A COMPARISON OF RV5 SEED COATING WITH AND WITHOUT NUTRIENTS IN PELLETED SUGAR BEET SEED TO RAW SEED FOR EMERGENCE, TOP TARE, AND SUGAR YIELDS

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PURPOSE

This study was continued for the third year to determine if nutrients and other additives contained in the coating material of pelletized sugar beet seed can enhance seedling emergence and growth by reducing seedling disease and result in higher sugar yields. In addition to previous years results, this years report includes percent top-tare as a comparison between single and multiple plants from plantings with pelleted and raw seed.

PROCEDURES

The trial contained three treatments, RV5 + nutrients, RV5 + Exp. 1 as pelleted seed and a uncoated raw seed as a standard check. The seed, both pelleted and raw, was TASCO variety WS-88. All were from the same seed lot.

The seed was planted in an Owyhee series silt loam soil. Soil organic matter and pH was 1.2 and 7.3 respectively. Winter wheat was grown in the field the year before the sugar beets were planted. Seed-bed preparation consisted of moldboard plowing in the fall and field tillage in the spring. One hundred pounds of P_2O_5 and 60 pounds of nitrogen was applied as a broadcast application before plowing. An additional 140 pounds of nitrogen was sidedressed during mid-June. Two pounds active Nortron and 1.5 pounds active Hoelon per acre were broadcast applied and incorporated with a double spike-tooth harrow before planting for weed control.

Each treatment was replicated eight times and arranged at random in blocks and the data analyzed by analysis of variance using a complete randomized block experimental design. Individual treatment plots were four rows wide and 22 feet long. Alley-ways four feet wide separated blocks.

The seed was planted on April 14 and irrigated on April 15 by rill irrigation. Subsequent stand counts for single, double, and triple plants were taken 10, 12, 14, and 18 days after irrigation. Plant counts were taken from 15 linear feet of the center two rows of each plot planted in eight replications. Areas counted from each row were flagged and emerged plants counted from the same section for each counting.

The sugar beets were not thinned and remained through the growing season as spaced (six inches) using a Beck drill. In early July, 70 pounds per acre of Sulfur dust was applied for powdery mildew suppression. One-half pound ai/ac Bayleton was aerial applied during mid-August.

The sugar beets were harvested on October 14. The plant foliage was removed with a rubber flail beater and the root crowns clipped by trailing scalper knives. The roots from

Presented at the Sugarbeet Schools in Burley (2/2/89) and Caldwell (2/3/89).

the two center rows of each four-row plot were lifted with a single-row wheel-type harvester and all roots in each 22-foot row were weighed to calculate root yield per acre. Samples of seven beets were taken from each of the two harvested rows in each plot and analyzed to obtain percent sucrose and conductivity. Milivolts readings were also taken for determination of root nitrates. Percent extractable sugar and yield of recoverable sugar per acre was calculated for each seed treatment. Harvested root yields were tared by 5 percent and percent sucrose readings were factored to 95 percent of actual readings when percent extraction and recoverable sugar yields were calculated. Tare results were obtained by hand harvesting ten feet of row from each of the two buffer rows for all plots. All beets were taken in the ten foot sections and tared as grower samples at the Amalgamated Sugar Company tare lab.

RESULTS

Soil tilth and irrigation after planting made soil conditions ideal for seed germination and seedling emergence.

Differences in rate of seedling emergence and total plants emerged existed between seed treatments. The differences between these treatments was great enough to be significant at the 5 percent level for all reading dates (Table 1). As not expected, plants from raw seed were slower to emerge than plants from the coated seed (10 day readings). Plants from uncoated seed was 1-2 days slower to emerge. Essentially full emergence was obtained at 14 days following irrigation. Results continue to indicate that with adequate soil moisture, seed germination, rate of emergence, and final stands are not reduced and may be enhanced by additives in the coating material of pelleted sugar beet seed.

Significantly more singles plants and less doubles and triples occurred from pelleted seed when both pelleted and raw seed was planted with a Beck planter set for 6 inch seed drop (Table 3). Sugar beets harvested from pelleted seed plantings had 3-4 percent less tare than beets taken from plots planted with raw seed. The increased tare was due to the difficulty removing tops by scalpers from plants not properly spaced. The differences in the amounts of tare between treatments was not great enough to be significant at the 5 percent confidence level.

Differences in root yields, root quality, or sugar yields did not exist between pelleted and raw seed. Yields and quality were excellent for all treatments with very little variation between treatments within replications as indicated by the C.V. values. Yield responses to initial plant stands were not affected by differences in plant densities occurring from singles, doubles, or triples as a result of using pelleted or raw seed.

Table 1. Number of sugar beet seedlings emerged from WS-88 variety of seed coated with different additives in the pelleting material. Plant counts began ten days after irrigation when emergence started. Seedling numbers are an average of counts taken from two, fifteen foot sections in each of eight replications, Malheur Experiment Station, OSU, Ontario, Oregon, 1988.

Seed Treatment	Plant Stand			
	10 days	12 days	14 days	18 days
RV 5 + Nutrients	20.88 ab	21.94 a	23.31 a	23.38 a
RV 5 + Exp. 1	21.94 b	23.63 b	24.75 b	24.75 b
Uncoated seed	19.88 a	24.25 b	25.88 b	24.88 b
LSD .05	1.66	1.20	1.28	1.15
P-value	0.05651	0.003342	.0023037	0.02498

Table 2. Sugar yields and root quality of WS-88 variety of sugar beet seed coated using different additives in the pelleting material, Malheur Experiment Station, OSU, Ontario, Oregon, 1988.

Seed Treatments	Root Yield	Sucrose	Conductivity	Nitrate	Extraction	Recoverable Sugar
	t/a	%		ppm	%	t/ac
RV 5 + Nutrients	47.69	16.78	801	353	84.27	6.743
RV 5 + Exp. 1	48.35	16.76	804	341	84.23	6.825
Uncoated seed	48.29	16.87	813	341	84.12	6.850
LSD(.05)	2.191	0.131	49	64	0.668	0.289
CV(s/mean)	4.24	0.73	5.77	17.45	0.739	3.965
Mean	48.11	16.80	806	345	84.21	6.806
*P - Value						

Table 3. Number of single and mutiply plants for raw and pelleted seed planted with a Beck drill set for a six inch drop, Malheur Experiment Station, OSU, Ontario, Oregon, 1988.

Seed Treatment	Singles	Doubles	Triples	Percent Tare
RV 5 + Nutrients	22.7	2.3	0	9.32
RV 5 + Exp. 1	23.3	1.9	0	8.45
Uncoated Seed	15.9	6.2	2.6	12.17
LSD(.05)	4.3	1.9	0.8	3.84
CV(s/mean)	3.86	4.93	8.20	9.30