Would smooth root beets reduce the cost of disposing of soil at our factories?

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A tremendous amount of soil is carried into the factory locations with the beets and must be hauled back out later. The soil that remains at Michigan Sugar Company factories is at least four percent of the tons of beets sliced. For us that means about 130,000 tons of soil to dispose of. The cost of soil disposal may vary dramatically between factories and areas but it is costly. Beets with smoother roots would also mean less soil for the grower to haul at harvest and also save them money. Most of the soil ends up in ponds and is more difficult to dispose of because it is wet. Disposal of soil from the factory sites is increasingly difficult because of government regulation. This soil handling and disposal is expensive. The USDA-ARS in East Lansing, Michigan has developed a series of beet lines that have a smoother root. The advantage should be to carry less soil into the factory sites. The test was designed to evaluate tare reduction with the smooth root lines.

METHODS: We used three of the smooth root lines and three traditional varieties being planted by our growers to compare the amount of soil tare. The seed was planted thick and then thinned, giving all beets planted the same population. The roots were harvested with a two-row Farmhand harvester that has a renk bed and also grab rolls for cleaning. To compare the amount of tare, we used our tare room beet washer to remove the soil from the roots.

2002
PERCENT TARE

TREATMENT	Wegner	Jurek	Bebow	Average of 3 Locations
Smooth Root 87	1.8	1.9	0.6	1.4
Smooth Root 95	2.5	1.9	0.9	1.7
Smooth Root 97	2.5	2.4	1.5	2.1
Beta 5736	3.3	5.9	1.5	3.6
SX Prompt	3.0	5.6	2.3	3.7
HM E-17	3.2	6.0	2.7	3.9
GM	2.7	3.9	1.6	2.7
LSD (5%)	1.6	1.6	0.6	0.7
CV%	48.7	34.0	33.5	40.1

2003
PERCENT TARE

TREATMENT	Dumaw	Knochel	Maxwell	Average of 3 Locations
Smooth Root 87	0.85	0.44	0.58	0.62
HM E-17	1.50	1.38	2.00	1.63
Smooth Root 97	0.89	0.90	1.20	0.99
Smooth Root 95	0.89	0.56	0.24	0.56
SX Prompt	1.62	2.26	1.51	1.80
Beta 5736	1.73	2.40	2.12	2.08
GM	1.25	1.3	1.3	1.3
LSD (5%)	0.63	0.9	1.0	0.5
CV%	41.9	59.5	65.3	56.8

2004
PERCENT TARE

TREATMENT	Jurek
Smooth Root 87	1.33
HM E-17	4.05
Smooth Root 97	2.12
Smooth Root 95	1.28
SX Prompt	2.91
Beta 5736	3.63
GM	2.56
LSD (5%)	1.14
CV%	37.5

AVERAGE OF THREE YEARS
PERCENT TARE

TREATMENT	
Smooth Root 87	1.07
Smooth Root 95	1.12
Smooth Root 97	1.58
SX Prompt	2.76
HM E-17	2.97
Beta 5736	2.98
GM	2.08
LSD (5%)	0.47
CV%	52.2

RESULTS: Comparisons were made from seven locations over three years. The tare of the traditional varieties varied from 1.62 to 5.83% at different locations. There was a significant reduction in soil tare on the smooth root beets at all seven locations tested. The lowest tare reduction was 28.4% and the remaining six ranged from 45.7 to 68.7% less tare on the smooth root beets. Over all locations there was a 56.6% reduction in tare for the average of the three smooth root lines compared to the average of the three traditional varieties.

CONCLUSIONS: The reduction in soil that adheres to smoother root beets would be of significant benefit. To have this trait incorporated into commercial varieties would benefit the growers and processors financially.