

Processing Sheared Seed

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The Spreckels Sugar Company will use for the 1946 season a shearing machine similar to the Bainer type machines; however, the Spreckels shearing plants will be equipped with steel wheels instead of grit. The steel wheel has been very satisfactory in its performance in that a setting remains constant and wear is very slow. A small rock passing over a grit wheel causes sufficient damage to change shearing performance, whereas 200 sacks of seed which contained enough rocks per sack to ruin a grit wheel were sheared in 1945 with a steel wheel before it was necessary to replace the wheel.

Because of the size of seed being sheared by the Spreckels machines in general it has not been necessary to grade seed prior to shearing; however, some grading is being done in order to improve germination prior to shearing. The present shearing wheels have a capacity of approximately 1,000 pounds of whole seed per hour, which is considerably greater than the cleaning equipment can handle.

Steel Wheel Specifications

Diameter	9 3/8 inches
Face	1/8 inches
Shaft	1 1/4 inches
Rim 3/8	inches thick case hardened
Divisions	23 6
Pitch	1248 inches
Speed	750 r.p.m.
Milled with a 60° miller with vertical face 1 inch ahead of center line blank.	

Cleaning Procedure

All sheared seed is screened through a number H-442 Crippen cleaner. Overrun seed is resheared to meet the desired size. Following the normal cleaning operation the sheared seed is elevated and dropped into an aspirator to facilitate further cleaning and improve germination. Table 1 demonstrates some improvements of germination by use of an aspirator. Two varieties of seed were used in this test at various shear-bar settings.

The aspirator is limited in its ability to improve extremely low germinating lots. In some lots of seed merely re-running them through the aspirator has improved the germination from 2 to 5 percent.

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Table 1.—Aspirator results for improvement of sheared seed.

Wheel settings, inches	Percentage cleaner loss	Percentage aspirator loss	Final recovery	Soil germination tests*		
				Before aspirator	After aspirator	
U.S. 15	.085	25.00	4.42	70.58	87.25	91.75
	.080	31.25	5.42	63.33	86.50	88.25
	.078	34.50	6.00	58.90	83.50	87.75
	.075	37.25	6.27	56.48	81.00	88.25
	.073	46.25	10.75	43.00	76.75	87.25
	.070	51.50	8.78	39.72	71.00	84.50
U.S. 33	.082	32.00	3.79	64.30	83.50	86.25
	.088	35.50	7.40	57.10	80.50	86.25
	.094	38.00	8.00	53.80	80.25	88.00
	.080	44.50	9.20	46.30	72.75	83.50
	.078	44.50	10.00	45.50	71.25	85.50
	.070	49.00	9.80	41.20	65.00	79.00

The germination of whole seed was U.S. 15—95.00, U.S. 33—93.00.

*Injured seedlings were not considered in the germination counts.

During the 1945 season 258,454 pounds of whole seed was sheared by one of the Spreckels machines. This seed was all sheared with a steel wheel and then passed through a cleaner and an aspirator. The final recovery of this seed was 57.15 percent with an average germination of 84.21 percent. The average seedlings per unit was 1.38. All this seed was run in 20-bag increments and germination tests conducted on the filial seed recovered from the 20 hags of whole seed. Germination tests made at Spreckels were conducted in soil or on blotters and in no case were injured seedlings included in the germinating percentage.

Seed Standards

Because of the types of planters used in the Spreckels Sugar Company's districts it has been necessary to make available three classes of prepared seed :

1. Normal whole seed sheared and screened through a 10/64 and over 7/64 screen. This product will be used on a rather large portion of the acreage and planted primarily with a Planet Jr. planter. The recovery of this class of seed is about 55 percent of the original.

2. Normal whole seed graded through an 11/64 and over an 8/64 screen. The seed passing over the 11/64 screen is sheared very lightly and then blended into the final product. The recovery of this class is approximately 70 percent of the original seed.

3. Normal whole seed sheared and screened through a 9/64 and over a 7/64 screen. This product is produced on a very small scale to accommodate a few Cobbly planters. The recovery of this class is 30 to 40 percent, and maintaining high germination is difficult.

All lots of seed handled must germinate 80 percent or more prior to issuing. Shearing at Spreackels plants is based on obtaining 1.25 to 1.40 seedlings per unit and not to exceed 3.50 seedlings per unit.

Based on the types of planters generally used and the wide variance that we encounter in field emergence it has not been necessary to attempt to secure an extremely high degree of singleness. Uniform seed of high germination planted at a moderate rate of seeding has given enough singleness to make hand thinning much easier than with the original normal seed plantings.