

Kernza® Perennial Grain: Cleaning & Dehulling Process



Agricultural Utilization Research Institute

Kernza from Combine

Test Grain for: Moisture, Molds and Mycotoxins

Vomitoxin and Aflatoxin
among the common issues

There are several processing steps which need to take place to clean and prepare Kernza for end users. AURI worked with equipment manufacturers and current cleaners/processors to identify the steps and equipment necessary to clean Kernza and remove/separate hulls to achieve a product for milling or to be supplied directly to end users. The identified processing steps are outlined in the diagram.

Inconsistencies in grain size and characteristics between various grain lots is currently a significant factor when processing Kernza. As a result, AURI recommends building flexibility into cleaning and processing equipment setups. The University of Minnesota and others are working to improve seed genetics, which will likely impact grain characteristics such as percentage of free threshed grain in the combine and size of individual grain kernels. Therefore, post-harvest dehulling and cleaning of Kernza grain are processes which are likely to change with time.

- As indicated on page 2, current expectations are for 30-50% of the harvested material to be dehulled usable grain

These steps can be done in conjunction with an air screener or fanning mill type setup

Removal of Dockage via Shaker Table/ Screens or Indent

3/32" x 1/2" slotted screen; 14mm
indent

Option 1:
Dehuller discharge recycled to aspiration and separation until all grain is dehulled

Option 2: Dehuller discharge sent to separate aspirator and gravity table for increased process efficiency

Removal of Hulls (Aspiration)

Removes hulls and
additional dockage

Hulls to be used as
feed, fuel or bedding

Dehulling (Impact Huller)

1,000—1,500 RPM
Stone impact surface
works best

Removal of Hulls (Aspiration)

Grain in-hull and hulled grain

Gravity Table Separation

Grain Separation: Indent Separation or Slotted Screen

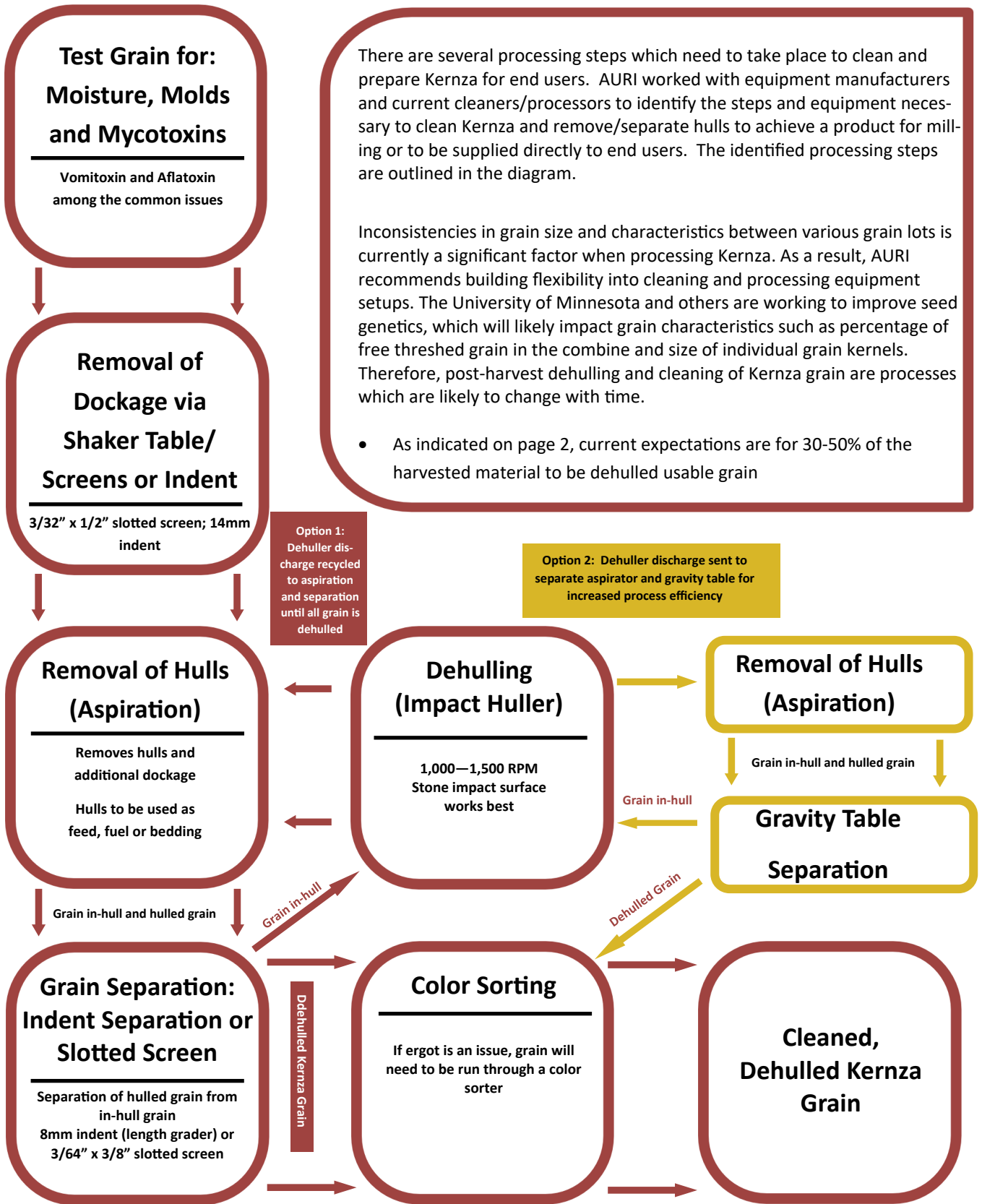
Separation of hulled grain from
in-hull grain
8mm indent (length grader) or
3/64" x 3/8" slotted screen

Dehulled Kernza Grain

Color Sorting

If ergot is an issue, grain will
need to be run through a color
sorter

Cleaned, Dehulled Kernza Grain

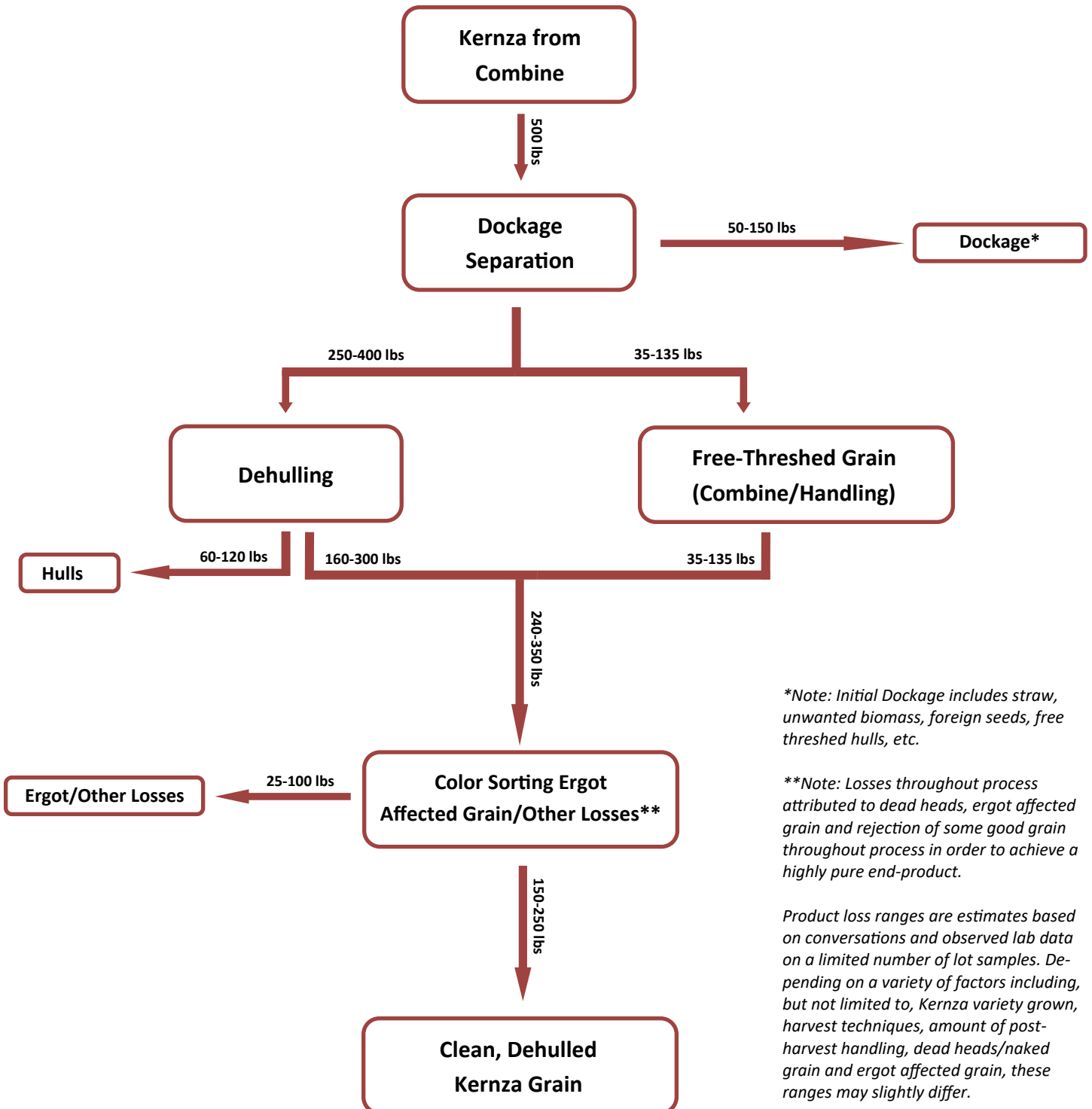


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Identified Ranges of Product Weights and Losses Throughout Cleaning and Processing Steps – One Acre Example



**Note: Initial Dockage includes straw, unwanted biomass, foreign seeds, free threshed hulls, etc.*

***Note: Losses throughout process attributed to dead heads, ergot affected grain and rejection of some good grain throughout process in order to achieve a highly pure end-product.*

Product loss ranges are estimates based on conversations and observed lab data on a limited number of lot samples. Depending on a variety of factors including, but not limited to, Kernza variety grown, harvest techniques, amount of post-harvest handling, dead heads/naked grain and ergot affected grain, these ranges may slightly differ.