

# MANAGEMENT STRATEGIES FOR IMPROVING SUCCESS IN DRYLAND CORN SYSTEMS

## TRIAL OVERVIEW

- The success of dryland corn production depends upon the environment and management strategies employed by the farmer. The availability of soil moisture on rainfed acres is always a big driver of yield.
- Dryland farmers have no control over how much moisture the environment provides through rainfall; however, they can significantly influence how much moisture is retained by the soil, is available to the crop, and how that limited water can directly impact yield.

| Treatment                               | Planting date  | Tillage              | Corn products         | Weed control                           | Seeding rate (seeds/acre) |
|---|----------------|----------------------|-----------------------|--|---------------------------|
| Poor management                         | 6/09/17        | Conventional tillage | 111RM RRC2            | Basic weed control program*            | 21,000                    |
| Early planting                          | <b>5/13/17</b> | Conventional tillage | 111RM RRC2            | Basic weed control program             | 21,000                    |
| Improved weed control                   | 5/13/17        | Conventional tillage | 111RM RRC2            | <b>Enhanced weed control program**</b> | 21,000                    |
| No tillage                              | 5/13/17        | <b>No tillage</b>    | 111RM RRC2            | Enhanced weed control program          | 21,000                    |
| Insect protection traits                | 5/13/17        | No tillage           | <b>111RM VT2PRIB</b>  | Enhanced weed control program          | 21,000                    |
| DroughtGard® Hybrids corn blend product | 5/13/17        | No tillage           | <b>114RM DGV2PRIB</b> | Enhanced weed control program          | 21,000                    |
| Increased population                    | 5/13/17        | No tillage           | 114RM DGV2PRIB        | Enhanced weed control program          | <b>24,000</b>             |

Highlighted text indicates difference from previous treatment.  
 \*Basic weed control program: PRE - 1 lb/acre atrazine; POST - 0.5 lb/acre atrazine + 0.25 lb/acre 2,4-D ester + 32 oz/acre Roundup PowerMAX® herbicide.  
 \*\*Enhanced weed control program: PRE - 32 oz/acre Roundup PowerMAX herbicide + 0.5 lb/acre 2,4-D ester + 0.02 lb/acre saflufenacil; POST- 1 lb/acre atrazine + 2.5 pt/acre Harness® Xtra herbicide + 0.09 lb/acre mesotrione + 32 oz/acre Roundup PowerMAX herbicide.  
 RRC2 = Roundup Ready® Corn 2, VT2PRIB = VT Double PRO® RIB Complete® corn blend, DGV2PRIB = DroughtGard® Hybrids with VT Double PRO® RIB Complete® corn blend

Table 1. Dryland corn treatments

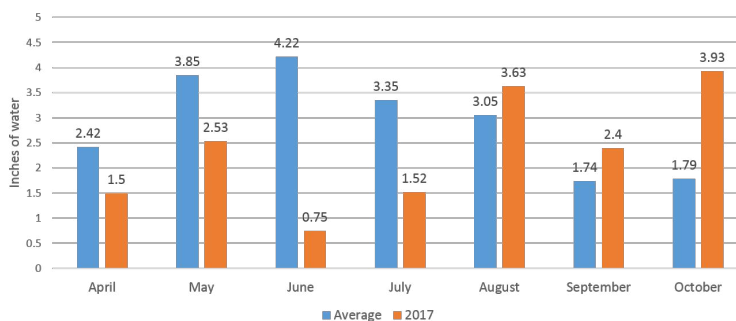


Figure 1. Precipitation in 2017 and average precipitation at the Gothenburg Learning Center, Gothenburg, NE

## RESEARCH OBJECTIVE

- A multi-factor study was initiated to evaluate the additive effects of various management components to manage water and help farmers produce high-yielding corn in a dryland system.

| Location       | Soil           | Previous Crop | Tillage Type                     | Planting Date | Harvest Date | Potential Yield/Acre | Planting Rate/Acre |
|----------------|----------------|---------------|----------------------------------|---------------|--------------|----------------------|--------------------|
| Gothenburg, NE | Hord silt loam | Winter wheat  | Conventional tillage, no tillage |               | 11/16/2017   | 175 bu/acre          | 21,000 and 24,000  |

SITE NOTES:

- This study consisted of various dryland management practices that can help improve yields and soil water retention. Subsequent treatments included the previous treatment plus an additional treatment creating a building block approach (Table 1).
- The study was a randomized complete block design with four replications.
- No insecticides or fungicides were applied.
- The number of barren plants, dropped ears, and lodged stalks per plot were assessed prior to harvest.

**UNDERSTANDING THE RESULTS**

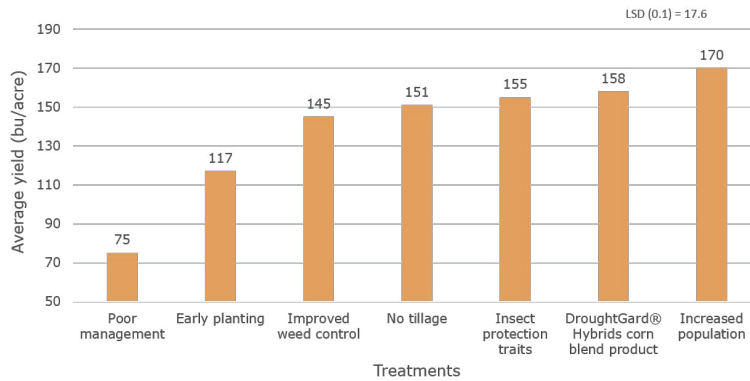


Figure 2. Average corn yield from the different treatments corrected to 15% moisture

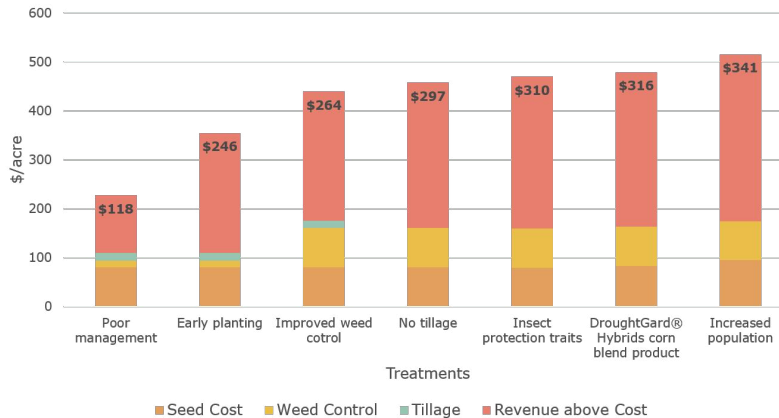


Figure 3. Input costs and net profits in \$/acre for each treatment. Data labels reflect grain revenue at \$3.03/bu minus the costs for seed, weed control, and tillage.



Figure 4. Corn ears from the Poor Management (top) and Increased Population (bottom) treatments



Figure 5. Excellent end-of-season weed control in the Increased Population treatment



- A significant increase in yield was observed from the earlier planting date, improved weed control, and increased population treatments (Figure 2).
  - **Early planting:** higher yields are typically observed from mid-May plantings compared to early to mid-June plantings. This was especially true in this case as dry conditions stressed plants early in the season due to below normal precipitation in June and July.
  - **Weed control:** an enhanced, layered weed control approach with a pre-emergence application with multiple modes of action followed by a post-emergence application with multiple modes of action provided the best opportunity to control weeds that compete with corn for soil moisture.
  - **Increased population:** the DroughtGard® Hybrids corn blend product performed well at the higher seeding rate in this challenging dryland environment.
- No differences were observed between treatments for the number of barren plants, dropped ears, or lodged stalks per plot.
- Better management not only led to higher yields, but also to higher profits in the study (Figure 3).
  - An earlier planting date increased revenue by more than \$100/acre.
  - The remainder of the treatments produced smaller, yet still beneficial yield benefits.
- Weed control costs had the sharpest increase by going to a program with multiple modes of action, but revenue gains more than offset costs because of improved yields.

## WHAT DOES THIS MEAN FOR YOUR FARM?

- Potential success for dryland corn systems involves managing all components of the system to maximize their benefit.
- Often, decisions in dryland fields can be more impactful than in irrigated fields because water cannot be applied to make up for moisture losses from tillage and poor weed control.
- Corn product selection and placement along with planting date and an enhanced weed control program are critical for success.

### LEGAL STATEMENT

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

For additional agronomic information, please contact your local seed representative. Developed in partnership with Technology Development & Agronomy by Monsanto.

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**IMPORTANT IRM INFORMATION: RIB Complete®** corn blend products do not require the planting of a structured refuge **except** in the Cotton-Growing Area where corn earworm is a significant pest. SmartStax® RIB Complete® corn blend is not allowed to be sold for planting in the Cotton-Growing Area.

**See the IRM/Grower Guide for additional information. Always read and follow IRM requirements.**

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