

Planting and Potential of Large Soybean Seed

- Yield potential, disease tolerance, relative maturity, plant height, and standability are characteristics that should be considered when selecting a soybean product.
- Seed size is not a component of maximizing soybean yield potential.
- Optimum seeding depth for soybean seed is 1 to 1.5 inches.
- Planting equipment should be calibrated according to manufacturer and aftermarket manuals.

Soybean Product Selection

Product selection is a critical component of maximizing soybean yield potential for any farming operation. Yield potential, disease tolerance, relative maturity (RM), plant height, and standability are characteristics that should be considered when selecting a product. Note that seed size is not mentioned as a component for maximizing yield potential.

Yield Potential. Products should maintain high yield potential and stable performance across multiple locations in the growing region. When possible, multi-year data summaries should be used to evaluate products.

Disease Tolerance. Products with tolerance/resistance to soybean diseases, such as soybean cyst nematode, late-season phytophthora, sudden death syndrome, southern stem canker, and brown stem rot, should be utilized if there is a field history of the diseases.

Relative Maturity. Selecting products with different maturities can help maintain yield potential when adverse environmental situations occur during seed fill. Full season products for an area tend to have the highest yield potential.

Plant Height and Standability. For fields with high fertility, a short or moderate plant height product with good standability can help minimize lodging concerns. In less fertile soils, taller plant types may set pods a bit higher, which can allow for greater harvest efficiency.

Seed Size

Small and large seeds of the same product have the same genetic material; therefore, the same yield potential. While seed size is influenced partially by genetics, the environment during seed fill plays a larger role. Under most conditions, germination and emergence are not affected by seed size. However, in some extreme and rare situations, differences may be observed. For example, large seed, when subjected to adverse conditions after planting, may be able to survive a longer period of time prior to emergence due to a larger energy reserve. The larger energy

reserve can also be detrimental, as the increased size of the cotyledons requires more energy to be pulled above the ground. Additionally, larger seeds, which require more moisture for germination, could suffer from extremely dry soil conditions. Given that these are extremes and do not normally occur, the optimum seeding depth for soybean seed and environmental conditions at planting is normally around 1 to 1.5 inches.

Adjusting Planting Equipment

To help achieve a stand with the desired population and uniformity, the planter should be adjusted according to the manufacturer's recommendations and those from any aftermarket equipment that may have been added to the original equipment. With larger seed, under seeding is more likely than over seeding. While soybean plants can often compensate for lower populations by bushing out, stand uniformity is still critical to help control early weed flushes. Often air planters, either vacuum or positive air flow planters, may require more pressure for larger seeds. Some planters may require a different disc or altered baffle settings.

Precision Planting® conducted plantability tests with larger soybean seeds to evaluate the impact of those seeds on meter performance. Tests were conducted on treated and untreated seed ranging in size from 2,670 to below 2,000 seeds per pound. Overall, seed treatment had no effect on planter performance within the seed sizes tested. Results and recommendations are as follows:

Feed Cup or Radial Meter Type Planters. The soybean plantability study found that the John Deere® mechanical planter (56 cell brush) had an increase in skips (under-population) when population was increased with seed sizes above 2,200 seeds per pound (Table 1). Target population settings should be adjusted to correct for meter under-population.¹

For Kinze® planters with Brush-Type Seed Meters, the black 60



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cell soybean disk is generally used for smaller seed. The dark blue 48 cell brush meter seed plate is recommended for larger seed (1,400 to 2,200 seeds per pound).² Soybean plantability studies found that the standard 60 cell brush works well until seed size falls below 2,000 seeds per pound. The 48 cell brush should NOT be used on seeds smaller than 2,200 seeds per pound. When unsure which to use, begin with the 60 cell brush and monitor performance.³

Vacuum Metering Units

The plantability study conducted by Precision Planting[®] found that the John Deere[®] Vacuum planter (108 cell) had no performance issues with large seed. Precision Planting[®] vSet[™] and eSet[®] vacuum disk planters had no performance issues but the eSet disks are only recommended for 15-inch rows. The Case IH[®] vacuum planter (100 cell) meter performance was highly variable. However, performance was not influenced by seed treatment, seed size, or population. In this situation, it is recommended to use the standard settings, monitor closely, and make adjustments as necessary.¹

Tips for Calibrating Planting Equipment

- Planting equipment should be calibrated for the seed size and seeding rate desired.
- Refer to the manufacturer's and aftermarket manuals for planter calibration instructions and seeding rate charts with specific settings and seed sizes.
- The seeding rate should be checked in the field by catching the seed coming from the meters when traveling a known distance and counting the number of seeds collected to determine the seeding rate.
- Calibration should be on the basis of seeds per foot of row and never on the basis of pounds of seed per acre.

Table 1. John Deere[®] Mechanical Planter (56 Cell Brush) setting recommendations for increased target populations.³

Desired Population (seeds per acre)	Target Population Settings Adjustment
Less than 145,000	No Change
145,000 to 175,000	+5%
175,000 to 205,000	+10%
205,000 and higher	+10% initially, monitor closely and correct as needed.

¹Technical Bulletin: Affects of large soybean seed size on meter performance. April 17, 2013. Precision Planting[®].

Table 2. Equipment Adjustments to Plant Larger Soybean Seed

Planter Type	Large Seeded Soybean Recommendations
John Deere [®] Vacuum	Use disk # A42586 (108 cell) for 1,700 to 3,500 seeds/lb and vacuum level of 8 inches ⁴
Case IH Early Riser [®] ASM Seed Meter System	Seed disk B7698875 (10045-SB) or 377669A1 (8045-SB) and vacuum setting of 15-17 inches, baffle setting of 2, and singulator dial setting of 8 for 2,000 to 3,500 seeds/lb ⁵
Kinze [®] Brush-Type Seed Meter	Use Dark Blue 48 cell soybean disc for 1,400 to 2,200 seeds/lb ²
Kinze [®] EdgeVac [®] Seed Metering System	Black 60 cell for 2,200 to 4,000 seeds/lb; Dark Blue 120 cell for high rate seeding of 2,200 to 4,000 seeds/lb ⁶
John Deere Radial Bean Meter	Use "C" setting for 2,000 to 2,800 seeds/lb ⁷
John Deere Feed-Cup	Use soybean cup and standard soybean seed guide
John Deere 750 Grain Drill	Set Seed Index Notches to manual specifications for the rate in lbs/acre

Sources:

¹Technical Bulletin: Affects of large soybean seed size on meter performance. April 17, 2013. Precision Planting[®]; ²Kinze[®] Black and Blue soybean discs. <http://www.sloanex.com>. (verified 3/6/14); ³<http://manuals.deere.com> (verified 3/6/14); ⁴John Deere[®] planter parts, parts guide. John Deere[®]. <https://jdparts.deere.com> (verified 3/6/14); ⁵Early Riser[®] Planter Productivity Tips. 2012. PL-3076-12. CNH America LLC. www.caseih.com (verified 3/6/14); ⁶Introducing Kinze[®] EdgeVac[®] seed metering. Kinze Manufacturing. EV 7-05. <http://www.machinery.com> (verified 3/6/14); ⁷OMA86807. Deere/Bauer Planters John Deere[®] Components. 2002. Deere & Company. <http://deere.com>; John Deere[®]. <http://www.deere.com> (verified 3/6/14). Other sources: QA seed services lab. Monsanto Company. Waterman, IL.; Hawkins, S. E., and D. R. Ess. Grain drill metering systems and the need for calibration. ABE-126-W. Purdue Extension. Purdue University.

For additional agronomic information, please contact your local seed representative.

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. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Leaf Design[®] is a registered trademark of Monsanto Company. Specialty and Design[®] is a registered trademark of American Seeds, LLC. Precision Planting[®] is a registered trademark of Precision Planting LLC. All other trademarks are the property of their respective owners. ©2014 Monsanto Company. 03262014LGM