Agronomic Impacts of Interseeding Cover Crops into Wide Row Corn

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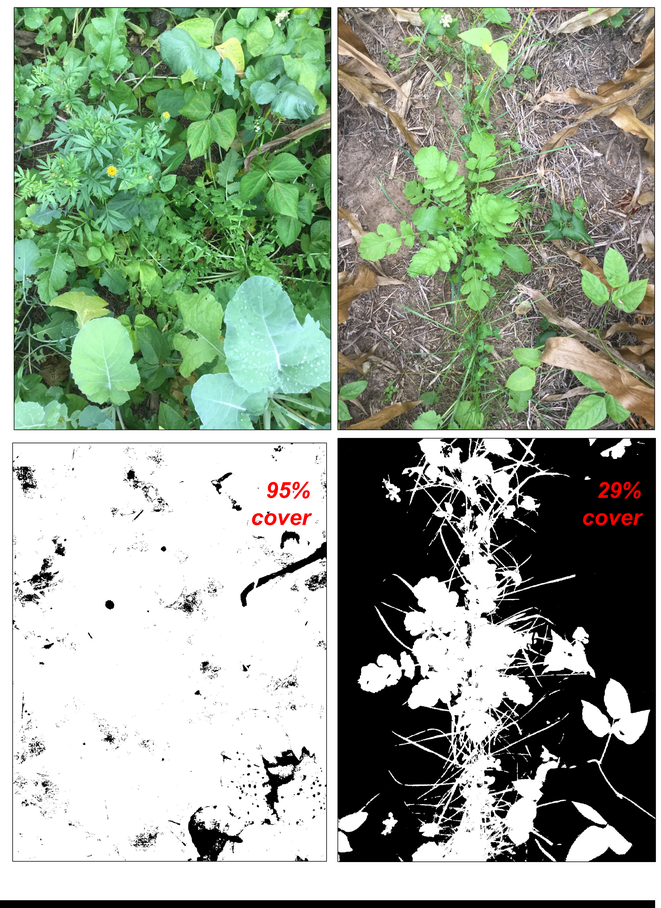
Abstract

Interseeding cover crops into standing corn can provide additional opportunities for growers to establish cover crops and increase the diversity of cover crop species utilized, especially in wide-rows (60”) where additional area between rows can allow for more rapid and extensive cover crop establishment. In this study, we examine several agronomic characteristics of 30” and 60” row corn interseeded with a cover crop mixture. Initial data analysis suggests that 60” corn reduces grain crop yield but will result in significantly higher amounts of cover crop coverage.

Cover crops established in mature 60” row (left) and 30” row (right) corn.

Ground cover in 60” row (left) and 30” row (right) corn 15 weeks after interseeding. Actual images (top) and Canapeo processed images for ground cover estimation (bottom).



Project Background

Cover crop use has been expanding on Wisconsin dairy farms due to a combination of government programs and increased interest in improving soil quality (WDATCP, 2020). Due to environmental, labor and equipment restraints, cover crop seeding typically occurs after corn harvest, limiting cover crop options due to the shortened growing season in Wisconsin. Cover crop interseeding could allow dairy producers to expand their cover crop options. Interseeding cover crops also has the potential to increase cover crop biomass and nitrogen fixation compared to traditional methods due to the extended growing season allowed with a V4-V6 interseeding. This increase in biomass and soil biological activity could allow for more efficient nutrient cycling and less nutrient loss to surrounding areas due to runoff and leaching. Recent farmer-led projects in Iowa suggest that wide row corn silage (60”) can be successfully used for establishing cover crops in a corn silage rotation and have minimal effects on corn yield (Recker, 2018).

The objectives of this study are to evaluate the following in traditional row-width (30”) and wide row-width (60”) corn interseeded with cover crop mixtures:

1. Agronomic characteristics (including yield) of the corn crop
2. Cover crop ground cover and biomass accumulation
3. Soil properties including moisture, temperature and plant available nitrogen

Cover Crop Coverage

Interseeded cover crops in 60” rows resulted in about 20% higher ground cover ($p=0.17$) two weeks after interseeding and about 60% more ground cover ($p<0.001$) 15 weeks after interseeding when compared to cover crop ground coverage in 30” row crops.

Yield Components

Initial analyses suggest that yield components (ear rows, kernels per row and test weight) are not significantly different between 30” and 60” interseeded corn. Although yield is almost 30% higher in 30” rows ($p<0.05$), this may be partially explained by the significantly higher ear counts per acre.

	Row width (")	
Yield Component	30	60
Ears Per Acre*	30,000	25,000
Ear Rows	14.4	13.9
Kernels Per Row	33.5	31.4
Moisture (%)	16.5	16.3
Test Weight (lb/bu)	57.4	57.5
Wet Bushels (bu/acre)*	214.7	154.4
Dry Bushels (bu/acre)*	212.1	152.8

*Significantly different means at $p<0.10$

Materials and Methods

Field site. Corn (Pioneer ‘P0306AM’) was planted on May 1, 2021, in Dunn County, WI with a target population of 31,000 seeds per acre for both 30” or 60” rows with banded starter fertilizer. Herbicide application included post-emergence atrazine and glyphosate. Sidedress fertilizer was applied prior to interseeding. Cover crops were interseeded on June 23 (V6) using a modified grain drill with row units removed every 30” to minimize corn crop disturbance. The cover crop was a custom mix including a mixture of 13 broadleaves (including legumes) and grasses.

Data collection. Ground cover measurements were taken using Canapeo (canopeoapp.com) two weeks (V12) and 15 weeks (R6) after interseeding. Yield components, cover crop measurements and other agronomic data were collected on $1X10^{-3}$ acre plots in 3 random areas throughout the 30” or 60” rows.

Next Steps

We are still in the data collection and processing phase for this project. Next steps for our work are to:

- Analyze additional field data including biomass accumulation, soil temperature and moisture
- Conduct nitrogen analysis on cover crop biomass samples
- Correlate nitrogen analysis with NDVI, biomass and soil test data to estimate plant available nitrogen

Acknowledgements

Eric Bechel for collaboration as a producer-partner, Jack Wolter for data collection, Dairy Innovation Hub for financial support

References

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