

YIELD IMPACTS OF DRYLAND SOYBEAN MANAGEMENT DECISIONS

TRIAL OVERVIEW

- Managing dryland soybeans is a challenge on the High Plains because highly variable moisture conditions make it difficult to determine whether an input or practice will be profitable.
- This trial evaluated several practices to determine how effective they are in improving dryland soybean yield.

RESEARCH OBJECTIVE

- To evaluate the yield effects of manageable inputs on a dryland soybean crop.

Location	Soil	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield/Acre	Planting Rate/Acre
Gothenburg, NE	Cozad silt loam	Corn	Conventional tillage or no-till	06/01/2017	10/19/2017	65 bu/acre	130K and 220K

SITE NOTES:

- A 3.1 RM soybean product was planted on a dryland field with nine different treatments including tillage type, planting rate, row spacing, and fungicide and herbicide applications (Table 1). *Note that treatment 9 was intended to evaluate an earlier planting date (5/15/17), but poor weather prohibited the pre-emergence herbicide application, which was a key treatment element. Therefore, we evaluated poor weed control instead.
- The study was designed as a randomized complete block with five replications.
- Fertilizer was broadcast applied prior to planting and amounted to 24 lbs/acre nitrogen, 40 lbs/acre phosphorus, and 26 lbs/acre sulfur.
- Rainfall amounted to: May 2.53 in., June 0.75 in., July 1.52 in., August 3.63 in., and September 2.4 in.

UNDERSTANDING THE RESULTS

Treatment	Tillage	Planting density (seeds/acre)	Row spacing	Fungicide	Pre herbicides	Post herbicides
1. Low management	Conv.	220K	30-inch	None	32 oz. Roundup PowerMAX® herbicide	32 oz. Roundup PowerMAX herbicide
2. Pre residual + XtendiMax® herbicide with VaporGrip® Technology	Conv.	220K	30-inch	None	32 oz. Roundup PowerMAX herbicide 14 oz. Authority® MTZ 22 oz. XtendiMax with VaporGrip Technology	32 oz. Roundup PowerMAX herbicide
3. No tillage	No-till	220K	30-inch	None	14 oz. Authority MTZ 22 oz. XtendiMax with VaporGrip Technology	32 oz. Roundup PowerMAX herbicide
4. POST application of XtendiMax with VaporGrip Technology	No-till	220K	30-inch	None	32 oz. Roundup PowerMAX herbicide 14 oz. Authority MTZ 22 oz. XtendiMax with VaporGrip Technology	32 oz. Roundup PowerMAX herbicide 22 oz. XtendiMax with VaporGrip Technology
5. Post residual	No-till	220K	30-inch	None	14 oz. Authority MTZ 22 oz. XtendiMax with VaporGrip Technology	32 oz. Roundup PowerMAX herbicide 22 oz. XtendiMax with VaporGrip Technology 48 oz. Warrant® Herbicide
6. Lower planting rate	No-till	130K	30-inch	None	14 oz. Authority MTZ 22 oz. XtendiMax with VaporGrip Technology	32 oz. Roundup PowerMAX herbicide 22 oz. XtendiMax with VaporGrip Technology 48 oz. Warrant Herbicide
7. 30-inch twin row	No-till	130K	30-inch twin row	None	32 oz. Roundup PowerMAX herbicide 14 oz. Authority MTZ 22 oz. XtendiMax with VaporGrip Technology	32 oz. Roundup PowerMAX herbicide 22 oz. XtendiMax with VaporGrip Technology 48 oz. Warrant Herbicide
8. Disease control with fungicide	No-till	130K	30-inch twin row	6 oz./acre Headline® fungicide	32 oz. Roundup PowerMAX herbicide 14 oz. Authority MTZ 22 oz. XtendiMax with VaporGrip Technology	32 oz. Roundup PowerMAX herbicide 22 oz. XtendiMax with VaporGrip Technology 48 oz. Warrant Herbicide
9. Missed weed control* (planted 5/15/17)	No-till	130K	30-inch twin row	6 oz./acre Headline fungicide	32 oz. Roundup PowerMAX herbicide	None

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Table 1. Treatment list. Application rates were on a per-acre basis. Highlighted text indicates difference from the previous treatment.

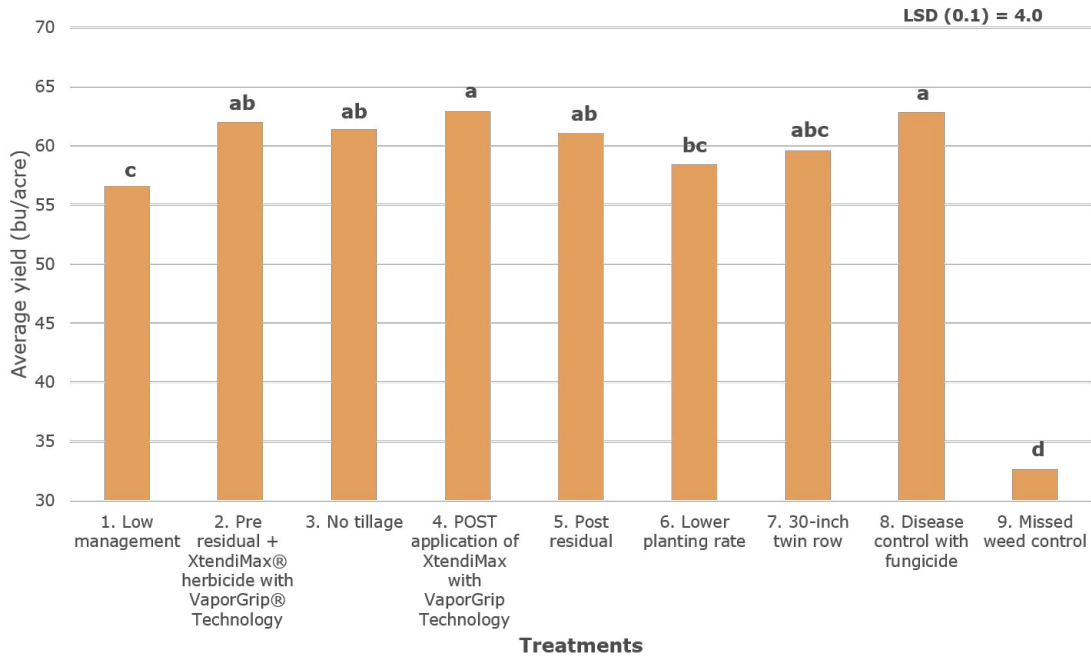


Figure 1. Dryland soybean yields in the different management treatments.

Treatment	Costs in dollars					Yield bu/acre	Soybean Price	Total Return	Net Profit
	Seed	Weed Control	Application	Fungicide	Tillage				
1. Low management	102.14	12.50	20.00	0.00	15.00	56.6	9.00	509.40	359.76
2. Pre residual + XtendiMax® herbicide with VaporGrip® Technology	102.14	49.03	20.00	0.00	15.00	62.0	9.00	558.00	371.83
3. No tillage	102.14	49.03	20.00	0.00	0.00	61.4	9.00	552.60	381.43
4. POST application of XtendiMax with VaporGrip Technology	102.14	61.06	20.00	0.00	0.00	62.9	9.00	566.10	382.89
5. Post residual	102.14	76.44	20.00	0.00	0.00	61.1	9.00	549.90	351.32
6. Lower planting rate	60.36	76.44	20.00	0.00	0.00	58.4	9.00	525.60	368.81
7. 30-inch twin row	60.36	76.44	20.00	0.00	0.00	59.6	9.00	536.40	379.61
8. Disease control with fungicide	60.36	76.44	30.00	28.13	0.00	62.8	9.00	565.20	370.28
9. Missed weed control (*planted 5/15/17)	60.36	6.25	10.00	28.13	0.00	32.7	9.00	294.30	189.57

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Table 2. Cost analysis of the different management treatments.

- Due to the dry conditions during the vegetative and early reproductive stages, uncontrolled weeds competed with the plants for moisture.
- Weed control was the factor that influenced yield the most with all residual weed control programs having significantly higher yields than treatment 1 (low management) or treatment 9 (missed weed control) (Figure 1).
- A reduction in the planting rate (treatment 6) significantly reduced yields relative to the highest yielding treatment planted at 220K seeds/acre (treatment 4), but the combination of using twin rows and fungicide (treatment 8) helped yields rebound.



WHAT DOES THIS MEAN FOR YOUR FARM?

- On irrigated acres, weeds are still damaging, but irrigation can replace some of the moisture taken up by the weeds. In dryland production, soil moisture management is paramount to achieving high yield potential.
- To achieve maximum profitability in dryland soybean production, focus on excellent weed control programs that include strong pre- and post-emergence weed control components.

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.

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