

Corn Yield Response to Seeding Rate (2014-2016)

Eric Richer, Ohio State University Extension Educator, Fulton County

Objective

To determine the effects of seeding rate on corn yield and profitability.

Background

Crop Year: 2014-2016	Soil Test ('14-16 avg):	pH 6.1
County: Fulton		P 19 ppm (Bray P1)
Location: Fayette, OH		K 105 ppm
Drainage: Systematic, 50' laterals		CEC 10.5 meq/100g
Previous Crop: Soybeans		O.M. 2.8%
Soil Type: Blount, Glynwood	Rainfall (April - Sept):	2016 – 21.6"
Tillage: No-till/strip till		2015 – 22.1"
Applied Fertilizer (each year): 200-65-75/ac		2014 – 10.9"

Methods

This multi-year study was designed with five treatments replicated four times in a randomized complete block design. Plots were 6 rows wide (15 ft) by 2250 feet long. All treatments received the same starter fertilizer, herbicide and sidedress nitrogen. Various seed corn hybrids were used in the research, based mainly on farmer choice. The trial was planted, sprayed, sidedressed and harvested with commercial farm equipment. Yields and moistures were measured with a calibrated Ag Leader yield monitor. Yields were adjusted to 15% moisture. Precipitation data was recorded at the nearest CoCoRaHS station (OH-FL-9).

Treatments:	1. 23,000 seeds per acre
	2. 28,000 seeds per acre
	3. 33,000 seeds per acre
	4. 38,000 seeds per acre
	5. 43,000 seeds per acre



Results

1b. Corn Yield response to Seeding Rate 2014-2016

Seeding Rate	2014 Yield (3 sites)	2015 Yield (1 site)	2016 Yield (1 site)	3 Year Average Yield*	3 Year Average Final Stand	Revenue Minus Seed Cost **
(seeds/ ac)	(bushels per acre)				(plants/ac)	(\$/ac)
23,000	-	152.1 b	191.3 ab	171.7	22,100	\$522
28,000	166.7 a	159.8 ab	193.4 ab	173.3	27,100	\$510
33,000	159.9 ab	171.3 a	191.6 ab	174.3	32,900	\$497
38,000	158.1 b	158.5 ab	195.5 a	170.7	37,600	\$467
43,000	155.6 b	-	186.0 b	170.8	41,000	\$450
LSD (p<.05)	7.2	15.8	7.5	-	-	-
County Average	183.1	161.3	TBD	172.2	-	-
Ohio Average	176.0	153	TBD	164.5	-	-

*23,000 and 43,000 seeds per acre rates only had 2 years of data.

**Based on \$3.44/1,000 seeds and \$3.50 market price (Source: OSUE Corn Production Budget 2016)

Discussion:

This three year study showed that a seeding rate of 23,000-33,000 seeds per acre achieved the highest statistically significant yield. The 33,000 seeds per acre showed the highest 3 year average agronomic yield while the 23,000 seeds per acre rate showed the maximum economic return. Because only 2 years of data were collected at the lowest rate of 23,000 seeds per acre, the author believes that there is higher confidence in the results of the 28,000-33,000 seeds per acre rates. In 2014 there was no statistical yield advantage to planting more than 33,000 seeds per acre. In 2015 and 2016, there was no statistical yield advantage to planting more than 38,000 seeds per acre.

Whereas 2015 was a year of higher than average rainfall during the growing season, both 2014 and 2016 had some early season drought stress that could have affected normal yield results. Additionally, the NRCS soil description for Blount-Glynwood soils indicates only a moderate water holding capacity. These site specific characteristics make a case for reduced corn seeding rates as an improved return on investment.

Acknowledgement

The author expresses appreciation to on-farm collaborators Les Seiler and Richard Snyder for the planting and harvesting of these plots. Thanks to summer agronomy interns Emily Herring, Troy Grime and Ben Eggers for assistance with data collection.



For more information, contact:
Eric Richer
OSU Extension –Fulton County
8770 State Route 108
Wauseon, Ohio 43567
Richer.5@osu.edu

agcrops.osu.edu

CFAES provides research and related educational programs to clientele on a nondiscriminatory basis. For more information: go.osu.edu/cfaesdiversity.