



## **Recommended Kernza® Evaluation Procedures** *For Grain Handler and Grower Use*

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## **PURPOSE:**

This publication provides training for grain handlers and guidance for establishing uniform Kernza® evaluation procedures.

Buyers are accustomed to using commodity grades, both certified and unofficial, to make more informed purchasing decisions.

Recommended procedures reflect the common ability of grain handlers to readily adapt existing procedures and equipment to lower the barrier of entry for Kernza® grain evaluation.

The needs of the buyer vary by intended end use and may require more stringent or specific quality standards.

## **BACKGROUND:**

Kernza® is a trademarked perennial grain (*Thinopyrum intermedium*) developed by The Land Institute, Salina, KS 67401, as a sustainable alternative to annual wheat. Kernza® can supply both grain and forage along with deep roots that benefit soil health. <sup>i</sup>

Local elevators and grain cooperatives provide an essential service to farmers by offering basic grain testing and grading. Such grading factors include: moisture, test weight, dockage, protein, and others. These services help farmers monitor the quality and condition of their crops, whether in storage, during harvest, or in preparation for sale. Expanding these grading services to include emerging or specialty commodities—such as Kernza® (intermediate wheatgrass)—would offer immediate benefits to farmers growing such commodities.

### Benefits of Expanding Local Grading Capabilities:

1. **Better Market Access for Farmers:**  
Farmers need reliable grading data to access markets, negotiate fair prices, and meet buyer specifications. Without local testing, farmers may face costly delays or need to ship samples long distances for analysis.
2. **Risk Management & Storage Decisions:**  
Accurate testing informs farmers about grain quality during storage, allowing them to manage spoilage risks and make timely marketing decisions.
3. **Stronger Relationships with Elevators/Co-ops:**  
By expanding testing services, elevators and cooperatives can strengthen their role as trusted partners for growers. Offering local testing services would also remove a major barrier for farmers interested in diversifying their operations.

To help facilitate the smooth integration of Kernza® into the existing grain market, grain handlers will need to be trained on the methods to evaluate Kernza® utilizing materials, equipment, and methods they already have on hand and are familiar with. Such equipment includes: a Carter Day dockage machine, hand sieves, moisture testers, and Test Weight equipment.

While the Kernza® end user will determine the specific ideal conditions that they want their purchased grain to reflect. Establishing a baseline evaluation standard will allow buyers to know how much additional processing will be required to bring purchased grain up to their ideal possessing conditions.

Establishing and adopting baseline grading standards for Kernza® benefits buyers by promoting consistency, transparency, and efficiency throughout the supply chain.

This guide provides step-by-step instructions for grading Kernza® using standard grain testing equipment available at most elevators and cooperatives.

- **Test Weight Cups & Hopper**
- **FGIS Certified Doerner Divider or similar divider**
- **Hand Sieves/Dockage Tester**
- **Grain Moisture Tester**
- **Scale (For % Calculations)**
- **Funnels, Collection Pans, Sample Containers**
- **Inspection Tools: Magnifier, Scoop, Grain Probe**



## PROCEDURE 1: SAMPLE COLLECTION

Obtaining a representative sample from a lot of grain is an essential part of the grain inspection process. Representative samples may be drawn from sacked grain, container lots, truck lots, and railcar lots by probe/trier, pelican, Ellis cup, or diverter-type mechanical sampler. Sampling equipment descriptions are listed in Chapter 7 of the FGIS Equipment Handbook. <sup>ii</sup>

The prescribed size of a representative sample is approximately 2,500 grams (5.5 lbs.) but not less than 2,000 grams (4.4 lbs.) in size.

Use an FGIS-approved Boerner divider, or an FGIS-approved divider that gives equivalent results, when reducing a sample to the portion size required for a specific test/analysis.

### For Growers:

For growers bringing Kernza® samples from the farm to a local elevator for testing, it is recommended they supply at least 2000 grams (4.4 lbs.) to ensure there is enough usable sample to run analysis on.

Growers often lack FGIS sampling equipment and may have trouble obtaining a true representative sample. To get as accurate a sample as possible keep these guidelines in mind.

- Avoid taking a sample from the edges of a truck or combine hopper as chaff may be higher along edges.
- Take multiple small samples and combine them.
- When sampling off a dumping truck, avoid sampling immediately upon opening the gate or near the end of the load as more chaff and foreign material may be present.
- The moisture of grain sitting on the top of a bin may be different than the rest of the bin.

### For Grain Handlers:

1. Use a grain probe to obtain a representative sample from the load, bin, or other source.
2. Collect at least **2000 grams** of Kernza® from source for testing.
3. Mix sample thoroughly to ensure dockage and moisture are consistent throughout the sample.
4. Use a divider to reduce the representative sample size to around **500 grams**.

## PROCEDURE 2: MOISTURE CONTENT TEST

Moisture content of Kernza® grain significantly affects the storability of the grain. The desired moisture content must be such that Kernza® grain quality will be maintained during, transportation and delivery, as well as for the long periods of time when the grain may be stored in an elevator, warehouse, or on the farm. Current guidelines recommend maintaining stored grain under 12% moisture for best storage conditions.

Moisture testers are calibrated pieces of equipment used to measure the moisture content of a grain sample. Two of the most common types are a DICKEY-john GAC Moisture Analyzer and a Perten AM 5200-A. Farmers will often calibrate their own moisture testers and combine settings against their local cooperative's moisture analyzer.

1. Use a calibrated FGIS approved grain moisture tester.
2. Follow the manufacturer's instructions; if Kernza® or intermediate wheatgrass is not a currently available program, select the setting to a most similar grain (**OATS IS THE CURRENT RECOMMENDATION**) and note this for calibration adjustments later.
3. Record the moisture %.

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## PROCEDURE 3: TEST WEIGHT (BULK DENSITY)

Test weight measures the bulk density of grain, expressed as pounds per bushel (lbs./bu.). It is used to help evaluate grain quality and marketability. Clean grain is used when calculating test weight.

1. Use the standard test weight cup, hopper, and funnel.
2. Fill hopper with cleaned grain, allowing grain to flow freely into the cup without shaking or pressing.
3. Level off with a straight edge.
4. Weigh and record in lbs per bushel (lbs./bu.)
  - Note Kernza® will generally have a lower test weight than other small grains such as wheat or barley.

### Step-by-Step Process:

1. **Set Up Test Weight Equipment:**
  - Use your standard test weight cup, hopper, and funnel.
  - Common cup sizes:
    - *Quart-sized cup (approx. 1,078 ml)*

- Standard 1-pint or 1-quart cups vary by region—be sure you know the conversion factor (usually marked on the cup).
2. **Fill Test Weight Cup Properly:**
    - Weigh the empty cup and tare it on a scale.
    - Pour the cleaned Kernza® grain sample into the hopper and allow it to flow freely into and over the cup.
    - Do not shake, pack, or tap the cup—this ensures consistency.
    - Level off the cup with a straight-edge stroker, using three smooth full-length, zigzag motions to remove excess grain.
    - Carefully place the kettle on the scale and record the results.
  3. **Weigh the Filled Test Weight Cup**
  4. **Convert the Weight to Test Weight in (lbs./bu.)**
    - If you are not using a standard test weight scale you will need to multiply the result by 32 to arrive at the (lbs./bu.) weight.
  5. **Record the test weight**
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#### **PROCEDURE 4: (CARTER DAY) DOCKAGE AND FOREIGN MATERIAL REMOVAL**

Dockage is a factor routinely determined for barley, flaxseed, rye, sorghum, triticale and wheat, but not for other grains. Perennial Kernza® grain is somewhat similar to barley, rye, triticale and wheat and will benefit from the determination of dockage to identify quality characteristics of Kernza® grain. Dockage consists of material which can be easily removed by machine and includes material lighter than, larger than and smaller than Kernza® grain.

One of the main devices used in grain handling to determine dockage is a specialized machine called the Carter Dockage Tester. The dockage tester uses aspiration (air) and a combination of riddles and sieves to prepare samples for inspection and/or grading by removing the readily separable, non-Kernza® grain foreign matter. Generally, the foreign material removed consists of all matter lighter, or of a different size than the grain.

Dockage is not the only factor to consider when separating the Kernza® samples. Knowing the relative amounts of naked Kernza® and hulled Kernza® in a sample is additionally valuable information to know.

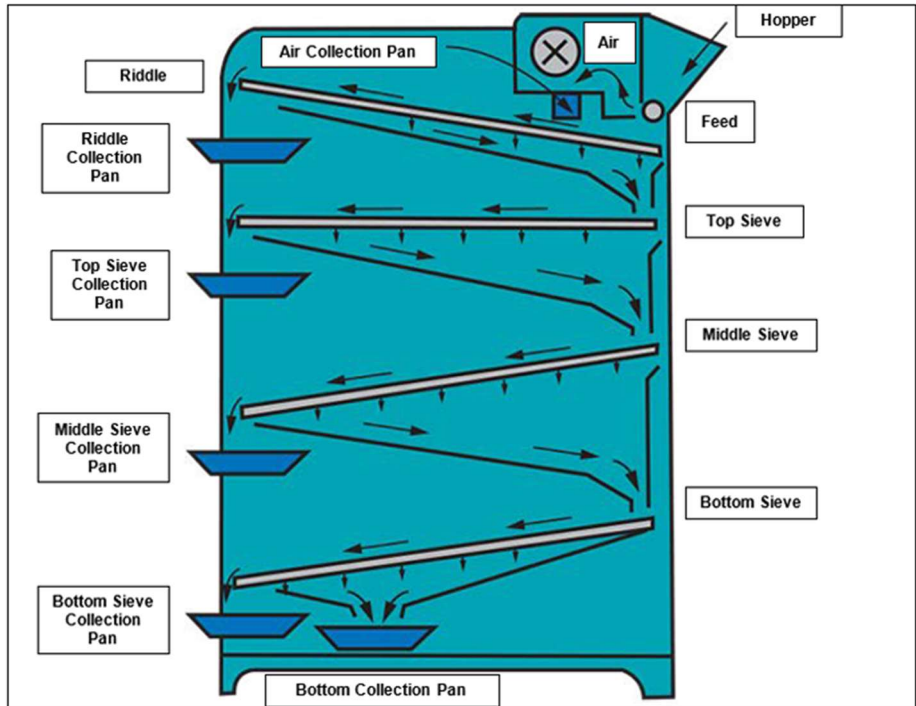


Figure 1: Carter Day Dockage Tester Flow Chart  
 Source: Grain Inspection Handbook Book II Grain Grading Procedures

Recommended Configuration:

<b>Carter Day Kernza® Configuration</b>		
<b>Component</b>	<b>Size/Setting</b>	<b>Purpose</b>
Aspirator	6	Removes light chaff, unfilled kernels
Air Collection Pan		
Feed Controller	2	Controls the speed at which material is drawn from the hopper
Riddle	# 000	Separates naked from hulled kernels
Riddle Collection Pan		Collects Hulled Kernels
Top Sieve	# 4	Separates larger material from naked kernels
Top Sieve Collection Pan		Collects Chaff/Large Hulled Spikelets
Middle Sieve	Empty	
Middle Sieve Collection Pan		
Bottom Sieve	# 7	Separates weed seeds and broken/shrunk kernels from clean seed
Bottom Sieve Collection Pan		Collects Clean Seed
Bottom Collection Pan		Collects Weed seeds and broken/shrunk kernels

## 1. Set up the **Carter Day Dockage Tester**

- Set the air control to 6 and the feed control to 2.
- Insert the No. 000 riddle in the riddle carriage.
- Insert a No. 4 sieve in the top sieve carriage.
- Leave the middle sieve carriage empty.
- Insert a No. 7 sieve in the bottom sieve carriage.

These are general Carter Day recommendations. Specific models (e.g., Carter Day 1E, 2E, Dockage Tester No. 400) may have different numbered dial settings that correspond to fan speed and feed rate.

NOTE: Samples with especially high dockage or poor separation may need to be ran through additional times.

1. Before starting the Carter Day Dockage Tester, ensure that all pans, sieves, and the riddle are in place and free from material from a previous test.
2. Weigh the dirty sample in a tared container.
3. Start the Carter Day Dockage Tester *first* and *then* pour the sample into the feed hopper.
  - Material that collects in the air collection pan is dockage.
  - Material which passes over the riddle is hulled Kernza® – large chaff may also collect in this pan. Manually remove any large chaff or foreign material seen. If too much large chaff is present use a 6/64"x3/4 slotted hand sieve to remove it. What does not pass through the hand sieve is dockage.
  - Material that collects in the Top Sieve Collection Pan is dockage.
  - Material that collects in the Bottom Collection Pan is dockage.
  - Material that collects in the Bottom Sieve Collection Pan is cleaned seed.
4. Weigh the material from the Bottom Sieve Collection Pan and use the original dirty sample weight to calculate the % of Naked Kernels in the sample.
5. Weigh the material from the Riddle Collection Pan and use the original dirty sample weight to calculate the % of Hulled Kernels in the sample.
6. Combine the material from the Air Collection Pan, the Bottom Collection Pan, the Top Sieve Collection Pan, and any large chaff manually removed from the Riddle Collection Pan: this is all dockage. Weigh the material and use the original dirty sample weight to determine the % dockage.
7. Record:
  - % Hulled Kernels
  - % Naked Kernels
  - % Dockage

## PROCEDURE 5: (HAND SIEVE) DOCKAGE AND FOREIGN MATERIAL REMOVAL

Kernza® kernels come in a variety of sizes which poses a unique challenge when separating naked kernels from hulled kernels and chaff. The variability necessitates multiple sieves to adequately separate the sample.

1. Hand sieves can be used to determine dockage.
  - When hand sieving a grain sample, hold the sieve in both hands with your elbows near your sides.
  - Use roughly 30 smooth side to side motions.
  - You may need to rotate the sieve a repeat the side-to-side motions to get adequate separation.
  - For larger or dirtier samples, it is best to sieve in smaller batches to ensure efficient separation of the sample.
  - Blowing lightly over the sample while shaking can help remove light chaff.
  - Material can often get stuck inside the grates of the sieves. Gently run your hand over the bottom of the sieve to help remove the material from the sieve.
2. Recommended sieve sizes for Kernza® (subject to adjustment as standards develop):
  - 1<sup>st</sup> sieve 6/64"x3/4" slotted: to catch larger foreign materials and large chaff.
  - 2<sup>nd</sup> sieve 3/64"x3/8" slotted: to separate naked kernels from small and large hulled kernels.
  - 3<sup>rd</sup> sieve .064"x3/8" slotted: to separate naked kernels from large hulled kernels.
  - 4<sup>th</sup> sieve 3/64"x5/16" oblong: to separate naked kernels from smaller hulled kernels.
  - 5<sup>th</sup> sieve .035"x15/32" slotted: smaller sieve to remove undersized kernels and weed seeds.



Figure 2: Hand Sieved Kernza®  
Source: Samuel Wanger NCI

## **Dockage Removal**

### *Materials Needed:*

6/64 x 3/4 slotted

3/64 x 5/16 oblong

Solid Sieve Collection pan

Empty containers to place the separated sample materials into for weighing

1. Weigh the sample in a tared tray.
2. Stack the 6/64 x 3/4 slotted sieve on top of the 3/64 x 5/16 oblong sieve and place both over a solid pan.
3. Pour the sample on to the top sieve and begin shaking using the technique described in Step 5.1.
4. Remove the top sieve, what did not pass through is dockage. Pour the dockage into a collection pan for weighing later.
5. Continue shaking the sample for an additional 30 seconds.
6. What passed through the sieve is dockage, add it to the dockage pan.
7. What did not pass through is a mixture of naked and hulled Kernza® kernels that will require additional sieve to estimate % naked kernels.
8. Weigh the dockage and use the original weight to calculate the percent (%) dockage present in the sample.
9. Record the % dockage.

## **Naked/Hulled Kernel Separation**

### *Materials Needed:*

3/64 x 3/8 slotted

.035 x 15/32 slotted

.064 x 3/8 slotted

Solid Sieve Collection pan

Empty containers to place the separated sample materials into for weighing

1. Weigh the mixture of naked and hulled Kernza® kernels.
2. Place the 3/64 x 3/8 slotted sieve on top of the solid pan and pour the mix of naked and hulled kernels on top and begin shaking the sample.
3. What passed through the sieve are naked kernels. Set them aside for future weighing.
4. What did not pass through the sieve needs additional sieving to further remove the naked kernels from the hulled kernels.
5. Place the .035 x 15/32 slotted sieve over the solid pan and pour the sample on top and begin shaking the sample.
6. What did not pass through the sieve are the large hulled kernels. Set them aside for later weighing.

7. What passed through the sieve is naked kernels and smaller hulled kernels that require additional sieving.
  8. Place the .064 x 3/8 slotted sieve over the empty solid pan and pour the sample on top and begin shaking the sample.
  9. What passed through the sieve is to be added to the naked kernels pan.
  10. What did not pass through is to be added to the hulled kernels pan.
  11. Weigh the naked kernels and use the weight from the combined naked and hulled kernels to determine the % of naked kernels.
  12. Record the % of naked kernels.
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## PROCEDURE 6: VISUAL & SENSORY INSPECTION

1. Kernel Examination:
  - The sample is visually inspected for damaged kernels (shrunken and broken), heat damage, sprouts, and other defects. Use a magnifier if necessary.
  - The number or percentage of damaged kernels and defects is recorded.
2. Inspect cleaned grain visually under good lighting:
  - **Color:** Should appear uniform; pale gold to light brown.
    - Record Color: Bright / Fair / Dull
    - Record any visually damaged or sprouted kernels.
  - **Odor:** Can be a strong indication of multiple issues such as disease, mold growth, storage issues, or insect presence. The sample is checked for odd or undesirable odors such as mustiness, sourness, and infestations.
    - If an infestation is suspected due to odor:
      1. Carefully examine the fine particulates that passed through the .035 x 15/32 sieve or collected in the Bottom Collection Pan to look for live insects.
      2. Spread the fine particulates out carefully.
      3. Place the sample under a good light.
      4. Hold your breath while carefully looking for movement or signs of insects.

## PROCEDURE 7: RECORD THE RESULTS

1. Documents the results on a Grading Ticket, along with any additional notes.
2. Label and keep remaining untested material for a reference sample if necessary.

This template is designed for grower and grain handler use. It includes the basic tests most grain handling facilities are already trained to run.

Tests for DON/protein/Aflatoxins and other such quality factors will still need to be sent into specific labs for analysis.

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**KERNZA® GRAIN SAMPLE**

**Elevator/Cooperative Name:** \_\_\_\_\_

**Location:** \_\_\_\_\_

**Date:** \_\_\_\_ / \_\_\_\_ / \_\_\_\_

**Ticket Number:** \_\_\_\_\_

**Contract Number:** \_\_\_\_\_

**Farmer / Grower Name:** \_\_\_\_\_

**Farm / Field ID:** \_\_\_\_\_

**Commodity:** *Kernza® (Intermediate Wheatgrass)*

**Variety:** \_\_\_\_\_

**Planting Year:** \_\_\_\_\_

**Harvest Year:**  First Year  Second Year  Third Year  Other: \_\_\_\_\_

**Sample Source (Check One):**

Sample ID: \_\_\_\_\_

Source Location: \_\_\_\_\_

Bin Run

Harvest Sample

Sale/Delivery Sample

Other: \_\_\_\_\_

**Test Parameter**

**Result**

**Moisture Content (%)** \_\_\_\_\_ %

**Test Weight (lbs./bushel)** \_\_\_\_\_ lbs./bushel

**Dockage (%)** \_\_\_\_\_ %

**Broken Kernels / Shriveling (%)** \_\_\_\_\_ %

**Dehulled (Naked) Kernels (%)** \_\_\_\_\_ %

**Color**  Bright  Fair  Dull

**Odor**  Normal  Musty  Sour  Other: \_\_\_\_\_

**Insect Infestation**  No  Yes Amount/Type present: \_\_\_\_\_

**Other Notes / Observations:** \_\_\_\_\_

## USEFUL RESOURCES:

### Sourcing Carter Day Screens

Replacement or compatible screens from:

- **Seedburo Equipment Co.** – [www.seedburo.com](http://www.seedburo.com)
- **A.T. Ferrell / Clipper Mfg.**
- **Custom sieve manufacturers** like Northland Screens or Hoffman Mfg.
- **Carter Day International Inc.** – [carterday.com](http://carterday.com)

Request:

- **Slotted oblong** screens for top deck
- **Round hole** screens for bottom deck
- **Brass or stainless steel** depending on intended use (seed vs. food grade)

Seedburo ↔ Carter Day Seive Conversion Chart

Round Hole Sieves (*diameter of round perforations*)

<b>Seedburo Size (fractional)</b>	<b>Decimal Inch</b>	<b>Metric (mm)</b>	<b>Carter Day Equivalent</b>
2/64" round	0.0313"	0.79 mm	Carter Day 2/64" round
2.5/64" round	0.0391"	0.99 mm	Carter Day 2.5/64" round
3/64" round	0.0469"	1.19 mm	Carter Day 3/64" round
3.5/64" round	0.0547"	1.39 mm	Carter Day 3.5/64" round
4/64" round	0.0625"	1.59 mm	Carter Day 4/64" round
4.5/64" round	0.0703"	1.79 mm	Carter Day 4.5/64" round
5/64" round	0.0781"	1.98 mm	Carter Day 5/64" round
5.5/64" round	0.0859"	2.18 mm	Carter Day 5.5/64" round
6/64" round	0.0938"	2.38 mm	Carter Day 6/64" round
6.5/64" round	0.1016"	2.58 mm	Carter Day 6.5/64" round
7/64" round	0.1094"	2.78 mm	Carter Day 7/64" round
7.5/64" round	0.1172"	2.98 mm	Carter Day 7.5/64" round
8/64" round	0.1250"	3.18 mm	Carter Day 8/64" round
9/64" round	0.1406"	3.57 mm	Carter Day 9/64" round
10/64" round	0.1563"	3.97 mm	Carter Day 10/64" round
11/64" round	0.1719"	4.37 mm	Carter Day 11/64" round
12/64" round	0.1875"	4.76 mm	Carter Day 12/64" round
13/64" round	0.2031"	5.16 mm	Carter Day 13/64" round
14/64" round	0.2188"	5.56 mm	Carter Day 14/64" round
15/64" round	0.2344"	5.95 mm	Carter Day 15/64" round
16/64" round	0.2500"	6.35 mm	Carter Day 16/64" round
18/64" round	0.2813"	7.14 mm	Carter Day 18/64" round
20/64" round	0.3125"	7.94 mm	Carter Day 20/64" round

## Oblong Slot Sieves

(WIDTH × LENGTH OF SLOT OPENING; LENGTH USUALLY STANDARDIZED AT 3/4" OR 1")

Seedburo Size (fractional)	Decimal Inch (width)	Metric (mm) (width)	Slot Length	Carter Day Equivalent
5.5/64" × 3/4" oblong	0.0859"	2.18 mm	19.05 mm	Carter Day 5.5/64" × 3/4"
6/64" × 3/4" oblong	0.0938"	2.38 mm	19.05 mm	Carter Day 6/64" × 3/4"
6.5/64" × 3/4" oblong	0.1016"	2.58 mm	19.05 mm	Carter Day 6.5/64" × 3/4"
7/64" × 3/4" oblong	0.1094"	2.78 mm	19.05 mm	Carter Day 7/64" × 3/4"
7.5/64" × 3/4" oblong	0.1172"	2.98 mm	19.05 mm	Carter Day 7.5/64" × 3/4"
8/64" × 3/4" oblong	0.1250"	3.18 mm	19.05 mm	Carter Day 8/64" × 3/4"
9/64" × 3/4" oblong	0.1406"	3.57 mm	19.05 mm	Carter Day 9/64" × 3/4"
10/64" × 3/4" oblong	0.1563"	3.97 mm	19.05 mm	Carter Day 10/64" × 3/4"
11/64" × 3/4" oblong	0.1719"	4.37 mm	19.05 mm	Carter Day 11/64" × 3/4"
12/64" × 3/4" oblong	0.1875"	4.76 mm	19.05 mm	Carter Day 12/64" × 3/4"

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- For **round-hole sieves**, Seedburo and Carter Day use **the same fractional numbering system**, so they're direct equivalents.
  - For **oblong slots**, the **fractional width is the key**; Carter Day and Seedburo again match directly (length usually 3/4").
  - Metric equivalents are included for reference in international specs or when ordering perforated plate stock

Sieve Sets				Individual Sieve			
Commodities	Sieves Included/Perforation Sizes	Commercial	Precision	Perforation Sieve	Commercial	Precision	
Corn	A (12/64"RD), Y (6/64"RD), E (Bottom Pan)	No. 1 Set	No. 1P Set	12/64" Round (0.1875") Scalper	No. A	No. A-P	
Wheat, Rye, Oats (D)	A (12/64"RD), B (5/64"TRI), C (1/12"RD), D (4.5/64"x1/2"OB), W (5/64"RD), E (Bottom Pan)	No. 2D Set	No. 2DP Set	5/64" Single Triangle (0.0781")	No. B	No. B-P	
Wheat, Rye, Oats (F)	A (12/64"RD), B (5/64"TRI), C (1/12"RD), D (4.5/64"x1/2"OB), F (.064"x3/8"OB), E (Bottom Pan)	No. 2F Set	No. 2FP Set	1/12" Round (0.0833")	No. C	No. C-P	
Soybean	H (10/64"x3/4"OB), I (8/64"RD), E (Bottom Pan)	No. 3 Set	No. 3P Set	4.5/64" x 1/2" Oblong (0.0703")	No. D	N/A	
Cottonseed	A (12/64"RD), E (Bottom Pan)	No. 4 Set	No. 4P Set	.064" x 3/8" Oblong (0.0703")	No. F	No. F-P	
Barley (L)	B (5/64"TRI), L (5/64"x3/4"SL), E (Bottom Pan)	No. 5L Set	No. 5LP Set	9/64" Dbl. Triangle (0.1406") .089" Inscribed Circle	No. G	N/A	
Barley (M)	B (5/64"TRI), M (5.5/64"x3/4"SL), E (Bottom Pan)	No. 5M Set	No. 5MP Set	10/64" x 3/4" Oblong (0.1563") Scalper	No. H	N/A	
Flax	T (3/64"x3/8"OB), U (4.5/64"RD), E (Bottom Pan)	No. 6 Set	N/A	8/64" Round (0.1250")	No. I	No. I-P	
Canola	R (.028"x15/32"SL), S (.0395"x15/32"SL), T (3/64" x 3/8"OB) V (.035"x15/32"OB), Y (6/64"RD), E (Bottom Pan)	No. 7 Set	N/A	10/64" Round (0.1563")	No. J	N/A	
Rice	X (5.5/64"RD), Y (6/64"RD), Z (6.5/64"RD), E (Bottom Pan)	No. 8 Set	N/A	2.5/64" Round (0.0391")	No. K	N/A	
Sorghum	B (5/64"TRI), K (2.5/64"RD), E (Bottom Pan)	No. 9 Set	No. 9P Set	5/64" x 3/4" Slot (0.0781")	N/A	No. L	
Weevil Detection	C (1/12"RD), E (Bottom Pan)	No. 10 Set	No. 10P Set	5.5/64" x 3/4" Slot (0.0859")	N/A	No. M	
Sunflower Seed	A (12/64"RD), B (5/64"TRI), J (10/64"RD), E (Bottom Pan)	No. 11 Set	No. 11P Set	10/64" Round Scalper (0.1563")	No. N	N/A	
Lentils	0032, 0050, A (12/64"RD), E (Bottom Pan)	No. 12 Set	N/A	6/64" x 3/4" Slot (0.0938")	N/A	No. P	
Whole Dry Peas	0105, 0110, 0115, H (10/64"x3/4"OB), E (Bottom Pan)	No. 13 Set	N/A	6.5/64" x 3/4" Slot (0.1016")	N/A	No. Q	
Split Peas	A (12/64"RD), I (8/64"RD), J (10/64"RD), K (2.5/64"RD), Y (6/64"RD), E (Bottom Pan)	No. 14 Set	N/A	.028" x 15/32" Slot	No. R	N/A	
				.0395" x 15/32" Slot	No. S	N/A	
				3/64" x 3/8" Oblong (0.0469")	No. T	N/A	
				4.5/64" Round (0.0703")	No. U	N/A	
				.035" x 15/32" Slot	No. V	N/A	
				5/64" Round (0.0781")	No. W	N/A	
				5.5/64" Round (0.0859")	No. X	N/A	
				6/64" Round (0.0938")	No. Y	N/A	
				6.5/64" Round (0.1016")	No. Z	N/A	
				Solid Bottom Pan (for use with all sieves)	No. E	N/A	

Figure 3: Seedburo Sieve Set Chart

Source: <https://seedburo.com/products/3266>

## 1.2 STANDARD ABBREVIATIONS

ADM	Admixture	DLQ	Distinctly low quality
ADU	Amber Durum wheat	DKG	Dockage
ANFL	Animal Filth	DU	Durum wheat
MOTH	Angoumois moths	DYED	Dyed
BADS	Badly stained	ERG	Ergoty
BADW	Badly weathered	ERC	Erucic acid
BLY	Barley	EHVY	Extra heavy
BRDX	Bird excreta	FINE	Fine foreign material
BLCH	Bleached	FLAX	Flaxseed
BLIT	Blight	FLIN	Flint
BLAL	Blue aleurone	FDK	Frost-damaged kernels
BLB	Blue barley	FLAD	Flint and Dent
BLMB	Blue Malting barley	FM	Foreign material
BNS	Bottom not sampled	FMOR	Foreign material other than rye
BRIT	Bright	FMOW	Foreign material other than wheat
BC	Broken corn	FMWR	Foreign material other than wheat or rye
BCFM	Broken corn and foreign material	GARB	Garlic bulblets
GLAS	Broken glass	GAR	Garlicky
BN	Broken kernels	GLUC	Glucosinolates
BNFM	Broken kernels and foreign material	GR	Grain
K	Canola	HP	Handpicked
CSTB	Castor beans	HPFM	Handpicked foreign material
CL	Class	HADU	Hard Amber Durum wheat
CRSE	Coarse	HARD	Hard kernels
CBUR	Cocklebur	HRS	Hard Red Spring wheat
COFO	Commercially objectionable foreign odor	HRW	Hard Red Winter wheat
CCL	Contrasting classes	HVAC	Hard and Vitreous Kernels of Amber Color
CADM	Conspicuous admixture	HDWH	Hard White wheat
C	Corn	HT	Heat-damaged kernels
CROT	Crotalaria	HTG	Heating
CSF	Cultivated sunflower seed	HVY	Heavy
DK	Damaged kernels	IADM	Inconspicuous admixture
DKT	Damaged kernels (total)	IDK	Insect-damaged kernels
DST	Damaged seeds (total)	INF	Infested
DHV	Dark, Hard, and Vitreous	IBF	Injured-by-frost
DNS	Dark Northern Spring wheat	IBHT	Injured-by-heat
DEF	Defects (total)	IBM	Injured-by-mold
DH	Dehulled	IBS	Injured-by-sprout
DENT	Dent	LGANX	Large Animal Excreta
DIAT	Diatomaceous earth	LGST	Large stones
DISC	Distinctly discolored	LGAR	Light garlicky
DGK	Distinctly green kernels		

Figure 4: Standard Commodity Grading Report Abbreviations Chart  
Source: Grain Inspection Handbook Book II Grain Grading Procedures

LSM	Light smutty	SMUT	Smutty
LIME	Limed	SRW	Soft Red Winter wheat
MSFM	Machine separated broken kernels and foreign material	SWH	Soft White wheat
MB	Malting barley	S	Sorghum
MWTH	Materially weathered	SBLY	Sound barley
MDKG	Mechanically separated dockage	SO	Sound oats
X	Mixed	SOUR	Sour
XC	Mixed corn	SB	Soybeans
XGR	Mixed grain	SBOC	Soybeans of other colors
XS	Mixed sorghum	SPL	Splits
XSB	Mixed soybeans	STND	Stained
XWHT	Mixed wheat	SKD	Stinkbug damaged
M	Moisture	STON	Stones
MDK	Mold-damaged kernels	SC	Stress cracks
MUST	Musty	SCL	Subclass
NS	Northern Spring wheat	SMT	Suitable malting type
NSG	Not standardized grain	SULF	Sulfured
O	Oats	SF	Sunflower seed
ODOR	Odor	TANS	Tannin sorghum
OIL	Oil	TW	Test weight
OCL	Other classes	THIN	Thin
OCOL	Other colors	TOM	Total other material
ODK	Other damaged kernels	TRET	Treated
OG	Other grains	TRIT	Triticale
OLI	Other live insects injurious to stored grain	TRB	Two-rowed barley
OT	Other types	TRMB	Two-rowed malting barley
OWH	Other White wheat	UNCL	Unclassed wheat
PL	Plump	FSUB	Unknown foreign substance
PROT	Protein	WASH	Washed
PMS	Purple mottled or stained	WAXY	Waxy
RS	Red Spring wheat	LW	Weevils (live)
RODX	Rodent excreta	WWH	Western White wheat
RYE	Rye	WHT	Wheat
SCOR	Scoured	WOCL	Wheat of other classes
SHBN	Shrunken and broken kernels	WHAL	White aleurone
SS	Similar seeds	WHCB	White Club wheat
SRB	Six-rowed barley	WHC	White corn
SRMB	Six-rowed malting barley	WHS	White sorghum
SRBM	Six-rowed blue malting barley	WW	White wheat
SLW	Slightly weathered	WB	Wild buckwheat
SKBN	Skinned and broken kernels	WBG	Wild brome grass seed
SBAL	Smut balls	WO	Wild oats
		YC	Yellow corn
		YSB	Yellow soybeans

**Note: Abbreviations may be expressed in upper or lower case.**

Figure 5: Standard Commodity Grading Report Abbreviations Chart (continued)

Source: Grain Inspection Handbook Book II Grain Grading Procedures

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<sup>i</sup> The Land Institute, <https://landinstitute.org/our-work/perennial-crops/Kernza®/>

<sup>ii</sup> Equipment Handbook - <https://www.ams.usda.gov/sites/default/files/media/EquipmentHB.pdf>