Processing and Testing of Monogerm Seed¹

(A panel discussion composed of L. A. KLOOR., Moderator, GEORGE E. WALTERS, G. E. RUSH, CHARLES PRICE AND AUSTIN ARMER.)²

Processing and Plantitng-Holly Sugar Corporation³

Two monogerm hybrid seed quantities of sufficient size for commercial testing were sent to Stockton, California, for processing. This quantity represented a sizeable portion of the total monogerm seed available for purposes other than breeding.

Briefly, little or no difficulty was encountered in processing either of the two varieties of monogerm seed. It was concluded that this type of seed could be successfully processed and average recovery attained. The characteristic flat shape of monogerm seed did not present any unsurmountable problem either in processing or planting.

Planting was made in two commercial fields with two types of commercial planters, a John Deere and an International. A very minor modification was made on the John Deere in order to adapt the plates to the flat character of the processed monogerm seed.

Each of the two plantings were made in fields with multigerm beets on either side. One planting was made on the Holly ranch at Tracy, California on April 25. Two pounds of seed per acre were planted at a speed of $2^{1/2}$ miles per hour. These beets were not thinned, a hoe was not permitted in the field until weeding time. This field was harvested after 201 days of growth and produced 20.23 net tons per acre, with an average sucrose percentage of 15.05 and a gross yield of sugar of 6,151 pounds per acre. This compared favorably with the multigerm variety in the same field. which had 60 additional growing days. The commercial field yielded 29.10 tons per acre.

A record planting at Tracy, California, was made one month later, using the unbelievably small amount of 1.029 pounds per acre. Seed was planted in 30-inch rows at a spacing of approximately three inches apart. An excellent stand was obtained which, at thinning time of the commercial multigerm, gave 205 beets per 100 feet of row. The only doubles occurred where the drill plate apparently accepted two seeds in a plate cell.

In this second planting, both the monogerm and multigerm were of identical age at harvest. The monogerm planting yielded 18.10 tons per acre with 16.14% sucrose and gross sugar per acre of 5.842 pounds. The commercial planting vielded 18.06 tons per acre. 16.81% sucrose and a gross sugar of 6.072 pounds per acre.

¹ Results here presented are of preliminary nature. Tests of monogerm seed processing, planting and thinning were conducted to answer questions of a nature necessary to the confitmation of the monogerm plant breeding program.
² Comments by George Walters appear as a separate paper. Data presented by G. E. Rush was not made available for publication.

[&]quot;Presented by L. A. Kloor.

Since the germination percentage of monogerm can be raised through processing, weight per bushel increased, and processing accomplished with standard decorticating and processing equipment, it can be concluded as follows: (1) Monogerm seed can be processed successfully, (2) Good yield of processed seed can be obtained from whole seed and (3) Comparable beet yields can be obtained from monogerm seed.

Photographic Inspection of Monogerm Seed-Spreckels Sugar Company⁴

By methods of "trick photography" close inspection of processed monogerm seed has been recorded on photographic film. By use of mirrors, the top view and side view were photographed simultaneously through a screen l/64ths of an inch apart. By this method, the top and side of a seed can be observed and compared.

Comparisons were made between the original recleaned seeds and decorticated seed. Before decortication, some evidence of biscuit-shaped flatness can be observed, particularly in the larger seed. The smaller seeds show a more or less roundness of spherical nature. A very definite flattening is observed in the silhouette of the processed seed.

Since this flat character of the seed is expected to give difficultv in the mechanical handling of seed in drills, pelleting has been suggested as a means of curing this ill. Unfortunately and in spite of the spherical shape imparted to the seed through pelleting, pelleting has not had much success in sugar beets. It is expected that the flat seed character can be eliminated through the plant breeding programs. With this aid of the plant breeders and a little caution in using this seed in planters, no particular troubles are expected from this flat characteristic.

Some concern is being shown toward Monogerm's natural small size. If this characteristic persists, some planter changes will be necessary to accommodate smaller seed sizes. Perhaps it is too early to be concerned over these factors since a few of our earlier concerns have been proved to be needless.

Planting Tests-U. S. Department of Agriculture⁵

Test plantings with monogerm whole, monogerm processed, monogerm pelleted, U. S. 56 processed and U. S. 56 pelleted were made at Brawley, California, on September 24, 1953. These plantings were made in a characteristically rough seed bed, typical to the conditions of the Imperial Valley. Such conditions cause irregularity in seed depth, some are placed shallow, others deep. This planting was irrigated up in the normal manner on September 28.

It was observed that a better stand was obtained from the unpelleted seed than from the pelleted seed. The pelleted seed emergd slower than those which were not pelleted. The whole seed produced a large portion of doubles and some triples, more than likely caused by seeds "stacking up" in the cells of the **drill**.

⁴ Presented by A. A. Armer. ⁵ Presented by Charles Price.

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Under greenhouse conditions, these same tests gave further results. Less of a delay between emergence of pelleted versus unpelleted seed than in the field was observed. The trays in the greenhouse were irrigated well which would lead us to believe that large quantities of water are necessary to make pelleted seed perform nearly as well as the bare.

In any case, a very definite increase in the number of single plants was noticed from monogerm seed. This was noticed regardless of the treatment the monogerm seed had received.

Monogerm Field Trials-Utah-Idaho Sugar Company"

During 1953, the Utah-Idaho Sugar Company conducted a total of 14 field trials comparing processed monogerm seed sized 8-10 and decorticated multigerm seed sized 8-10. In these trials, five pounds of seed were sent to each factory district with the request that they go into fields where farmers were drilling, empty two cans of the drill, place the monogerm seed in the two cans and make several rounds in the field. This gave us alternate 4-row strips of processed monogerm and decorticated multigerm seed, both of which had been processed and sized 8-10/64ths.

Satisfactory stands were obtained in all of these trials and it was evident that processed monogerm seeds sized the same size as the seed we are now using in the districts could be planted very satisfactorily with all of the improved drills now in operation in our various districts. Counts on these comparative strips show^ted 64% singles from the decorticated seed and 89.6%. singles from monogerm seed.

This would indicate that when monogerm seed becomes available for commercial planting, it would prove to be advantageous in our spring mechanization program. It might be summed up b ysaying that we see no particular problems in the handling and planting of monogerm seed. We expect to be able to plant it with the same drills that are now in use and mechanically thin it with the same type of mechanical thinners which we are using at the present time.

8 Presented by Bion Tolman.