



Integrating Cover Crops and Manure Yield and Nitrogen Effects

Project Procedure:

- Plant Winter Cereal Rye ASAP after Corn Silage or Soybean Harvest
- Three replications on each plot, multiple farm locations around MN
- The variable in the trial is Rye – everything else is the same
- Late Fall – Inject Dairy or Swine Liquid Manure
- Terminate & Incorporate Rye in Spring before planting Corn
- At Termination – Measure 24" Soil NO₃ and Nitrogen in Rye
- Harvest Corn Grain or Corn Silage in Fall
- Measure Yield and Nitrogen Uptake
- Two Crop-Year Project: Fall 2015 - Fall 2017



Results of Two-Years of Study

- Grain Yield – No Significant Difference across sites
- Corn Silage Yield – No Significant Difference across sites
- Nitrogen in Winter Cereal Rye above ground growth in Spring
 - Average - 45 #/Acre
 - Range - 4 #/Acre to 102 #/Acre
 - Largest Influence on increased Rye N - Earlier Fall Seeding Date of Rye
- Spring 24" Soil NO₃ (Nitrate)
 - Averaged 78 #/Acre less Soil NO₃ under Winter Cereal Rye
 - Largest Influence on NO₃ uptake: Later Spring Harvest of Rye
- Total Nitrogen Yield at Fall Harvest – No Significant Difference across sites

Summary

- Winter Cereal Rye can be successfully established after fall harvest of:
 - Corn silage
 - Soybeans
- If not harvesting Winter Cereal Rye for a Forage:
 - Terminate at < or at 8" Height to reduce chances of corn yield loss
- Winter Cereal Rye sequesters manure Nitrogen
 - In roots first, then above ground growth
 - Most of this Nitrogen scavenging is in the spring
- Benefits of Cover Crops:
 - Soil Water Erosion Control
 - Soil Wind Erosion Control
 - Nitrogen Sequestration
 - Increase Soil OM
 - Increase Soil Health

