

# **ALTERNATIVES TO TRADITIONAL SUGARBEET PILING USING THE ROPA MAUS AND HOLMER FELIS CLEANER/LOADER BEET MACHINES**

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## **ABSTRACT**

Michigan Sugar Company and several of its' growers have utilized the sugarbeet field cleaning/loading technology that is commonly used in the European beet sugar industry. Since 2002, Michigan Sugar Company has transitioned from one cleaner/loader to thirteen operating machines in 2012 (both Ropa Maus and Holmer Felis). Growers who have access to this system are permitted to field pile sugarbeets in field clamps for short periods of time. The cleaner/loader is used to field clean piled sugarbeets and simultaneously load onto large transport trucks for direct-delivery to factory wet hoppers or stackers (modified sugarbeet pilers).

Direct delivery allows traditional sugarbeet receiving stations to remain idle during the pre-pile segment of harvest. This system permits a fresher sugarbeet going to the factory wet hopper than conventional pile receiving operations and offers growers many advantages.

Beet stacking is the next step of direct delivery with the cleaning/loading machine. Stacking takes place during the permanent piling stage of harvest by growers placing sugarbeets in field piles briefly until the loader/cleaner system delivers it to a receiving station stacker piler. The stacker piler is a simplified sugarbeet piler that conveys beets to a boom for placement into a traditional long-term pile...

In 2002, the direct delivery cleaning/loading system was brought to the growers' fields utilizing the Ropa Maus at one operation. The Maus has a header roll bed of 160 sq. ft., a center intake conveyor of 67 sq. ft., a rear roller bed of 64 sq. ft. and a truck conveyor of 90 sq. ft., giving this system a total capacity of 381 sq. ft. In comparison traditional beet piler rollers are significantly smaller; Kringstad (110 sq. ft.), 4800 Dakota (95 sq. ft.), 3600 Dakota (75 sq. ft.) and Silver (50 sq. ft.). Slow but steady growth of this technology continued throughout the company during the last decade; two operations in 2004, three operations in 2008, four in 2010, six in 2011 and currently we have eight direct delivery operations at Michigan Sugar.

During early (pre-pile) delivery, the grower harvests and piles the crop in the field. The crop is cleaned and loaded in the field by the field cleaner then delivered directly to the processing facility wet hopper by commercial transfer trucks. Grower delivery to the piling yards is bypassed and the piling yards remain closed.

A lottery system is used to determine a grower's eligibility for acreage/tonnage selection. Growers are allowed to trade or sell position within the company; however, piling sites must fall within the guideline of safe loading in all weather. Early delivery participation is voluntary but the company controls when the growers harvest their crop to create field loading efficiency. Communication between the grower and the agriculturist is paramount to making the system run smoothly. Growers harvest field and acreage as scheduled by the co-op. They can use harvesters, trucks and carts to pile the beets with roadside loading in mind. Beets are delivered to the factory wet hoppers.

There are many advantages to this direct delivery system for the grower. The grower transfer freight costs are the same as delivering to the piling yard; no additional trucking costs are incurred. There is no waiting in long lines at the pilers. Reduced labor costs.

The co-operative also benefits. The piling facilities remain idle from start of harvest to the time of permanent piling, reducing labor and electricity costs, as well as, repair and maintenance to the pilers themselves. Early harvest havoc is eliminated with less traffic on the roads. The factories are processing fresher beets. At Michigan Sugar Company four piling yards were closed for pre-pile in 2010; six piling yards were closed for pre-pile in 2011 and seven were closed in 2012 from the start of harvest to October 20. Thirty-eight per cent of slice went directly to four factory wet hoppers during pre-pile time which translates into 411,000 tons. The co-op also pays the owner for cleaning and loading approximately \$2.00 per ton. A high level of management is required by the company including complex logistical procedures and communication to successfully orchestrate Direct Delivery.

The next phase of direct delivery is the stacking program. Stacking is done during permanent pile. Beets are field piled briefly then cleaned and loaded at the field allowing most of the tare dirt to remain in the field. The beets are roadside loaded and delivered to the piling site where a stacker is used to place the crop in long-term piles. The stacker is a converted beet piler. Removal of the piler cleaning bed is the major conversion factor. The stacker is basically a conveying operation of beets from the transfer truck to top of the pile. The stackers have a higher volume capacity allowing two trucks to dump at once increasing efficiencies for both the grower and the piling yard.

With stacking there are advantages for both the grower and co-operative. First of all, it disconnects the harvester from the piling yard. Tare dirt stays in the field where it belongs; eliminating cross contamination at the pilers. Old pilers can be converted into efficient stackers. The field cleaning/loading machine cleans and handles beets very well. The operator can monitor and adjust the cleaning bed unlike beet pilers can operate. When stackers operate there is less truck volume at the piling ground because fewer trucks are required for the same job. Reduced freight costs are realized for the grower because there is less soil to haul and less mudding up of roads. On the co-op side, a continuous supply of beets can be maintained because 24-hour stacking can be orchestrated. Predictability leads to greater efficiency.

Stacking protocols are straightforward. Lay the beets down and pick them up as soon as possible; the fresher the beet the better. A three-day stale date has been established as a reference for picking up field piled beets. Day 1...great, same as piler; Day 2...good, same as overnight in truck; Day 3..., waiting for soil to dry; To make this program run smoothly however, requires intense management, control, co-operation, commitment, resources and communication.

Stacking is not without challenges. Field accessibility is very important. Growers can't harvest when they want because it must be governed by the company and tare dirt can create hot strips in the field. On the co-op side, intense management must be maintained to bring the crop in. Root condition and cleanliness of stacker loads can create concerns. With grower owned equipment Co-op employee control is reduced. Duration clamps are piled in the field and long-term storage of stacker piles can be an issue.

In 2010, Michigan Sugar Company used three stackers to pile 65,000 tons; in 2011 the three stackers piled 136,000 tons and in 2012, 209,000 tons (or 6 %) of Michigan Sugar Company beets were piled with four stackers. From an equipment standpoint in 2012, eight field cleaners were used for direct delivery during pre-pile/early harvest. During permanent pile harvest four field cleaners delivered to stackers and nine field cleaners delivered to wet hoppers.

This translates into 70 per cent of the slice from Oct. 20 to Nov. 20, about 15,000 to 20,000 tons per day for a total of 509,000 tons. One converted Ropa Maus recovered 133,500 tons of beets from permanent piles.

In summary, the North American sugarbeet industry will likely see more of this field cleaning/loading technology integrated into traditional methods. Michigan Sugar Company has placed a moratorium on field cleaner operations for now so direct delivery will remain at the same eight operations as 2012. The stacking program will expand from four to five stackers in 2013, piling approximately 318,000 tons.