

# The effect of soybean seeding rate on yield in a field with high disease pressure from water molds

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## Objective

To determine the effects of seeding rate on soybean yield when the crop is affected by water molds (*P. sojae* and *Pythium spp.*)

## Background

Crop Year: 2014

Location: Archbold, OH

County: Fulton

Soil Type: Fulton silty clay loam

Drainage: Undrained

Previous Crop: Corn

Tillage: Minimum

Soil Test: pH 6.7, P 73 ppm\*, K 284 ppm

Planting Date: May 8, 2014

Fertility: VRT applied in corn year

Harvest Date: September 20, 2014

Rainfall (May-Sept): 15.7"

\*Bray P1 Extractant

## Methods

Five soybean populations were evaluated in a field with high disease pressure from *P. sojae* and *Pythium spp.* The study was planted in a randomized complete block design with four replications. A 40 foot John Deere 1790 air seeder which could accurately monitor seed was used to plant the study. All treatments received the same tillage and herbicide applications. Seed used was Rupp 7251 with Apron Maxx fungicide seed treatment at a rate of .32 oz/cwt and Cruiser insecticide seed treatment at a rate of 1.28 oz/cwt. Data for stand counts were taken at V3, R1, and leaf drop from 8 locations within each treatment. Plot centers were harvested with a commercial combine equipped with a 35 foot grain header. Yields and moistures were obtained by using a calibrated GreenStar 2630 monitor. Yields were adjusted to 13% moisture. Precipitation data was obtained from Weather.com and recorded weekly.

## Results

Seeding Rate 5/8/2014	Stand Count- V3 6/11/2014	Stand Count- R1 7/9/2014	Stand Count 9/18/2014	% Total Stand Loss	% Moisture	Yield Bu/acre	
107	80.1	73.8	73.8	-31%	13.6%	51.2	B
131	106	97.3	88.9	-32%	13.4%	52.9	B
154	127	118	113	-27%	13.3%	55.5	A
175	157	139	136	-22%	13.6%	54.2	AB
200	160	149	126	-37%	13.8%	55.7	A

LSD = 2.49 (p<.05); CV 3.00

\*\*Seeding rates and stand counts reported to 3 significant figures, in thousands per acre\*\*



Week of:	Rainfall	Week of:	Rainfall	Week of:	Rainfall	Week of:	Rainfall
May 5	.31"	June 9	.64"	July 14	0"	Aug. 18	1.47" *
May 12	1.5"	June 16	1.8"	July 21	0"	Aug. 25	.03"
May 19	.27"	June 23	1.09"	July 28	.15"	Sept. 1	1.18"
May 26	.09"	June 30	0.05	Aug. 4	.24"	Sept. 8	3.18" *
June 2	1.17"	July 7	.43"	Aug. 11	1.99" *	Sept. 15	.51"

\*= single day rain event; weather.com

## Summary

Seeding rate (x1,000)	Yield Bu/acre	Gross Revenue per acre	Seed Cost per acre	Net Revenue per acre
107	51.2	\$512.00	\$43.87	\$468.13
131	52.9	\$529.00	\$53.71	\$475.29
154	55.5	\$555.00	\$63.14	\$491.86
175	54.2	\$542.00	\$71.75	\$470.25
200	55.7	\$557.00	\$82.00	\$475.00

**Economics:** Gross income= yield x \$10.00/bu; Seed cost= \$0.41 per 1,000 seeds x seeding rate; Net revenue= Gross revenue – seed cost.

## Discussion:

The loss in plant population averaged 30% across treatments due to *P. sojae* and *Pythium spp.* during the growing season. Treatments where harvest stands fell below 100,000 plants per acre resulted in significantly lower yields than treatments with a harvested population above 100,000 plants per acre. Based on 1 year of data, planted population of 154,000 seeds/acre or harvest stand of 113,000 plants/acre resulted in the greatest returns per acre when significant stand losses occurred. Further data in the form of multi-year replications will add to the validity of these results.

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