Meeting Production Trait Requirements Terry Garner October 11th, 2018

Production Trait Requirements

Documentation: Agreements and Processes

- Field Activities
- Plant Activities
- Distribution

Documentation: Agreements and Processes

Provider Agreements - Clearly stating

- Trait and variety information
- Defined trait approval status, or approval pending
- Specific production practices required
 - Isolation, and rotation
 - Quality testing and standards
 - Who can test and approved test

Production Practices and Processes

- Agreement with producers and suppliers
- Varietal information, agronomic and trait
- Documentation of production expectations
- Clearly stated quality standards for producers and suppliers

If Stewardship Required

- Supplemental language for producers
- Required training for suppliers and growers
- Enhanced storage and distribution requirements for seed stock and seed as work in process
- Treated seed stock
- Specified Isolation and rotation requirements
- Expanded audits and assessments

Testing Plans

Test	LibertyLink	RR2Y	LL GT27
SG = Sand Germ	Х	Х	X
AA = Accelerated Aging	Х	Х	X
Mst = Moisture	X	X	X
Soak	X	X	X
SCnt = Seed Count	X	X	X
P = Purity	X	X	X
SSplit = SoySplit	X	Х	X
LL = Liberty Link	X		X
GT = Glyphosate Tolerant		X	
Nst = 2mEPSPS LFS	X	Х	
Bal = Balance IFT			X
STS = Sulfonylurea Tolerant Soybean	Select Varieties		
DMO LFS = (DMO Lateral Flow Strip)		Х	X
VP = Varietal Purity	Х	Х	Х
VSD = Visual Seed Defects	Х	Х	X
WSO = Weed Seed Observation	X	Х	X
USN = US Noxious	X	Х	X

Soybean Maturity Map

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Varieties can be moved into different maturity zones to aid growers in overall planning.

 Varieties out of zones may impact yield and agronomic characteristics.

Crop Rotation

Growing different crops in sequential seasons allow for management of volunteer from the previous years crop, improved weed, disease, and insect control.

- > It is critical when working with specific traits to understand the rotation order.
- Non-approved trait rotations require additional documentation and assurance that the same crop is not produced in the field for the defined period of time.



Grower and Field Selection, and Isolation



- Understand the variety to be grown, and any specific information on agronomics and traits, or pending approvals.
- Grower and field selection to address the production requirements.
 - Grower may require stewardship training, and field may need isolation or specific rotation plans.

 Isolation from surrounding crops if stewarded
Natural and planned

- Crop Rotation
 - Proceeding year
 - Following year, including monitoring if stewarded



Planter and Equipment Change-Over



 Planters allow the growers to manage their planting patterns, seed populations and planting depth.

- Nutrients and other materials can also be applied during planting.
- GPS and GIS systems can also be leveraged.
- All planters have seed delivery mechanisms that have to be thoroughly cleaned.

All seed stock is tested prior to planting to understand seed quality, germs, and traits



Planter boxes, seed plates, vacuum systems and hoses, as well as metering systems have to be inspected when working with non-approved traits

Soybean Growth Stages



Field Inspections



Confirmation of field acreage, row spacing, planting population.

- Verification of field isolation when working with stewarded varieties.
- Fields may have herbicide application requirements.

- Field observations for plant health and flower color
- Flowers either purple or white





Final field inspection before harvest. Looking for leaf drop consistency and late inspections for pubescence.

 Pubescence is gray, tawny, or light tawny (hairs on stem and pod)

Harvester and Equipment Change-Over

Soybean harvest preferably occurs between 11.0% and 13.5% moisture.

- Critical control points occur at harvest: grain segregation, harvester seed cleaning, truck inspection and cleaning, grain bin and conveyor checks if used.
- If stewarded varieties, additional handling precautions and change-over verification is completed.





Bulk raw sample taken at harvest



Numerous areas to clean within a harvester.

Soybean Markers

PHYSICAL MARKERS IN SOYBEAN



Tawny



Brown

Yellow

Gray















Buff

Yellow

Gray

Imp. Black



Gray



Yellow Buff



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Air Screen Cleaner



- Air screen cleaners are a key activity in conditioning soybeans.
- Removes the extra large seeds, pods and stems, as well as small seeds and dust.
- Documented change-over processes are imperative to ensure all remaining seed is collected and discarded appropriately.



Removal of screens and transition inspections are critical in ensuring varietal and trait integrity.

Color Sorter and Gravities



Color sorters utilize the lights and cameras in order to remove identified containments.

- Discolored soybeans or other particles.
- Shape sorting if equipped to do so.



Gravities use aeration, motion, and seed density to separate heavy seed from lighter seed and splits.



The bulk storage bins, conveyance equipment, and all activities in the conditioning process have to be thoroughly seed cleaned between varieties.

- Extra measures are undertaken if handling and stewarded varieties.
 - Documentation and in some cases double sign-off.



Packaging Systems



5.6M containers and paper bags are labeled with: (not all inclusive)

- Variety Brand Name w/Trait
- Variety
- State of Origin
- Lot Number
- Patent and PVP status
- Seeds per Pound
- Germination
- Bag Weight

Representative seed samples are collected at packaging and submitted to an approved lab for testing.



60 units – 140K seeds per bag

Customer Expectations

When customers buy soybean seed, they expect:

- Seeds in each bag or bulk load to have the same basic appearance and contain the desired traits.
- The yield potential and agronomic characteristics as stated.
- Ability to market the soybeans

