

# Mississippi Crop Situation

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## Soybeans

### **Dr. Trey Koger, Extension Soybean Specialist**

For the second week in a row seed quality and seed availability are the most critical issues affecting our soybean producers and everyone involved in the soybean industry as a whole. I spoke specifically in last week’s newsletter article about issues regarding seed quality and what is causing the low germination and poor quality seed in most cases. This week I feel it is important and timely to discuss our options when it comes to planting seed having low germination. The low germination is due mostly to mechanical damage to the seed. We only have two options to offset low germinating seed that is due to mechanical damage. One is to plant different seed, and with the short supply and high demand this is not an option this year. The other option is to plant more seed to account for the low germination. In the past we have typically assumed and our standard has been 80% germination. Even when seed tested higher than 80% germination, and outside of this year this has occurred frequently, we have typically tagged it 80% germination because that has been the norm. In years when demand has not been so high and supplies have not been limited, seed companies didn’t have to put seed having lower than 80% germination in the pipeline for planting purposes. This year is definitely an exception. We are going to plant a lot of seed this year having germination levels below 80%. By law we can not sale soybean seed for planting purposes in Mississippi that has less than 60% germination. This year we are going to plant a lot of seed that is between 60 and 80% germination. So be mindful of the percent germination of each variety that you plant. By state law, all soybean seed sold in the state must be tagged with percent germination information.

Extensive research has been conducted in the past three years on optimizing seeding rates for our early soybean production system. This research was conducted on heavy clay soils across planting dates ranging from early April to mid-May and for maturity group three, four, and five varieties. We found that planting date played a minor role in seeding rate recommendations. This was especially true for group three and four varieties. We have not planted many group three varieties in Mississippi in the past few years, but we will likely plant more this year due to the overall seed shortage. Maturity group three’s should be planted at rates to reach plant populations of 140,000 plants / acre and should be planted in the mid- to late-April planting window. Planting group three varieties earlier than mid- to late-April often result in sub-optimal growth and yield potential, as well as exposed row middles that do not canopy over in most cases. These seeding rate recommendations for group three’s are higher than those for group

four's and five's. Higher recommendations for group three's are due to the plants not establishing as much overall plant height and growth as group four's and five's. Planting group three's should be restricted to narrow row patterns only, since the plants often don't put on enough growth to lap the row middles in 38 or 40 inch rows. Group three's will probably put on sufficient growth to canopy the row middles in a twin-row system under irrigated settings.

As far as maturity group four's and five's the following explanations, diagrams, and tables define recommended seeding rates for Mississippi soybean producers. These seeding rate recommendations are based on desired plant populations that result in optimal yields. Table 1 indicates optimal plant populations for group four and five varieties across various planting dates. This table is derived from a lot of research conducted over multiple group four and five varieties, over years, as well as a wide range of seeding rates.

Tables 2 – 4 indicate seeding rates based on desired plant populations and more specifically the recommended number of seed to plant per acre and per foot of row for narrow row patterns. There is an individual table for narrow row patterns for 80, 70, and 60% germination levels.

Tables 5 – 7 indicate the same information but for twin-row systems. There are also individual tables for 80, 70, and 60% germination levels.

If you have any questions regarding seed quality issues, seeding rates, how germination levels affect seeding rate recommendations, or any other issues related to soybean please don't hesitate to contact me.

### Steps to determining soybean seeding rates based on seed quality.

Ideal seeding rates for your soybean production system can be determined using the four step process listed below. Seeding rate recommendations are based on recommended plant population for your system, percent germination and percent emergence estimates. Once a seeding rate is derived please refer to seeding rate charts for various row patterns including twin-row patterns.

#### Step 1. Identify recommended plant population for your system from table 1 (below).

- Recommended plant population based on planting date and maturity group.

<b>Table 1. Recommended plant populations for Mississippi soybean producers.</b>		
Planting date	Recommended <b>plant</b> population (plants / acre)	
	Group 4's	Group 5's
Late March to April 5	130,000	120,000
April 5 to April 20	120,000	100,000
Late April to early May	100,000	100,000

These numbers are recommended **plant populations** not final seeding rates.

#### Step 2. Determine the percent germination, which should be indicated on the seed bag.

**Step 3. Estimate percent emergence, which is the % of the seed capable of germinating that will actually come up. This estimate should be determined on a field by field situation and is dependant on the type of planter or drill, field conditions (i.e. roughness),**

planting depth according to moisture conditions, etc. The % emergence estimate is not provided on the seed tag and is an arbitrary number to be determined prior to planting. Typically 90% percent emergence is a good rule of thumb, but should not be used in all situations.

**Step 4. Calculate required seeding rate based on desired plant population, percent germination, and estimated percent emergence.**

First calculation: Divide desired plant population by % germination

Second calculation: Divide 150,000 / percent emergence estimate

Final number will be the recommended seeding rate.

**For example:** assume a grower is planting a group 4 variety in mid-April. The recommended plant population (table 1) is 120,000 plants / acre. The bag states 75% germination and the grower assumes 90% of the seed capable of germinating will actually come up.

Here are the calculations to go through to get the desired seeding rate for this scenario.

First calculation: 
$$\frac{120,000 \text{ (desired plant population)}}{0.8 \text{ (percent germination)}} = 150,000$$

Second calculation: 
$$\frac{150,000}{0.9} = 167,000 \text{ seed / acre is the recommended seeding rate to plant}$$

**Following tables indicate how many seed per foot of row to plant depending on row spacing and percent germination level.**

- Tables 2 – 4 are for **narrow row spacings** at 80, 70, and 60% germination levels.
- Tables 5 – 7 are for **twin-row patterns** at 80, 70, and 60% germination levels.
- All tables assume 90% emergence.
- Step 1. Use the table above (Table 1) to determine recommended plant population to be planted.
- Step 2. Then find appropriate table below depending on your row pattern and percent germination of your seed to determine how many seed to plant per foot of row.

**Table 2. 80% germination and narrow row spacings**

Desired # of plants / acre	Seeding rate seed / acre	Row spacing (inches)							
		7.5	8	10	15	18	20	25	30
		seed / ft of row to be planted							
<b>100,000</b>	139,000	2.0	2.1	2.7	4.0	4.8	5.3	6.6	8.0
<b>110,000</b>	153,000	2.2	2.3	2.9	4.4	5.3	5.9	7.3	8.8
<b>120,000</b>	167,000	2.4	2.6	3.2	4.8	5.8	6.4	8.0	9.6
<b>130,000</b>	181,000	2.6	2.8	3.5	5.2	6.2	6.9	8.6	10.4
<b>140,000</b>	195,000	2.8	3.0	3.7	5.6	6.7	7.5	9.3	11.2
<b>150,000</b>	209,000	3.0	3.2	4.0	6.0	7.2	8.0	10.0	12.0

**Table 3. 70% germination and narrow row spacings**

Desired # of plants	Seeding rate	Row spacing (inches)							
		7.5	8	10	15	18	20	25	30
plants / acre	seed / acre	seed / ft of row to be planted							
100,000	159,000	2.3	2.4	3	4.6	5.5	6.1	7.6	9.1
110,000	175,000	2.5	2.7	3.3	5	6	6.7	8.4	10
120,000	191,000	2.7	2.9	3.6	5.5	6.6	7.3	9.1	11
130,000	206,000	3	3.2	3.9	5.9	7.1	7.9	9.9	11.9
140,000	222,000	3.2	3.4	4.2	6.4	7.6	8.5	10.6	12.8
150,000	238,000	3.4	3.6	4.5	6.8	8.2	9.1	11.4	13.7

**Table 4. 60% germination and narrow row spacings**

Desired # of plants	Seeding rate	Row spacing (inches)							
		7.5	8	10	15	18	20	25	30
plants / acre	seed / acre	seed / ft of row to be planted							
100,000	185,000	2.7	2.8	3.5	5.3	6.4	7.1	8.9	10.6
110,000	204,000	2.9	3.1	3.9	5.8	7	7.8	9.7	11.7
120,000	222,000	3.2	3.4	4.2	6.4	7.6	8.5	10.6	12.8
130,000	241,000	3.5	3.7	4.6	6.9	8.3	9.2	11.5	13.9
140,000	259,000	3.7	4	5	7.4	8.9	10	12.4	14.9
150,000	278,000	4	4.3	5.3	8	9.6	10.6	13.3	16

**Table 5. 80% germination for wide-row and twin-row patterns**

Desired # of plants	Seeding rate	Wide-row (inches)		Twin-row*	
		38	40	38-inch row	40-inch row
plants / acre	seed / acre	Seed / ft of row to be planted in each row			
100,000	139,000	10.1	10.6	5.1	5.3
110,000	153,000	11.1	11.7	5.5	5.8
120,000	167,000	12.1	12.8	6.1	6.4
130,000	181,000	13.2	13.9	6.5	6.9
140,000	195,000	14.2	15.0	7.1	7.5
150,000	209,000	15.2	16.0	7.6	8.0

\*Seeding rate does not need to be adjusted for row spacing within a twin-row set (ex. 7.5, 8, or 10 inches between individual rows of a twin-row set). Adjust seeding rate for twin-rows only when switching from 38 or 40 inch main row pattern to twin-row row patterns.

**Table 6. 70% germination for wide-row and twin-row patterns**

Desired # of plants	Seeding rate	Wide-row (inches)		Twin-row*	
		38	40	38-inch row	40-inch row
plants / acre	seed / acre	Seed / ft of row to be planted in each row			
100,000	139,000	11.5	12.1	5.7	6.1
110,000	153,000	12.6	13.3	6.3	6.6
120,000	167,000	13.8	14.5	6.9	7.2
130,000	181,000	15	15.7	7.5	7.8
140,000	195,000	16.1	17	8.1	8.5
150,000	209,000	17.3	18.2	8.6	9.1

\*Seeding rate does not need to be adjusted for row spacing within a twin-row set (ex. 7.5, 8, or 10 inches between individual rows of a twin-row set). Adjust seeding rate for twin-rows only when switching from 38 or 40 inch main row pattern to twin-row row patterns.

**Table 7. 60% germination for wide-row and twin-row patterns**

Desired # of plants	Seeding rate	Wide-row (inches)		Twin-row*		
		plants / acre	seed / acre	38	40	38-inch row
Seed / ft of row to be planted in each row						
100,000	185,000	13.5	14.2	6.7	7.1	
110,000	204,000	14.8	15.5	7.4	7.7	
120,000	222,000	16.1	17	8	8.5	
130,000	241,000	17.5	18.4	8.7	9.2	
140,000	259,000	18.8	19.8	9.4	9.9	
150,000	278,000	20.1	21.2	10	10.6	

\*Seeding rate does not need to be adjusted for row spacing within a twin-row set (ex. 7.5, 8, or 10 inches between individual rows of a twin-row set). Adjust seeding rate for twin-rows only when switching from 38 or 40 inch main row pattern to twin-row row patterns.

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