



## Bin-Run vs. Professionally Grown Soybean Seed

### Interest in Planting Saved Soybean Seed

- Periods of low commodity prices can generate interest among soybean growers in planting bin-run seed rather than purchased seed as a cost-cutting measure.
- The patent for the original Roundup Ready trait expired in 2014, making it possible for the first time to legally save and replant seed of varieties possessing this trait not also protected by other patents.
- **However, in addition to legal considerations regarding patented soybean varieties, there are numerous agronomic and management considerations that make bin-run seed a less-favorable option than it may initially appear.**



### Legal Considerations

- The 1994 Plant Variety Protection Act (PVPA) allows growers to save and replant seed of protected varieties; however, the amount of seed a grower can legally save is limited to the amount needed to plant his or her own holdings.
- Most soybean varieties are protected by patents. Research-based seed companies have two tools to protect their inventions and Intellectual Property (IP):
  1. Commercial seed patents that prohibit saving and replanting seed. Patents can cover traits possessed by a variety (such as herbicide tolerance) or the variety itself.
  2. Plant Variety Protection (PVP) gives the developer the right to exclude others from selling the variety for a period of 20 years.
- Most seed companies – including DuPont Pioneer – require farmers to sign a technology use agreement (TUA) that grants the right to plant the seed for only one growing season.

### Yield of Professionally Grown Seed

- The first and most significant difference between planting professionally grown vs. bin-run soybean seed is yield.
- Numerous trials conducted across the country show professionally grown soybean seed outyields bin-run soybean seed — up to 2.7 bushels more per acre (Table 1).
- Professionally grown seed includes the most recent advancements in elite variety genetic gain (0.5 bu per year or more) and defensive traits (e.g. SDS).

**Table 1.** Summary of research trials comparing yield of soybean from professionally-grown seed vs. bin-run seed.

State	Seed Lots	Comparisons	Yield Advantage
			bu/acre
Illinois trials	44	—	+1.1
Illinois/Crop Improvement Assn.	—	5 acre side-by-sides	+2.7
North Carolina trials	166	204	+1.9
North Carolina/ Official Variety Tests	—	—	+1.0
Ohio trials	72	—	+1.4
Wisconsin/Soybean Yield Contests	—	—	+2.2
15-state trial results	—	769	+1.9
Canada trials	9	34	+0.7

### Environmental factors affect seed quality and germination

- There are many environmental factors from planting to harvest that can negatively impact seed quality and germination.
- Drought and heat stress during the seed fill period tends to lower standard germination percentage of the harvested soybeans. According to university research, germination percentage can be reduced 10% by severe drought, 3% by high air temperature and 29% by the interaction of drought stress and temperature (Dornbos, 1988).
- DuPont Pioneer soybean seed production fields are monitored throughout the growing season. Seed fields are harvested at optimum moistures to prevent cracked/shattered seed.



- Timely harvest is critical, as repeated wet and dry cycles prior to harvest can significantly impact seed quality.
- Cold and warm germination tests taken every eight weeks from harvest through seed delivery assure customers of consistent seed quality.

## Gentle handling from planting through conditioning prevents seed damage

- Soybean seed is sensitive. The seed coat can be damaged by routine handling through on-farm harvesting and grain conveyance equipment. The end result is lower germination and early stand establishment problems with bin-run seed.
- Application of a seed treatment to bin-run seed requires additional handling and transportation steps that are likely to result in additional seed damage.
- DuPont Pioneer uses the latest in seed handling technology to keep seed damage to a minimum and enhance the quality of the seed. The seed is handled as seed and not as commodity grain throughout planting, harvest, storage, and conditioning.



## Varietal Purity

- Varietal purity is important especially when considering the maturity, defensive traits and herbicide resistance of the varieties you wish to grow.
- Costly problems could be created if different varieties of herbicide-resistant and non-herbicide resistant seed were mixed together. Mixing varieties of different maturities can also create uneven stands and harvesting difficulties.
- Keeping varieties separated on the farm requires very careful cleaning of the planter, combine, wagons/trucks and storage facilities.

## Seed Purity

- Purity also means the absence of foreign matter - including weed seeds, corn seeds, dirt particles and disease/pest-carrying sclerotia and soil peds.
- Sclerotia (fungi particles that carry white mold) and soil peds (particles that can carry disease or pests such as SCN) are commonly found in farmer-grown seed. Because they are similar in size to soybean seed, these particles may escape basic seed cleaning equipment employed by the farmer and can contribute to the spread of white mold or SCN infestation if planted.
- Pioneer seed production facilities utilize specialized equipment to separate and remove foreign matter from seed.
- Quality control measures at Pioneer seed conditioning plants include zero tolerance for weeds such as black nightshade, which has berries nearly the same size and weight as soybean seed. When mature, these berries are easily crushed and the small, sticky seeds inside are very difficult to remove from the soybeans.
- The proliferation of weed populations resistant to glyphosate and other herbicides makes seed purity even more important to help prevent the spread of resistant weed seed.

## Value Calculator

- Growers need to carefully consider the full cost of bin-run seed, which can include several key factors that can easily be overlooked:
- Tangible Cost Considerations
 

1. Grain value lost	\$10
• (Cash price \$10/bu)	
2. Cleaning, storing, trucking & labor cost	\$3
• (\$3.00 /bu)	
3. Yield difference (bin run deficit).	\$27
• (2.7 bu x \$10)	
4. New variety yield gain (y/y genetic gain).	\$10
• (1.0 bu x \$10)	
<b>Total Cost = \$50/bu</b>	
- Intangible Cost Considerations
  1. No replant support
  2. No returns or swapping options
  3. No marketing offer opportunities

## References

Dombos, D.L. 1988. Soybean seed yield, viability and vigor, and chemical composition resulting from drought and high temperature stress during seed fill. Retrospective Theses and Dissertations. Paper 9337. Iowa State University.

Dunphy, E.J. and J.M. Ferguson. 1991. Field performance of farmer-saved and professionally grown soybean seed lots. Proceedings of the American Seed Trade Association Annual Meeting.

**Authors:** Mark Jeschke and Dan Alexander