Field Stands Obtained from Plantings of Variously Processed Mono- and Multi-Germ Sugar Beet Seed

GEORGE E. WALTERS[1]

With mono-germ seed becoming more and more a reality there is much work to be done on processing the seed so it can be handled in our present drills. Also, there may be some change in thinning methods. In the past two years the Great Western Sugar Company has obtained some very interesting results with mono- and multi-germ seed, both bare and coated.

Table 1 gives results obtained in 1952 with our commercial segmented seed, bare and coated. In order to get an exact comparison, we took 300 pounds of our untreated commercial seed, mixed it thoroughly, and then took 100 pounds of this mixed seed to the Filtrol Corporation in California and had it coated. For the plantings, we used two Milton drill units with the correct size seed plates for use with the bare and coated seeds. The plantings were made in a four-state area: Montana, Wyoming, Nebraska and Colorado. Preference was not given to fertility, seed beds, etc., in making the plantings.

The seed was drilled on farms where the farmer was using a Milton drill on which our units could be attached. Two rounds were made in each field, making four rows of the coated seed and four rows of the bare seed. As you will note on the chart, the percent emergence of the coated seed was slightly above that of the bare seed. Also, a much better planting pattern was obLained with the coated seed, indicating that there was some shearing of the bare seed in the drill units.

Table 2 gives results of mono- and multi-germ plantings made on the Windsor Experimental Farm in 1953. These experiments were made to determine what advantages we can expect with mono-germ seed with respect to mechanical thinning. After the plantings and emergence counts were made we had some very adverse weather conditions (8 degrees above zero) and we began to doubt the value of the experiment. The emergence figures used in the chart are taken from the first counts before the storm; however, new counts had to be made prior to thinning. The results obtained in our thinning after the second counts were satisfactory. Of the five ways the seed was handled, the coated seed showed a distinct advantage over the bare seed in the number of singles obtained. This was probably due to cell fill on the drill at the time of planting. The Milton drill fitted with the proper size plates was used in the experiment.

Since the coated seed shows up so well in these tests, I think it would be proper to give a brief account of the coating process. The coating process is very time-consuming. The actual machine consists of a 60-inch diameter ball with an opening to admit the seed. It takes one man two to three hours to coat one 50-pound batch of seed. The operator will be busy adding the coating material and moisture. The coating is a dry powder and water is

[1] George E. Walters, Agricultural Engineer, the Great Western Sugar Company, Denver, Colorado.

Table 1.—Comparison of Bare and Coated Seed Plantings in 1952[1]

Factory	Type of Soil	Condition of Seed Bed	Fall or Spring Plowed	Precip. 1st 2 wks.	Which Came Up First	% Emergence	
						Bare	Coated
1. Billings	Light	Good	Fall	.45"	Bare	57	57.8
2. Billings	Sandy Loam	Fair	Fall	.15 snow	Bare	50.5	53.6
3. Lovell	Silt Clay	Good	Fall	.15	Same	53.4	74.4
4. Wheatland				0	Same	33.5	35.8
5. Gearing	Sandy Loam	Fair	Fall	.21	Same	16.5	15.8
6. Scottsbluff	Sandy	Fair	Spring	.19	Same	30	32.2
7. Lyman	Light Silt	Good	Spring	0	Bare	26.5	32.5
8. Mitchell	Sandy Loam	Fair	Spring	.09	Bare	21.2	28.7
9. Longmont	Clay Loam	Fair	Spring	.45	Same	22.3	25.4
10. Loveland	Clay	Fair	Fall		Bare		
11. Fort Collins	Clay Loam	Fair	Fall	1.02	Same	31	45.2
12. Sterling	Sandy Loam	Good	Spring	3.6	Same	19.2	10.3
13. Longmont Experiment Station						15.96	55.31
14. Ovid	Clay Loam	Fair	Spring	1.24	Bare	20.9	8.9
Average Percent Emergence, All Counts						33.38	35.07

[1] This table based on: Bare Seed—57,449.8 germs per pound of seed; Coated Seed—8,553.6 germs per pound of seed; Bare Seed—41,580 seed balls per pound of seed; Coated Seed—4,760 seed balls per pound of seed.

Table 2.—Results of Single Germ Plantings Made at Windsor in 1953[1]

Type Seed	Seed Description				Germination (Average 16 Counts)						Thinned Stand				
											Per 100"			Per 100'	
	Seed Balls /lb.	Germs /lb.	% Germ.	% Sngls	% Emergence	Sngls	Dbls	Trpls	Total Beets /100"	Total Inches /100"	Sngls	Dbls	Trpls	Beet Hills	Total Beets
Tehachapi Mono-Germ Decorticated, Bare	67,400	44,653	66.25	99.62	63.6	32.5	11.0	2.25	61.0	45.75	9.0	.95	0	119.4	128.0
Tehachapi Mono-Germ Decorticated. Coated, Small Size	9,560	7,361	77.00		75.7	26.2	2.5	.05	32.5	28.75	7.6	.2	0	93.6	96.0
Tehachapi Mono-Germ Segmented, Bare	62,360	41,937	67.25	98.88	63.4	28.5	6.25	.625	42.8	35.05	8.1	.25	0	100.2	104.4
Commercial Segmented, Bare	41,580	57,450	86.25	46.2	57.7	21.8	11.05	4.70	59.5	37.55	8.8	1.5	.2	126.0	148.8
Utah-Idaho Mono-Germ, Bare	40,520	36,265	89.5	99.0	55.8	22.3	7.1	.5	35.75	29.9	8.2	.7	0	106.8	118.8
Tehachapi Mono-Germ Decorticated, Coated, Large Size	8,800	6,949	78.25		66.2	21.5	1.8	0	24.75	23.3	8.7	.25	0	107.4	109.85
Commercial Segmented, Coated	5,760	8,554	88.50	42.7	53.2	17.0	9.1	1.5	38.5	27.6	7.8	.7	.05	102.7	114.6

[1] Date of Planting—April 6, 1953.

introduced to enable the coating to form on the seed. Several times during the process the seed has to be screened to separate the seeds which have reached the size desired. The sizing screen is a long cylindrical type with four sizes of mesh. The axis of the cylinder is at an angle to the horizontal so that the seed will move from one end to the other. The first screen has an 8/64 inch mesh, number 2—10/64 inch mesh, number 3—12/64 inch mesh, and number 4—14/64 inch mesh. This will allow different sizes of seed to be screened off. Undersize seed is returned to the coating machine. The seed of desired size is dried for six hours in racks of drying trays. The trays are constructed with screen bottoms to allow warmed air to pass through the seed.

It would be practically impossible for all of any one company's beet seed to be treated in this manner because of the space required for the coating machinery and the time involved in the actual coating process.

Fred Burgresser has been working on a continuous-type coating machine, and if it proves satisfactory it would then be possible for a sugar company to process all of its seed. If coating of the mono-germ seed is accepted, we should expect a much higher percent of singles and a more uniform stand, using our present-day drills.