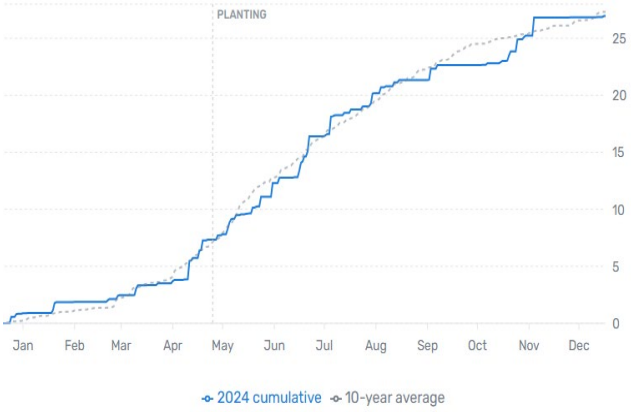
# Long Term Rye/ No Rye

**Study ID:** 0064099202402
**County:** Kearney
**Soil Type:** Coly-Kenesaw silt loam; Hersh sandy loam
**Planting Date:** 5/9/24
**Harvest Date:** 9/24/24
**Population:** 32,000
**Row Spacing (in):** 30”
**Hybrid:** Beck’s® 5864AM
**Reps:** 4
**Previous Crop:** Soybean
**Tillage:** Strip-till
**Herbicides:** ***Pre:*** 2 qts/ac Fulltime® + 44 oz/ac Roundup PowerMAX® ***Post:*** 2.5 qts/ac Acuron® + 24 oz/ac Roundup PowerMAX® + 5oz/ac Status®
**Seed Treatment:** Pivot Bio PROVEN® 40
**Foliar Insecticides:** 7.3 oz/ac bifenthrin
**Foliar Fungicides:** 7.1 oz/ac Veltyma® on 7/19/24 and 8/8/24

**Fertilizer:** 169 lb N/ac, 51 lb P/ac, 9 lb K/ac, 6 lb S/ac
**Irrigation:** Pivot
**Rainfall (in):**




**Introduction:** This study compared the effects of a cereal rye cover crop on the following cash crop yield. This is the eighth year of the study, with cereal rye and check strips maintained in the same location from year to year. Rye was drilled in 10" rows in the fall of 2023, at a rate of 56 lbs/ac. The rye was terminated with the pre-plant herbicide application of 40 oz/ac Roundup PowerMAX ® in the spring. Corn was planted in 30" rows on May 9, 2024. Corn stand counts were taken on June 6 and June 18. Soil samples were collected for all replications of the study to determine the impact of the cereal rye cover crop on soil organic matter after seven years.

**Results:**

| | Soil OM (0-8") (%) | Stand Counts (plants/acre) June 6 | Stand Counts (plants/acre) June 18 | Yield (bu/ac)† | Marginal Net Return‡ ($/ac) |
|---|---|---|---|---|---|
| No Rye (Check) | 2.1 A* | 31,750 A | 31,625 A | 235 A | 1032 A |
| Rye | 2.2 A | 32,000 A | 30,500 A | 236 A | 997 B |
| P-Value: | 0.87 | 0.77 | 0.57 | 0.2 | 0.09 |

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $4.30/bu corn, rye cost of $29/ac for seed and establishment.

**Summary:**

- There were no significant differences in soil OM, stand counts, or yield. In year eight, no significant yield difference was found between the addition of rye (235.78 bu/ac) and no rye (235.2 bu/ac).
- There was a significant difference in marginal net return, with the no rye strips ($1032/ac) returning more than the rye strips due to the additional costs of seed and establishment of the rye ($997/ac).
- Other cover crop benefits such as reduced erosion, nutrient cycling and weed control were not looked at by this study.

## Summary of Previous Years

### 2017

In year one (2017), cover crops were drilled on November 1, 2016. Rye was terminated with glyphosate on May 5, 2017. Soybeans were drilled in 10" rows on May 8, 2017.

**Results:**

| | Moisture (%) | Soybean Yield (bu/ac)† | Marginal Net Return‡ ($/ac) |
|---|---|---|---|
| Check | 12.0 B* | 80 A | 714.25 A |
| Cover Crop - Rye | 12.1 A | 81 A | 692.20 B |
| P-Value | 0.058 | 0.682 | 0.008 |

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $8.90/bu soybean and $24.30 cover crop cost.

### 2018

In year two (2018), cover crops were drilled on October 21, 2017, following soybean harvest. Cattle pastured the rye in March and early April. The rye was terminated with glyphosate on May 6, 2018, at a height of approximately 15". Corn was planted into the strips on April 28, 2018. The field was replanted on May 17, 2018, due to poor stand resulting from fertilizer salt injury.

**Results:**

| | Moisture (%) | Corn Yield (bu/ac)† | Marginal Net Return‡ ($/ac) |
|---|---|---|---|
| Check | 15.5 A* | 227 A | 733.70 A |
| Cover Crop - Rye | 15.6 A | 228 A | 713.43 B |
| P-Value | 0.219 | 0.454 | 0.014 |

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from cleaned yield monitor data. Bushels per acre corrected to 15.5% moisture.
‡Marginal net return based on $3.23/bu corn and $24.30 cover crop cost.

### 2019

In year three (2019), cover crops were drilled on November 1, 2018, following corn harvest. The rye was terminated with glyphosate on May 5, 2019, at a height of approximately 12". Soybeans were planted into the strips on May 13, 2019.

**Results:**

| | Moisture (%) | Soybean Yield (bu/ac)† | Marginal Net Return‡ ($/ac) |
|---|---|---|---|
| Check | 11.9 A | 86 B | 694.94 A |
| Cover Crop - Rye | 11.9 A | 87 A | 674.64 B |
| P-Value | 1 | 0.017 | 0.002 |

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.

## Summary of Previous Years, Continued

### 2020

In year four (2020), yields were not reported.

### 2021

In year five (2021), cover crops were drilled on September 2, 2020, following corn harvest. Sheep grazed on the rye from January 1 to April 1, 2021. The rye was terminated with herbicide on April 26. The rye was approximately 30" tall at the time of termination. Soybeans were planted into the strips on May 2, 2021.

**Results:**

| | Rye Biomass (lb/ac) | June 27 Stand Count (plants/ac) | Sept. 28 Stand Count (plants/ac) | Grain Moisture (%) | Soybean Yield (bu/ac)† | Marginal Net Return‡ ($/ac) |
|---|---|---|---|---|---|---|
| Check | - | 144,123 A | 139,333 A | 11.2 B* | 92 A | 1,085 A |
| Cover Crop – Rye | 2,248 | 145,865 A | 141,075 A | 11.4 A | 92 A | 1,053 B |
| P-Value | - | 0.719 | 0.572 | 0.015 | 0.813 | 0.015 |

*Values with the same letter are not significantly different at a 90% confidence level.
†Yield values are from cleaned yield monitor data. Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $11.80/bu soybean and $30/ac for cover crop seed and drilling cost.

### 2022

In year six (2022), yields were not reported.

### 2023

In year seven (2023), cover crops were drilled on September, 5, 2022 ,following corn harvest. The rye was chemically terminated on May 4, 2023. The rye was approximately 18-24" tall at termination timing. Corn was planted on May 15, 2023 in 30" rows.

**Results:**

| | Soil OM (0-8") (%) | Early Stand Count (plants/ac) | Harvest Stand Count (plants/ac) | Moisture (%) | Soybean Yield (bu/ac)† | Marginal Net Return‡ ($/ac) |
|---|---|---|---|---|---|---|
| No Rye | 1.5 A* | 134,979 A | 117,998 A | 8.4 A | 78 A | 1,070 A |
| Cover Crop - Rye | 1.4 A | 123,223 A | 120,610 A | 8.4 A | 74 B | 1,004 B |
| P-Value | 0.690 | 0.191 | 0.816 | 0.638 | 0.027 | 0.015 |

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13% moisture.
‡Marginal net return based on $13.76/bu soybean and $13/ac for the cover crop treatment.