

Beet Seed Standardization

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The first practical method of reducing the number of sprouts per beet seed ball was the segmenting or shearing process developed by Professor Roy Bainer of the University of California College of Agriculture at Davis. The Holly Sugar Corporation recognized the possibilities of this new type of beet seed, and early in 1942 a single stone seed shearing unit was built and installed in the Holly warehouse in Stockton.

Because of the rapidly developing shortage of field labor and the demand on the part of the growers for some means of reducing labor requirements, sheared beet seed was accepted readily and the percentage of our total acreage planted with such seed increased very rapidly. The initial results under generally favorable field conditions proved satisfactory and the percentage of sheared seed increased further until 1945 and 1946 when about 90% of our plantings in California were made with this seed.

Because of the enthusiasm over this new development in beet seed and the critical need for field labor savings, some of the shortcomings and problems involved were not recognized immediately. Very soon, however, dry spring conditions and limited soil moisture produced unsatisfactory stands on a substantial portion of our total beet acreage.

The seed produced by this original shearing process was graded through 9/64ths and over 7/64ths round hole screens. While the resulting size was very uniform the seed pieces were still very irregular in shape, even though the process included a seed polisher. There were also a large number of exposed germs. Growers generally were very critical of these exposed germs and empty locules and were quick to criticize the whole principle of sheared seed planting when poor stands resulted from deep planting or limited soil moisture.

It was about this time that the importance of the damage done to the beet seed germ by the shearing process was generally recognized and Professor Bainer undertook further work in the perfection of seed processing to eliminate this fault and improve the recovery of good seed. As a result of this work, he developed the decorticating process which reduced the size of seed balls by the use of stone grinding wheels, stationary steel burr plates and rubber-faced pressure plates. It was immediately recognized that the seed produced with this process was improved insofar as damage to germs was concerned, even though the percentage of double and multiple sprouts was increased rather materially. Field tests showed that germination and emergence were improved significantly with this new decorticating process and the seriousness of higher double and multiple sprout count was recognized as being of minor importance.

The Holly Sugar Corporation worked with Professor Bainer and the Blackwelder Manufacturing Company to perfect a practical design for a commercial unit employing the principles worked out by Professor Bainer.

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With the use of this new type unit, the seed processed proved to be more symmetrical in shape and had fewer exposed germs, even though the seed size range of 7/64-9/64 was continued.

California beet growers readily recognized the improved features of this seed over the sheared product, and the grower demand increased rapidly through the 1947 and '48 crop years. During this time, the need for increased production necessitated the addition of two more University of California type decorticating units, as well as two new Eureka seed cleaners.

Early in the testing period of this expanded processing plant a fundamentally important factor was recognized. The gradual reduction in the size of the seed ball by successive grinding and polishing steps resulted in producing a much more desirable type of seed, of higher germination, and with a resulting higher recovery of the finished product than was possible with any single grinding action. This principle was utilized in a practical way by returning the over-run from the cleaners to separate decorticating units. In this way, the clearances between the stones and the steel and rubber wheels can be set to closer tolerances because of the uniformity of the seed introduced. We believe this principle has reduced the damage to seed, improved the germination and increased the actual recovery very materially. With the use of Eureka cleaners and some further grower acceptance of the increased germ count, it was decided to increase the seed size range to 7/64ths-9^{1/2}/64ths and the resulting seed has been accepted very favorably by most of our growers.

Our beet growers generally have indicated their appreciation of our processed beet seed. The fact that it has been so universally satisfactory for all types of planting equipment and seed bed conditions has caused us to feel that this type and size of seed should become our standard product. While we have not had universal grower acceptance of this seed, the high percentage of our total acreage planted with it and the fact that the demand for graded whole seed is relatively unjustifiable, we hope to establish a policy beginning with the 1950 fall planting season of issuing only this standardized processed beet seed.

We believe that this type of seed can be planted in any and all planters now in use and at any desired rate, from the most limited precision spacing to the heaviest practical basis, where no thought of labor saving or mechanical thinning is planned. We have had such a universally satisfactory experience in securing good stands with this standardized processed seed, especially when treated with fungicidal and insect-repellent materials, that we feel there is little, if anything, to be gained by any change in size or methods of processing.

The following table indicates the approximate average specifications of our decorticated beet seed:

Screen hole size	7-9/64	7-9 ^{1/2} /64
Bushel weight	30-31 lbs.	29-30 lbs.
Seeds per lb.	45,000-47,000	38,000-43,000
% Sprout count		
Singles	40-50	30-40
Doubles	25-40	40-50
Multiples	0-15	5-15
Hand Screen Fractions		
% of Sample on		
7/64ths	15-25	15-20
8/64ths	40-75	40-50
9/64ths	10-30	30-40
10/64ths	Neg.	0-5

We recognize some of the advantages of a definite standardization of processed beet seed to every one concerned, including the beet grower, sugar processing company and implement manufacturer. Certain economies in processing work can, no doubt, be effected and the product further improved by continued and more intensive work on our present processing methods.

We should be justified in arbitrarily issuing only standardized processed seed to growers, even including the old "die-hards" who still feel that they can produce larger beets from larger seed balls, or those who would like to utilize an old 1925 planter. The benefits of improved processed seed in quick germination, more uniform emergence and the increased vigor of seedlings should certainly justify the 100% acceptance and use of this seed.

We believe that some degree of standardization of processed beet seed among all sugar companies would be of material assistance *in* attaining further perfection, improving planting equipment and securing universal grower acceptance, and these advantages probably should determine the compromise which is necessary to bring about an ultimate standardized procedure.