



CORN IS EVERYWHERE

IN ILLINOIS, THERE IS A LOT OF FARMLAND.

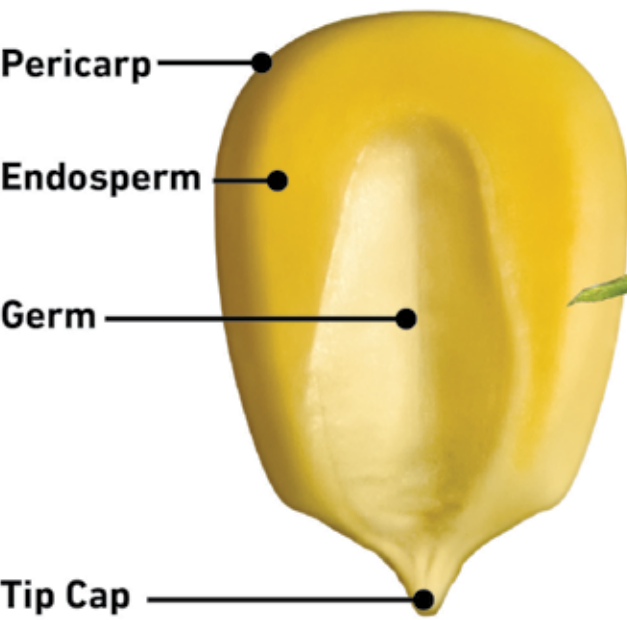
About **27 MILLION ACRES**, or about **75%** of all the land in the state, is used for farming. One **ACRE** is about the size of a football field. Every year, around 11 million acres in Illinois are used to grow corn, but not just the kind of corn you eat on the cob in the summer. Most of the corn grown here is called field corn or dent corn.

This type of corn is made into products we use every day. This is called processing, which means turning field corn into different things we can use. The corn is soaked in water and ground up so that different parts can be separated. From this, we can make things like cornstarch, cooking oil, sweeteners, cereal, drinks, and even fuel for cars. There are more than 4,000 different things made from corn, and people are still finding new uses for it!

TAKE A CLOSER LOOK AT CORN



Corn Kernel



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

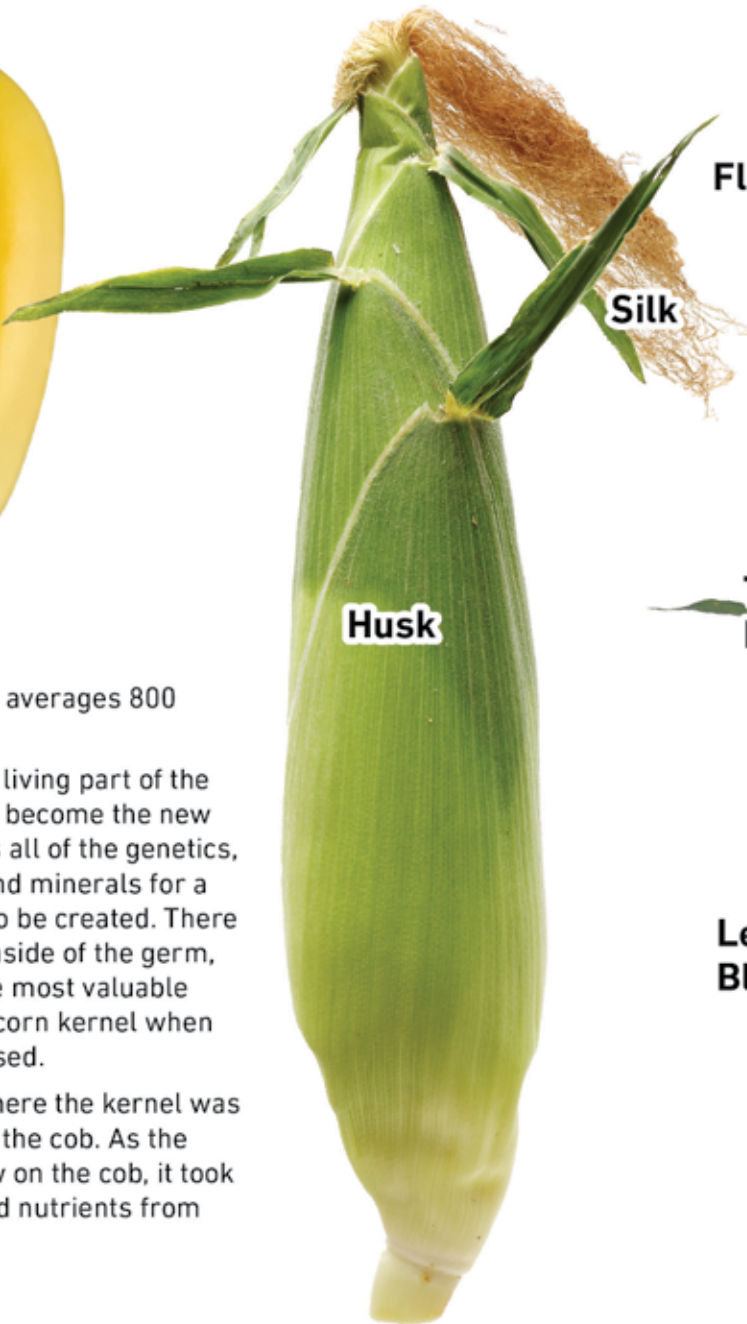
Pericarp (seed coat): Outside cover of the seed. It protects the inside of the seed from cold temperatures, moisture, and insects until the seed is ready to germinate.

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.

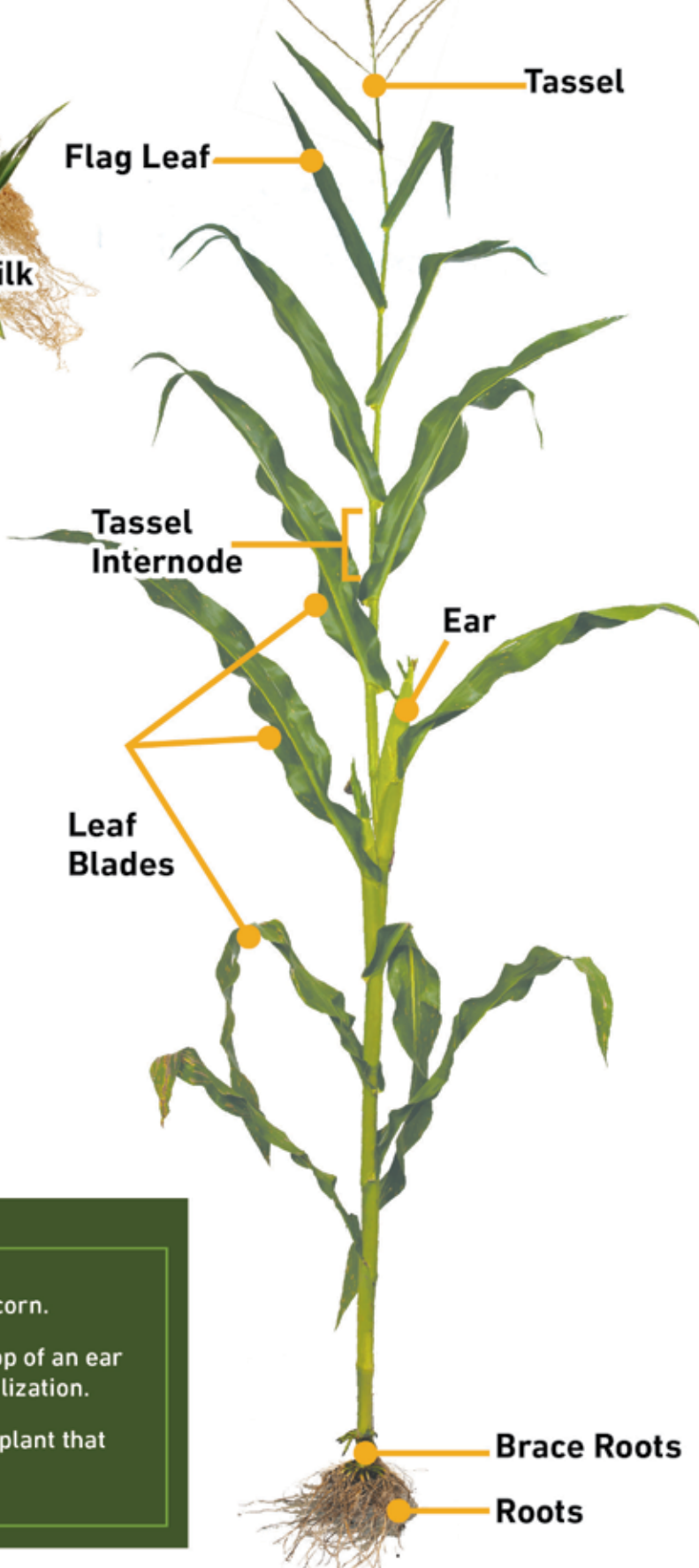
Germ: Only living part of the seed. It will become the new plant. It has all of the genetics, vitamins, and minerals for a new plant to be created. There is also oil inside of the germ, which is the most valuable part of the corn kernel when it is processed.

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.

Ear of Corn



Corn Stalk



WORDS TO KNOW

ACRE - a piece of land equal to 43,560 square feet (about the size of a football field).

POLLEN - a fine powdery substance needed for the plant to reproduce. Pollen is produced on the tassel of the corn plant.

HUSK - the outer covering of an ear of corn.

SILK - the long, silky "threads" at the top of an ear of corn that receives the pollen for fertilization.

TASSEL - the tuft at the top of the corn plant that contains pollen.

TYPES OF CORN



FIELD CORN / DENT CORN:

Most of the corn you see grown in Illinois is called field corn or dent corn. It contains lots of starch. It is dried and processed into livestock feed, food products, and ethanol.

Some field corn is considered Food Grade, which means it can be made into foods for humans to eat. Other field corn is considered Feed Grade, which means it is used to make animal feed.



SWEET CORN:

Sweet corn is a different type of corn which contains mostly sugar, not starch. Sweet corn makes up only 1% of corn grown in the United States. It is the only type of corn that is picked when it is soft. Sweet corn is eaten on the cob, canned, or frozen.



POPCORN:

Popcorn is grown to have a specific size, shape, and moisture level. Popcorn is the only type of corn that will pop.



FLINT CORN:

Flint corn has a hard seed coat like popcorn but is grown for its special colors. It is used for decoration and for some foods like corn meal, grits, and polenta.

CORN vs. GLOBAL CHALLENGES

Too Much Trash

Plastics are everywhere in our daily lives. Regular plastic is made from petroleum and can take a long time, even hundreds of years, to break down. Illinois farmers have a solution: corn. Corn can be used to make a special kind of plastic that is better for the Earth. This corn-based plastic is called **BIODEGRADABLE** plastic, or bioplastic for short. It can break down in just a few months and makes less pollution than regular plastic. Many 3D printers use a corn-based bioplastic called polylactic acid, or PLA, for printing! If we use more corn-based plastics, it could help reduce the pollution in the U.S. by 25%. Next time you are at the store, look for bioplastic products like straws, cups, and bags.



Oil Supply

Ethanol is a special kind of fuel made from corn. It is called a biofuel and is good for our planet and our economy. Regular gasoline comes from **CRUDE OIL**. There is only so much crude oil on Earth to use. Ethanol comes from corn, which we can grow more of each year. By making ethanol, we can save some of the crude oil we have left and use less oil from other countries. The ethanol industry provides over 400,000 jobs in the U.S. and can help families save about \$1,200 a year on gas. Plus, making ethanol does not use the entire corn kernel, and we can use the other parts to make other products we need.



TRUST THE PROCESS

It takes around 100 days for a corn plant to be ready to harvest, but the whole process takes much longer. Farmers start making plans for planting many months before seeds go in the ground. Harvested corn can sometimes sit in storage for years before it is made into products we use. Follow the arrows below to learn more about the steps in growing and processing corn.



PLANTING

Corn is planted in rows with a special planter that places each kernel at exactly the right depth and spacing to grow best.



POLLINATING

Once the corn plant is mature and has produced tassels, the corn is pollinated. This happens when the pollen from the tassel falls onto the silk on the ear. There is one silk for every kernel of corn on the cob, usually around 800!



MATURING

In the late summer and early fall, the kernels are growing as the corn plant matures. During this time, an acre of corn gives off 4,000 gallons of water a day in evaporation!



HARVESTING

Field corn is harvested in late fall when it is hard and dry. The **COMBINE** plucks the ear of corn off the plant and shakes the kernels from the cob. The average corn **YIELD** per acre in the United States is 177.3 **BUSHELS** per acre.



STORING

Corn is stored either in grain bins on the farm or it is taken to a grain **ELEVATOR**. Sometimes, the bins have dryers on them which blow air on the corn to dry it out.



TRANSPORTING

Corn is transported by semi-truck to the grain elevator and then usually by train or barge to its next destination, which could either be a processing facility or a major port to be sent overseas.



PROCESSING

Corn is processed into many different products, such as livestock feed, ethanol, and food products.



REPEAT

After the corn has left the farm, farmers spend the winter months reflecting on the year, learning from successes and failures, and planning for next year's crop.

Sustainable Aviation Fuel

Ethanol can also be used to make a special biofuel for airplanes. This biofuel is called Sustainable Aviation Fuel, or SAF. SAF can be mixed in with jet fuel made from crude oil to help reduce greenhouse gas emissions by airplanes by up to 80%. The first flight using Sustainable Aviation Fuel was in 2008, and since then over 800,000 planes have flown using this biofuel. In 2024, more than 330 million gallons of SAF were produced.



Air Pollution

Using ethanol can help clean the air by reducing harmful gases by 48% compared to regular gas. This happens because biofuels like ethanol burn much cleaner than crude oil. When corn grows, it takes in carbon dioxide, or CO₂, which is a **GREENHOUSE GAS** that can hurt the environment. The United States Department of Agriculture says that one acre of corn can take out eight tons of CO₂ from the air while it grows.



Soil Health

Growing corn is good for the soil because it limits **EROSION**. The roots of corn plants hold the soil in place. Corn plants also create a cover that protects the soil from heavy rain. After we harvest the corn, most of the corn plant stays on the ground. This leftover plant material adds nutrients to the soil for the next year's plants and helps the soil hold air and water better.



WORDS TO KNOW

BUSHEL - a measure of how much grain is harvested. One bushel of corn weighs 56 pounds.

COMBINE - a piece of machinery used to harvest grain.

ELEVATOR - a place where grain is stored and prepared for sale.

YIELD - the amount of product harvested. Usually measured in bushels per acre.

BIODEGRADABLE - something that can break down naturally into smaller pieces over time.

EROSION - when soil gets worn down and carried away by wind and water.

CRUDE OIL - oil that comes from the Earth, also known as petroleum.

GREENHOUSE GAS - gases in the Earth's atmosphere that trap heat from the sun. Too much can make the Earth too hot.

ONE BUSHEL OF FIELD CORN MAKES:



31.5 pounds of corn starch



33 pounds of sweetener



17 pounds of animal feed



3 gallons of ethanol



22.4 pounds of corn plastic



Farmers understand that it takes lots of time and lots of people to grow crops. **Justin Allaman**, a farmer in Warren County, Illinois, says...

There are many careers involved with corn production besides the farmer. There are salespeople who sell the corn seed to the farmer, agronomists who give fertilizer and nutrient recommendations, mechanics who work on and operate the equipment, and grain merchandisers who buy the grain from the farmer. Farmers need all these people and more to be able to farm successfully.

You may know someone personally who is not a farmer but is still important to agriculture!



Chris Gould is a farmer in Kane County, Illinois. He grows several thousand acres of corn and soybeans. He was also a pilot in the Navy for 10 years. Chris says that farming and aviation are similar because they both follow a process cycle.

In aviation, we do the same thing every time to try to eliminate mistakes. Agriculture is similar, even if the "flight" is a year-long crop cycle. Aviation is all about planning, briefing, executing, and debriefing. I try to implement the same mindset on our farm. We develop the plan, make sure everyone understands it, we execute as well as possible, and then debrief to try and improve for the next cycle.

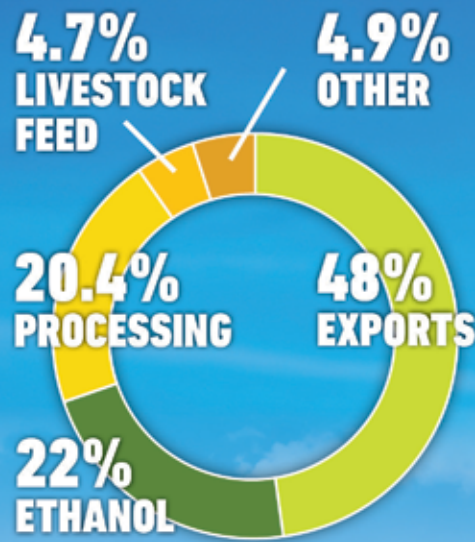
CORN FARMING: A FAMILY TRADITION

In Illinois, 96% of farms are owned by families. These family farmers in Illinois work hard to grow healthy crops and take care of the land so it stays healthy for future generations. Everyone in the family helps on the farm. Kids who grow up on farms learn important lessons about hard work. Today, family farms mix old farming methods with new technology. This helps them work better and take care of the environment. Because of this, they can keep providing safe and healthy food for more people.



Meet some more Illinois farming families at: watchusgrow.org/we-are-the-96

Corn Use in Illinois



WORDS TO KNOW

GPS – Global Positioning System. GPS systems allow farmers to navigate and map their fields more closely.

EXPORT – to send to another country to be sold.

CAREERS-IN-CORN



Chris Gould, a farmer in Kane County, Illinois, says, “the overall process of growing corn hasn’t changed - plant a seed, care for it, and harvest - but technology has changed. We are now able to plant crops with more precision, learn more about our soil life and health, and use **GPS** to manage specific areas of the field rather than making blanket decisions on the whole thing.” Chris’ family has been farming since 1963. Like all farmers, he takes pride in growing food with his family. Chris says he gets “a great deal of satisfaction from producing something that is of utmost importance to everyone: food and energy. **When you get right down to it, farming is one of the most important occupations.**”



Justin Allaman grows corn in Warren County, Illinois. Justin is the sixth generation in his family to run their farm, which was started in 1852. Justin and his family grow yellow field corn, which they sell to an ethanol plant or to an exporter to be sent overseas and processed. Justin says, “**farming isn’t just a job, but a way of life.** We do the best we can to take care of the land and provide quality food for people in our communities and even in other countries. Farming continues to change, and we never know what the future will bring, but it’s special to be the next generation carrying on our operation.”



AG MAG IN REVIEW

Name: _____

ACTIVITY 1:

Place the following Corn Production steps in order by writing the correct number from 1 – 7 in the blanks below each step.



Processing



Maturing



Transporting



Harvesting



Livestock feed



Corn on the cob



Polenta



Ethanol



Planting



Pollinating



Storing



Microwave popcorn



Canned corn



Fall decoration



Corn starch

ACTIVITY 2:

Identify which type of corn is used to make the following products. In the blanks below each item, write an **F** for **Field Corn**, an **S** for **Sweet Corn**, a **P** for **Popcorn**, or an **L** for **Flint Corn**.

This Ag Mag complements, and can be connected to, the following educational standards:

Common Core State Standards:
ELA-Literacy – RI.4.2; RI.4.4; RI.4.7; RI.4.10;
W.4.7-4.9; SL.4.1; SL.4.4; L.4.1; L.4.6
Mathematics – 4.MD; 5.MD

Next Generation Science Standards:
3-LS4-3; 4-ESS3-1; 4-LS1; 5-PS1-3;
5-PS1-4

IL Social Science Standards:
SS.G.3.4; SS.G.3.4; SS.EC.2.4; SS.H.3.4



This issue of Ag Mag has been provided by the IAA Foundation and the Illinois Corn Marketing Board.

