Field corn is not the type of corn you eat on the cob. It is a special type of corn with a hard outer shell and a lot of starch. It is processed to make products you use every day. Processing means changing field corn into different usable products through a series of events. The corn is soaked and milled (ground) so the germ, oil, starch, gluten and hulls can be separated. These items are then made into cornstarch, cooking oil, sweeteners, cereal, beverages and fuel. And that’s just the beginning! In fact, there are over 4,000 uses for corn products and more are being found every day.
From Planting to Harvest

Illinois farmers rank second in the country in corn production. Over 12,000,000 acres of field corn are planted each year in Illinois, which produce approximately 2 billion bushels of little golden kernels. One bushel of corn weighs 56 pounds, meaning Illinois farmers haul nearly 112 billion pounds of corn out of their fields each year. Now that is a lot of corn! So how do those little kernels go from the field to the products you use every day?

Farmers plant the corn seeds, or kernels, in the ground using a piece of machinery called a planter. A tractor pulls the planter through the field as it drops the kernels one by one into the ground. Corn is planted in the spring when the soil is warm enough to germinate the seeds, but not so early that the young plants are likely to be damaged by frost. Once the corn plant tassels, pollen from the tassel lands on the silk on the ear and travels down to make one kernel of corn. 800 grains of pollen land on 800 different silks which develop into the 800 kernels on an ear of corn. Each corn plant produces just one or two ears of corn. In the fall, after approximately 120 days of growth, the corn plant dies and is harvested with a machine called a combine. The combine separates the kernels from the ear and the rest of the corn plant. After the corn is harvested, it is taken to a grain elevator where it is dried, stored, and prepared for wholesale. When the corn is ready, it is loaded onto semi-trucks, freight trains or barges and shipped all over the United States and around the world where it will be used for animal feed, fuel and other consumer products.
What’s Inside That Seed?

Corn seeds are called kernels. One ear of corn averages 800 kernels in 16 rows.

**Endosperm**—Holds the energy and protein the new plant will use to begin to grow. This area is full of starch, which is used the most in corn processing.

**Pericarp** (seed coat)—Outside cover of the seed. It protects the inside of the seed from cold temperatures, moisture and insects until the seed is ready to germinate.

**Germ**—Only living part of the seed. It will become the new plant. It has all of the genetics, vitamins and minerals for a new plant to be created. There is also oil inside of the germ, which is the most valuable part of the corn kernel when it is processed.

**Tip Cap**—Where the kernel was attached to the cob. As the kernel grew on the cob, it took in water and nutrients from this area.
Illinois and the United States are great places to grow corn. We actually grow more than we can use. We sell this extra corn to other countries. This is called exporting. The Illinois and Mississippi Rivers play a very important role in the exporting of Illinois corn and other commodities. Corn can be loaded onto large, flat boats, called barges, and shipped south, down the river to New Orleans, cheaper and more environmentally friendly than if it was hauled by semi trucks or trains. Once in New Orleans, the corn is loaded into large ships and sent around the world.
Ethanol

Ethanol is a high-performance fuel made from corn. Most gas stations sell gasoline that is mixed with ethanol. How do you know which gasoline at the station has ethanol in it? Just look for the sticker on the fuel pump that says “10% ethanol.” Some vehicles use fuel mixed with 85% ethanol or E-85. These vehicles have a yellow gas cap to let the driver know that they can use gasoline mixed with more ethanol. Today, ethanol makes up 10% of the U.S. gasoline supply.

So why is it important for us to use this fuel made from corn? Ethanol is better for the environment and the economy. Here’s how:

- Ethanol is a renewable resource. When we need more fuel, we grow more corn. Can you name another renewable resource?
- Gasoline is made from crude oil, which is not a renewable resource. Producing 20 barrels of ethanol requires just one barrel of crude oil. So making ethanol helps Earth’s limited supply of crude oil last longer, and reduces the need to import oil from other countries. Ethanol is “locally grown.”
- Ethanol reduces greenhouse gas emissions by 40-50% when compared directly to gasoline.
- Ethanol is the cleanest and most affordable source of octane on the market today.
- The ethanol industry is directly responsible for creating over 87,000 jobs, and indirectly supports nearly 300,000 others.
- Ethanol reduces gasoline prices saving American families approximately $1,200 in fuel costs each year.
- Approximately 1/3 of every bushel of corn processed by an ethanol biorefinery returns to the livestock feed market in the form of distillers grains or corn gluten. In fact, USDA and university studies have shown these feed products carry greater nutritional value at a lower cost.
Corn-Based Products

Here in Illinois, we grow several different types of corn. **Sweet corn** is the kind of corn that is grown in gardens and is sold on the cob in the grocery store and at farmer’s markets and roadside stands. You will also find this type of corn in the canned and frozen vegetable aisles at the store.

**Popcorn** is another type of corn that we eat. Illinois ranks 3rd in the nation for popcorn production. Popcorn is also the official Illinois snackfood. There is a little bit of water in every kernel of popcorn. When the kernel is heated, the water heats and builds up pressure. The pressure makes the water take up all the available space. When enough pressure builds up, the kernel pops and turns inside out.

**Field corn**, or dent corn, is a special type of corn that has a hard outer shell and is full of starch. Most of the corn grown in the United States is field corn. There are over 4,000 uses for corn products and more are being found every day. Corn is used in everything from livestock feed to cereal, wallpaper, skateboards, cosmetics and even plastic! Today, some brands of carpet, as well as the stuffing in pillows and bed comforters, are made from corn plastic that has been spun like cotton.

Corn plastic is a more environmentally friendly plastic than that made from petroleum. Producing corn plastic generates less greenhouse gases and no toxins since it is made from corn. It is also completely biodegradable. Biodegradable means that it breaks down into little pieces that become part of the soil, instead of adding to our landfills. Styrofoam and petroleum-based plastic products are not biodegradable.

Use Corn To Make Your Own...

**Corn Putty**

1. Place 1 cup of cornstarch in a bowl.
2. Add ¼ cup + 1 tablespoon of water to the cornstarch.
3. Add a few drops of food coloring to the bowl.
4. Blend mixture with a fork. It should flow when the bowl is tipped but feel solid when you touch it. If it is too thick, add a little water. If it is too runny, add a little cornstarch.
5. Play with it like clay, then watch it become liquid again.
Family Farms: A Tradition

Did you know that 95% of all corn farms in America are family owned? In fact, those family farms produce 90% of all corn grown in the United States. Family farmers throughout Illinois and around the United States are committed to raising crops that are nourishing and healthy for not only your family, but theirs, too. In order to do this, they are devoted to taking care of the land on which these crops are raised. This is important not only because of the responsibility farmers feel to take care of the environment, but also because they want to ensure the land on which they farm is there for future generations.

In order to keep family farms running and to guarantee they are around for years to come, every member of the family is involved. Whether it is driving the combine, picking sweet corn, running a roadside fruit and vegetable stand or delivering meals to the field, each family member has a job. Farm kids learn about hard work, dedication and family loyalty from an early age. This helps prepare them to come back to the farm to continue the legacy of their family. This is why so many farms have been around for several generations. Modern day family farms carry on the traditions of their ancestors, but continue to grow and learn about technology and practices that make their farm more efficient and sustainable while being good stewards of the land. This ensures their farm will continue to raise safe healthy food for our growing population.
One Bushel of Field Corn Can Provide One of the Following Four:

- 31.5 pounds of starch
- 33 pounds of sweetener
- 22.4 pounds of PLA fiber/polymer
- 2.8 gallons of fuel ethanol
  - or 17.5 pounds of distillers dried grains
  - or 13.5 pounds of gluten feed
  - or 2.6 pounds of gluten meal
  - or 1.5 pounds of corn oil

The “Corn Belt”
Illinois, Indiana, Iowa, Nebraska, and Minnesota account for over 62% of the corn grown in the United States. Other major growing states are Wisconsin, South Dakota, Michigan, Missouri, Kansas, Ohio, and Kentucky.

Use Corn To Make Your Own...

Biodegradable Plastic
1. Place a tablespoon of cornstarch in a plastic zipper-seal bag.
2. Add 2 drops of corn oil to the cornstarch.
3. Add 1 ½ tablespoons of water to the oil and cornstarch. Seal the bag.
4. Mix the cornstarch, oil and water in the plastic bag by rubbing the outside of the bag with your fingers.
5. Add 2 drops of your favorite food coloring to the mixture and mix well.
   **DO NOT** completely seal the bag.
6. Place the bag in a microwave oven for 20-25 seconds on high. Be careful. It will be hot.
7. Record your scientific observations.
   - What happens to your plastic?
   - Form your plastic into a ball while it is still warm and describe what it does.

   7. Record your scientific observations.
   - What do you notice about your biodegradable plastic?
   - Is your biodegradable plastic the same as your classmates’ plastic?
   - What could you make with this biodegradable corn plastic if you let it harden? Remember, it will dissolve.
   - Compare your biodegradable plastic with the plastic zipper-seal bag.
Tell us about your background in agriculture.
I grew up on a family farm raising row crops like corn, soybeans, and wheat. I was able to watch my dad, uncle, and grandpa run our family operation and learn the best ways to produce a high quality crop. When I got into high school, I joined both FFA and 4-H and became very active growing produce and grain crops. I started my own sweet corn business in 8th grade in my back yard and have about 7.5 acres (a little under 7½ football fields) worth of sweet corn that I raise and sell in order to pay for college. I own a sweet corn stand called “The Sweet Corn Shack” and employ two high school students full time all summer to help sell my corn. I loved being active in my high school working with FFA and 4-H to give back to the community while learning even more about agriculture. Even farmers have to learn how to grow the best crops somewhere!

How has your background influenced your college and future career goals?
Growing up, I wanted to have a job in science, specifically chemistry. When I got into high school I really began to love working on our farm and learning as much about agriculture as I could. I was very active through FFA in a part of agriculture called agronomy, which is the study of crop plants and what makes them grow better. I really enjoyed both science and learning about crops. I put what I love together and decided to pursue a job in plant genetics, learning about the very small parts of plants called DNA. I want to learn how to make plants grow better so that they can make more food for our growing population. In addition to becoming an agronomist working on plant genetics, I am also studying to be an agriculture teacher. I love to learn and hope to gain as much knowledge as possible so that I can teach others.

What is one thing you want everyone to know about agriculture today?
There are many arguments about crops called Genetically Modified Organisms or GMO’s. These are when scientists like me work with the DNA of a plant to help it grow more food. I want people to know that researchers and agri-scientists work very hard to ensure that the crops they work with are safe and healthy because they want people to eat high quality nutritious food that is safe. Farmers care very much about what they grow as not only are they providing an income for their families, but they are also working to help feed the world. With just one U.S. farmer feeding 156 people, they have a lot of hungry people that depend on them!

Tell us about your background in agriculture and describe your current farming operation.
I was raised on a multi-generational family farm where we raised pigs from farrow to finish. My husband, Bart, and I live and work on our grain farm near Oakland, IL. We farm nearly 1,000 acres of corn, soybeans and wheat. I also keep the business-end of our farm running smoothly and am CEO of Get It To The Bin, Inc; our auger business. Growing up on the farm taught me about hard work and perseverance and instilled in me a love of agriculture.

How do you advocate for agriculture?
As the elected District 12 Director for the Illinois Corn Growers Association, I represent corn farmers in Douglas, Edgar, Coles, Clark, Cumberland, Jasper and Crawford Counties. Specifically, I lobby on their behalf at the state level in Springfield, Illinois and nationally in Washington, D.C. The goal of lobbying is to explain to the lawmakers what is happening on our corn farms, discuss how legislation is impacting farmers and therefore consumers, and hopefully, leave the lawmakers better informed so they are able to make decisions about laws affecting agriculture based on facts straight from the farm. I am excited to represent my fellow corn farmers and hope to help positively shape the future of agriculture.

What role do you think Illinois corn will play in the future of agriculture?
Corn has always been and will always be an important player in the Illinois economy because of the flat to slightly rolling land, rich soils and seasonal weather patterns. It is a huge source of animal feed, human food, fiber, and fuel. Now and in the future, it is ever important that ethanol production and usage be supported. Corn farmers and consumers alike will benefit if the demand for foreign oil is lessened by ethanol.