

# ONTARIO SUGARBEET PILE RECOVERY INNOVATION PROJECT

Keith Kalso\* and Wayne Martin

Michigan Sugar Company, 159 S. Howard Street, Croswell, MI 48422

## **Abstract:**

An innovative approach to sugar beet pile recovery was developed by the unique partnership between Michigan Sugar Company and Ropa North America in the summer of 2007. The partnership utilized a Ropa Maus loading and cleaning beet machine with a locally fabricated header built for recovery of large long-term beet storage piles. The typical wheel loader used industry wide was replaced with this new system. The unique design not only direct loads trucks but also has a cleaning capacity similar to a conventional sugar beet piler as used in the United States.

The first Ropa Maus entered the North American market in 2002. This unit was utilized by a group of Canadian sugar beet growers that were shareholders of company stock for Michigan Sugar Company. Their group loaded then, as well as still currently, the entire beet acreage in Lambton County, Ontario. The Lambton acreage is field piled and directly shipped by transport trucks to the sugar factory in Croswell, Michigan. A second Maus came to Lansing, Michigan in 2004 to load out field piled beets destined for the Michigan Sugar Bay City factory. In 2005 a prototype header was designed and built for the Canadian Maus and tested in 2005 and 2006 for its effectiveness for loading out beets from large permanent beet piles. In 2007, Michigan Sugar Company leased a new Maus for the sole purpose of recovering beets from large permanent beet piles. The campaigns of 2007/2008 and 2008/2009 saw the Maus load out the entire tonnage from the Dover receiving grounds. Another Maus was utilized in Ruth, Michigan to recover beets from storage piles in 2008 and 2009.

## **Objectives:**

The projects purpose included removal of excess soil, reducing freight costs and pile shoulder removal to improve ventilation.

## **Results:**

	<u>Campaign 2007/2008</u>	<u>Campaign 2008/2009</u>
Beets piled (shipped) (tons)	176,821	91,069
Material recovered or not shipped (tons)	8,664 (4.89%)	3,441 (3.77%)
Freight savings	\$104,404	\$41,477
Extra cost of Maus system	(\$90,177)	(\$46,445)
Savings of tare removal @ factory (not shipped)	\$ 51,984	\$17,205
Profit from tare recovery alone	\$ 66,211	\$12,237

Enhancing Sugar Beet Storage Quality by Dr. Laura Van Eerd and John W. Zandstra, University of Guelph, Ridgetown Campus (February 2008)

This study analytically measured the impact of two different beet pile environments on storage losses (sugar loss due to degradation). It compared the traditional method of pile recovery (using wheel loader) to that of the Maus recovery system. In November of 2007, sugar beet samples were placed in mesh bags and those bags placed in well ventilated mesh cages. The cages were placed near the base of the pile and covered with loose piled beets. Groups of sugar beet samples were removed throughout the recovery campaign following the Maus machine activity; a path of loading out the crop from the exterior (or shoulder) of the piles. A section of beet pile #1 was left intact until the end of the recovery campaign (no shoulder removal). Results as follows:

	<u>Intact Pile</u>	<u>Maus Pile (stripped shoulders)</u>	<u>Difference</u>
% Purity	91.0	94.7	3.70%
% Sugar	18.5	19.5	1.00%
RWST	249.7	288.5	38.80 lbs/T

Comments from the trial:

- ✓ Pile management had large impact on beet quality over time.
- ✓ After 104 days of storage weight loss of beets in intact pile had significantly less weight loss presumably due to reduced pile ventilation
- ✓ Purity, sugar content and resulting RWST were significantly reduced in the intact pile.
- ✓ Suggests that continual pile shoulder removal maintains sugar quality in beets stored in large piles.

### **Conclusions:**

The project is moving forward with improvements in the sugar business that are more than was expected. The Ropa Maus is an amazing machine that is being adapted to new areas that were never foreseen. We now have documented data from the University of Guelph study that shows large increases in sugar available for refinery extraction using the pile shoulder removal path that the Maus follows. The future looks brighter than it did just a few short years ago for the Ontario area that has had its challenges with high freight costs and beet storage problems. The Ropa Maus system is now being utilized in other areas of the Michigan Sugar Company to improve storage quality and sustainability of the industry.