# Economic Significance and Some Possible Approaches to Reducing Storage Losses

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Sugarbeet storage is a very complex problem. It has been with the industry, I suppose, since the time of Napoleon. I don't know how many beets were stored in those days, but I do know that today in the temperate zones beets are harvested during the fall season and a substantial percentage of the crop is stored for future processing. In California-Arizona very little of the crop is stored for long periods, but in other areas of the United States a great percentage of the crop is stored. In our Red River Valley area, where we're growing about 2 1/2 million tons a year, 70 to 75% of the crop is stored. I think the lowest percent of the crop stored that I can find in recent reocrds is 65% and that was in 1958 when we had a very poor crop. And back in 1962 we were down in the 60% range. The highest we've ever been is 79% and I suspect that other areas of the country have comparable figures.

We'll all agree that sucrose loss begins at the time the top is removed and the lifter pulls the root from the ground, and continues from that time until it is sliced and through the diffuser.

The two major losses are the loss of respiration to keep the beet root alive until it's processed and the second most important loss is conversion. to other forms of sugar that do not have the economic value that sucrose has. I tried to put together some figures on really how large this loss would be on a national basis. In the United States in the last several years we have grown about 27 million tons of beets. If a third of those beets are stored for a period of 60 days which I believe is a fair estimate ( I think probably it's a little more than that) that would be 9 million tons of beets. If those beets are stored at about 50 degrees which is about right for a 60 day storage period, they would lose a half pound per ton per day of sucrose to respiration. In other words it takes that much sugar just to keep that root alive. At least an equal amount is lost through conversion to other types of sugars, for a total loss of a pound per ton per day. If that be true there is about 540 million pounds of sugar lost in storage every year. This is talking about beets that are processed, and does not include beets that are spoiled and thrown away. Not many of us ever say much about them, but we do have to throw some beets away once in a while. If my loss estimates are valid and if sugar is worth 10 cents a pound, which is a pretty low price for sugar, that's about 54 million dollars a year that goes to storage losses. At 12 cents a pound that is about 65 million dollars that go to storage losses.

There is no way to stop all storage losses, but if out of a conference of this type we could start a program to save 10%, whatever it cost your company to send you here would be very insignificant. I really believe that if we implement the things that are currently known concerning proper storage techniques, we could recover 10 to 20% of these losses. I think there are some things we need to do first and there must be a lot of capital money spent, but I believe we can substantially reduce our storage losses.

We're talking about 10 to 20 million dollars worth of sugar a year that could be saved and I'm talking only about losses in storage piles. Every operating man knows that there are a lot of other benefits to good storage in the mill that I'm not even trying to put a dollar value on. Probably some of our operating people say that the 10 to 20 million dollars I'm talking about saving is peanuts compared to the handling of these beets in a mill.

How are we going to solve this problem? Certainly I don't know. I think the first step though is to be taken by what I think is the top flight committee of one man from each one of the processors that is going to come back to the Foundation board with a proposal and recommendations on how we can best pool our talents and how we should start to attack this problem as an industry.

As I dream about it, one of the possible answers will come through genetics. We all know that different varieties store differently. I think in the future every new variety we put in the field is going to have to go through some very, very rigid storage tests before we dare put it in the field. Another possible approach is controlled atmosphere and rapid cooling to reduce or slow down respiration. I think we're going to decide that we've spent a lot of time trying to get rid of all the dirt and the trash and in the process we're damaging the beet root so badly that we're bringing some of the storage losses upon ourselves. We think nothing of crushing beets and some of these metal screens practically take the skin off of them. I think some day there will be preharvest treatments such as growth regulators and hormones that may improve storage conditions, improve ripening or something of that nature. Another possible solution in the northern areas is to freeze vast quantities of beets solid as a rock and that the mill people are going to learn how to process them. I think someday that's going to happen, but it is going to take a lot of study and a lot of time.

In summary I think all companies, whether they be California companies, eastern companies, all of us are aware of this storage problem. We've spent a lot of time and money on it individually and now I hope we can pool our resources, money and talent for the benefit of the whole industry.