Growing Beets
Sugarbeets are a unique row crop with broad green leaves above the ground and cone-shaped roots below the ground.

Making Sugar
Transforming sugarbeets into sugar is part science, part manufacturing, part people, and the biggest part of what we do.

Tasting Sweet
Our all-natural sugar is the benchmark of all things sweet—the original, unchanged, time-proven ingredient that makes countless foods taste better.

American Crystal Sugar Company is a world-class agricultural cooperative specializing in sugar and sugar-related products and by-products. We simultaneously maximize customer satisfaction and shareholder value through the use of innovative farming practices, advanced production methods, and sales and marketing leadership.

American Crystal has about 2,800 shareholders and 1,800 employees who commit their time, talents, and resources to strengthen the company’s leadership position in the sugar industry.
Operating Roots

Nestled in eastern North Dakota and northwestern Minnesota, the Red River Valley is home to nearly half of the nation’s sugarbeet-growing acres. The shareholders who own American Crystal produce about 425,000 acres of sugarbeets each year. Additional acres of sugarbeets are grower-contracted in eastern Montana and western North Dakota.

As the largest beet sugar manufacturer in the United States, American Crystal operates sugar factories in Crookston, East Grand Forks, and Moorhead, Minnesota; Drayton and Hillsboro, North Dakota; and in Sidney, Montana, under the name Sidney Sugars Incorporated. American Crystal’s corporate headquarters and technical services center are also located in Moorhead.
Delivering Value

As a grower-owned cooperative, American Crystal has the unique ability to market its products with other grower-owned cooperatives. As a member of United Sugars Corporation, our sugar marketing entity, and Midwest Agri-Commodities, our by-products marketing entity, we offer many exclusive supply chain benefits that help sell our customers’ products. By focusing on the whole delivery system, from the field to the product to the table, we’re working to exceed the diverse and changing needs of all our customers.

United Sugars Corporation

United Sugars Corporation markets nearly one-third of the industrial and consumer sugar manufactured in the U.S. As a preferred supplier, United Sugars has an extensive distribution system to ensure timely, in-specification sugar deliveries to leading food manufacturers and major retailers across the nation.

Midwest Agri-Commodities

Midwest Agri-Commodities is a leading marketer of sugar by-products around the globe. From pressed beet pulp pellets and beet pulp shreds to beet molasses and betaine, Midwest Agri annually distributes over one million tons of livestock and poultry feed products to customers in North and Central America, Europe, and Asia.

Pure Crystal Sugar

Leaving a great taste in people’s mouths is good for business. That’s why we offer our Crystal Sugar brand in so many forms—from the fine granulated sugar, powdered sugar, and brown sugar packages you’ll find in your grocery store to customized sugar varieties used by commercial bakers and food manufacturers. Regardless of how our sugar is put to use, it is made with the highest quality assurance measures and food safety standards to ensure as perfect a product as possible.

Naturally Good

There are no substitutes for pure sugar. The distinctive taste and texture of sugar are exactly what our customers want and count on. From the most time-honored recipes to the most trusted consumer brands in the world, our sugar makes a flavorful difference. And at 15 calories per teaspoon, our naturally fat-free sugar is a delicious part of a healthy diet and active lifestyle. If original goodness is your goal, make it with real sugar.
A Brief History of Beet Sugar

In 1748, a German scientist, Andreas Marggraf, discovered a process to extract sugar from the root of a sugar beet. In 1799, the first beet sugar factory was built in Breslau, Germany. Prior to these developments, the only source of sugar was from cane grown in tropical locations.

After the British Navy blockaded French ports during the Napoleonic wars, Napoleon decreed that the country’s farmers should grow sugar beets. He also banned sugar imports and provided state assistance to the beet sugar industry. By 1813, France had a flourishing beet sugar industry with more than 300 factories. Therefore, many of the terms used in today’s sugar industry are French.

While the first beet sugar factory in the United States was built in Northampton, Massachusetts, in 1838, it wasn’t until 1870 that the first successful factory came online in Alvarado, California, near San Francisco.

Origin of American Crystal

The American beet sugar industry was jump-started in earnest by Henry Oxnard, the son of a wealthy Brooklyn, New York, cane refiner. In 1890, Oxnard and investors opened their first beet sugar factory in Grand Island, Nebraska, under the name Oxnard Beet Sugar Company. The company changed its name to American Beet Sugar Company in 1899 when it consolidated its four factories. It continued to expand its holdings, and in 1926, it opened its first Red River Valley factory in East Grand Forks, Minnesota. In 1934, the organization updated its name to American Crystal Sugar Company to more closely associate with its popular Crystal Sugar brand.

Cooperative Difference

“Cooperative” isn’t just a description of who we are, it’s the way we do business.

In 1972, sugar beet growers in the Red River Valley proposed purchasing the privately held American Crystal for $86 million. In 1973, following this landmark purchase, 1,300 Red River Valley farmers successfully transformed the company into America’s very first grower-owned beet sugar cooperative.

With its grower-owner vision in place, the productivity of American Crystal began to increase dramatically due to a series of successful investment strategies. These initiatives continue today and focus on improving the productive capacity of every sugar beet acre, advancing storage methods to preserve the sugar in the beets longer, enhancing factories’ performances through capacity and efficiency improvements, and investing in people to give them the tools, technology, and training to perform at higher levels.

While insights of one generation become the knowledge of the next, what’s inside American Crystal is a shared mindset of people working together to be the best sugar company in the industry.

Economic Impact

Research by North Dakota State University shows the region’s beet sugar industry supports over 30,000 jobs in the farming, processing, transportation, and related industries. Furthermore, the beet sugar industry contributes an annual impact of more than $3 billion to the region’s economy.

Investment in commercializing beet sugar production and Napoleon Bonaparte’s blockade of sugar cane imports jump-start an industry.

Henry Oxnard, sugar pioneer and founder of today’s American Crystal Sugar Company.

American Crystal’s first Red River Valley factory is built in East Grand Forks, MN, in 1929.

Red River Valley growers vote to ratify the purchase of American Crystal in 1973, making it America’s first farmer-owned beet sugar cooperative.

Early Crystal Sugar brand consumer packaging.
Sugarbeet Agriculture

In the field, sugarbeets are planted in early spring and take about five months to mature. The cream-colored root of a full-grown sugarbeet weighs about two pounds and measures close to a foot long. Eight-inch stems rise from the root’s center and bear big, dark green leaves. Toward the end of the growing season, cool autumn nights cue the sugarbeets to begin storing sugar in their roots. The sugarbeets are left in the ground until the sugar content peaks, and then are harvested quickly. Harvest is a two-stage process. First, the leaves are removed by a topper or roto-beater. Second, the sugar-filled roots are lifted out of the ground with a specialized harvester and loaded onto waiting trucks. From the field, the trucks haul the sugarbeets to numerous receiving stations where they are carefully stored in large piles to maintain the highest possible quality and sugar content until being transported to our sugar factories.

Beet Sugar Production

As the cool days of autumn give way to the frigid temperatures of winter in the Red River Valley, the large piles of sugarbeets freeze, locking in the root’s sugar. The freezing of the sugarbeets allows American Crystal to process beet sugar longer than any manufacturer. A typical processing season runs from late August through mid-May. Once processing begins, the factories operate 24/7 churning out 150 pounds of sugar every second of each processing day until all the beets are finished. In total, about 3 billion pounds of sugar are manufactured each processing season. As part of this process, around 800,000 tons of key by-products are produced from the fibrous beet pulp and residual beet juices.

Crystal Sugarbeet Seed

By providing genetically superior sugarbeet hybrids, and by producing, processing, and marketing the highest quality seed varieties, Crystal Beet Seed is the brand trusted by growers. By focusing on variety characteristics that advance biotechnology, disease resistance, and stand establishment, Crystal Beet Seed is committed to helping farmers plant, grow, and reap the rewards of higher yielding sugarbeet crops.
How American Crystal Makes its Products

Refer to the beet sugar production diagram on the following fold-out page for a visual presentation of each step in the process.

A Beet Handling
Sugar beets are harvested in mid to late autumn when sugar content peaks.

The leafy beet tops are sliced off and the roots are lifted out of the ground with special harvesting equipment.

The harvested sugar beets are trucked from the field to one of 38 receiving stations where they are weighed, sampled, and tested for sugar quality, unloaded, and piled.

The beets are stored in long trapezoid-shaped piles. Some of the piles have large culverts running underneath them. At end of the culverts are fans that blow cold winter air through the culverts to cool down and freeze the piles to better preserve the sugar contained in the beets. Other piles are stored in large sheds that use similar culvert technology to freeze the stored beets.

The beets are trucked from outside receiving stations to factories throughout the processing campaign.

B Factory Control
The following processes are controlled through state-of-the-art computerized flow and monitoring systems. The systems are operated from a central control room to optimize operations throughout the many functional areas of the factory.

C Washing
Beets entering the factory must first go through a washing process. A large paddle wheel lifts the beets to the washers where they are rolled against each other in water, removing dirt and debris. This water then goes to a holding pond or wastewater facility for treatment.

D Slicing
After washing, the beets enter the slicer where razor-sharp, corrugated knives cut the beets into long white, french fry-like looking strings called cossettes. They are then transported to the cossette mixer where they are mixed with hot juice and pumped into the bottom of the diffuser.

E Diffusion
In the diffuser, the sugar is diffused out of the beet cossettes by using very hot water. The raw sugar juice stays in the lower part of the diffuser while the remaining beet cossette pulp moves up and out of the top of the diffuser.

The pulp goes through a separate process where it is put into presses, which squeeze out most of the water. Then it is heat dried in huge drying systems before it is pressed into pellets as livestock feed.

F Purification
The raw sugar juice leaves the bottom of the diffuser to go through several purifying and filtering steps. During this process the raw juice is clarified and filtered to remove impurities, remaining solids, and fine particles.

G Evaporation
Through a series of evaporators, the juice is heated with steam to evaporate the natural water and filtered once more, concentrating it into dark caramel syrup.

H Crystallization
The syrup then enters the crystallization process. The sugar juice syrup is carefully boiled and seeded with microscopic sugar crystals to start the crystallization process. When the crystals reach their desired size, a rich mixture of crystals and molasses syrup is formed.

The sugar crystals are separated from the molasses syrup in a large, high-speed spinning drum or centrifuge. These crystals are now 99.9% pure white sugar. The crystals move into the granulator where they are then dried, cooled, and separated according to size.

The remaining molasses syrup still contains some sugar, which is claimed through additional processes called molasses desugarization. The remaining beet molasses ends up as liquid agri-product used as a livestock feed additive.

I Sugar Handling
The granulated sugar is then advanced to huge storage silos. Most of the sugar is shipped by train in bulk railcars to manufacturers as a primary ingredient for candy, baked goods, cereals, and other fine products.

Sugar for grocery stores is packaged into bags that range from 2 pounds to 25 pounds. The automatic packaging lines can fill 4-pound bags at a rate of more than 2 bags per second. A portion of our sugar is finely ground to make powdered sugar while another portion of the sugar is turned into light brown and dark brown sugar.
Workforce Training
Ongoing training helps advance the abilities of our employees and provides growth opportunities for personnel. These knowledge-building activities strengthen the competitive foundation of our workforce and our sugar manufacturing process.

Quality Assurance
All American Crystal work sites uphold the highest quality and food safety standards. This commitment encompasses our entire operation from raw material purchases through manufacturing and packaging and warehousing to delivery.

Workplace Safety
The actions of our talented workforce clearly demonstrate their dedication to safety. Not only do they share the company-wide attitude that no job is so important that a person cannot take time to do it safely; their performance proves it as we work together toward an accident-free workplace.

Beet Sugar Production at American Crystal Sugar Company
Taking Part
For American Crystal, being an agricultural and food manufacturing leader means more than blazing a trail of progress. It means actively participating in the communities where we live and work. It means being a responsible agri-business, a good steward of the environment, and an organization dedicated to the safety of its people and its products. These values are what set us apart and make us a reputable company to do business with.