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Sugar PRODUCER

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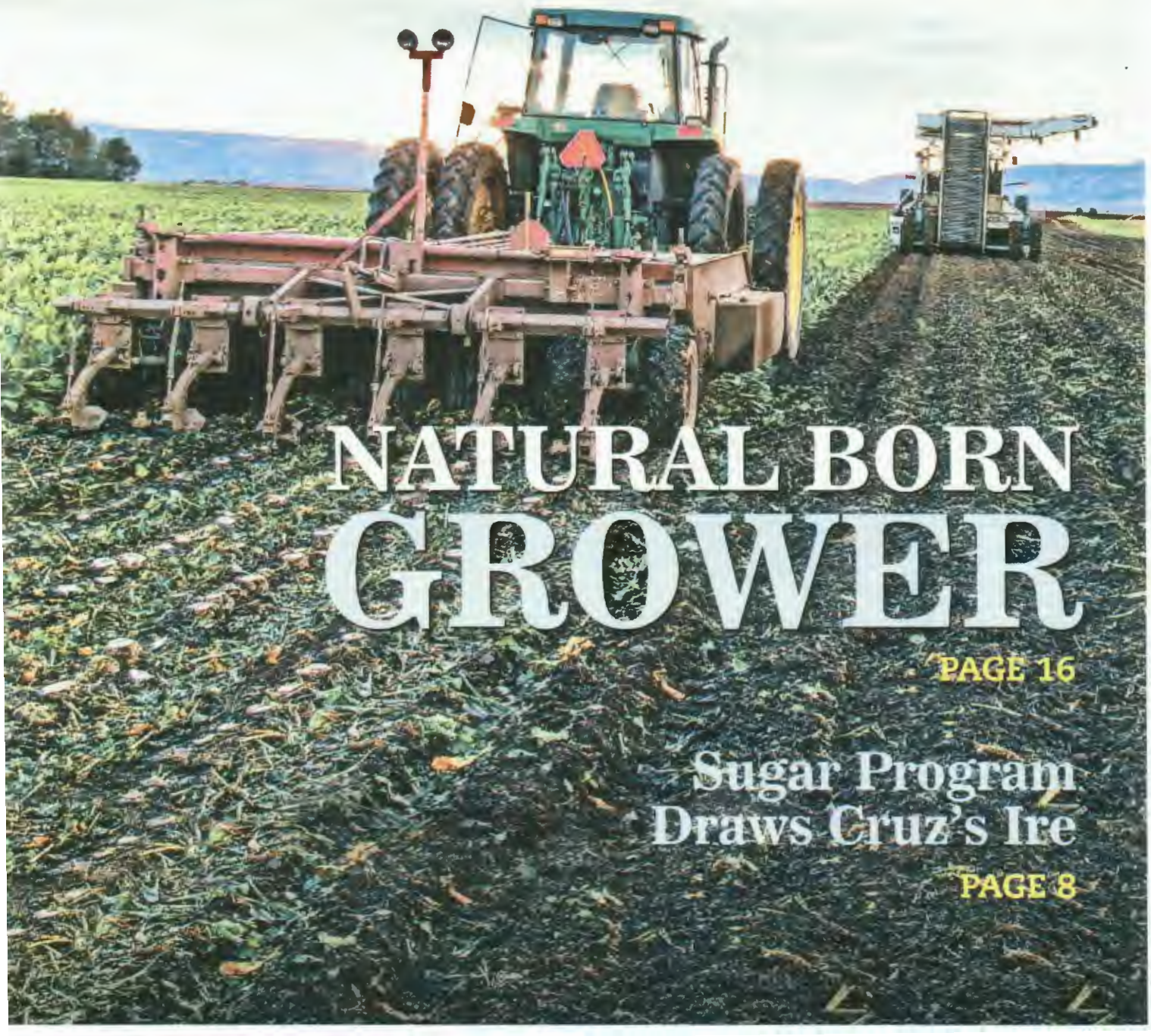

NATURAL BORN GROWER

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Sugar Program Draws Cruz's Ire

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Odor Control by Atomized Mist Aids Beet Processing

By Derek Schussele

The odor control mixture is delivered through an open-ended barrel with a fan on one end and the Odor X Atomizer nozzle on the other.

The atomizer nozzle creates an engineered fog of tiny droplets, which travel with the odor vapor.

MICHIGAN SUGAR IS the third-largest beet sugar processor in the United States, and the only remaining sugar company in the state of Michigan. Originally founded more than a century ago when six independent sugarbeet companies merged, the firm has perfected the process of turning one of the region's largest cash crops into pure, all-natural sugar.

In 2004, the organization became a grower-owned cooperative, and today approximately 900 growers have a stake. Together they farm 161,000 acres, delivering about 5 million tons of beets annually—enough to produce about 1.3 billion pounds of sugar each year. Counting its three warehouses in Michigan and Ohio, the company employs about 700 people year-round and an additional 1,600 during peak processing season.

In all, Michigan Sugar Company's seven facilities generate more than half a billion dollars annually in direct economic activity. Its products include granulated sugar, powdered sugar, brown sugar and liquid sugar, sold in wholesale and retail quantities under the Pioneer Sugar and Big Chief Sugar brands.

The Bay City factory was originally constructed in 1901 and remains the largest of four Michigan Sugar plants. With a daily slice of about 8,700 tons of sugarbeets during its production campaign (usually 200-220 days), the facility typically processes 1.5 million tons per year, yielding more than half a billion pounds of sugar annually.

With company owners and employees all living in and around the areas where the facilities are located, management is acutely aware of its role as a corporate citizen.

"We have always strived to be a positive force in the communities where we operate, and to demonstrate responsible environmental stewardship," said Gary Witzgall, Bay City factory manager. "We believe that we can have the greatest positive impact by supporting issues and causes that are important to our grower-owners, neighbors and employees right in their own communities."

As part of that philosophy, company officials take a number of proactive measures to control the inevitable odors that accompany sugarbeet processing. The first step is washing the incoming stock, catching the debris and depositing it into a settling pond. Effluent moves through several purifying stages—including anaerobic digestion, aeration and clarification—while microbes feed off the residual sugar and effectively clean the water.

One detail that differentiates the manufacturing operation at the Bay City plant is an additional step beyond conventional processing.

"In most sugarbeet factories, at the end of the process you have the final product with a quantity of molasses left over,"

Slurrying tends to release large amounts of odor vapor, so the OB-60G is positioned where the concentration is highest.


Laura Stiverson


The OB-60G is mounted on a towable roadworthy trailer fitted with a 500-gallon (1893 L) water tank.

Witzgall said. "We process that molasses again in a special operation to extract even more sugar. It helps us maximize our resources and reduce waste."

At the end of the process, a slurry is created with water jets to allow the remaining settled solids to be pumped into tanker trucks. The mixture is recycled by transporting it back to the fields, where it's injected into the soil as a nutrient-rich organic fertilizer. The disturbance from the high-pressure water jets tends to release large amounts of odor vapor as the liquid reaches the proper consistency. Although the perimeter misting system forms a barrier surrounding the ponds, it doesn't reach far enough to interact with the odor at its worst—as it's being generated.

To supplement the perimeter system, the company first attempted to mitigate the odor from slurrying by using atomized mist equipment designed for snowmaking. While the unit had some beneficial effect, plant operators felt that it wasn't sufficient, so operations personnel began searching for a better technique to improve odor control. Company officials wanted to enhance their odor management capabilities in a further effort to prevent any objectionable smells from leaving the property.

During that search, they contacted Dust Control Technology, supplier of the OdorBoss brand of odor control equipment, and also visited a scrap yard where the firm's equipment was being used to control odor in a large outdoor operation. Impressed by the effectiveness of the method and the company's deodorizer that was being applied, they decided to rent an OB-60G for a month when the ponds were being emptied.

RE-ENGINEERING ODOR CONTROL

Inspired by DCT's DustBoss line of industrial fan-driven dust suppression products, the OB-60G has been engineered to deliver a finer mist that is better suited to odor control.

"We already had these industrial-strength, extremely durable designs that are very effective at suppressing dust," said DCT President Laura Stiverson. "And both dust suppression and odor control are based on similar principles of matching the droplet size to its target. The closer the water droplet size is to the size of the odor vapor droplets, the more likely there will be a collision between the two."

The system creates an engineered fog comprised of millions of tiny droplets as small as 15 microns in diameter (approximately twice the size of a human red blood cell), which travel with odor molecules on air currents. The OB-60G is designed to run on plain water or with an injection system that precisely meters in odor management additives for maximum effectiveness. DCT recommends starting with a 1000:1 water-to-additive ratio and adjusting if necessary. Suppression is delivered by a special open-ended barrel design containing a powerful fan on one end and the company's Odor X Atomizer nozzle on the other. The device is mounted on a towable roadworthy trailer that is also fitted with a 500-gallon (1893 L) water tank.

"We had been getting a number of inquiries about odor control applications," Stiverson said. "There appears to be a growing need in a variety of different industries, and large-scale food processing operations are among them. As regulatory concerns and public scrutiny continue to escalate, we feel that more companies will be looking at odor management as an increasingly important issue."

MOBILITY

One of the key benefits for Michigan Sugar is the versatility of the OB-60G, which can be quickly repositioned on its trailer to accommodate changing work locations or shifting wind patterns.

That easy mobility is one of the features setting it apart from other misting systems. Engineered to be moved and adjusted with changing conditions by a standard pickup truck or small skid steer, the low-maintenance unit runs for up to 16 hours on a single tank under normal operating conditions. The design can also be set for specific oscillation arcs and aimed precisely to intercept odor vapor where the concentration is highest.

"Since the unit is transportable, if there is a problem area or a drastic change in wind direction, the unit can be hitched to a pickup and repositioned," Stiverson said. "It only takes a few minutes."

The water/treatment agent mixture is pumped from the tank by an integrated 10 horsepower air compressor through the single air atomizing nozzle, which atomizes the pressurized liquid. The cone of fog is propelled by a 25 horsepower electric fan generating 30,000-cubic-feet per minute (152.4 CMS), and the unit features a standard 359 degree built-in electric oscillator. In addition to its side-to-side oscillation, the unit also has a vertical angle adjustment between 0-50 degrees for expanded reach and precise aiming. A touch screen panel housed in a protective

Odor Control

NEMA 3R cabinet attached on the side of the OdorBoss controls the device's features.

With a strong policy toward corporate environmental responsibility and a close working relationship with the community, Michigan Sugar is continuously investigating additional solutions to odor emissions.

"We take odor concerns voiced by the surrounding community very seriously," Witzgall said. "We all live in the immediate area, so it's more than an issue of following the regulations. We want to do what's best for the community over and above merely staying compliant."

RESULTS

After running the unit 24/7 for a month at the Bay City plant, operators found it so effective that they decided to extend the rental for another month.

"We've done a lot of homework on odor control systems, traveling across the country looking at different methods in action," Witzgall said. "We haven't seen anything with this kind of mobile, yet high-strength, platform. It does a nice job for us, and we plan to rent again next year."

Odor complaints are down since implementing the OdorBoss, and visitors to the site have remarked on the unit's effectiveness.

"Odor management is our company's top priority," Witzgall said. "Although it's largely behind-the-scenes work, we are continuously making improvements to our process that help us better control the smell. That includes re-designing some of our piping routes, adding the perimeter misting system and experimenting with various filters. We've made some great strides, but we're not stopping there."

After successfully specializing for over a decade in atomized mist technology that has innovated dust suppression for applications in waste and scrap handling, recycling, demolition and landfills, Dust Control Technology has extended its knowledge and expertise toward odor control solutions. Headquartered in Peoria, Ill., the company's dust and odor control products are designed and manufactured in the USA and delivered to customers around the world. Visit www.odorboss.com.

Editor's note: Derek Schussele is the odor management specialist at Dust Control Technology. ■