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Seed Handling Efficiency, Contamination and Damage

J. M. Beck

SEED HANDLING - EFFICIENCY, CONTAMINATION AND DAMAGE

James M. Beck 1/

Efficient seed handling requires application of knowledge gained by experience and constant research. Individual seed handling requirements vary widely, but there are several points that should never be overlooked. Seed handling systems must: (1) utilize methods and equipment adequate to complete operations on time, (2) maintain seed quality by preventing contamination and mechanical injury and (3) keep the unit cost of handling seeds low enough to be competitive. Fast. Gentle. Economical. Match these features with flexibility and easy clean-out and your seed handling problems have been solved!

Mechanical mixing and contamination often occur before seeds reach the processing plant, but let us assume that each bag or lot of seed entering the plant is properly labeled so that its identity can be maintained. It then must be recognized that the IDENTITY OF EACH CONTAINER OR LOT OF SEED MUST BE MAINTAINED FROM THE TIME IT ENTERS THE PLANT UNTIL IT IS PLANTED.

Since contamination and seed handling are the two most serious problems encountered in moving seed through a seed processing system, perhaps we should first identify the different areas. The following are usually included in a seed processing system: (1) drying, (2) receiving, (3) conditioning and precleaning, (4) cleaning, (5) separating and upgrading, (6) treating and bagging and (7) storage and shipping. In the past 20 years all the elements in seed handling in these areas have been covered quite comprehensively. You will find many articles by competent authroities in Proceedings of previous Short Courses. I will devote my time to a single area, DRYING, and introduce you to a new method of emptying flat bottom bins that could be utilized to prevent mechanical damage caused by conventional methods and simplify clean up between lots that often result in contamination problems.

For the past 10 years - I joined the Seed Technology Laboratory Staff in 1961 - I know that you have been coming to this annual meeting, and other times during the year, seeking better answers to your seed problems and sharing withall of us information and ideas that you have found profitable. IT IS THIS SHARING OF INFORMATION AND IDEAS THAT HAS MADE OUR PROGRAM SUCCESSFUL.

1/ Mr. Beck is Engineer Technician, Seed Technology Laboratory, Mississippi State University.

1. Sawston bin top panel
2. Sawston bin intermediate panel
3. Sawston bin bottom panel
4. Sawston bin corner post
5. Airpack base panel
6. Airpack base corner post
7. Airsweep self emptying and ventilating floor
8. Independent built in sheet steel air duct
9. High capacity corn outlet chute to floor level conveyor or auger

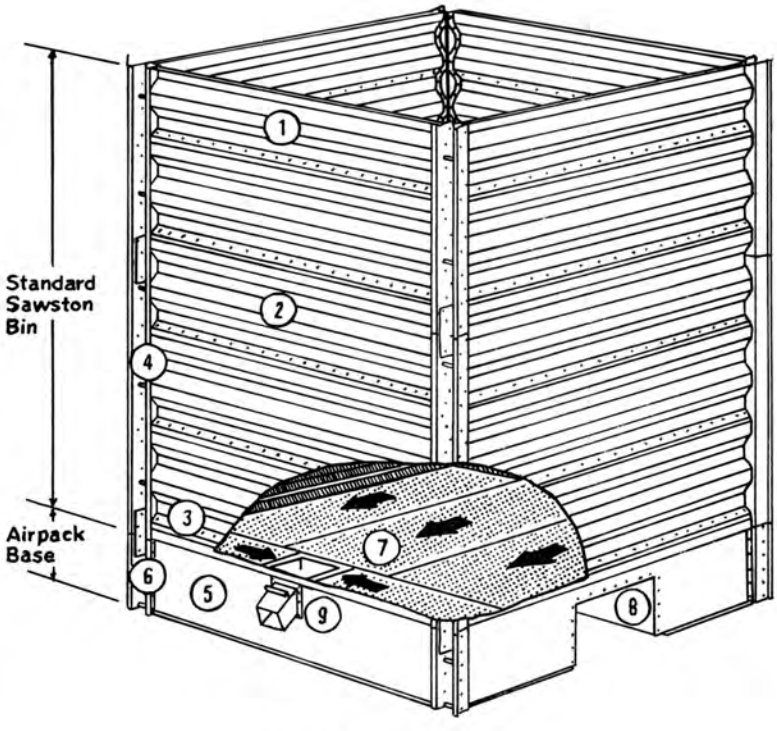

Figure 1

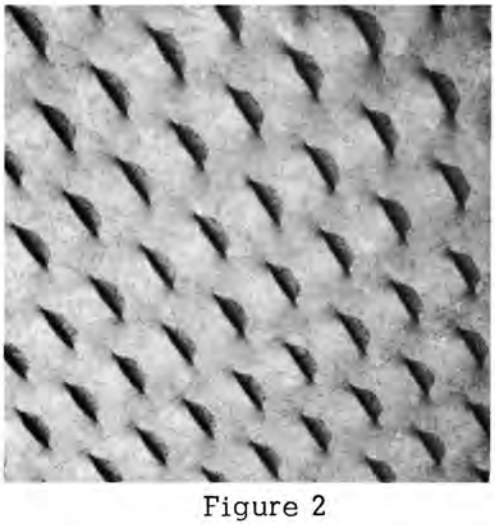

Figure 2

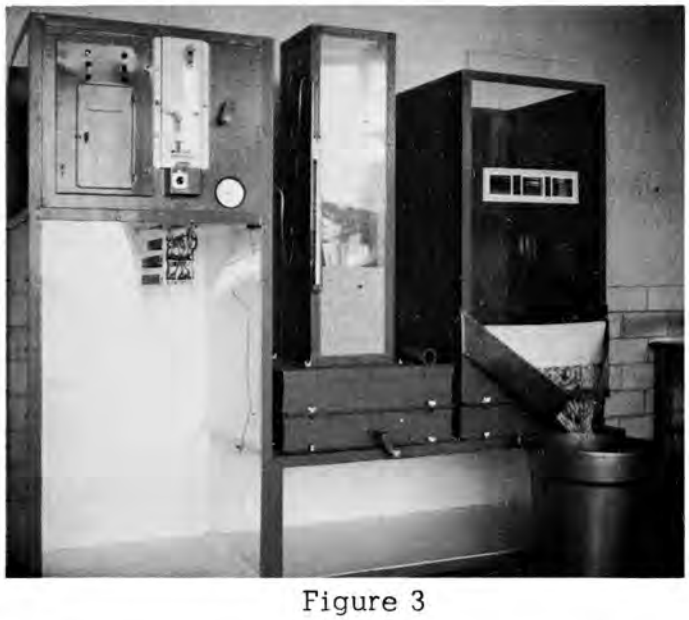

Figure 3

The scope of activities in which the Seed Technology Laboratory is engaged has taken our staff to many areas of the world. Just two weeks ago I was able to arrange a stop-over in London after a two month assignment in the Philippines. As a result of this experience I am privileged to introduce you to AIRSWEEP, a new system for unloading flat bottomed storage and drying bins.

AIRSWEEP FLOORING - invented, developed, patented and manufactured by Simplex of Cambridge can be fitted to any flat bottomed aeration, storage or drying bin to:

(a) Provide an efficient ventilating floor for drying and conditioning of seed.

(b) Make the bins completely self-emptying with minimum space requirement.

(c) Reduce mechanical injury and contamination problems by eliminating in-bin mechanical unloading devices.

Figure 1 illustrates a standard Sawston storage bin with a built-on base incorporating an AIRSWEEP self-emptying and conditioning floor, air ducting, air control doors and grain outlet chute, all for installation on a flat floor. Bins can be arranged in banks or nests to make the best use of available space and to provide completely self-contained storage. These units can be used to slow dry or condition bulk stored seed and they are fully self emptying.

Figure 2 shows the actual perforations in the AIRSWEEP metal flooring. The apertures of this mesh flooring must be pointing in the direction of grain travel. Figure 1 shows the grain travel from the back of the bin toward the front and the cross pieces at the bin front direct the grain toward the outlet in the center of the front bin wall.

You must remember that efficient operation of an AIRSWEEP floor is entirely dependent upon the correct design and installation of the supporting framework and the provision of an adequate supply of air. The following are essential requirements:

(1) The support joists for the Airsweep sheets must all run in the direction of grain travel and be 1 foot apart. The width of the top face of the joists must not exceed 2 inches.

(2) The joists must be supported clear of the floor to allow free air circulation underneath. The gap between the joists and the concrete floor must be at least 9 inches.

Figure 1 from Simplex of Cambridge brochure.

(3) The air inlet must be positioned to give the most even air distribution and a central position is preferable. If air is supplied from a pressurized conveyor tunnel, two air inlets per bin must be used.

(4) The air inlet must be of adequate size - a minimum of 1 square foot inlet area to 30 square feet floor area is recommended.

(5) The Airsweep mesh must be laid smooth side up with the aperture pointing in the direction of grain travel. With rectangular bins 2 feet wide cross pieces will be required at the bin front to direct the grain towards the outlet.

(6) The floor must be securely fastened down. Upthrusts of up to two tons are possible with large fans.

(7) A minimum air volume of 100 c.f.m. per square foot of floor area is essential. The fan must be capable of delivering the total volume required on this basis at 4 inches swg.

Figure 3 shows AIRSWEEP flooring being used to empty seed from a 2 ft. by 2 ft. drying bin that is now a component of a model drier that was designed and constructed by the author.

Since AIRSWEEP is a patented* device and because the Seed Technology Laboratory has not determined the efficiency nor the limitations of application of this type bin flooring for full scale seed drying and storage facilities, inquiries for further information should be directed to:

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Export Sales Manager
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Sawston, Cambridge (England)

*Patented by Simplex of Cambridge Limited.
Patent Nos. 1115224 and 1125273