



High Input Soybean Production

Trial Objective

- With crop budgets tight, farmers must continually evaluate what inputs provide the most value to their operation.
- The objective of this study was to evaluate how soybean yield potential is influenced by twelve different management treatments.

Experiment/Trial Design

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Gothenburg, NE	Hord silt loam	Corn	Strip-till	5/1/21 6/3/21	10/7/21	90	160,000 220,000

- A 2.9 MG XtendFlex® Soybean product was sprinkler irrigated to meet the water needs of the crop and planted on 30-inch rows.
- The study was setup as a randomized complete block with four replications with twelve management treatments (Table 1).
- Weeds were controlled uniformly across the study.
- A base fertilizer application of 60 lb/acre Phosphorous (P), 25 lb/acre Sulfur (S), and 0.25 lb/acre Zinc (Zn) was strip-tilled across all treatments on April 23, 2021.
- Soybean lodging was rated prior to harvest on a scale of 1 to 9 with 1 = no lodging and 9 = severe lodging.
- Plots were combine-harvested.
- Grain moisture content, test weight, and total weight were determined.
- Statistical analysis for Fisher's LSD was performed.

Table 1. Management Treatments

Treatment	Seeds/acre	Planting Date	Delaro® Complete Fungicide (8 fl oz/acre applied at R3 growth stage)	Leverage® 360 Insecticide (2.8 fl oz/acre applied at R3 growth stage)	Micronutrients at 64 fl oz/acre and Plant Growth Hormone at 2 fl oz/acre applied at R3 growth stage
Low Management (LM)	220,000	6/3/21	NO	NO	NO
LM + Low Density	160,000	6/3/21	NO	NO	NO
LM + Early Planting Date	220,000	5/6/21	NO	NO	NO
LM + Fungicide	220,000	6/3/21	YES	NO	NO
LM + Insecticide	220,000	6/3/21	NO	YES	NO
LM + Micronutrients	220,000	6/3/21	NO	NO	YES
High Management (HM)	160,000	5/6/21	YES	YES	YES
HM + High Density	220,000	5/6/21	YES	YES	YES
HM + Late Planting Date	160,000	6/3/21	YES	YES	YES
HM - Fungicide	160,000	5/6/21	NO	YES	YES
HM - Insecticide	160,000	5/6/21	YES	NO	YES
HM - Micronutrients	160,000	5/6/21	YES	YES	NO

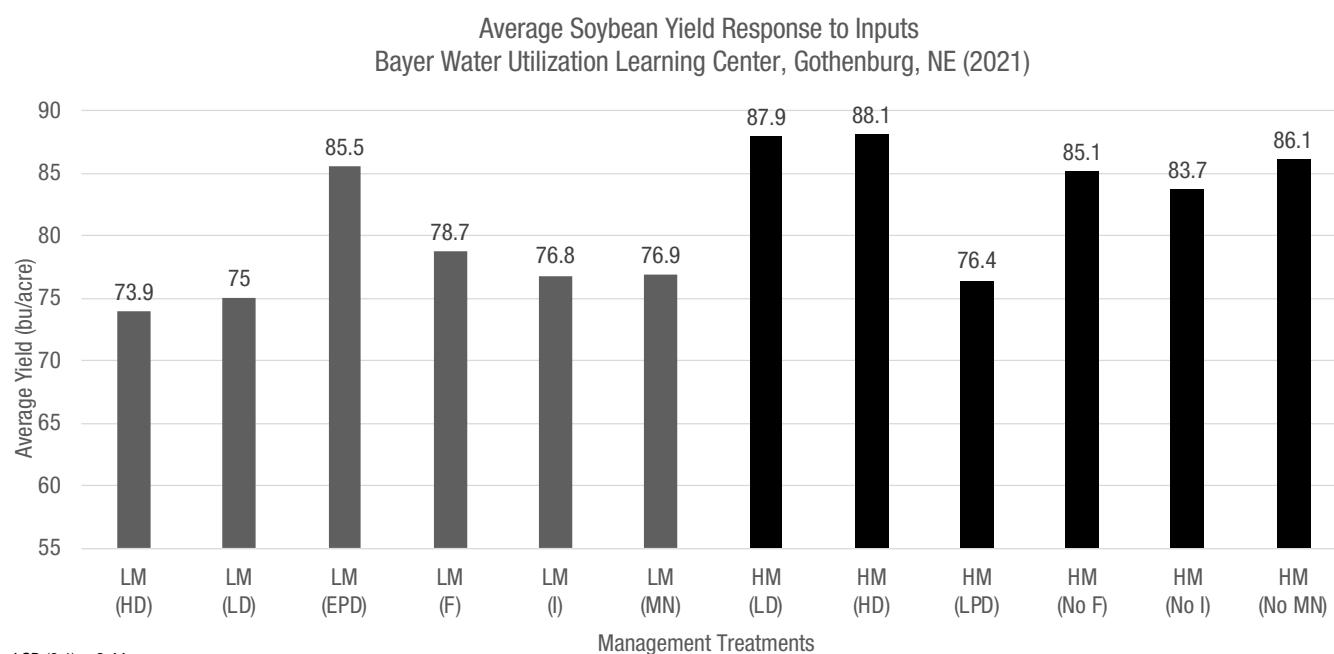


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Understanding the Results

Yield – Figure 1

- The average increase in yield for all HM treatments compared to all LM treatments was 6.8 bu/acre.
- The highest soybean yields were consistently observed with the May 1 planting date compared to the June 3 date. When the date was moved to the earlier planting in the LM treatments, a 11.6 bu/acre increase was recorded. For the HM treatments, a reduction of 11.5 bu/acre was recorded when changing from the May 1 planting date to June 3. In previous years, research at the Gothenburg Learning Center showed an end of April planting date through the first week of May for soybean has consistently produced higher yields than other planting dates.
- An application of Delaro® Complete Fungicide at the R3 growth stage increased yield over the LM treatment by 4.8 bu/acre and a reduction of 2.8 bu/acre was recorded when Delaro® Complete Fungicide was removed from the HM treatment.
- An application of Leverage® 360 Insecticide at the R3 growth stage increased yield over the LM treatment by 2.9 bu/acre and a reduction of 4.2 bu/acre was recorded when 360 Insecticide was removed from the HM treatment.
- A micronutrient application provided an increase in yield with LM treatments but did not significantly increase yield with the HM treatments.
- Increasing the density from 160,000 to 220,000 seeds/acre did not increase yield.



LM = Low Management (No Inputs at 220,000 seeds/acre); HM = High Management (All Inputs at 160,000 seeds/acre)
Density (seeds/acre): Low (LD) = 160,000; High (HD) = 220,000; Planting Date: Early (EPD) = 5/6/21; Late (LPD) = 6/3/21
Fungicide (F) = Delaro® Complete Fungicide (8 fl oz/acre at R3); Insecticide (I) = Leverage® 360 Insecticide (2.8 fl oz/acre at R3);
(MN) = Micronutrients at 64 fl oz/acre and Plant Growth Hormone at 2 fl oz/acre at R3)

Figure 1. Average soybean yields as impacted by management treatments at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).



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Test Weight – Figure 2

- The average increase in test weight for all HM treatments compared to all LM treatments was 0.8 lb/bu.
- The May 1 planting date had a positive impact on test weight compared with the June 6 planting date by increasing test weight by 1.5 lb/bu over the LM treatment and decreasing test weight by 1.1 lb/bu compared to the HM treatment.

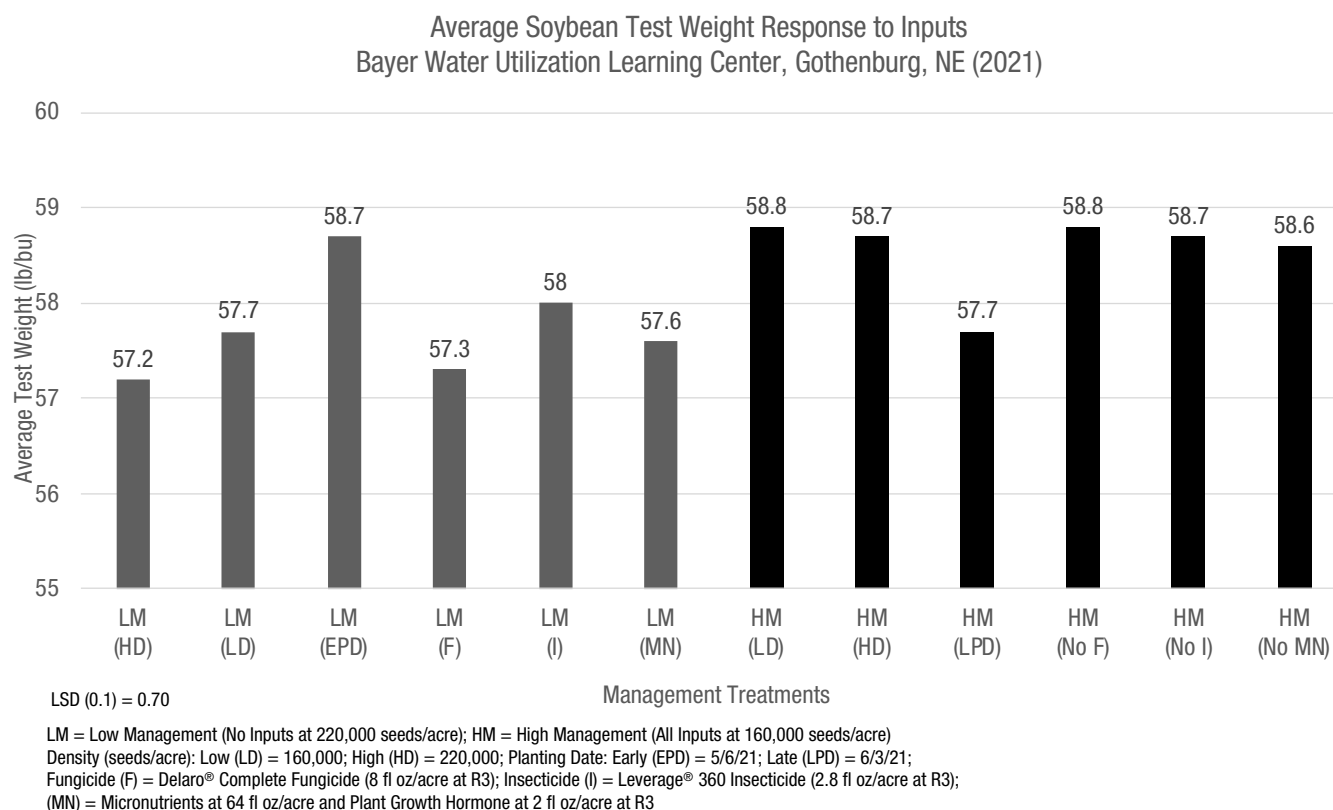


Figure 2. Average soybean test weight as impacted by management treatments at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

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Lodging – Figure 3

- The average reduction in lodging for all HM treatments compared to all LM treatments was 1.3.
- Even though the May 1 planting was in the field a month longer than the June 6 planting, there was a 1.2-point reduction in lodging for the LM treatment.

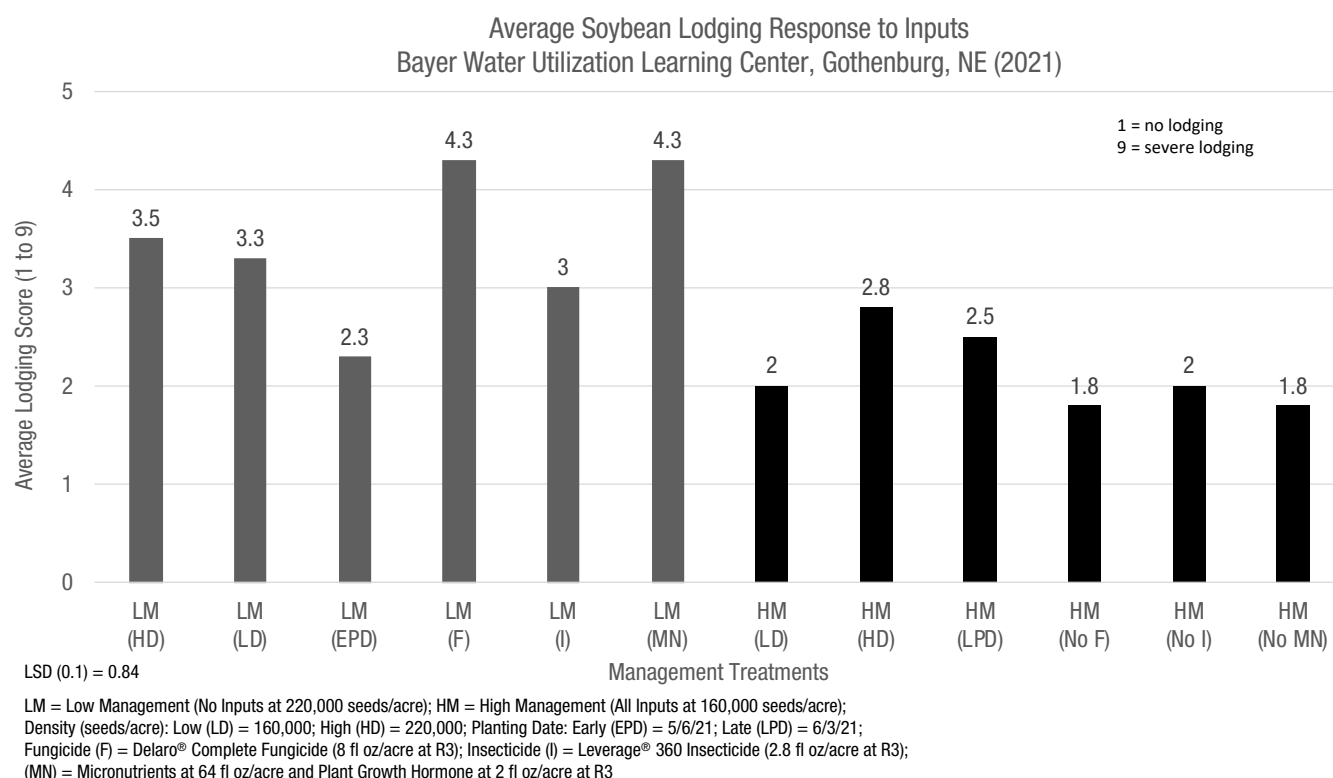


Figure 3. Average soybean lodging as impacted by management treatments at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

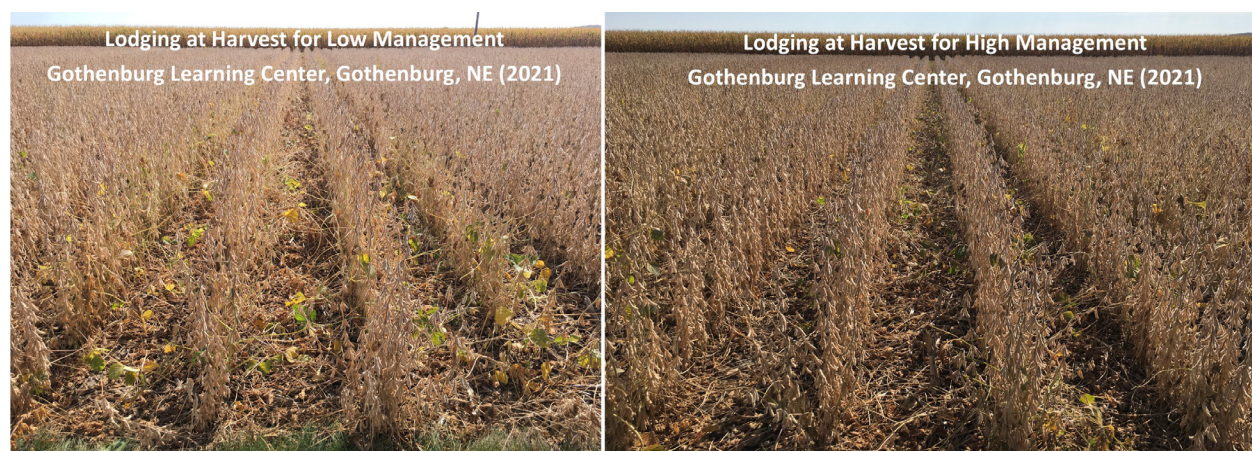


Figure 4. Lodging comparison for low management (left) and high management (right) at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

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Figure 5. Aerial view of lodging differences between planting dates. Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

Key Learnings

- The earlier planting date of May 1 had increased yield potential and test weight across all treatments compared to the June 6 planting. There was also a trend that the later planting had increased potential for lodging.
- Delaro® Complete Fungicide and Leverage® 360 Insecticide increased yield potential in both LM and HM treatments.
- A 14 bu/acre yield increase was recorded for the HM treatment compared to the LM treatment.
- Farmers should carefully weigh the value of soybean inputs as high yields can be realized with additional inputs.



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Legal Statements

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