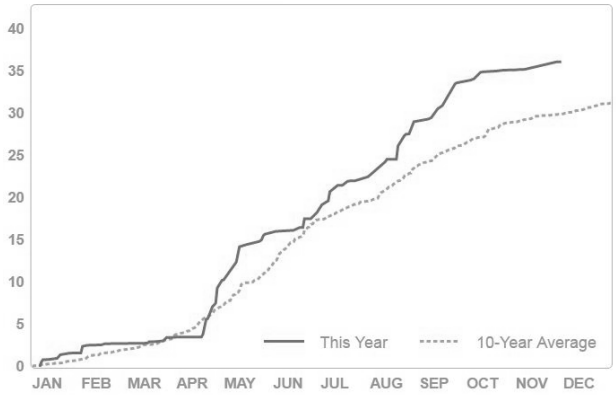
Rainfed Corn Population Study

Study ID: 027025201601
County: Cass
Soil Type: Nodaway silt loam occasionally flooded; Colo silty clay loam occasionally flooded
Planting Date: 4/11/16
Harvest Date: 10/5/16
Row Spacing (in): 30
Hybrid: DeKalb DKC61-79RIB
Reps: 6
Previous Crop: Soybean
Tillage: No-Till
Herbicides: ***Pre:*** 13 oz/ac Authority® MTZ on 11/17/15 and 2 qt/ac Degree Xtra® + 32 oz/ac of Roundup PowerMAX® at 4/13/16 ***Post:*** 32 oz/ac Roundup PowerMAX and 2 oz/ac Callisto® on 5/27/16
Seed Treatment: None
Foliar Insecticides: 3.4 oz/ac Capture® LFR® and 3.6 oz/ac Xanthion® in-furrow on 4/11/16
Foliar Fungicides: 10.5 oz/ac Quilt® on 6/13/16
Fertilizer: 237.9 lb/ac 11-52-0, 74.96 lb/ac 0-0-60, and 3.25 lb/ac of Zinc Sulfate, and 17.94 lb/ac of 90% Sulfur on 11/20/15; 175 lb/ac Anhydrous Ammonia on 11/28/15; OptiStart™ Pro 9-18-6-2 Sulfur + 0.5 Zn + 0.05 Mn with N Avail in-furrow at 4/11/16.
Note: Population loss across all treatments/reps due to spring flooding
Irrigation: None
Rainfall (in):



Introduction: The purpose of this study was to determine what planting population is most profitable for corn production. The study started in 2010. The populations evaluated in 2014, 2015, and 2016 were the same, therefore 2014 and 2015 results are included for comparison. The populations chosen to be evaluated this year and in previous years were determined by the grower. The field associated with this study is sub-irrigated.

2014 and 2015 results:

Planting Population	2014 Yield (bu/ac)†	2015 Yield (bu/ac)†
28,000 seeds/acre	309 B*	239 AB*
32,000 seeds/acre	322 A	233 B
36,000 seeds/acre	321 A	233 B
40,000 seeds/acre	322 A	246 A
P-Value	0.0078	0.0117

†Bushels per acre corrected to 15.5% moisture.
*Values with the same letter are not significantly different at a 90% confidence level.

2016 Results:

Planting Population	Harvest Stand Count	% of Planted Seeds Present at Harvest	Yield (bu/acre)†	Marginal Net Return‡ ($/ac)
28,000 seeds/acre	27,167 D*	97.0 AB	261 A	706.79
32,000 seeds/acre	30,667 C	95.8 B	268 A	715.64
36,000 seeds/acre	34,917 B	97.0 AB	268 A	702.92
40,000 seeds/acre	38,983 A	97.5 A	256 A	653.60
P-Value	<0.0001	0.076	0.2898	-

†Bushels per acre corrected to 15.5% moisture.
*Values with the same letter are not significantly different at a 90% confidence level.
‡Marginal net return based on $3.05 corn and $254.40/bag seed corn (80,000 seed count).

Summary: In 2016, there was no yield difference between the seeding rates tested. In this case, planting 32,000 seeds/acre maximized marginal net return. Population loss occurred across all treatments and replications due to spring flooding. Because actual populations were slightly different than intended, we conducted a covariate analysis (to test if the actual population affected yield). Including actual treatment populations as a covariate did not affect the analysis, so the analysis presented is the original test of intended populations and their effect on yield. The percent of seeds planted which were present at harvest varied between the seeding rates tested, with the 32,000 seeds/acre treatment having a lower percent of planted seeds present at harvest than the 40,000 seeds/acre treatment.

In previous years, yield varied between the seeding rates tested. It is important to look at multiple years and locations when using this information for making production decisions. Previous research results can be found at http://cropwatch.unl.edu/on-farm-research.

Sponsored by: University of Nebraska Lincoln, Nebraska CornBoard

In Partnership with: Nebraska Soybean Checkoff, Nebraska Corn Growers Association, Nebraska Dry Bean Commission