

HANDLING BULK SOYBEAN SEED BEFORE PLANTING

Soybean planting seed frequently are purchased, handled, and planted from bulk quantities instead of the traditional 50 lb. bag. This creates a seed handling situation that can lead to mechanical damage of the seed, and the likely result is injury to the embryo which is located near the thin seed coat of soybean seed. A damaged embryo may result in a seed that will not germinate or one that may still germinate but produce a weakened seedling.

An [article](#) authored by Dr. Matt Darr, Mr. Ben Rethmel, and Mr. Randall Reeder provides results from research conducted to determine how the handling of bulk soybean seed can affect germination.

The researchers measured germination rates of soybean seed that had been subjected to four systems used for transporting seed from a gravity wagon to the bulk storage container on planters [for pictures and a detailed description of each transport system, see the [article](#)]. The four delivery systems were:

- 16-ft. brush auger, 6-in.-diameter steel tube;
- 16-ft. steel auger, 6-in.-diameter steel tube;
- 16-ft. plastic cupped auger, 6-in.-diameter steel tube;
- 18-ft. rubber-paddled belt conveyor, 6-in.-diameter steel tube.

During the tests, variety, seed size, seed moisture content, seed temperature, testing room conditions, and transport angle of each system were constant. Each handling system was in like-new condition at the start of the test to eliminate the effect of wear and machinery quality on the results. A standard 10 bu/minute flow rate was used. The [warm germination test](#) was used to measure germination of seed from each delivery system plus germination of seed from a control lot that was not handled through any bulk method.

Results are in the following list and table.

- Seed emanating from the plastic cupped auger system were similar in germination to that of the control seed.
- Germination of seed emanating from the belt conveyor, brush auger, and steel auger systems was at least 6% lower than germination of seed from the control lot.

Transport type	Avg. germination
Control	87.5 a
Plastic cupped auger	86.0 a
Belt conveyor	81.6 ab
Brush auger	80.8 b
Steel auger	80.8 b

The authors proffered three additional points to consider for lessening seed damage by all of the transport systems.

- Use a padded vs. an unpadded metal deflector plate at the exit of the transport systems.
- Use slower operating speeds with the same flow rate to ensure a fuller auger and slower exit speed.
- Germination losses realistically could be greater than those in this study if parts of the transport system are worn or damaged.

Take-Away Message

Bulk handling of soybean planting seed in the field can increase planting efficiency. However, the delivery system for moving these seed from a bulk storage container to the planter storage container should be selected and used according to the following guidelines presented by the researchers.

- Operate augers at low speeds and keep the mouth of the auger well supplied with seed.
- Use a padded nose at the end of the auger since plastic deflector plates can have a hardness rating comparable to that of metal.
- Replace worn augers, especially if using steel augers.
- Keep bearings and tubes well-maintained since a wobbling auger inside the tube will increase seed damage because of increased contact of the seed with the flighting edge.

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