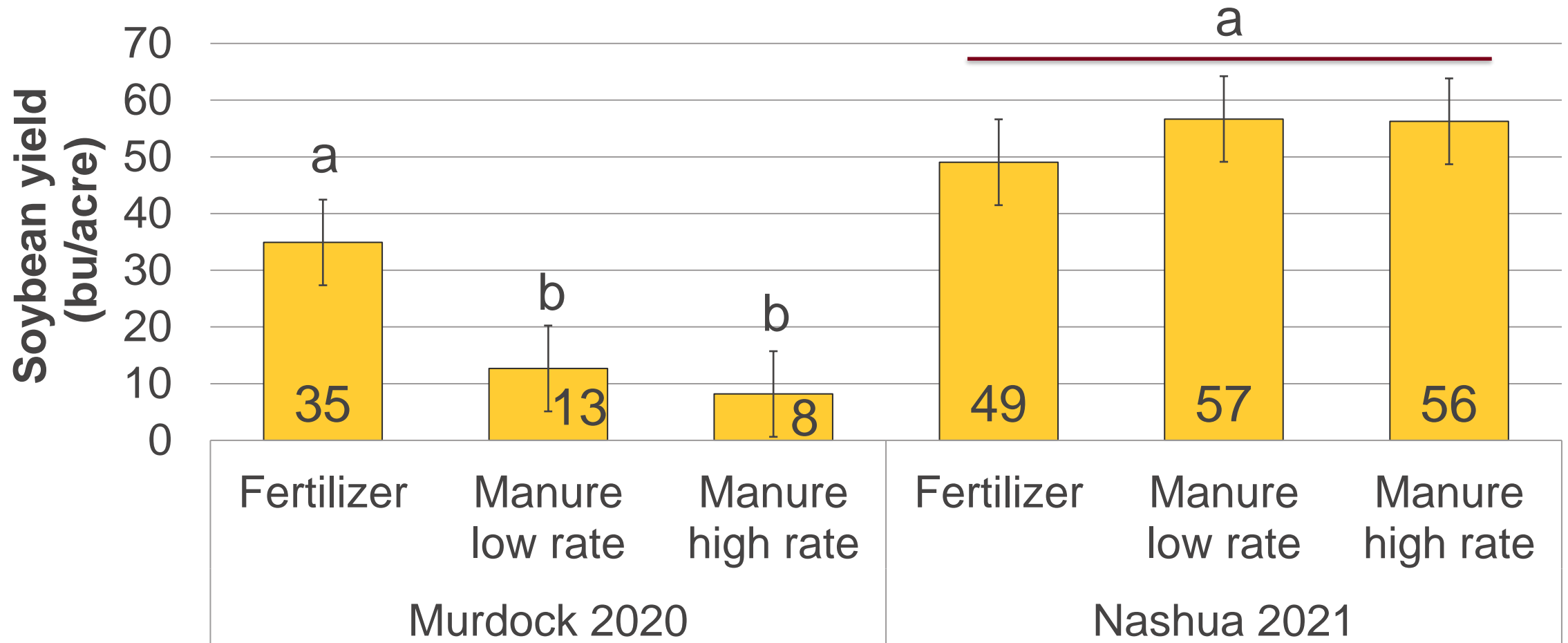




# Corn yield – First year after manure at Nashua



# Soybean yield – First year after manure

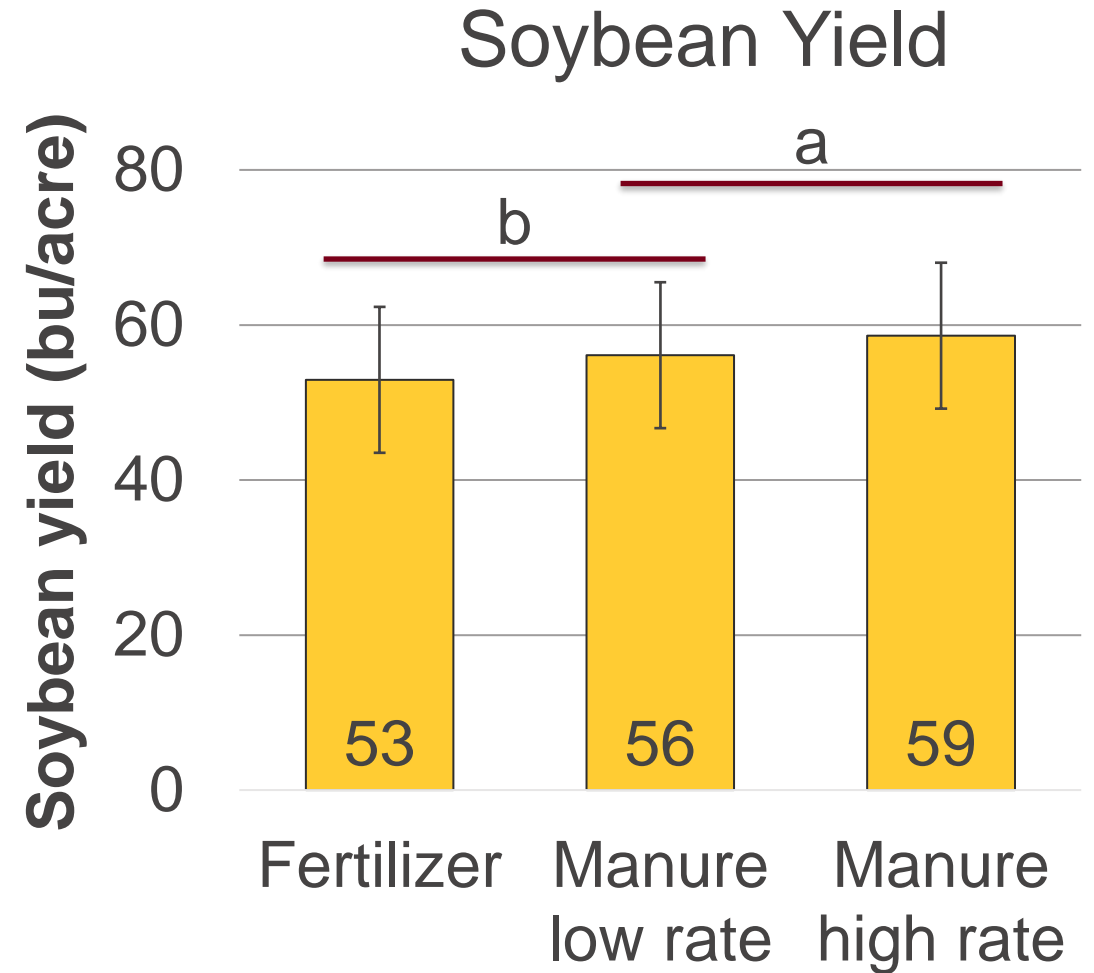
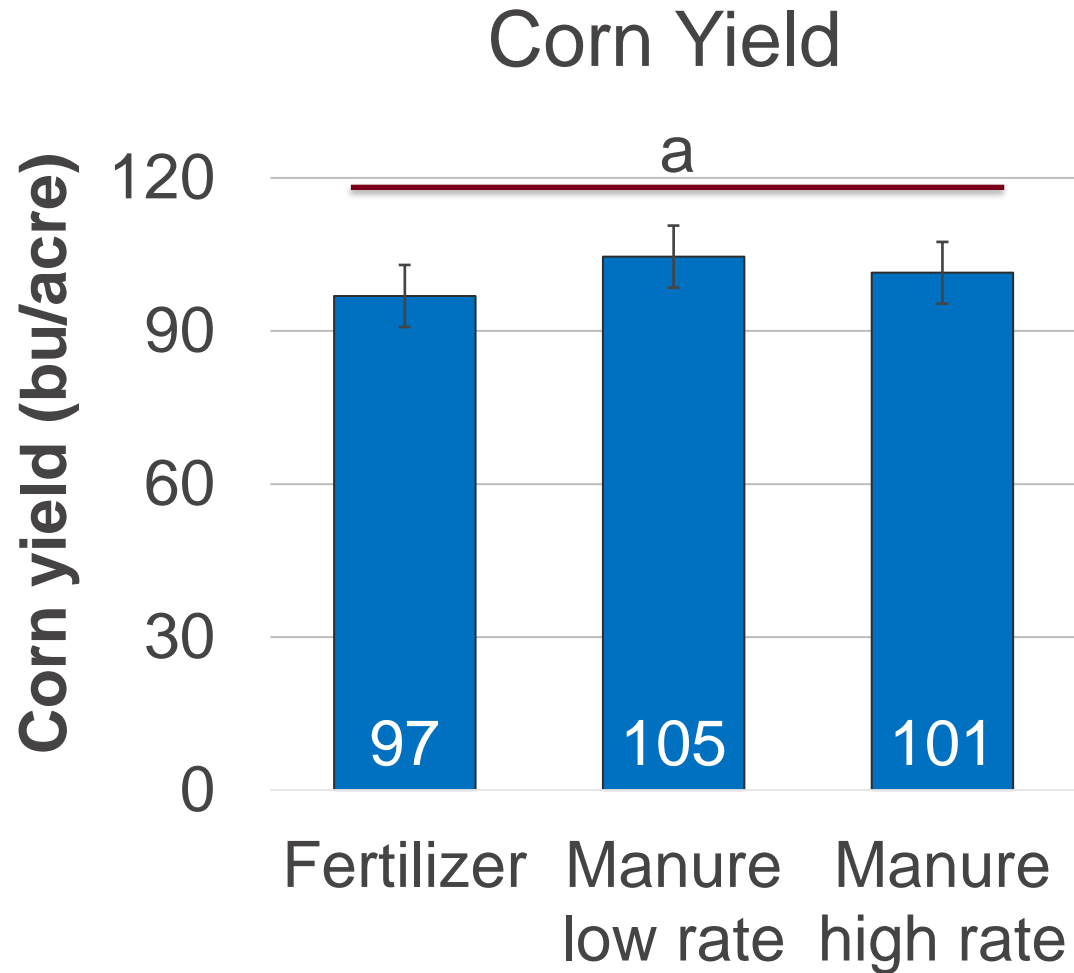




# Sugarbeet yields in 1<sup>st</sup> year of trial at Nashua

Nutrient Source	Yield (tons/acre)	Sugar (%)	Recoverable Sugar (lbs/ton)	Recoverable Sugar (lbs/acre)	Payment (\$/acre)
Fertilizer only	39.5a	16.3a	282a	11,195a	--
Low dairy manure rate	38.0a	16.3a	283a	10,756a	-\$72
High dairy manure rate	41.5a	15.8a	271a	11,282a	+\$14

# Corn & soybean yield – Two years after manure





# Sugarbeet yields in 2<sup>nd</sup> year of trial at Nashua

Nutrient Source	Yield (tons/acre)	Sugar (%)	Recoverable Sugar (lbs/ton)	Recoverable Sugar (lbs/acre)	Payment (\$/acre)
Fertilizer only	23.1b	19.4a	343a	7,910b	--
Low dairy manure rate	22.1b	19.0a	336a	7,451b	-\$75
High dairy manure rate	26.4a	19.3a	332a	8,777a	+\$141



# Thank you!

**Funding:** Sugarbeet Research and Education Board of MN and ND

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