

# Two Seasons' Experience with Beet Seed Decorticating Equipment

R. J. TINGLEY<sup>1</sup>

ALL OF THE beet seed planted by growers for Holly Sugar Corporation in California, as well as that for Los Alamitos Sugar Company in Imperial Valley, is distributed by Holly from its Stockton headquarters. A high percentage of this seed, during the last two seasons, has been decorticated as one phase in the complete processing and preparation of seed for planting.

The equipment used for this work consists of two University of California beet seed decorticators built by the Blackwelder Manufacturing Company of Rio Vista, California. The original unit was constructed from plans worked out by the writer and the engineering staff of Blackwelder Manufacturing Company, using the ideas and general specifications of the pilot model developed by Professor Roy Bainer of the University of California at Davis.

Essentially, this machine consists of a vertical shaft on which is mounted a 10-inch diameter carborundum grinding-wheel revolving below a stationary steel burr plate, of the same diameter; and another vertical shaft on which is mounted a 20-inch diameter carborundum grinding-wheel revolving below a stationary rubber-faced plate. These shafts are driven from a single 5-horsepower electric motor by separate V-belt drives. They are so arranged that the sack-run beet seed is fed into the center of the steel burr plate, and after passing through it and around the grinding-wheel, it is collected into a funnel, thence by gravity into the center of the rubber-faced plate for final reduction in size.

The first one of these units was installed in the fall of 1946 and preliminary tests were run in cooperation with Professor Bainer to determine the best methods of operation, and to devise practical means of setting and adjusting the machine for the most efficient performance.

The second unit was installed in January, 1947, and both are now a part of the continuous seed-processing plant. The present procedure is to determine correct settings, of both the steel burr plate and the rubber plate, for each lot of seed by frequent checking of results with hand screens. The seed is all sized through 9/64-inch and over 7/64-inch round-hole screens, and is then further polished in a sandpaper-faced disc machine. The final grading is done over a "gravity-table" separator, to remove the desired fraction of light seed, determined by systematic cracking tests.

The original unit was equipped with a neoprene (synthetic rubber) plate which did not prove satisfactory. Subsequent plates were faced with

<sup>1</sup>District Agriculturist, Holly Sugar Corporation.

other grades of neoprene, natural rubber, and truck tread stock, but these materials lasted through only 100 to 200 bags of beet seed each. After our experience with these plates, and the experience gained by other sugar companies with similar materials, the Blackwelder Manufacturing Company secured a synthetic-rubber facing designated at No. 1285 which has proved very satisfactory, and the indicated life of this material will reduce the operating cost of the machines to a very reasonable figure. The first No. 1285 rubber plate actually processed 230,000 pounds of whole seed before it needed replacing. The second one, now being used daily, appears to be wearing even better, and it should handle even more seed than the first.

We are now using the second 20-inch diameter grinding wheel and indications are that it will outwear the first one by a wide margin. The 10-inch grinding wheel has been replaced, and the first steel burr plate has been changed to determine whether a new plate would increase the capacity even though the old one was not badly worn. No difference was noted in the hourly capacity with the new burr plate.

Up to December 31, 1947, these two decorticating units had processed 556,200 pounds of whole seed and produced 333,500 pounds of finished 7/64 to 9/64-inch seed. This represents an actual recovery of 60 percent of the original weight, including all of the experimental period of use, and also the elimination of about 10 percent of seed weight by the gravity table. Operations during the month of December, 1947, on U. S. 15 seed showed a net recovery of 62.74 percent of a total of 60,720 pounds of whole seed.

Some test runs have been made to determine the capacity of these units which indicated a rating of 400 to 600 pounds per hour, but our actual season's operations show a performance for the two units of about 500 pounds of whole seed or 300 pounds of processed seed per hour. Comparative germinations have shown that the decorticated seed usually has a germination of 3 to 6 percent lower than the original lot, and we plan to continue our work to see if this factor can be improved.

It is felt that the first half-million pounds of decorticated seed have contributed the preliminary information necessary to formulate plans for a sound, future seed-processing program. The experience in the field, as to rates of planting, distribution and emergence of decorticated seed, has amply justified our recommendation of this product over any other type of processed or graded seed.