



**THE OHIO STATE
UNIVERSITY**

COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

2022 POLLINATOR RATINGS IN SOYBEAN VARIETIES

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INTRODUCTION

Although soybeans do not require bee pollination to produce a crop, immense areas of soybean cultivation can be an important floral resource for pollinators. The objective of this study was to evaluate nectar production and attractiveness of soybean flowers to bees in different varieties.

METHODOLOGY

Study Location. Data of bee activity and nectar production were collected from varieties grown for protein and oil analysis at the C2 location of the Ohio Soybean Performance Trials in 2022. Information about the trials, including yield and seed quality data, can be found at: <https://ohiocroptest.cfaes.osu.edu/soy2022/>.

Bee Visitation. Bee visitation rates were determined by counting the number of bees in 30-second sessions in each single-variety plot during bloom. Observations were on 9 separate days when weather was suitable for bee foraging. Visitation rates were standardized as the number of bees observed per minute for each variety.

Nectar Production. Nectar was measured with 0.5 μL microcapillary tubes from 20 flowers randomly collected, on two separate days, from each variety at growth stages R2 and R3.

CONCLUSIONS

Bee activities were observed in all plots, although both nectar production (ranging 0.08 - 0.31 $\mu\text{L}/\text{flower}$) and bee visitation rate (0.2 - 3.0 bees/min) were highly variable across varieties. Bee visitation was primarily driven by floral nectar volume and not by differences in flower color or nectar sugar concentration (unpublished data).

READING THE SUMMARY TABLE (PAGE 2)

Entry. Maturity and type information from the 2022 report of Ohio Soybean Performance Trials is included. Types listed are Conventional (CV), Enlist (EN), Liberty Link/glyphosate tolerant (LLGT27), RoundUp Ready (RR), sulfonylurea-tolerant soybean (STS), Xtend-Flex (XF).

Bee. Averaged visitation rate (bees/minute) recorded for each variety. Asterisks indicate values greater than 90% (***) , 75% (**), and 50% (*) of all varieties evaluated.

Nectar. Volume of nectar a flower produced on average. Asterisks indicate values greater than 90% (***) , 75% (**), and 50% (*) of all varieties evaluated.

Choosing varieties for pollinator support. Varieties with high nectar scores and at least a moderate level of bee visitation are expected to provide excellent support for pollinators.

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DATA USE. Inclusion of entries in the Ohio Soybean Performance Trials does not constitute an endorsement of a particular entry by the Ohio State University, Ohio Agricultural Research and Development Center, or Ohio State University Extension.

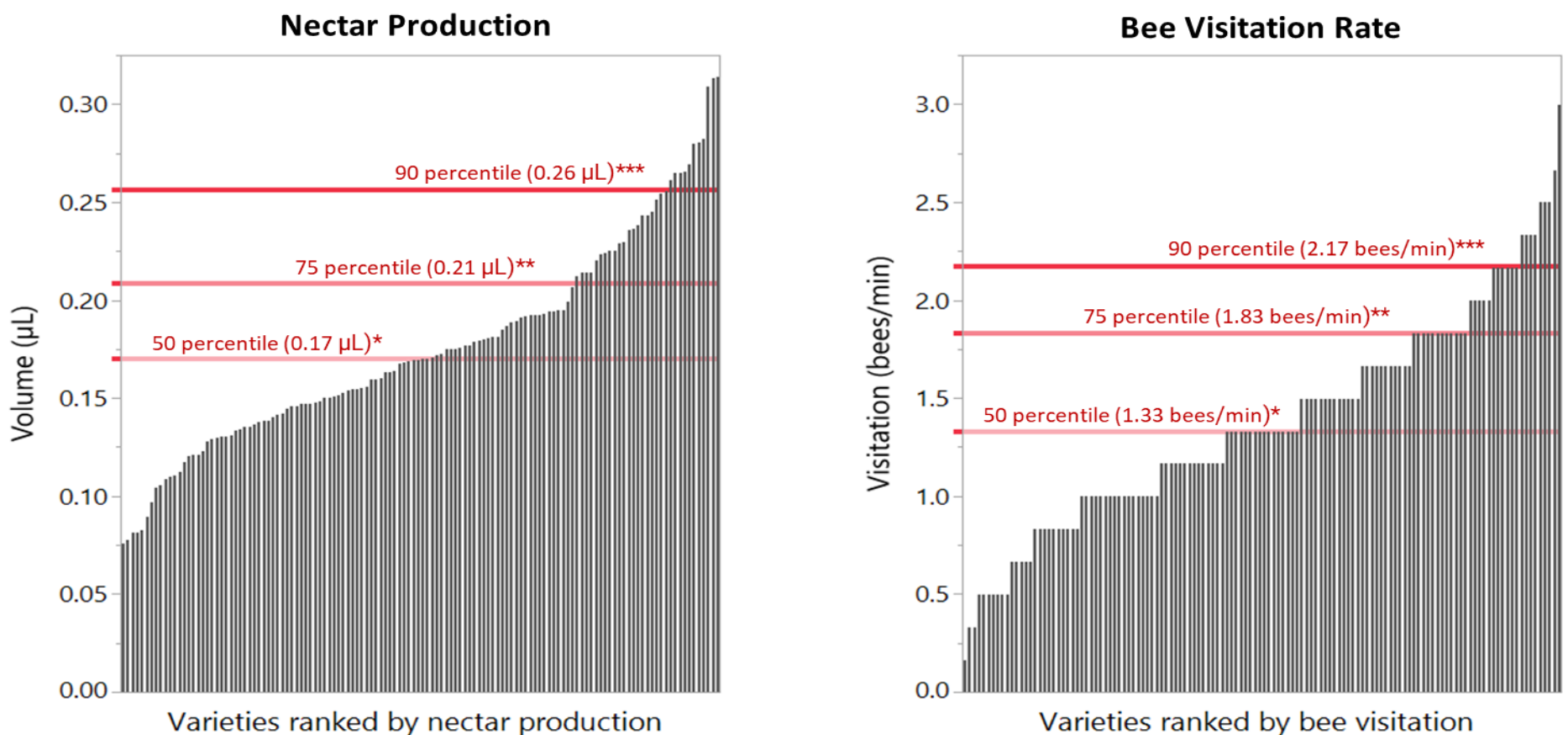


Figure 1. Nectar production and bee visitation rate of 128 soybean varieties evaluated at the Union County location in 2022.

TABLE 1. Bee visitation and floral nectar production for varieties evaluated at the Union County location, 2022.

Entry					Entry				
Variety	RM	Type	Nectar Volume (µL)	Bees Per Minute	Variety	RM	Type	Nectar Volume (µL)	Bees Per Minute
Advanced Genetics, Inc.					Albert Lea Seed/Viking Corn & Soybeans				
AGI 0725AE	2.5	EN	0.24 **	1.50 *	O.2418N	2.4	CV	0.17	0.50
26CN06	2.6	CV	0.15	0.83	O.2702	2.7	CV	0.31 ***	1.50 *
AGI 1727AE	2.7	EN	0.28 ***	1.67 *	O.3118N	3.1	CV	0.21 **	2.00 **
2801GL	2.8	LLGT27	0.08	0.50	O.3418N	3.4	CV	0.17 *	1.83 **
AGI 1729AE	2.9	EN	0.11	2.17 **	Asgrow/Bayer Crop Science				
AGI 1732AE	3.2	EN	0.19 *	1.67 *	AG22XF2	2.2	XF	0.19 *	1.67 *
32CN08	3.2	CV	0.17	1.17	AG24XF1	2.4	XF	0.14	0.50
AGI 0733AE	3.3	EN	0.20 *	1.83 **	AG25XF1	2.5	XF	0.08	0.67
AGI 1734AE	3.4	EN	0.10	1.17	AG27XF1	2.7	XF	0.12	0.83
AGI 1736AE	3.6	EN	0.14	1.17	AG28XF2	2.8	XF	0.23 **	1.33
AGI 1737AE	3.7	EN	0.16	1.50 *	AG30XF2	3	XF	0.14	1.83 **
AGI 2737AE	3.7	EN	0.15	1.17	AG32XF2	3.2	XF	0.18 *	1.00
AGI 1738AE	3.8	EN	0.17 *	1.17	AG33XF2	3.3	XF	0.13	0.17
AGI 9739AE	3.9	EN	0.24 **	2.50 ***	AG35XF1	3.5	XF	0.18 *	0.67
AGI 0743AE	4.3	EN	0.14	2.17 **	AG38XF1	3.8	XF	0.12	0.67
Dyna-Gro Seed					Ebberts Field Seeds Inc.				
S26EN53	2.6	EN	0.15	0.50	E2671 E3	2.6	EN	0.16	1.00
S28EN22	2.8	EN	0.19 *	1.00	E2960 E3	2.9	EN	0.22 **	1.33
S2872N	2.8	CV	0.11	2.17 **	303XF	3	XF	0.18 *	1.17
S28XF92S	2.8	XF, STS	0.15	1.00	E3151 E3	3.1	EN	0.17 *	2.17 **
S29EN62	2.9	EN	0.15	1.00	E3370 E3	3.2	EN	0.21 **	0.83
S31EN91	3.1	EN	0.15	0.83	333XF	3.3	XF	0.15	1.83 **
S33EN42	3.3	EN	0.22 **	1.50 *	E3460 E3	3.4	EN	0.27 ***	1.67 *
S35ES82	3.5	EN, STS	0.24 **	1.83 **	E3560 E3	3.5	EN	0.19 *	1.67 *
S3681STS	3.6	CV, STS	0.31 ***	2.00 **	E3760 E3	3.6	EN	0.08	1.17
S37ES52	3.7	EN, STS	0.21 **	1.00	372XF	3.6	XF	0.13	1.00
S37XF33	3.7	XF	0.15	0.83	E3970 E3	3.8	EN	0.21 **	1.00
S39EN19	3.9	EN	0.27 ***	1.00	GROWMARK, Inc.				
S41EN72	4.1	EN	0.16	2.33 ***	HS 26E20	2.6	EN	0.22 **	1.33
Golden Harvest					HS 28F20	2.8	XF	0.19 *	1.67 *
GH2922E3	2.9	EN	0.17 *	1.00	HS 28E10	2.8	EN	0.27 ***	1.33
GH3132E3	3.1	EN	0.11	1.33	HS 29F10	2.9	XF	0.14	2.00 **
GH3373E3S	3.3	EN, STS	0.17	0.83	HS 31E20	3.1	EN	0.17	1.67 *
GH3442XF	3.4	XF	0.15	2.67 ***	HS 31F10	3.1	XF	0.14	1.33
GH3582E3	3.5	EN	0.24 **	1.50 *	HS 32F10	3.2	XF	0.13	1.00
GH3762E3S	3.7	EN, STS	0.12	1.17	HS 33E20	3.3	EN	0.18 *	1.50 *
NK Seeds					HS 34F00	3.4	XF	0.25 **	2.17 **
NK29-Z4E3	2.9	EN	0.16	0.83	HS 35E10	3.5	EN	0.25 **	1.83 **
NK30-B2E3	3	EN	0.23 **	1.83 **	HS 35F20	3.5	XF	0.13	1.33
NK33-W2E3S	3.3	EN	0.19 *	1.33	HS 37E10	3.7	EN	0.16	1.83 **
NK36-H9E3S	3.6	EN	0.26 ***	1.00	HS 38E20	3.8	EN	0.28 ***	1.17

Asterisks indicate values greater than 90% (***), 75% (**) and 50% (*) of all varieties evaluated.

NOTE: Table is Continued on the Next Page.

TABLE 1 (Continued)

Entry		Nectar		Bees		Entry		Nectar		Bees			
Variety	RM	Type	Volume (µL)	Per Minute			Variety	RM	Type	Volume (µL)	Per Minute		
Seed Consultants, Inc.						Seedway, LLC							
SC7282E	2.8	EN	0.17	*	1.67	*	SG 2942XTF	2.9	XF	0.19	*	0.33	
SC7311E	3.1	EN	0.18	*	0.83		SG 2920E3	2.9	EN	0.16		1.50	*
SC7322E	3.2	EN	0.25	**	2.50	***	SG 3393E3	3.3	EN	0.26	***	2.50	***
SC7332E	3.3	EN	0.13		0.50		SG 3522E3	3.5	EN	0.14		3.00	***
SC7341E	3.4	EN	0.15		1.00		Shurgrow						
SC7372E	3.7	EN	0.19	*	1.50	*	SG2753E	2.7	EN	0.09		0.83	
SC7381E	3.8	EN	0.11		2.17	**	SG3053E	3	EN	0.08		1.00	
SC7412E	4.1	EN	0.12		1.50	*	SG3152E	3.1	EN	0.23	**	1.17	
Stewart Seeds						SG3352E							
3531XF	3.5	XF	0.19	*	1.67	*	SG3652E	3.6	EN	0.18	*	1.00	
3731XF	3.7	XF	0.20	*	1.00		SG3754E	3.7	EN	0.15		1.50	*
3843XF	3.8	XF	0.19	*	1.33		SG3853E	3.8	EN	0.21	**	1.33	
4053XF	4	XF	0.12		1.83	**	University of Missouri						
Virtue Seeds						S19-3530RY							
V2922	2.9	CV	0.14		1.50	*	Wellman Seeds						
V3632S	3.6	CV	0.18	*	0.50		W 6330E	3	EN	0.14		0.67	
Williamsfield Seed Company						W 6319E							
WSC 1217N	3.1	CV	0.18	*	1.33		W 6125E	2.5	EN	0.31	***	2.33	***
WSC 1248N	3.6	CV	0.17		0.83		K 1226GL	2.6	LLGT27	0.10		1.00	
WSC 7400N	4.3	CV	0.23	**	1.17		W6237E	3.7	EN	0.15		1.33	
Xitavo Soybean Seed						Xitavo Soybean Seed							
XO 2323E	2.3	EN	0.26	***	1.83	**	XO 3483E	3.5	EN	0.13		1.33	
XO 2472E	2.4	EN	0.13		1.33		XO 3651E	3.6	EN	0.19	*	2.33	***
XO 2501E	2.5	EN	0.15		2.33	***	XO 3752E	3.7	EN	0.15		2.00	**
XO 2613E	2.6	EN	0.15		0.67		XO 3861E	3.8	EN	0.19	*	2.00	**
XO 2832E	2.8	EN	0.18	*	1.17		XO 3803E	3.8	EN	0.08		1.83	**
XO 2921E	2.9	EN	0.18	*	0.33		XO 3922E	3.9	EN	0.28	***	1.83	**
XO 2963E	2.9	EN	0.16		1.33		XO 4132E	4.1	EN	0.19	*	1.17	
XO 3131E	3.1	EN	0.13		1.17								
XO 3341E	3.3	EN	0.24	**	1.67	*							
XO 3402E	3.4	EN	0.16		1.33								

Asterisks indicate values greater than 90% (***), 75% (**) and 50% (*) of all varieties evaluated.