K-STATE Research and Extension | Wildcat District

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Over-Planting Thin Soybean Stands

It might not seem like it after a year of drought, but we haven't had much more than the average amount of rain in May here in southeast Kansas. However, all these storms have been consistent and have had areas of localized flooding. This has been hard on getting long-season soybeans in the ground and created thin stands in fields that did get planted. While poor germination can be caused by a great variety of factors, flooding of our heavy clay soils is a common one.

Many soybean fields have been left with poor stands in terrace channels and on the edges of fields where water collects. Saturated conditions for 48 hours can reduce germination by 30 to 70%. The seedlings that do make it through can be damaged and slowed as well. For the fields that were already germinated and had a little growth, young seedlings at V2 to V4 can survive 3 to 4 days of waterlogging, depending on variety.

Over-planting soybeans is not ideal, but an area of the field can have such a poor stand that there could be few other options. The first step in over-planting is not underestimate soybeans ability to compensate for thin stands. As can be seen in Table 1 from Purdue Extension, a soybean population between 60,000 to 80,000 plants per acre can still result in nearly full yields. Similar results have been shown in K-State Extension research where nearly 100% yield were achieved at populations of 77,000 plants per acre. It isn't until plant populations get into 30s to 40s, often only a third of planting rates, which yield effects start majority decline. Another thing to keep in mind is that replanting is going to damage some of the current stand of seedlings. Soybeans at the V3 to V4 stage are pretty flexible but not from a direct hit from a coulter and closer wheel.

The second step is to calculate what the current stand is. One method is to count the number of plants in a row for a certain length. It is easiest to do this in 1/1000 of an acre row lengths;

15" rows: Number of plants in row for 34 ft and 10 inches X 1000 = population per acre

30" rows: Number of plants in row for 17 ft and 5 inches x 1000= population per acre

In thin stands, the hulu hoop method is often the easiest.

24" diameter hoop: Number of plants in hoop X 13,872 = population per acre

30" diameter hoop: Number of plants in hoop X 8,878 = population per acre

For either method, make at minimum 5 averaged checks throughout the area in question, and attempt to be as random in sampling as possible. Often the real problem is deciding the line between the good part of the field and that which might be replanted. Usually that decision depends on the length of the planter.

To majorly summarize the research from Missouri and Purdue Extension, the expected yield from soybeans planted in mid to late June are around 80% of those planted as full season in mid-May. To determine if the flooded area is even large enough to be worth the effort, Google Maps

can calculate area with some estimating from a satellite picture. In the field, there are some phone apps that can help. Personally, I use Field Area Measure but there are a number of good ones.

The third step is putting it all together and determining if the expected yield increase from over-planting is worth the cost of seed and fuel. Figure 2 from Purdue Extension lines out many of the expected costs and returns within the replanting calculation.

It is likely that, unless farmers have large areas of the field at least a planter length wide that have been completely wiped out, it is going to be hard to justify replanting. Please contact your local K-State Extension office is you have questions or need help in finding publications for replanting or overplanting.

Population	**Yield as Percent of Normal**	
Plants/Acre	**Drill** (7.5-inch rows)	**Planter** (30 inch rows)
160,000	100	100
120,000	100	100
80,000	96	100
60,000	92	94
40,000	87	88
20,000	77	81
10,000	58	72

Adapted from Purdue Extension publication ID-179, Corn & Soybean Field Guide

Figure 1. Final Soybeans Populations to Expected Yield

1. Base yield for field		_____ bu./A
2. Estimate of yield as percent of normal from reduced stands (see Table 3)		_____ %
3. Estimate of deficient stand yield [(line 1 x line 2) / 100]		_____ bu./A
4. Projected gross income (line 3 x market price)		$ _____ /A
5. Additional weed control cost for poor stand		$ _____ /A
6. Gross return with no replanting (line 4 – line 5)		$ _____ /A
7. Estimate of yield as a percent of normal from delayed planting (see Table 4)		_____ %
8. Estimate of yield for replanting [(line 1 x line 7) / 100]		_____ bu./A
9. Projected gross income from replanting (line 8 x market price)		$ _____ /A
10. Cost of replanting		
a. Seed	$_____/A	
b. Fuel, machinery, labor	$_____/A	
c. Pesticides	$_____/A	
d. Other costs	$_____/A	$ _____ /A
11. Gross returns from replanting (line 9 – line 10)		$ _____ /A
12. Compare gross returns on lines 6 and 11 to determine whether to replant		

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Figure 2. Over-planting Cost and Benefit Calculation.

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