

2024 Soybean Value-Added Product Impact on Yield

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Objectives were to demonstrate yield impact of value-added products in soybean, display value-added product portfolios from eleven industry collaborators, and provide an unbiased evaluation of entries to allow growers to benchmark competitive performance of value-added products on the market. Growers should use the data set as a guide to visit with their crop consultants or local suppliers to determine a value-added product, if any, that may provide the greatest return on investment based on local supplier pricing and availability of products.

MATERIALS AND METHODS

Experiments were conducted on a fine-textured webster-clay loam soil with 5.0% organic matter and a 6.8 soil pH near Renville, Minnesota, in 2024. The study area has been a corn-soybean rotation for decades. Spring tillage was a field cultivator at 3" depth. Becks 1830E3 soybean was seeded 1.25 inches deep on 30-inch row spacings at 140,000 seeds per acre on May 14, emerging May 22. Study was kept weed free with a preemergent application of Outlook on May 14 followed by a postemergence application of Enlist One, RoundUp PowerMax II, Zidua SC and Class Act NG on June 1. A subsequent postemergence application of Enlist One, Class Act NG, Section 3, Liberty 280 SL, MSO, and Interlock was made on June 27. On July 30, Endigo ZCX at 4.5 fl oz was applied as a blanket insecticide. Treatments were applied to soybean in-furrow, at V4, at R1, and at R3 soybean growth stages (Table 1). In-furrow treatments were applied with a planter in a 7 GPA spray solution through #30-flat disk orifice pressurized with CO₂ at 30 psi to all four rows directly overtop the seed, but prior to furrow closure. Foliar treatments applied with bicycle sprayer in 15 GPA spray solution through AIXR11002 air-induction flat fan nozzles pressurized with CO₂ at 26 psi to the center two rows of four row plots 40-foot in length.

Yield data were collected on September 27 utilizing a Hege 160 two-row small plot research combine equipped with a HarvestMaster large plot weigh hopper. The middle two rows of the four-row plot were harvested and samples were taken with moisture and test weights recorded using a Perten 5200-A moisture tester. Experimental design was a randomized complete block with 6 replications. Data were analyzed with GLM procedure of SAS (Statistical Analysis Software, SAS Academic Studio October 30, 2024, SAS Institute, Inc.) at alpha=0.10 and differences are determined with 90% confidence; meaning, if the study was repeated 100 times, that 90 times out of 100 we would expect treatments that are statistically similar (within one LSD value of each other) to continue to be similar.

Description	In-Furrow	V4 Growth Stage	R1 Growth Stage	R3 Growth Stage
Application Code	A	B	C	D
Date	May 14	June 19	July 2	July 16
Time of Day	7:00 PM	1:00 PM	1:30 PM	10:00 AM
Air Temperature (F)	64	69	78	72
Relative Humidity (%)	45	70	70	82
Wind Velocity (mph)	5	3	3	2
Wind Direction	NE	NW	SW	NW
Soil Temp. (F at 6")	60	66	71	69
Soil Moisture	Good	Very Wet	Good	Good
Cloud Cover (%)	20	80	80	5
Crop Growth Stage (avg)	-	V4	R1	R3

RESULTS AND DISCUSSION

Soybean yield was evaluated across six replications with each treatment randomized and appearing only once within each of the six replications to mitigate impact of field location and environment on the data set. Overall, the study was uniform and high-yielding, with an average yield of 70.2 bushels/ac across the study. Data table has been displayed in descending order of yield (Table 2). There was an 11.1-bushel per acre range in the yield data set. A few observations

could be made, that out of 22 entries, the top 13 treatments were all statistically similar, however, only one treatment (top performer by 0.5 bu/A) was statistically better than the untreated check. Treatments including an in-furrow were all statistically similar to the top performer. The addition of more than one value-added product or multiple application timings in a treatment did appear to have an advantage on final yield in some cases, but not consistently.

Treatment	Rate oz/A* or fl oz/A	App. Code ^a	Harvest		Company
			Yield Bu/A ^b	Moisture %	
Delaro+Masterlock	8+6.4	D	75.2 a	11.7 ab	Bayer
AZterknot+VCP-035+Masterlock	8+4+6.4	D	74.1 ab	11.2 a-d	Vive
Fort. Stim. Yield Enhan. Plus + Energy Power / Stimulate Auxin/Cytokinin+ Bio-Forge Advanced+Keylate Manganese / Stimulate Auxin/Cytokinin+ Harvest More Urea Mate / Sugar Mover Premier+X-Cyte	4+8 / 2+16+32 / 2+40* / 32+8	A/B/C/D	73.9 a-c	10.8 b-f	Stoller (Now Corteva)
Delaro Complete+Masterlock	8+6.4	D	73.6 a-d	11.5 ab	Bayer
Bio-ForgeAdvanced+Energy Power / Stimulate Auxin/Cytokinin+Bio-Forge Advanced+Keylate Manganese / Energy Power+Stimulate Auxin/Cytokinin / Sugar Mover Premier+Harvest More Urea Mate	8+8 / 2+16+32 / 16+2 / 32+40*	A/B/C/D	73.3 a-e	11 b-e	Stoller (Now Corteva)
Vigorion	27	D	72.6 a-e	10.8 b-f	Fertinagro
AZteroid FC 3.3 +6-26-6+Masterlock+AZterknot+VCP-035	4.2+3 Gal.+6.4 / 8+4	A/D	71.8 a-f	10.4 c-g	Vive
Revytek+Masterlock	8+6.4	D	71.6 a-f	11.6 ab	BASF
Superbia / Superbia	16*	B/D	71.5 a-f	11 b-e	Fertinagro
Accomplish MAX+Riser / Terramar+Radiate+ReaxK / Radiate Next	32+128 / 32+2+16 / 2	A/B/C	71 a-g	11.2 a-d	Loveland
AZteroid FC 3.3+Bifender FC+6-24-6+Masterlock	4.2+4+3 Gal.+6.4	A	70.8 a-g	11.2 a-d	Vive
Yield On	24	C	70.7 a-g	11.3 a-c	Winfield
Levitate / Terramar+Radiate+ReaxK / Radiate Next+Nutrisync Complete 3d	128 / 32+2+16 / 2+16	A/B/C	70.2 a-h	10.9 b-e	Loveland
Miravis Neo+Masterlock	13.7+6.4	D	69.8 b-h	12.2 a	Syngenta
Miravis Neo+Masterlock / Miravis Neo+Masterlock	13.7+6.4 / 13.7+6.4	C/D	69.5 b-h	12.1 a	Syngenta
Untreated Check	-	-	69.5 b-h	10.8 b-f	-
6-24-6 Check	3 Gal.	A	69.4 b-h	10 e-g	-
Velytma+Masterlock	7+6.4	D	68.8 c-i	11.4 ab	BASF
AZterknot+VCP-035+Masterlock	14+4+6.4	D	68.5 d-i	10.9 b-e	Vive
Delaro Complete+Masterlock+Yield On	8+6.4+24	C	68.2 e-i	9.6 fg	Winfield
Voyagro 4-0-16+Masterlock	16+6.4	C	67.1 f-i	10.2 d-g	Winfield
Sosdia Stress / Sosdia Stress	6.4+6.4	B/C	65.9 g-i	11 b-e	Corteva
Ascend SL	3.4	C	65.3 hi	10 e-g	Winfield
LSD (0.1)			5.2	1.4	

^aApplication codes refer to the information in Table 1.

^bBu/A=Soybean yield is corrected to a moisture of 13.5%. Same letters next to values are statistically similar values at alpha=0.1.

CONCLUSION

The addition of multiple value-added products or multiple application timings in a treatment may have an advantage on final yield. Although only a single treatment yielded above the untreated check, 14 of the 22 entries appeared above the untreated check. This would suggest a grower should consider the addition of at least one value-added product to their program. A grower should consider adding an in-furrow value-added product to their program as this timing appears to have 100% chance of trending above the untreated check for final yield, however, there were plenty of single foliar application timings that trended above the untreated check as well. This study was uniform and high-yielding, allowing treatments a better chance of achieving a “yield ceiling”. Growers should use the data set as a guide to visit with their crop consultants or local suppliers to determine a value-added product, if any, that may provide the greatest return on investment based on local supplier pricing and availability of products.

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