NEW DEVELOPMENTS IN SEED PROCESSING

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A paper* was presented at the last general meeting of the ASSBT covering the latest developments concerning the beet seed investigations at the University of California. In the meantime several lots of seed were processed by burr reduction and decortication for field trials throughout the sugar beet producing areas. Very little data regarding these plantings have been made available to date.

Seed processed by segmentation and decortication from the same lot (US 33) was used in a series of plantings made at Davis. The decorticated seed contained 40% single germ seed units as compared to 87% for the segmented seed, while the laboratory germinations amounted to 91% and 75% respectively. Both samples were graded 9-7 and were planted at 4 to 5 (5 to 7 in another trial) seeds per foot with precision planting equipment. In one planting the decorticated seed showed an 88% field emergence as compared to 70% for the segmented seed. In another the field emergences were 35% and 19% respectively, for decorticated and segmented seed. Seedling stand counts showed an equal number of inches containing single plants per 100 seed units planted for both samples of seed, under the best germination conditions. Under the lower germinating conditions decorticated seed produced twice as many inches with singles per 100 seed units planted when compared with segmented seed. The safety factor of the additional germs per viable seed unit, in the decorticated seed, apparently insured a better seedling stand under unfavorable germinating conditions.

During the past year a commercial machine employing both the burr reduction and decortication principle was built by the Blackwelder Mfg. Co., of Rio Vista, California for use at the Holly Sugar Co. plant at Stockton, Calif. The burr reduction unit employs a 10" stone, while a 20" stone is used in the decorticating unit. The machine is designed to permit the use of the two units separately or together. When used together, sack run seed is fed into the burr reduction unit (clearance — 0.125") where it is reduced to pass a 12/64" screen (approx.). The partially reduced seed, from the burr plate, then feeds directly into the decorticating unit (clearance 0.125") where it is rubbed down to 9/64 or 10/64" maximum diameter. Following the final reduction, the seed passes through cleaner and grader. Final separation may be done on a gravity table or in an aspirator.

The average results of five--1000 pound test runs with the new machine, operating on US 22 beet seed, is shown in Table I. The seed was reduced to pass through a 9/64" round hole screen and over a 7/64" round hole screen. Little change in germination is noticed for the processed seed as compared to the original. The seedlings per viable unit were reduced from 1.9 for the whole seed to 1.6 for the processed seed, while the seeds per pound were 28,216 and 42, 492 respectively. Recovery, on the basis of weight, number of seed units and number of viable seed units, amounted to 56.0%, 84.4% and 83.7% respectively.

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* Bainer, Roy and L. D. Leach. Processing Sugar Beet Seed by Decortication, Burr Reduction and Segmentation. Proceedings of the American Society of Sugar Beet Technologists. (In Press) 1946

The pressure pad in the decorticating unit will no doubt be the chief source of trouble with the new machine until a more satisfactory material can be found. So far it has been necessary to use Neoprene because of the shortage of natural rubber. One trial, on the experimental machine, with rubber indicated that it had a longer life than Neoprene. Arrangements have been made to secure natural rubber for further testing.

Precision planting equipment is essential for the best results with decorticated seed. The additional safety factor of decorticated seed permits seeding rates to be reduced to not to exceed 6 seed units per foot. Under good field conditions, satisfactory seedling stands have been obtained with 4 seeds per foot. With proper plate selection, decorticated seed can be metered one at a time because of its uniformity and smoothness.

TABLE I

AVERAGE RESULTS OF FIVE RUNS ON HOLLY DECORTICATOR

U. S. 22 SEED REDUCED TO 9-7 SIZE

Germination						Seeds Per	Seeds Per	% Recovery		
Normal	Abnormal	S	D	T	Q	Vu	Pound	Weight	Number	Viable unit
						WHOLE				
90.4		25.0	47.25	15.3	2.8	1.9	28216	100	100	100
						DECORTICATED				
89.6	1.9	35.7	48.7	4.8	0.2	1.6	42492	56.0	84.4	83.7