



Agronomic Spotlight

Adjusting Your Planter for Corn Seed Size

- Genetic yield potential is not affected by corn seed size or shape.
- Adjustments to planter equipment can help achieve desired plant stands by minimizing doubles or skips.
- Corn seed performance can be optimized by focusing on genetic yield potential, increasing populations, and identifying planter settings that can help deliver seed more accurately.

Seed Size and Yield Potential

Varying environmental conditions may result in a variety of seed sizes and shapes from the same corn product. Seed size is also affected by corn product genetics and growing conditions, especially during the pollination and grain fill period. Typically, large rounds come from the base of the ear, flats from the center, and small flats and small rounds from the tip (Figure 1). Plateless seed usually comes from the base or the tip. Regardless of size or shape, all seeds from the same ear and from the same plant have the same genetic material, and thus the same genetic yield potential.



Figure 1. Seed size and shape on a corn ear varies from large rounds (cob base), flats (middle of cob), to small rounds (cob tip).

Though genetic yield potential is not affected by seed size, there can be differences in germination related to seed size under adverse planting conditions. Large seed can have slightly decreased emergence rates in dry soil conditions because large seed requires more moisture to germinate compared to small seed. Small seed can have slightly decreased emergence in cool or crusted soils because the energy needed for emergence in these environments may be greater than the amount stored in the endosperm. The differences noted in early growth related to seed size are usually not apparent after tasseling. Similar silking dates and grain yield are expected when emerged plant populations are the same regardless of seed size and shape.

Seed Weight

It is becoming more common for seed companies to sell seed based on weight as opposed to size. Farmers often purchase specific seed weights based on how their planter is configured. As noted above, the size and weight of the seed does not affect yield potential. Yield potential is

determined by genetics, product positioning, and management practices. When purchasing corn seed by weight, it is important to review the seed bag labels and your planter manufacturer's recommendations, and talk with your seed brand agronomist or representative for information on dealing with different sizes and weights of seed, planter specifications, and proper field placement. When properly managed and properly positioned, corn seed of any size and weight can produce a successful crop.

Adjusting Planters for Seed Size and Shape

Planter settings should be adjusted for accurate seed positioning, placement, and seeding rate. When adjusted for seed size, a planter can more accurately singulate and deliver seed. Planters can deliver excessive numbers of doubles or skips when improperly adjusted for seed size. Consequently, grain yield potential can be reduced by 3 to 10 bushels per acre.¹

Vacuum Planters. Adjustments can be made to the vacuum pressure, disk and/or cell size, and seed singulation devices that can affect plantability. Planters equipped with cell or flat disks have different requirements for adjustment. Another component to examine, regardless of disk type, is the way the disk is adjusted relative to the meter housing. Having the disk rub the housing with light contact can help improve singulation, reduce seed damage, and help load the planter drives, improving their consistency.

Using talc, graphite, or a blend of the two can help improve seed flow and drop, especially with high rates of seed treatments and/or humid conditions. Higher amounts of talc or graphite may be necessary for the increased surface area with small seed. Talc or graphite should be mixed well throughout the hopper or tank to provide adequate coverage.

Vacuum Planters with Cell Disks. With cell disks, seed is partially held in place by the cell and partially by the vacuum pressure. Plantability is aided by matching different cell sizes and vacuum pressures to fit a given seed size and shape. Disks with cells that are on the larger end of the acceptable range for a given seed size could lead to doubles, even if the vacuum pressure is adjusted to the lower end of the acceptable range. Low vacuum pressures can increase the chance of seed being shaken off of the disk when planting over rough ground, resulting in increased skips. To help reduce doubles and skips, disks with cells on the smaller end of the acceptable range can be used while running vacuum pressures on the higher end of the acceptable range.

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Vacuum Planters with Flat Disks. Flat disks are less sensitive to different seed sizes and shapes and can provide more consistent plantability while reducing the need to adjust vacuum pressure. Examples are the Precision Planting® eSet® and vSet® systems and the John Deere® ProMAX 40 Flat Disk. Use of flat disks usually requires an additional component or two for singulation. The eSet and vSet systems utilize a floating singulator that requires no adjustments for ease of use while the ProMAX 40 Flat Disk uses a double eliminator and a knock-out wheel. Flat seed disks may need a slightly different environment than cell disks and users may benefit by visiting their equipment dealer for inspection and testing of their seed meters.

Finger Pick-up Planters. To help minimize planting errors, the following items can be evaluated and adjusted to operator manual specifications:

- Proper tension on the fingers
- Condition of meter brushes and carrier plate
- Pliability of seed delivery belt
- Seed baffle cleanliness
- Proper lubrication (graphite) rate
- Good alignment with meter drive and the lugs on the unit drive sprocket
- Well-maintained and lubricated drive chains

Plantability Tests

Plantability tests have been conducted to provide planter setting recommendations for seed lots. Results are represented in terms of percent singulation (the percentage of single seeds released by the seed meter at the proper time). If the seed sensor detects two seeds where only one should be, then it is called a multiple. If the seed sensor detects nothing where a seed should be, then it is considered a skip. Therefore, percent singulation is determined by taking 100% properly timed single seed drops and subtracting the percentage of multiples and skips.

Figures 2 and 3 depict singulation data for vacuum or finger pick-up planters with various seed sizes and shapes. The finger pick-up units were calibrated for larger seed, and data for smaller seed sizes and shapes are not presented. Simulated planter speed was 5.5 miles per hour. Data was collected using seed harvested in 2004 through 2010 for planting seasons in 2005 through 2011, respectively.

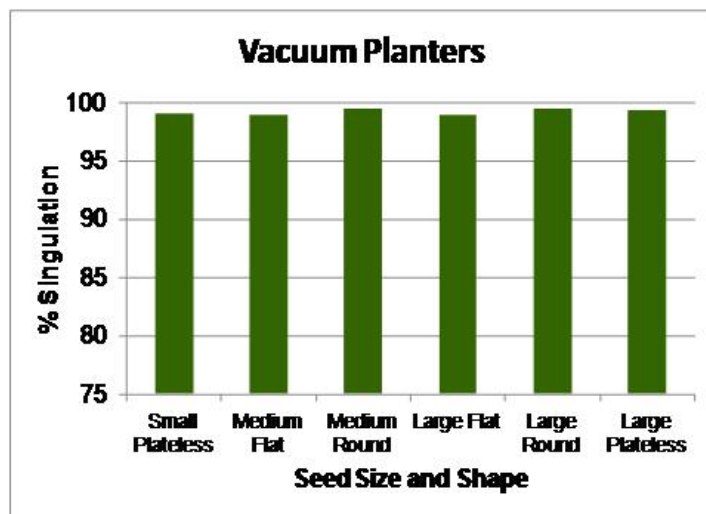


Figure 2. Percent singulation of Case IH ASM, John Deere® Pro-Series XP with ProMAX 40 Flat Disk, John Deere® MaxEmerge™ with cell disk, Kinze® EdgeVac® with cell disk, and Precision Planting® eSet® flat disk. Source: Monsanto Seed Technology Center in Waterman, Illinois.

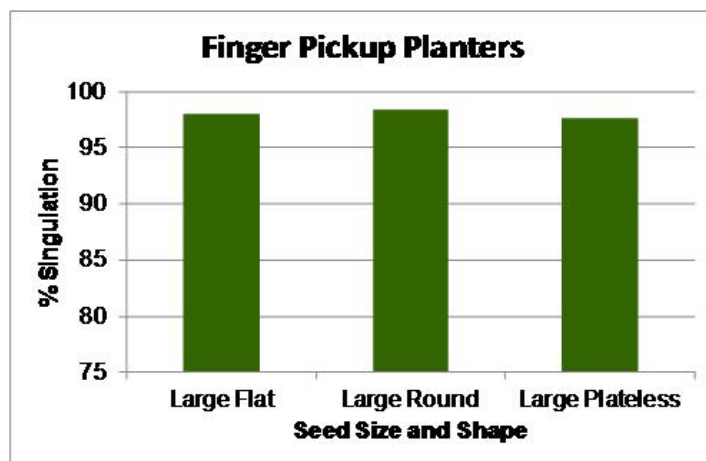


Figure 3. Percent singulation of John Deere®, Kinze®, and Precision Planting® are represented in the data. Source: Monsanto Seed Technology Center in Waterman, Illinois.

Sources

¹ Nielsen, R. 1996. Seed size, seed quality, and planter adjustments. www.agry.purdue.edu.
Elmore, R. and Abendroth, L. 2005. Do corn kernel size and shape really matter? Crop Watch Newsletter. University of Nebraska-Lincoln. Shillington, S. Senior Sales and Service Representative for Planters. John Deere Seeding Group. Moline, Illinois. October 22, 2010.
Monsanto data. 2010. Brian Urban, Waterman, IL. Seed Technology Center. Web sources verified 4/6/16. 140107070111

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. eSet®, Precision Planting® and vSet® are registered trademarks of Precision Planting, LLC. All other trademarks are the property of their respective owners. ©2016 Monsanto Company. 140107070111 041316CAM