

# Making a difference

## Balancing The Checkbook After 30 Years!

### The Situation

A producer in Walsh County had a saline-sodic site with a high water table. The site hadn't produced a crop over 30 years. The producer was considering tiling the land, and contacted Walsh County Extension agent who referred the producer to the Langdon REC Soil Health Specialist.

### Extension Response

The Extension specialist and agent met the producer and explained how saline soils differ from sodic soils and their relationship with field tiling. Saline soils have excessive soluble salts that can be leached out effectively with rainfall and tiling. Sodic soils have excessive sodium that is not mobile in soil water. Excessive sodium can cause sealing of soil layers above and around tiles rendering them ineffective. Remediation of soil sodicity requires application of amendments which directly or indirectly supply calcium that displaces sodium from the cation exchange sites. Once displaced, sodium converts into a salt (Na<sub>2</sub>SO<sub>4</sub>) and the salt leaches out via water.

With Extension assistance, the producer took soil samples to measure the Electrical Conductivity (EC) for soil salinity and Sodium Adsorption Ratio (SAR) for soil sodicity. Soil samples were taken at 12 inch increments down to 4 feet on November 5, 2014.

In January 2015, the producer and three neighboring farmers met with the Extension team to discuss the results. The soil was saline-sodic the entire depth. However, the N, P and OM levels were good. To lower sodium levels, an amendment was required. Cost was an issue. Gypsum and elemental sulfur were too expensive at a total cost of at \$1,096 (5.48 ton/acre X \$200/ton) and \$920 (1.15 ton/acre X \$800/ton) respectively per acre. Standard lime (CaCO<sub>3</sub>) can be used as an amendment on sodic soils with pH 5.0 or less. However, standard lime also increases soil pH. Beetlime (VersaLime), a byproduct of sugarbeet refining was considered. Beetlime is considered a spent lime that may not increase soil pH. With appropriate paperwork, it also cost nothing. Beetlime at a rate of 14 tons/acre on were incorporated into 16 acres in the first week of May 2015 and planted into barley.

### Impacts

The barley averaging 80 bushels/acre. Cost for hauling and spreading beetlime was \$200/acre. The cost to grow barley was \$208/acre. At 80 bushels/acre and \$3/bushel, the gross profit was \$240/acre, with a net profit of \$32/acre. This was the first time the producer was able to balance his checkbook for that land in 30 years!

Previously, he lost \$100-115/acre/year on seed, tillage and fertilizer alone. With 5.5" of rain right after application, 2015 soil results showed that beetlime lowered sodium level in the 1<sup>st</sup> foot (by lowering SAR from 13.90 to 7.73) and salt levels in all 4 feet (by lowering EC), helping barley germinate and flourish. Over time and more rainfall, beetlime is expected to further lower the sodium levels in the entire soil column (all 4 feet).

Site	Depth (in.)	pH	EC (dS/m)	SAR
<b>Before Beetlime Application (fall-2014)</b>				
Vesta-23	0-12"	6.95	10.20	13.90
Vesta-23	12-24"	6.92	10.75	15.87
Vesta-23	24-36"	6.81	11.18	19.45
Vesta-23	36-48"	6.81	10.09	16.24
<b>After Beetlime Application (fall-2015)</b>				
Vesta-23	0-12"	7.49	1.94	7.73
Vesta-23	12-24"	7.78	4.26	15.60
Vesta-23	24-36"	7.99	6.57	21.45
Vesta-23	36-48"	8.07	6.70	19.89

Neighbors also planted barley on a saline-sodic soil without applying any amendment. That seed didn't even germinate.

### Feedback

*I am amazed to see a crop growing on this soil!*

*What did Mark do to his land? He actually got a good crop for the first time I can remember.*

### Contact

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