

Comparison of a Radish and Cereal Rye Cover crop to No Cover crop on Corn Yield

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Objectives

To compare corn yield response to a cover crop consisting of radishes and cereal rye to no cover crop.

Background

Crop Year:	2012	Tillage:	Conventional
Cooperator:	Jim Leopold	Soil Test	pH 6.4, P 55 ppm, K 140 ppm
County/Town:	Putnam, Glandorf		OM 2.6%
Soil Type:	Toledo	Planting Date:	April 24, 2012
Drainage:	No tile	Row Width:	30 inch
Previous Crop:	Soybeans	Herbicide:	Cinch 2 qts/acre
Corn Hybrid:	Pioneer 33W84	Harvest Date:	October 15, 2012

Methods

A randomized block design with two treatments and four replications was used. Plots were 8 rows (20 feet) wide and 650 feet long. Liquid swine manure from a nursery building was surface applied in late August of 2011 at a rate of 6,000 gallons per acre. The manure was worked in using tillage within two days. The swine manure application resulted in 97 pounds per acre of available nitrogen being applied. Available nitrogen is the ammonia portion of the nitrogen in the swine manure and approximately one-half of the organic portion.

A cover crop was then planted with a White corn planter with a row splitter attachment. Radishes were planted at a rate of two pounds per acre. Cereal rye was planted at a rate of one-half bushel per acre. The cover crops were in alternating rows resulting in cover crops every 15 inches. Adequate soil moisture for the remainder of the 2011 growing season resulted in excellent radish and cereal rye stands. Radishes reached a length of approximately 12 inches and 1.25 inches in diameter. On average, approximately 80% of the radish mass was below ground.

Four replications were not planted to cover crops and left bare. There were some winter annual weeds that grew in the bare soil reps, especially chickweed.

Most of the radish cover crop was winter killed. The few surviving radishes and the cereal rye were killed with a spring burn down herbicide applied across all treatments.

Corn was planted on April 24th. The corn planted was aligned with the cover crop radish rows so the corn was planted almost directly on top the dead radishes.

All treatments were sidedressed with 28% UAN at an application rate of 150 units of nitrogen per acre.

Table 1. Swine Nursery Manure Analysis

Nutrient	lbs. per 1,000 Gallons
Nitrogen (available the 1 st year)	16.1
Phosphorus as P ₂ O ₅	4.2
Potassium as K ₂ O	12.1

Weather conditions during the time of manure application were sunny with an ambient air temperature of 77 degrees. The plot received well below average rainfall for the growing season.

Table 2. Treatment Summary

Treatment	Description
Treatment 1 (T1)	Cover crop of radishes and cereal rye
Treatment 2 (T2)	No cover crop

Results and Discussion

Table 3. Yield Summary

Treatments	Yield (bu/ac)
Cover crop (T1)	160.4
Bare ground (T2)	159.2

LSD (0.05) = NS

The results of this plot indicated no statistically significant difference between the treatments (LSD (0.05) = 12.48, C.V=3.47). The early portion of the growing season was very dry. The dry weather limited corn yields and could have masked the potential benefit of the cover crops. No soil testing was conducted to determine if the cover crops captured and held nitrogen applied the previous year for the current corn crop.

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