Is Hybrid Rye a Viable Crop in Wisconsin?

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Introduction

• Cereal rye is a hardy winter annual that is often used as a cover crop due to low yields.

• Hybrid rye has been shown to have comparable forage and grain yields to other common crops in WI like wheat and triticale.

• However, there are currently no management recommendations for growers.
Importance

• Winter cover crops absorb nutrients and excess water in the fall and spring and can help prevent erosion throughout the winter when the soil would otherwise be bare.

• Rye is winter hardy, meaning it will survive the winter and begin growing again in the spring.

• Hybrid rye would provide these benefits on top of providing growers with a dual crop to utilize on the farm or sell.

• Hybrid rye is versatile and can be grown as a grain or as a forage, providing flexibility.
Methods

• Planted September 25, 2020

• Arlington Agricultural Research Station

• Two Split Plot Design Trials
  • Main Plot Treatment
    • Fall N: 0, 15, 30, 45 lbs. N ac\(^{-1}\)
  • Split Plot Treatments
    • Spring N: 0, 30, 60, 90, 120, 150 lbs. N ac\(^{-1}\)
    • Variety: KWS Serafino & KWS Propower
  • Triticale and Cereal Rye Check Plots
    • 60 lbs. N ac\(^{-1}\) in the spring (standard rate)
Methods

• Forage trial harvested May 17, 2021.

• Grain trial harvested July 21, 2021.

• Quality parameters were determined via NIR. Forage quality was analyzed at Dairyland Labs and grain quality was completed in-house.

• Analysis was completed using R Statistical Software (v. 4.1.0).
Hybrid Rye Forage Yield

Forage Yield (tons acre$^{-1}$)

Fall Nitrogen (lbs. N acre$^{-1}$)

Spring Nitrogen (lbs. N acre$^{-1}$)

Adj. $R^2$

0.38
0.33
0.23
0.19

Preliminary Data - Not for Publication
Hybrid Rye Forage Crude Protein

Forage Crude Protein (% DM⁻¹)

Spring Nitrogen (lbs. N acre⁻¹)

Adj. R²
0.63
0.43
0.46
0.41

Fall Nitrogen (lbs. N acre⁻¹) 0 15 30 45
Forage Partial Returns

Spring N (lbs. N acre\(^{-1}\))

Forage Partial Return ($/acre\(^{-1}\))

- Fall 0
- Fall 15
- Fall 30
- Fall 45

Preliminary Data - Not for Publication
Forage Partial Returns

Forage Partial Returns (§ acre\(^{-1}\))

Spring N (lbs. N acre\(^{-1}\))

- Fall 0
- Fall 15
- Fall 30
- Fall 45
- $0.50 Fall 0
- $0.50 Fall 15
- $0.50 Fall 30
- $0.50 Fall 45

Preliminary Data - Not for Publication
Hybrid Rye Grain Yield

- **Spring Nitrogen (lbs. N acre\(^{-1}\))**
- **Fall Nitrogen (lbs. N acre\(^{-1}\))**

Grain Yield (bu. acre\(^{-1}\))

- 0
- 15
- 30
- 45

**Adj. R\(^2\)**

- 0.36
- 0.27
- 0.17
- 0.19
<table>
<thead>
<tr>
<th>Crop</th>
<th>Hybrid Rye¹</th>
<th>Triticale²</th>
<th>Hybrid Rye¹</th>
<th>Rye³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Forage</td>
<td>Grain</td>
<td>Forage</td>
<td>Grain</td>
</tr>
<tr>
<td>Nitrogen (Fall, Spring) (lbs. ac⁻¹)</td>
<td>(0, 0)</td>
<td>(0, 60)</td>
<td>(45, 150)</td>
<td>(0, 60)</td>
</tr>
<tr>
<td>Avg. Yield (tons/bu ac⁻¹)</td>
<td>1.78c</td>
<td>2.90b</td>
<td>4.22a</td>
<td>2.93b</td>
</tr>
</tbody>
</table>

¹Hybrid Rye Varieties: KWS Propower & KWS Serafino ²Triticale Variety: Trical Ace ³Rye Variety: Spooner

At the same nitrogen rate, hybrid rye produces similar forage yields to triticale and produces almost double the grain yield of non-hybrid rye or winter wheat.

**Is Hybrid Rye a Viable Crop in Wisconsin?**

Yes, hybrid rye is a promising and viable crop in Wisconsin!
Summary

• Forage yield is not as dependent on fall nitrogen application as grain yield.
  • Treatments receiving no fall nitrogen required more spring nitrogen to produce adequate grain yields.

• With current fertilizer prices it will be important to balance input with returns.

• Hybrid rye is an exciting opportunity for WI farmers.

• This trial will be replicated at the Arlington and Lancaster research stations in 2022.
Acknowledgments

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Questions?

coolbean.info

Scan QR Code for a link to the presentation.