



Factors to Help Increase Rainfed Corn Success

Trial Objective

- The success of dryland corn production depends upon growing conditions and the management strategies employed by the farmer. To help maximize yield potential, the availability of soil moisture on rainfed acres is always an important factor.
- Dryland farmers have no control over how much moisture the environment provides through rainfall. However, through management practices they can greatly influence how much moisture is retained by the soil, is available to the crop, and how the limited water can directly impact yield potential.

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	Soybean	No-till and Conventional-till	5/11/2021	10/25/2021	160	15,000; 20,000; 25,000

Table 1. Treatment Systems (greyed blocks are system treatment changes from previous treatment)

Treatment	Tillage	Seeds/acre	Corn Product	Crop Protection and Rate	Application Timing
Base	Conventional tillage	15,000	113 RM Roundup Ready® Corn 2	Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	Preemergence
				Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	At V7 corn
Residual	Conventional tillage	15,000	113 RM Roundup Ready® Corn 2	Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	Preemergence
				DiFlexx® Herbicide (8 fl oz/acre)	Preemergence
				Degree® Xtra Herbicide (RUP)* (3 qt/acre)	Preemergence
				Balance® Flexx Herbicide (RUP)* (4 fl oz/acre)	Preemergence
				DiFlexx® Herbicide (8 fl oz/acre)	At V7 corn
				Warrant® Herbicide (1.5 qt/acre)	At V7 corn
				Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	At V7 corn
Seeding Rate	Conventional tillage	20,000	113 RM Roundup Ready® Corn 2	Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	Preemergence
				DiFlexx® Herbicide (8 fl oz/acre)	Preemergence
				Degree® Xtra Herbicide (RUP)* (3 qt/acre)	Preemergence
				Balance® Flexx Herbicide (RUP)* (4 fl oz/acre)	Preemergence
				DiFlexx® Herbicide (8 fl oz/acre)	At V7 corn
				Warrant® Herbicide (1.5 qt/acre)	At V7 corn
				Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	At V7 corn



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Treatment	Tillage	Seeds/acre	Corn Product	Crop Protection and Rate	Application Timing
No-till	No tillage	20,000	113 RM Roundup Ready® Corn 2	Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	Preemerge
				Degree® Xtra Herbicide (RUP)* (3 qt/acre)	Preemerge
				Balance® Flexx Herbicide (RUP)* (4 fl oz/acre)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	At V7 corn
				Warrant® Herbicide (1.5 qt/acre)	At V7 corn
				Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	At V7 corn
Tough Acre	No tillage	20,000	115 RM DroughtGard® Hybrids, VT Double PRO® RIB Complete Corn Blend	Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	Preemerge
				Degree® Xtra Herbicide (RUP)* (3 qt/acre)	Preemerge
				Balance® Flexx Herbicide (RUP)* (4 fl oz/acre)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	At V7 corn
				Warrant® Herbicide (1.5 qt/acre)	At V7 corn
				Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	At V7 corn
Enhanced Rate	No tillage	25,000	115 RM DroughtGard® Hybrids, VT Double PRO® RIB Complete Corn Blend	Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	Preemerge
				Degree® Xtra Herbicide (RUP)* (3 qt/acre)	Preemerge
				Balance® Flexx Herbicide (RUP)* (4 fl oz/acre)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	At V7 corn
				Warrant® Herbicide (1.5 qt/acre)	At V7 corn
				Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	At V7 corn
Out of Place**	No tillage	25,000	115 RM SmartStax® RIB Complete Corn Blend	Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	Preemerge
				Degree® Xtra Herbicide (RUP)* (3 qt/acre)	Preemerge
				Balance® Flexx Herbicide (RUP)* (4 fl oz/acre)	Preemerge
				DiFlexx® Herbicide (8 fl oz/acre)	At V7 corn
				Warrant® Herbicide (1.5 qt/acre)	At V7 corn
				Roundup PowerMax® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal)	At V7 corn

*Restricted Use Pesticide. **Out of Place system treatment has a high yielding corn product for an irrigated environment; however, it is not the best choice for a rainfed environment.



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- The trial was a randomized complete block design with four replications of the seven treatments.
- The planter was a fully mounted 4-row, 30-inch planter units utilizing Precision Planting® DeltaForce® for downforce control and Precision Planting® vDrive® for seeding rate control.
- A base fertilizer application of 25 lb/acre Nitrogen (N), 50 lb/acre Phosphorous (P), 21 lb/acre Sulfur (S), and 0.2 lb/acre Zinc (Zn) was broadcast with stream bars across all treatments on April 13, 2021.
- A sidedress application of 60 lb/acre N was made on 6/21/2021.
- No insecticides were applied.
- Plots were combine-harvested.
- Grain moisture content, test weight, and total weight were determined.
- Statistical analysis for Fisher's LSD was performed.

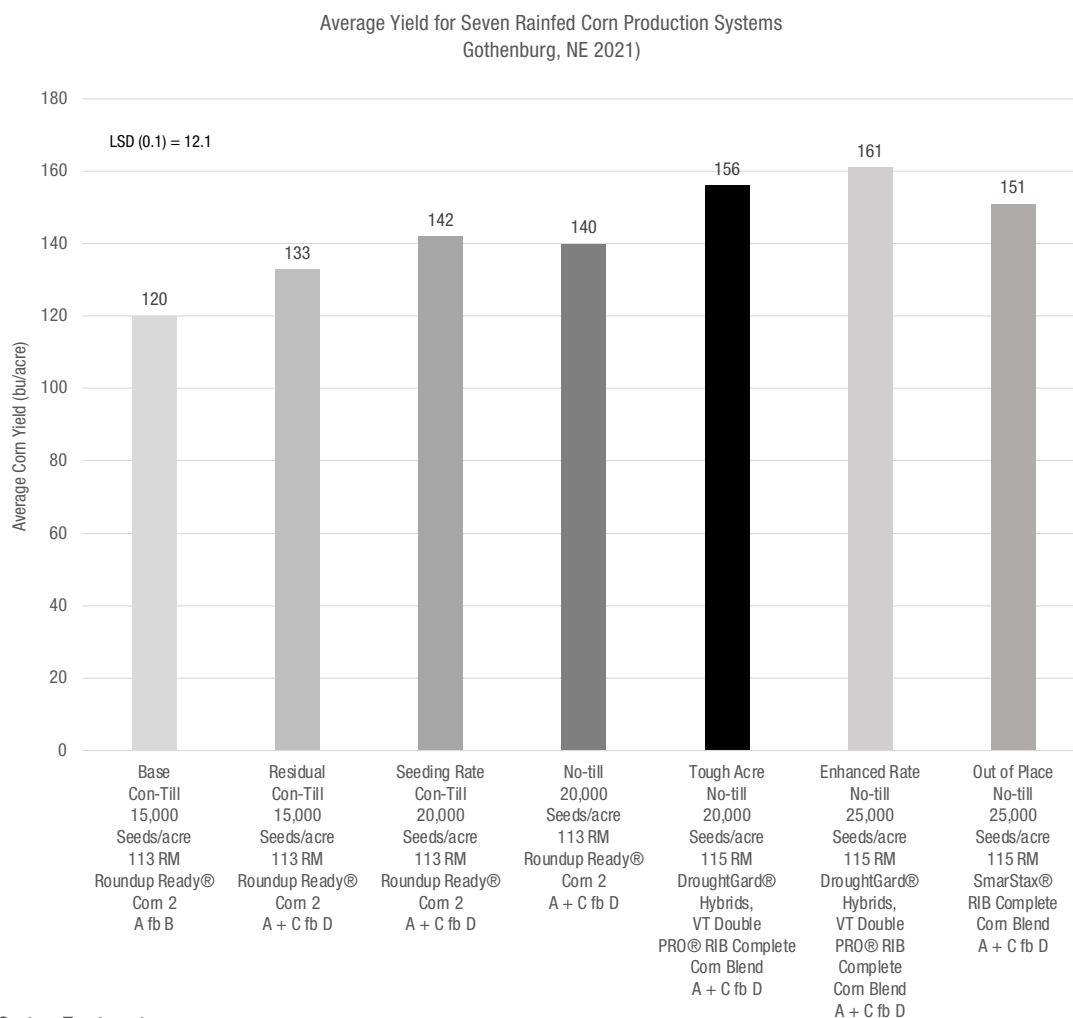
Understanding the Results

Yield

- Yield was impacted by the treatment treatments; the lowest yield occurred with the Base Treatment (Figure 1). The Base Treatment was conventional tillage with no residual herbicides which resulted in considerable weed pressure (Figure 2).
- The Residual Treatment, which used residual herbicides at planting and at V7 growth stage increased yield significantly (Figure 1) and decreased weed pressure (Figure 3) over the Base Treatment.
- Yields for the Seeding Rate Treatment (conventional till, 20,000 seeds/acre, residual herbicides applied) and the No-till Treatment (20,000 seeds/acre, residual herbicides applied) tended to have higher yields than the Residual Treatment which was planted at 15,000 seeds/acre and used residual herbicides (Figure 1). The yields of the Seeding Rate, No-till, and Residual Treatments were significantly more than the Base Treatment (Figure 1).
- The 115 RM DroughtGard® Hybrids, VT Double PRO® RIB Complete Corn Blend product used in the Tough Acre Treatment provided significant value to the treatment by increasing yield by 14 to 16 bu/acre over the Seeding Rate and No-till Treatments, respectively (Figure 1).
- With the use of a 115 RM DroughtGard® Hybrids, VT Double PRO® RIB Complete Corn Blend product, the Enhanced Rate Treatment with a seeding rate of 25,000 seeds/acre demonstrated a 5 bu/acre average yield advantage over the Tough Acre Treatment with a seeding rate of 20,000 seeds/acre (Figure 1).
- The residual herbicide applications for the Enhanced Rate Treatment (Figure 4), Tough Acre Treatment, and Out of Place Treatment (Figure 5) kept weed growth in check.



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System Treatments

fb = Followed by; A = Preemerge: Roundup PowerMAX® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal); B = At V7 Growth Stage: Roundup PowerMAX® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal); C = Preemerge: DiFlexx® Herbicide (8 fl oz/acre) + Degree® Xtra Herbicide (RUP)* (3qt/acre) + Balance® Flexx Herbicide (RUP)* (4 fl oz/acre); D = At V7 Growth Stage: DiFlexx® Herbicide (8 fl oz/acre) + Warrant® Herbicide (1.5 qt/acre) + Roundup PowerMAX® Herbicide (32 fl oz/acre) + AMS (17 lb/100 gal). *(RUP) = Restricted Use Pesticide

Figure 1. Average yield for seven rainfed corn production systems. Gothenburg, NE 2021.



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Figure 2. The Base Treatment (conventional tillage and no residual herbicide) experienced considerable weed growth and had the lowest average yield of the seven treatments in the trial. Picture taken August 28, 2021 at Gothenburg, NE.



Figure 3. The Residual Treatment, which used residual herbicides applied at planting and V7 growth stage, demonstrated much improved weed control and the average yield was significantly higher compared to the Base Treatment. Picture taken August 28, 2021 at Gothenburg, NE.



Figure 4. The Enhanced Rate Treatment, which increased the seeding rate to 25,000 seeds/acre, had the highest average yield of the seven treatments in the trial; however, the average yield was not significantly different compared to the Tough Acre and Out of Place Treatments. Picture taken August 28, 2021 at Gothenburg, NE.



Figure 5. The average yield of the Out of Place Treatment was not significantly different than the average yields of Enhanced Rate and Tough Acre Treatments. Picture taken August 28, 2021 at Gothenburg, NE.

Key Learnings

- Farmers can realize a significant increase in yield for rainfed corn when the whole treatment is managed. There was a 41 bu/acre difference between the Base Treatment and the Enhanced Rate Treatment that incorporated good weed control, no-till, good corn product selection, and enhanced seeding rates.
- Farmers should work with their local seed sales team member to select a corn product that best fits their field treatment along with selecting a herbicide program that provides good weed control of the problematic weeds in their area.



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Legal Statements

The information discussed in this report is from a single site, replicated trial. 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.

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

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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