The 2012 growing season will be remembered by many as one of the driest on record. Many parts of the Midwest were under drought conditions for the majority of the growing season. As a result of the drought stress conditions, some lots of soybean seed may have low quality with germination below 90 percent. In addition, soybean size may also be more variable. To compensate for low germination, adjustments may be needed to seeding rates for the 2013 growing season.

**Seed Size**

While seed size is influenced partially by genetics, the environment during seed fill plays a larger role. Small and large seeds of the same variety have the same genetic material and therefore, the same yield potential. Under most conditions, seed size does not affect germination or emergence. In extreme situations, differences may be observed. Large seed, due to a larger energy reserve, may be able to survive a longer period of time prior to emergence under adverse weather conditions. However, the size of cotyledons increases with seed size and therefore large seeds require more energy to emerge from the soil. Larger seeds, which require more moisture for germination, may also suffer from reduced emergence relative to small seed in extremely dry soil moisture conditions.

**Low-Germination Soybean Seed and Seeding Rate**

For several years, a general rule of thumb for soybean seeding rates in parts of the Midwest was 150,000, 175,000, and 200,000 seeds per acre in 30 inch rows, 15 inch rows, and drilled beans, respectively. In the past, it was not uncommon for farmers in some geographies to plant upwards of 240,000 seeds per acre to compensate for potential stand loss from challenging clay soils and seedling diseases such as Phytophthora.

Both historically and currently, a healthy, consistent, and uniform stand of 100,000 plants per acre (ppa) is generally considered the threshold for replant situations\(^1\). Often 100,000 to 125,000 ppa at harvest is the optimum for profitability and possibly yield potential. While the threshold for replant situations may be around 100,000 ppa, the seeding rate recommendations to help attain maximum profitability and/or yield potential vary by geography and local conditions. Follow local university recommendations for desired plant populations.

Since germination in some seed lots may be below the normal 90 percent, seed tags should be checked for each seed lot planted to determine the germination percentage and seed size. Drills and planters should be adjusted for each seed lot to assure an adequate plant population. A general formula to determine seeding rate is\(^2\):  

\[
\text{Desired Plant Population} = \frac{\text{Percent Germination} \times \text{Percent Pure Live Seed} \times \text{Percent Live Seed Emergence}}{100}
\]

The percent live seed emergence estimate is not provided on the seed tag and is an arbitrary number determined prior to planting. The estimate should be determined on a field by field basis and is dependent on variables such as the type of planter or drill, field conditions, planting depth, etc. Typically 90 percent is a good rule of thumb, but should not be used in all situations.

For example, let's say a grower wants to establish a stand of 165,000 ppa in 7.5 inch drilled rows. The seed tag indicates the seed has an 89 percent germination rate and is 95 percent pure live seed. Assuming a 10 percent loss in germination due to clay soil that crusts, what seed rate will achieve the goal stand?

\[
\begin{align*}
\text{165,000 plants per acre (Desired Stand)} & = 165,000 \\
\text{(.89) Percent Germination x (.95) Percent Pure Live Seed x (.90) Percent Live Seed Emergence} & = 216,834 \\
\text{216,834 seeds per acre} & \text{ (Planting Rate)}
\end{align*}
\]

Continued on next page
When managing low germination soybean seed, it is important to achieve a good stand the first time and avoid situations where it becomes necessary to replant. It is also important to reduce the stresses when planting low germination soybean seed, particularly cold and/or wet soils. Seed lots with higher germination percentages should be planted first leaving low germination seed lots for later in the planting season when conditions are more ideal.

**Soybean Seed Treatments**
Seedling diseases of soybean may result in reduced plant stands, poor plant vigor, and lower yield potential. A fungicide treatment, such as Acceleron® Seed Treatment Products for soybean, can be effective at protecting seeds and young seedlings from many seedborne and soil borne pathogens. Fungicide treatments will not improve germination of seed that has reduced quality, but may protect the seed from soil pathogens if the seed is planted into cold and/or wet soils.

**Summary**
Due to drought conditions in 2012, germination levels in some soybean seedlots may be below the “normal” 90 percent. Read the seed tag for each bag or unit and adjust seeding rates as necessary for low germination seedlots. Plant soybeans when soil conditions are suitable and consider a seed treatment to help protect soybeans form seed and soil born fungi.

**Sources**

Additional resources:


**Individual results may vary**, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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