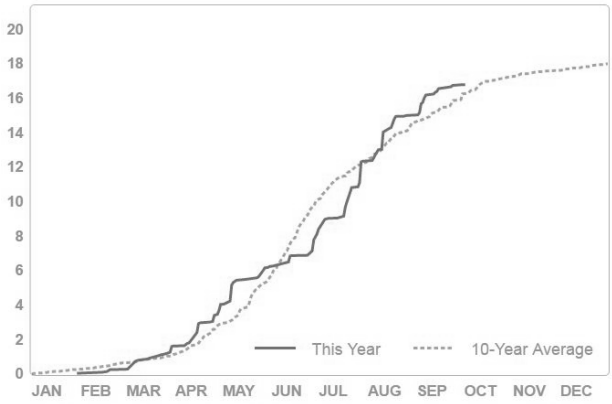
Non-Irrigated Dry Edible Pea Population Study

Study ID: 600013201601
County: Box Butte
Soil Type: Keith loam; Creighton very fine sandy loam
Planting Date: 4/12/16
Harvest Date: 7/15/16
Population: varies
Row Spacing (in): 7.5
Hybrid: Midas
Reps: 4
Previous Crop: Wheat
Tillage: Straight line pre-plant disking, 2 times
Herbicides: ***Pre:*** 2 oz/acre Sharpen® on 4/20/16
Post: Dessicant of 2 oz/acre Sharpen® and 8 oz/acre Destiny® crop oil on 7/12/16
Seed Treatment: Inoculated with N-Charge® peat base and Primo GX2 in small seeder attachment
Foliar Insecticides: None
Foliar Fungicides: None

Fertilizer: 16 lb/acre N, 20 lb/acre P, 10 lb/acre S, 4 lb/acre Zn, and humic acid as dry fertilizer in March
Note: Very dry June created crop stress and low yields.
Irrigation: None
Rainfall (in):



Introduction: Dry edible pea production has been on the increase for several years with 40,000 to 50,000 acres grown annually in the western Nebraska region. This study evaluated three different populations of dry edible peas under dryland farming conditions to help evaluate the optimal population, looking at both yield and economic return. Midas was the pea variety planted and we evaluated target field populations of 300,000, 350,000 and 400,000 live peas per acre. The peas were planted with a 30 foot Great Plains drill in 7.5 inch rows. The three population levels were replicated 4 times in plots 30 feet wide by 2,600 feet long. There are approximately 1.8 acres in each plot. The plots were planted in a randomized complete block design on April 12.

Stand counts were taken on May 16 and 17 when peas were approximately 2 inches tall. Pod height measurements to determine the percent of pods 2 inches above the soil were estimated at harvest time. In all treatments approximately 95% of the pods were 2 inches above the soil surface or more. Low hanging pods are a major cause of harvest loss in the direct harvest process.

The plots were harvested on July 15 using a Case IH 8230 combine equipped with a MacDon FD70, 40 ft flex draper head. A total of nine, individual square foot counts along the plot area were taken on July 27th to estimate harvest loss during combining. A sample of peas was taken from each plot and analyzed for quality by New Alliance Bean Company in Alliance.

Results:

Treatment (seeds/ac)	Early Season Stand Count (plants/ac)	Harvest Loss (bu/ac)	Damaged (%)	Split (%)	Cracked Seed Coat (%)	Density (lbs/bu)	Moisture (%)	Yield (bu/ac) †	Marginal Net Return‡ ($/ac)
300,000	292,914 C*	1.4 A	1.2 A	0.6 A	1.8 B	63.3 A	11.6 A	21 B	103.74
350,000	372,721 B	0.7 A	1.2 A	0.5 A	3.2 A	63.3 A	11.3 A	20 B	84.95
400,000	448,171 A	1.3 A	1.2 A	0.4 A	2.4 AB	62.6 A	11.1 A	23 A	94.81
P-Value	<0.0001	0.142	0.946	0.299	0.083	0.561	0.257	0.0359	-

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 14% moisture and clean yield.
‡Marginal net return based on $7/bu field pea price and seed prices of $14.77 per 100,000 seeds. Because the early season stand counts were higher in some cases than the target seeds per acre, the early season stand count values are likely more representative of actual treatment costs, therefore the stand count value was used to determine the seed cost for each treatment.

Summary: Except for the lowest targeted population the drill settings used by the grower delivered more seed than planned. The actual stand counts are in the table and cost and return marginal analysis is based on these actual stands. Due to a very warm and dry June, yields were poor due to crop stress during flowering. Dryland yields for dry edible beans typically exceed 30 bu/acre. In this case the peas planted at the higher rate did yield significantly more but only by 3 bu/acre. This seeding rate (400,000 plants/acre) yielded the highest at 23 bu/acre; however, it was not economical due to high seed cost. A better return on higher populations may be realized with more moisture during the growing season, however more research is needed with adequate moisture conditions. Harvest losses were in an acceptable range due to good pod height and timely harvest.

Sponsored by: University of Nebraska Lincoln; Nebraska Corn Board

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