

Soybean Population Study (2006-2008)

With rising input costs, producers are examining ways to reduce costs of production. The objectives of this study were to evaluate the effects of various planting populations on soybean yield and economics.

Quad County On Farm Research Group

Year: 2006

Title: Soybean Population Study

Crop: 3 Irrigated Soybean Fields (Two 30" rows, one drilled)
1 Dryland Soybean Field (30" rows)

Quad Operators: Dan Aspegren John Dolnicek
David & Doug Cast Rick Hughes

Objective: Evaluate the effects of various planting populations on yield and economics.

Treatments:

90,000	120,000	150,000	180,000 –6 reps
100,000	130,000	160,000 – 3 reps	
150,000	175,000	190,000 – 3 reps	

2006 Soybean Population Results

Producer	90 K	100 K	120 K	130 K	150 K	160 K	175 K	180 K	190,000	Average
Fillmore #1*					68.4		66.6		67.1	67.4
Fillmore #2	65.9		66.2		68.4			68.6		67.3
Seward #1	65.2		65.9		65.3			66.3		65.7
Nuckolls #2**		38.7		40.6		42.7				40.7

*Drilled.

**Dryland and 30" Rows. Hailed at cotyledon stage but not replanted.

¹Fungicide seed treatment applied.

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**Fillmore #1 Producer
(drilled)**

Rep	Population	Stand	Yield	Avg.
1	190000	166000	68.4	67.2
	175000	166500	68.4	66.5
	150000	130500	69.3	68.4
2	190000	152666	66.6	
	150000	145000	68.0	
	175000	181000	65.9	
3	150000	145000	67.8	
	175000	172000	65.5	
	190000	177000	66.5	
		Plot Av	67.4	

Statistically significant at the 95% level for 150 vs. 175K and 150 vs. 190K. Significant at 99% level for 150 vs. 175K.

**Nuckolls Producer
(dryland and 30" rows)**

Rep	Population	Stand	Yield	Avg.
1	100000	67250	37.1	38.64
	130000	82250	39.8	40.61
	160000	101750	43.8	42.69
2	160000	95500	41.0	
	100000	82750	39.4	
	130000	96000	38.9	
3	130000	90000	43.1	
	160000	96500	43.3	
	100000	73250	39.4	
		Plot Av	40.7	

Statistically significant at the 95% level for 100 vs. 160K. Hailed at cotyledon stage but not replanted-look at the final stands and yield. August rains benefited these soybeans.

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**Fillmore #2
Producer (30" rows)**

**Seward Producer
(30" rows)**

Rep	Population	Stand	Yield	Avg.
1	180000	150250	69.0	68.5
	120000	106000	66.2	66.2
	150000	134500	68.6	68.4
	90000	91750	65.9	65.9
2	180000	149250	67.7	
	120000	107000	67.0	
	150000	144500	69.9	
	90000	86000	67.2	
3	180000	175500	68.9	
	120000	104250	65.4	
	150000	141500	66.6	
	90000	89250	64.5	
		Plot Avg.	67.2	

Rep	Population	Yield	Avg.
1	90000	65.5	65.2
	180000	67.3	66.3
	120000	66.3	65.9
	150000	66.5	65.3
2	120000	65.0	
		64.6	
		64.1	
		63.9	
		65.4	
		66.4	
		67.8	
		65.4	
		65.4	

Population	Avg. Yield
90,000	65.5
120,000	66.1
150,000	66.9
180,000	67.4

**Statistically significant at the 95% level for:
90 vs. 150K, 90 vs. 180K,
and 120 vs. 180K.**

Quad County On Farm Research Group

Year: 2007

Title: Soybean Population Study

Crop: 7 Irrigated Ridge till Soybean Fields (30" rows)

Quad Operators: Dan Aspegren

Don & Mike Campbell

David & Doug Cast

Brandon & Daryl Hunnicutt

Jerry Stahr

Alan & Kevin Songster

South Central Ag Lab

Objective: Evaluate the effects of various planting populations on yield and economics.

Treatments: **90,000 120,000 150,000 180,000 --- 17 reps.**

80,000 100,000 120,000 140,000 160,000 --- 3 reps.

130,000 150,000 180,000 --- 3 reps.

2007 Soybean Population Results

Planting Dates & Varieties

Producer	Planting Date	Variety
Hamilton #1 3 Reps	6/4/07	Kruger 315SCN
Clay #1 4 Reps	5/21/07	Hogemeyer 316
York #1 3 Reps	5/5/07	NK S28G1
Fillmore #1 3 Reps	5/4/07	Pioneer 93M11
Seward #1 4 Reps	5/20/07	Asgrow AG3001

2007 Soybean Population Results

Final Populations

Producer	90 K	120 K	150 K	180 K
Hamilton #1 3 Reps	88,667	114,333	143,333	171,667
Clay #1 4 Reps	88,950	112,450	142,500	167,200
York #1 3 Reps	94,333*	119,833	153,667*	155,833
Fillmore #1 3 Reps	82,167	97,417	134,500	160,500
Seward #1 4 Reps	72,625	102,000	126,000	159,375
Average	84,812	108,974	139,324	162,959
% Stand	93%	91%	93%	91%

* 90K planted @ 95K & 150K planted @ 151K

2007 Soybean Population Results

Pods/Plant

Producer	90 K	120 K	150 K	180 K
Hamilton #1 3 Reps	57	46	38	36
Clay #1 4 Reps	-	-	-	-
York #1 3 Reps	70	47	40	45
Fillmore #1 3 Reps	83	68	43	49
Seward #1 4 Reps	93	44	42	34
Average	76	49	41	40

2007 Soybean Population Results

Pods/Acre

Producer	90 K	120 K	150 K	180 K
Hamilton #1 3 Reps	5.0 M	5.2 M	5.4 M	6.2 M
Clay #1 4 Reps	-	-	-	-
York #1 3 Reps	6.6 M	5.7 M	6.1 M	7.0 M
Fillmore #1 3 Reps	6.9 M	6.5 M	5.7 M	7.9 M
Seward #1 4 Reps	6.7 M	4.5 M	5.4 M	5.4 M
Average	6.3 M	5.3 M	5.6 M	6.4 M

2007 Soybean Population Results

Yield Results

Producer	90 K	120 K	150 K	180 K	Average
Hamilton #1* 3 Reps	52.8	51.8	51.4	52.9	52.2
Clay #1 4 Reps	61.5	60.9	61.1	61.7	61.3
York #1¹ 3 Reps	61.4	61.9	62.2	62.5	62.0
Fillmore #1* 3 Reps	56.5	57.5	58.0	58.9	57.7
Seward #1 4 Reps	63.1	63.9	62.8	63.4	63.3
Average	59.4	59.6	59.4	60.2	59.7 NS

*Some Hail

¹Fungicide Seed Treatment applied.

No statistical significance at the 95% or 99% level for any population.

2007 Soybean Population Results

Yield Results

Producer	80 K	100 K	120 K	130 K	140 K	150 K	160 K	180 K	Average
Hamilton #2* 3 Reps	60.2	61.8	63.2		61.9		61.7		61.7 NS
York # 2* 3 Reps				60.0		60.1		61.7	60.6 NS

* Hamilton #2 – Pioneer 33M11 planted 5/21/07.

* York # 2 -- Dekalb 256 planted 5/21/07.

No statistical significance at the 95% or 99% levels for any population.

Year: 2008 (3rd Year of Study)

Title: Soybean Population Study

Crop: 6 Irrigated Soybean Fields

Quad Operators: Dan Aspegren
David & Doug Cast
Jerry Stahr
Mike Campbell
Gerry George (data not included yet)
SCAL

Objective: Evaluate the effects of various planting populations on yield and economics.

Treatments: 90,000 120,000 150,000 180,000 --- 20 reps.

2008 Final Populations

Producer		90 K	120 K	150 K	180 K
Campbell	2 Reps	77,250	106,000	122,000	155,000
Stahr*	3 Reps	87,333	110,667	137,333	161,333
Aspegren	3 Reps	87,333	110,500	145,000	163,000
Casts	6 Reps	80,667	106,833	127,000	150,333
SCAL	6 Reps	86,883	111,417	142,667	166,750
Average		84,190	109,250	135,450	159,275
% Stand		93.5	91.0	90.3	88.5

* 90K planted @ 95K & 150K planted @ 151K

2008 Pods/Plant

Producer	90 K	120 K	150 K	180 K
Campbell 2 Reps	71	64	48	40
Stahr 3 Reps	70	56	48	38
Aspegren 3 Reps	63	58	51	45
Cast 6 Reps	60	43	42	38
SCAL 6 Reps	66	56	39	32
Average	65	54	44	37

2008 Pods/Acre

Producer	90 K	120 K	150 K	180 K
Campbell 2 Reps	5.5 M	6.8 M	5.9 M	6.2 M
Stahr 3 Reps	6.1 M	6.2 M	6.7 M	6.1 M
Aspegren 3 Reps	5.5 M	6.4 M	7.4 M	7.3 M
Cast 6 Reps	4.8 M	4.6 M	5.3 M	5.7 M
SCAL 6 Reps	5.6 M	6.2 M	5.6 M	5.3 M
Average	5.5 M	5.9 M	6.0 M	5.9 M

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2008 Yield Results

Producer	90 K	120 K	150 K	180 K	Average
Campbell 2 Reps	69.2	69.5	71.1	70.9	70.2
Stahr ¹ 3 Reps	67.7	69.7	71.0	71.8	70.1
Aspegren 3 Reps	76.7	77.3	78.1	78.2	77.6
Casts ² 6 Reps	65.9	67.2	68.2	68.2	67.4
SCAL ² 6 Reps	65.6	67.8	66.1	66.3	66.5
Average	68.1*	69.5	69.8	69.9	69.3

*Significant for 90K at 95 and 99%

¹Fungicide seed treatment or ²Fungicide/Insecticide seed treatment applied for planting date vs. population combined study.

2006-2008 Quad County Soybean Population Study

Summary: In 2006 (two locations), the average yield was 65.5 bushels/acre at 90K vs. 67.4 bushels/acre at 180K even though significant statistical yield differences occurred between populations. In 2007 (five locations), there were no significant population interactions with an average yield difference between 90 and 180K of 0.8 bushels/acre.

In 2008, the average yield was 68.1 bushels/acre at 90K compared to 69.9 bushels/acre at 180K. There was no significant yield difference between 120, 150, or 180K.

The data demonstrates that producers could plant 120,000 seeds/acre on 30" rows, reducing seeding rates by an average of 40,000 seeds/acre with no significant effect on soybean yields. Doing so could result in seed savings of \$10.66-18.57 (based on \$40-65/bag seed cost). This was observed regardless of whether or not a seed treatment fungicide was applied.