



Adjusting Plant Populations for Low-Germination Soybean Seed

// Soybean seed quality was impacted by the fall weather in many locations in 2018, which may result in lower germination rates in the spring of 2019.

Planning, preparation, and management can be used to reduce the impact of lower seed germination rates.

Seeding rates for soybean have been trending lower in the past decade, with many recommending a seeding rate of 140,000 seeds/acre, with a final stand of 100,000 plants/acre in highly productive fields and 135,000 plants/acre in less productive fields or low productivity areas within fields.^{1,2}

It is uncommon for any soybean seed lot to test at 100% germination; review the seed tag for the germination percentage given by the seed company. Additionally, not every seed that germinates will result in a mature plant at harvest. On average, the survival rate for a germinating soybean seed is 85%.³ Estimate the seeding rate by using both the germination percentage listed on the seed tag and the survival rate.

For example, at 90% germination and an 85% survival rate, multiply the decimal equivalents of both ($0.90 \times 0.85 = 0.765$). Then, divide the desired final stand (100,000 plants/acre) by the decimal number obtained previously ($100,000/0.765 = 130,719$ seeds/acre). You may want to round this up to 140,000 seeds/acre to ensure that you reach the desired final plant population of 100,000 plants/acre. Use of a seed treatment is also recommended to ensure that the survival rate is as high as possible, particularly when planting under cool and wet soil conditions, which are more common with early planting dates, and/or if the field has a history of seedling diseases, particularly phytophthora.⁴

Additional Management Suggestions

To obtain the desired seeding rate, ensure that the planter or drill is properly calibrated. For calibration tips for a small grain drill, check out this [article](#) from Purdue Extension. For a row planter, consult the owner's manual for proper calibration. Plant at the recommended depth of 1 to 1.5 inches.⁶ With early planting, high residue seedbeds, fine textured soils, or moist conditions, consider planting at the shallower range. If planting later, in coarse textured soils, or in dry soils, plant at the deeper end of the range.

Impact of Seed Size

Most soybean products are sold by seed count, 140,000 seeds/bag. An average seed size is 2,800 seeds/pound, but seed size can vary among seed products. Using the average seed size of 2,800 seeds/pound a bag of 140,000 seeds would weigh 50 pounds. If the seeds were smaller, at 3,200 seeds/pound, a bag of 140,000 seeds would weigh slightly less than 44 pounds. While seed size may vary, under most conditions, seed size will have no impact on germination or vigor.⁵

Sources (verified 02/15/19)

1 Conley, S. and Smith, D. 2018. The soybean seeding rate conundrum. University of Wisconsin Extension. University of Wisconsin. <https://coolbean.info/2018/04/18/the-soybean-seeding-rate-conundrum/>

2 Rees, J., Thompson, L., and Mueller, N. 2018. What on-farm research has taught us about soybean seeding rates. University of Nebraska. <https://cropwatch.unl.edu/2018/what-farm-research-has-taught-us-about-soybean-seeding-rates>

3 Specht, J., Thompson, L., Rees, J., Grassini, P., Glewen, K., and Tenorio, F. 2016. Soybean seeding rate tips. University of Nebraska. <https://cropwatch.unl.edu/2016/soybean-seeding-rate-tips>

4 Specht, J., Wright, R., and Prior, R. Q&A: when does soybean seed treatment pay?. 2018. University of Nebraska. <https://cropwatch.unl.edu/2018/qa-when-does-soybean-seed-treatment-pay>

5 Wiebold, W. 2008. Soybean seed size does not affect yield performance. University of Missouri. <https://ipm.missouri.edu/ipcm/2008/11/Soybean-Seed-Size-Does-Not-Affect-Yield-Performance/>

6 Staton, M. 2016. Soybean planting depth matters. Michigan State University Extension. https://www.canr.msu.edu/news/soybean_planting_depth_matters

Web Links: <https://www.extension.purdue.edu/extmedia/ABE/ABE-126-W.pdf>

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Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

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