

Experience with Decorticated Seed on 30,000 Acres

ROBERT C. BROWN¹

APPROXIMATELY 30,000 acres of sugar beets were planted in the Imperial Valley in 1947 with a new type of seed. The change from sheared seed, which had been used previously, was made because of the results of tests conducted in 1946.

In the search for better ways to process sugar beet seed, a new method has been developed, which is called seed decortication, and which shows much promise. Our aim in processing seed is to give the grower a product that will lessen his labor, and still give him a normal stand of beets at a reasonable cost. The decortivating process is so recent a development that it has not been thoroughly tested in all areas as yet. The tests to date, however, have been encouraging.

In the decortivating process, whole seed is worn to the size desired instead of being broken into segments as is the case in seed-shearing operations. The new product is rounder and smoother than sheared seed, thus making it more adaptable for use in precision planters. Decortivating is less severe on seed than shearing, which accounts for less seed damage and fewer abnormal plants. In field comparison, decorticated seed appears to have more vigor in the early stages of growth. Upon observation of the seedlings, there appears to be less damage to seed leaves in decorticated seed as compared with heavy seed leaf damage in sheared seed. This type of damage may have a much greater effect on young plants than we realize. In the Imperial Valley the difference in vigor between the two types of seed is quite definite in the early stages of plant growth.

Taking the same lot of seed and processing it by both methods, 7/64 inch to 9/64 inch in size, it was found that the decorticated seed was reduced to 1.6 seedlings per viable seed unit as compared to 1.13 seedlings per viable seed unit in the shearing process. Under good germinating conditions, field emergence for both types of seed is about the same. Under poorer germinating conditions, it was noticed that we produced more inches of single plants from decorticated seed than we did from sheared seed. It was also noted that the percentage of inches containing single plants increased with a decrease in field emergence. In other words, it appears that the more severe the field conditions are, the better the performance of decorticated seed.

In the Imperial Valley, as well as other beet-growing areas, only a very small percentage of the acreage has the physical requirements for ideal germinating conditions. It is up to us to recommend the type of seed that

¹District Agriculturist, Holly Sugar Corporation, Brawley, California.

gives the best results for general local conditions. Since decorticated seed, with 1.6 seedlings per viable seed unit as compared to 1.1 in sheared seed, seems to have been giving us better results in general field performance, then perhaps our breeding program in search of a single-germ seed may not be the answer to a beet grower's dream, and seed with a uniform factor of doubleness may come closer to solving the problem. Charles E. Cormany² made an interesting test in regard to this situation. He picked out, under a magnifying glass, seed that contained single-seed locules, double locules and triple locules. These were field planted by hand, and the results as shown in table 1 seem to indicate that double seed is the most desirable.

Table 1.—Summary of stand counts by hills on
Single-, double- and multiple-germed segmented seed.
Beet Seed Breeding Department—Planting at Sheridan, 1946.

Variety MW4B-44					
Treatment	Percent singles	Percent doubles	Percent multiples	Percent hills containing seedlings	Total number plants Basis 100 hills
Singles	26.75	1.75	0.25	28.75	31.00
Doubles	22.75	15.25	1.75	39.75	58.50
Multiples	17.25	12.50	4.75	34.50	58.00

Table 1 shows that the total number of plants germinated from single locules was only 31 percent, as against 58 percent from double-locule seed. The distribution factor for double seed is 38 percent better than single seed. In the case of triple-locule seed, the total number of plants is about the same as double-locule seed. The triple-locule seed was down on singles, not bad on doubles, but produced more triples and showed poorer distribution than double seed.

Further consideration of the comparative merits of decorticated and sheared seeds must include the stands produced after thinning. Table 2 shows a comparison of decorticated seed with sheared seed in Imperial Valley, in respect to stand count after thinning. Professor Roy Bainer³ mentioned the fact that decorticated-seed plantings appeared to produce fewer skips than sheared-seed plantings. With this thought in mind, we tried to evaluate the degree of loss from skips in the stand. We made a series of four tests, in widely separated areas in the Imperial Valley, on various types of land. One-third-acre test plots were marked off and planted in commercial beet fields. In our 34-inch row spacing, we require an average of 150 well-spaced beets per 100 feet of row length for maximum production. We estimate that skips of less than 12 inches are negligible, while skips of 12 inches or longer will lessen production. With the above thought in mind, we averaged the number of skips 12 inches or over for each type of seed. The results of the four plantings showed an average of twelve 12-inch skips in the decorticated seed and 22½ skips in the sheared seed. In the stand count per 100 feet, the average number of beets from decorticated seed was higher than the average number from sheared seed.

²Chief Agronomist, Holly Sugar Corporation, Sheridan, Wyoming.

³Agricultural Engineer, California Agricultural Experiment Station, Davis, California.

Both types of seed produced enough beets per 100 feet, but evaluating the stand by the skips, decorticated seed showed an 88-percent stand as against a 77-percent stand for sheared seed.

Table 2. Decorticated seed plantings, Imperial Valley.

Cobbley Plantrol Planters—13 Cells per Foot Row Spacing—34 inches U. S. 15 Seed				
Seed	Size	Soil type	12-inch gaps per 100 feet	Stand count per 100 feet
Brown & Simons				
Decorticated	7-9	medium	2	161
Sheared	7-9	medium	7	157
R. B. Wilson				
Decorticated	7-9	medium	21	131
Sheared	7-9	medium	28	128
Rutherford & Alvarez				
Decorticated	7-9	heavy	7	190
Sheared	7-9	heavy	28	168
Harry C. Smith				
Decorticated	7-9	light	18	148
Sheared	7-9	light	23	144
Average Decorticated			12.0	157
Average Sheared			22.5	149

During the 1947 planting season, we planted our entire acreage with decorticated seed, and the results so far have been most gratifying. Out of 28,400 acres originally planted, we have replanted 418 acres and have abandoned 540 acres. In no case could the abandonment or replanting be attributed to failure of the seed. The percentage of replanted and abandoned acres comes to only .0303 of the total, which is quite remarkable when we consider that a large number of growers are raising their first beets.

Our average rate of seeding was 4.6 pounds of decorticated seed per acre, and more than 80 percent of our acreage was planted with precision-type planters. Stands were generally good and a normal crop of beets is in evidence. We believe that it will be shown by our 1947 sugar beet crop that decorticated seed is better adapted to Imperial Valley conditions than is sheared seed.