On-Farm Corn RyzUp® Plant Growth Regulator Trials

RFR-A1665

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Introduction

Farmers continue to search for ways to increase corn yields, including the use of plant growth regulators. Plant growth regulators, such as gibberellic acid, are organic compounds that modify plant growth processes at very low concentrations. Gibberellic acids control cell elongation and division in plant shoots. Plant growth regulators are more commonly used on fruit and vegetable crops than on grain crops. RyzUp® contains a gibberellic acid and is labeled for corn. The purpose of these trials was to investigate the effect of foliar applications of the plant growth regulator RyzUp® on corn grain yield.

Materials and Methods

In 2016, 25 trials investigated the effect of foliar applications of the plant growth regulator RyzUp® at 0.5 oz/acre on corn grain yield (Table 1). Applications were made to corn at the V2 to V6 growth stages. RyzUp® is marketed by Valent and is promoted to increase yields and overcome the effects of heat and drought. All trials were conducted on-farm by farmer cooperators. Strips were arranged in a randomized complete block design with at least three replications per treatment. Strip length and width varied from field to field depending on field and equipment size. All strips were machine harvested for grain yield. Strips treated with RyzUp® were compared with untreated strips in all trials.

Results and Discussion

Foliar applications of RyzUp® resulted in a significant yield increase from 1 to 16 bushels/acre in trials 17 and 25 ($P \leq 0.04$) and a significant yield reduction from 2 to 6 bushels/acre in trials 1, 2, and 10 at $P \leq 0.10$ (Table 2). There was no effect on corn yield in 20 of the 25 trials. This agrees with most past research showing that although plant growth regulators can affect corn growth, effects on grain yield are less common.

Table 1. Hybrid, row spacing, planting date, planting population, previous crop, and tillage practices from foliar Ryzup trials in corn in 2016.

Exp. no.	Trial	County	Hybrid	Row spacing (in.)	Planting date	Planting population (seeds/ac)	Previous crop	Tillage practices
160649	1	Cass	Syngenta 07F23	30	4/24/16	32,000	Soybean	No-till
160650	2	Shelby	Pioneer P1555CHR	30	4/16/16	32,000	Soybean	No-till
160651	3	Shelby	Pioneer P1197AM	30	4/18/16	32,000	Soybean	No-till
160652	4	Crawford	Dekalb DK62-93rtz	30	4/29/16	32,000	Soybean	No-till
160653	5	Crawford	Pioneer P1197AM	30	5/1/16	32,000	Soybean	No-till
160600	6	Potta-wattamie	Wyffels 7456	30	4/20/16	35,000	Soybean	No-till
160601	7	Cass	Wyffels 7696	30	4/21/16	35,000	Soybean	Disked
160604	8	Cass	Epley 1418GT3000	30	5/7/16	35,000	Soybean	No-till
160605	9	Cass	Dekalb DK6208	30	4/14/16	35,000	Soybean	Vertical till
160609	10	Potta-wattamie	Pioneer P0937	30	4/17/16	32,000	Soybean	No-till
160610	11	Cass	Epley E1803GT2P	30	4/17/16	34,304	Soybean	No-till
160611	12	Potta-wattamie	Dekalb DK6297	30	4/28/16	32,000	Soybean	No-till
160615	13	Potta-wattamie	Nutech 5N410	30	4/25/16	33,000	Soybean	No-till
160618	14	Cass	Pioneer PO506AM	30	4/24/16	33,626	Soybean	No-till
160619	15	Cass	Wyffels 7456	30	4/26/16	33,000	Soybean	No-till
160620	16	Cass	4 Star 6D73	30	5/15/16	34,000	Soybean	No-till
160621	17	Potta-wattamie	Nutech 914	30	5/8/16	32,000	Soybean	No-till
160624	18	Shelby	Pioneer P1197AM	30	4/30/16	32,000	Soybean	No-till
160625	19	Crawford	Dekalb DK62-93vt2pro	30	5/1/16	32,000	Soybean	No-till
160628	20	Potta-wattamie	Dekalb DK61-67	30	4/25/16	33,000	Soybean	No-till
160639	21	Cass	Mycogen 2C788	30	5/6/16	33,000	Soybean	Vertical till
160641	22	Cass	4 Star 6D73	30	5/15/16	34,000	Soybean	No-till
160648	23	Cass	Pioneer P1197	30	4/25/16	33,000	Soybean	Field cultivate
160642	24	Cass	Pioneer PO825AMXT	30	4/24/16	33,464	Soybean	No-till
160501	25	Story	Pioneer P119AM1	30	5/12/16	34,000	Soybean	Spring field cultivate

Table 2. Yield from on-farm corn trials with foliar Ryzup at 0.5 oz/ac in 2016.

Exp. no.	Trial	Application timing	Yield (bu/ac) Ryzup	Control	Response	P-value[a]
160649	1	V4	205	211	-6	0.03
160650	2	V6	230	233	-3	0.10
160651	3	V4	231	230	1	0.16
160652	4	V5	227	223	4	0.12
160653	5	V5	241	241	0	0.91
160600	6	V5	243	236	7	0.19
160601	7	V5	235	246	-11	0.24
160604	8	V5	167	163	4	0.53
160605	9	V6	204	204	0	0.73
160609	10	V5	232	234	-2	0.06
160610	11	V6	202	203	-1	0.20
160611	12	V2	173	175	-2	0.39
160615	13	V5	219	210	9	0.28
160618	14	V6	246	240	6	0.12
160619	15	V4	209	209	0	0.75
160620	16	V4	196	190	6	0.23
160621	17	V2	172	171	1	0.04
160624	18	V5	232	229	3	0.29
160625	19	V4	233	231	2	0.75
160628	20	V5	207	206	1	0.55
160639	21	V3	214	213	1	0.65
160641	22	V4	187	186	1	0.99
160648	23	V4	227	222	5	0.25
160642	24	V6	245	238	7	0.15
160501	25	V4	247	231	16	0.01

[a]P-value = the calculated probability that the difference in yields can be attributed to the treatments and not other factors. For example, if a trial has a P-value of 0.10, then we are 90 percent confident the yield differences are in response to treatments. For P = 0.05, we would be 95 percent confident.