



# Impacts of Stubble Height and Cover Crop on Dryland Corn Yield

## Trial Objective

- Increasing stubble height can enhance snow capture and increase soil moisture.
- The benefits of cover crops include reduced erosion and increased organic matter, soil tilth, and infiltration.
- Understanding how stubble height and cover crops interact can help when deciding which system to use in your cropping systems.
- The objective of this study was to evaluate the potential interaction of wheat stubble height and cover crop mixes when used prior to a dryland corn crop.

## Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Gothenburg, NE	Hord silt loam	Wheat & cover crop	No tillage	05/17/18	11/12/18	180	24K

- A single 110 RM corn product was planted at four replications in a randomized complete block design.
- The treatments consisted of all combinations of the following two factors:
  - Stubble height
    - » Low: 8 inches
    - » Medium: 18 inches
    - » High: 28 inches
  - Cover crop
    - » No cover crop
    - » Winter sensitive mix: spring lentil, black oats, spring barley, and diakon radish
    - » Winter hardy mix: hairy vetch, winter triticale, winter barley, and diakon radish
- Wheat was harvested on July 17, 2017 and stubble was cut to a height of 28 inches with a stripper header for the whole experiment.
- On August 31, 2017, a straight header was used to cut the plots to the three different stubble heights.
- On September 7, 2017, the two cover crop mixes were planted.
- The winter sensitive and no cover crop plots were sprayed on March 28, 2018 with Roundup PowerMAX® herbicide to control volunteer wheat.
- The winter hardy cover crop was terminated with Roundup PowerMAX® herbicide on May 3, 2018, two weeks prior to planting.



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Figure 1. Stubble height and cover crop treatments with low stubble height in the foreground and taller stubble heights in the background on September 25, 2017.

## Understanding the Results

- No significant interaction was observed between stubble height and cover crop treatments.
- The winter hardy cover crop type resulted in corn yielding significantly lower than the winter sensitive or no cover crop plots.
- No impact on yield was observed for the different stubble heights. The low stubble height treatment was 8 inches, which is below the height considered to maximize stored soil moisture. However, precipitation was 4.3 inches above normal from May to July, 2018 at Gothenburg, which likely minimized yield differences among the treatments.

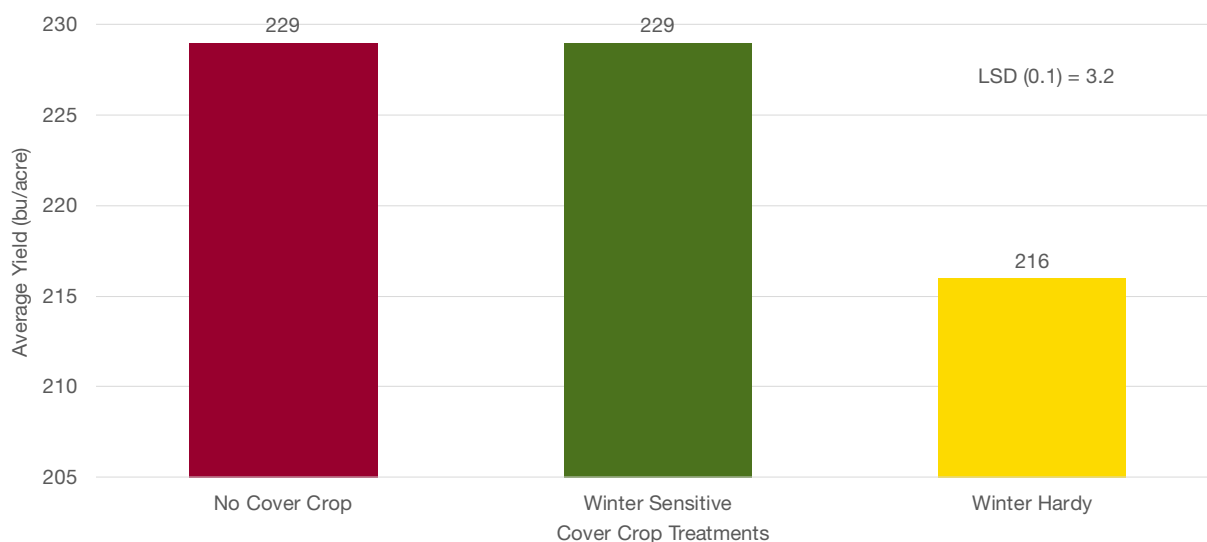


Figure 2. Average corn yield by cover crop mix.

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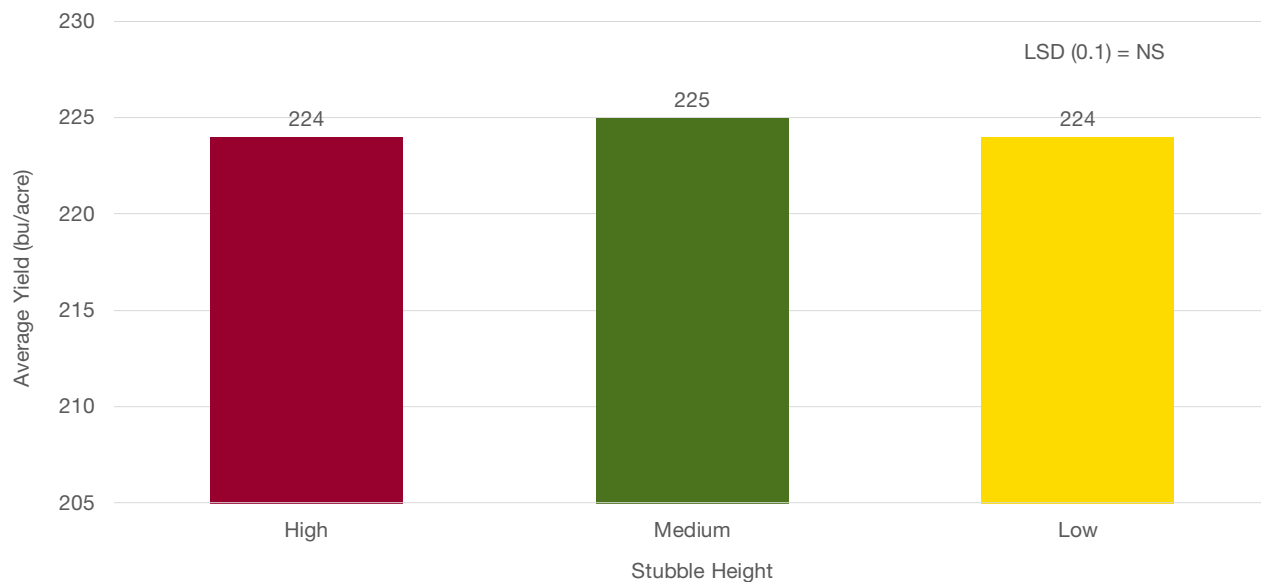


Figure 3. Average corn yield by stubble height.



Figure 4. (Left image) low stubble height with no cover crop at the end of the growing season. (Right image) low stubble height with the winter hardy mix at the end of the growing season.

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## What Does This Mean for Your Farm?

- There were no beneficial or negative interactions between wheat stubble height and cover crops in this study.
- The value of a cover crop may be limited in semi-arid production areas on dryland fields. Using a cover crop for a specific purpose, such as to decrease wind erosion over the winter on low residue fields, is very important. However, using a cover crop on all dryland fields in areas where precipitation is limited may adversely affect subsequent corn yields.
- Managing wheat stubble is an important water conservation tool on dryland fields. Research from Kansas State University indicated that a minimum wheat stubble height of around 14 inches is needed to maximize corn yield potential in a dryland production system.<sup>1</sup>

## Source

<sup>1</sup> Schlegel, A. 2013. Effects of wheat stubble height on subsequent corn and grain sorghum crops. Cropping and Tillage Systems. Kansas State University. Southwest Research-Extension Report of Progress 1088. P. 43.

## Legal Statements

The information discussed in this report is from a single site, replicated demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

**Performance may vary**, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

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