

Kentucky's Grain Farmers
proudly present

KENTUCKY
FARMS
Feed Me
A Virtual Field Trip Series



Amazing Grains



A Study Guide for
Corn and Wheat



Kentucky farmers grow grains, which are part of a nutritious diet.

GRAINS are the seeds or kernels of plants that belong to the grass family. When farmers collect the grains from the plants, they take them to a mill so that they can be cleaned and ground into a meal or flour and turned into nutritious grain foods that we enjoy.



wheat



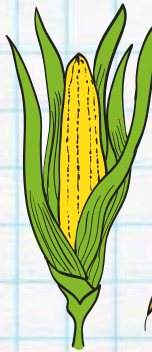
barley



rye



rice



corn (maize)



oats



sorghum

All of these grains are grown in Kentucky, but our farmers grow more CORN and WHEAT than the other grains. While climate and soil types are very important for deciding which grains to grow, Kentucky's farmers will grow crops that have the biggest demand; a lot of corn and wheat are purchased and used here.

Harvesting Energy and Nutrients from Grain Foods

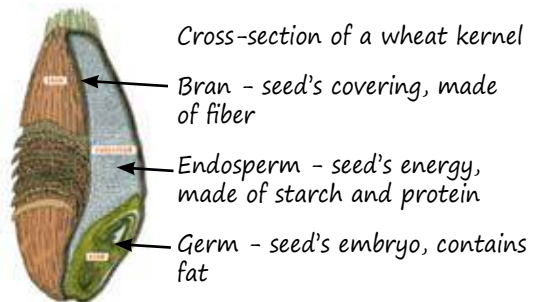


Grain foods, such as bread, pasta, crackers and cereal, are naturally low in fat and rich in complex carbohydrates, which give us energy. Grain foods are also excellent sources of fiber and important vitamins and minerals, which keep us healthy. The nation's leading nutritionists say that we should be eating at least 6 servings of grain foods per day* and half of our grain foods servings should come from whole grain sources. Whole grains contain protective antioxidants in amounts near or exceeding those in fruits and vegetables.

*For serving guidelines, visit www.choosemyplate.gov. My Plate was developed by the United States Department of Agriculture Center for Nutrition Policy and Promotion.

What is a Whole Grain?

Most grain foods are made from flour, which is made by crushing the seeds of the plant. Seeds contain endosperm, the germ, and bran. Whole grain flours and foods contain all of three parts of the seed, while others only contain the endosperm or starch.



Soft Red Winter Wheat

(the type of wheat grown in Kentucky)



Kentucky wheat in May

There are 6 different classes of wheat grown in the U.S., and each class is used for different types of grain foods.

In Kentucky, farmers grow Soft Red Winter

Wheat. It is planted in the late fall and harvested in June. Farmers can then plant soybeans in the same fields. This is known as a “double-crop.” The wheat grown in Kentucky is sold to a mill, where it is ground into flour. Soft Red Winter Wheat flour is used in cookies, crackers, biscuits and baking mixes.

Did you know?

The biscuits sold at McDonald’s restaurants are made with Kentucky wheat flour! In fact, Kentucky wheat is used in several name-brand products on our grocery shelves.



Grain & Technology

We've come a long way!



Grains have been grown for thousands of years and helped mankind create permanent civilizations around the world. Since grains do not spoil like fruits, vegetables and meat, they can be stored for long periods of time; people did not have to travel to find food.

Corn was discovered in North America. Early native Americans domesticated

the corn plant and eventually shared their seeds and knowledge with European visitors and settlers. Christopher Columbus took corn back with him to Europe in 1492, and we are all aware that corn was an important crop for the Pilgrims in the early 1600s. Wheat was not grown in America until after the Revolutionary War in the late 1700s. Both of these grains are now grown worldwide.



Up until the 20th century, grains were grown using only human and animal labor, simple tools, and organic fertilizers such as dead fish and manure. It took many labor hours to grow and harvest a crop. Tractors only started to replace horses and mules in the 1940s, and production began to rise dramatically.

Farmers now have a number of tools to help them produce enough grains for the world: high-tech machinery, seeds that resist pests and disease, and plants that can better withstand poor weather. Farmers are also looking for ways to improve the environment for the future. They are reducing soil erosion, using less fuel and water, and maintaining habitats for wildlife.



A COMBINE harvests grain.

Growing Grain is a Science



Like most all other plants, grains require soil, water, air, and sunlight to grow.

Their roots take up nutrients and water, and the chlorophyll in their leaves produce sugar through photosynthesis.

Plant scientists continue to try to find the right balance of "ingredients" and practices to produce the most grain per acre while reducing resources.



Pests

Insects, animals, weeds and disease are a constant struggle for grain farmers, but most can be managed.

Weather

Farmers have no control over the weather, which has the power to destroy an entire crop.



Corn is Kentucky's Top Grain Crop for Food, Feed & Fuel!

More than 1 million acres¹ of field corn are planted in Kentucky each spring. If the weather cooperates and provides the right amount of rainfall, those acres will produce between 150 and 180 million bushels² of corn in one year. The price per bushel a farmer receives changes all the time, but the value of all that corn is nearing \$1 billion.

¹acre - unit for measuring land area. It is about the size of a football field.

²bushel - unit for measuring the volume of grain. It is equal to 8 gallons.

How is that field corn used in the Commonwealth?

Livestock Feed

About half of our corn crop is fed to livestock like poultry, cattle (beef and dairy), and hogs.



Fuel

Ethanol fuel is made from Kentucky corn.



Food & Beverage

There are several food processors and distillers in Kentucky. They use about 1/4 of our corn.

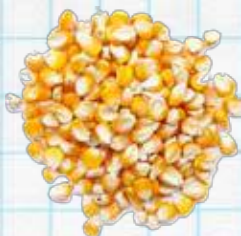


Exports

Other states and countries need our corn.



Types of Corn Grown in Kentucky



Yellow Field Corn - Also known as Dent Corn, this type of corn is fed to animals or used to make fuel, spirits or other everyday products. See a list on the next page. It is the most abundant type of corn grown in Kentucky and the U.S.



Food-Grade Corn - This type of corn is similar to yellow field corn, but may have a higher starch content for milling into corn meal, flours and starch for food items. It also comes in more than one color: yellow, white, blue, and red.



Popcorn - Popcorn is a different species of corn plant, and the kernels have a very hard outer shell (pericarp). The moisture inside expands when heated, and causes the seed to burst open.



Sweet Corn - While it is similar to field corn, sweet corn has been developed over time to have more sugar in its starch. It is also harvested while the kernels are still soft. Only 1% of all the corn grown in the U.S. is sweet corn.

1 Kernel = 4,000 Uses



What's in a Yellow Dent Corn Kernel?

- 62% Starch
- 19.2% Protein and Fiber
- 3.8% Corn Oil
- 15% Water

We all know that corn can be used in many food products, such as chips, cereals, breads, and most baked goods. However, did you know that corn starch and corn oil are important ingredients in hundreds of non-food products we use everyday? Here are a few of our favorite products that have corn-based ingredients.

ASPIRIN
BABY FOOD
BABY POWDER
BATTERIES
CANDLES
CARPETING
CEREAL
CHEWING GUM
CHOCOLATE
COSMETICS
CRAYONS
DRYWALL
DYES
ETHANOL FUEL
FABRIC
FIBERGLASS
FIREWORKS

FLOUR
GLUES
ICE CREAM
INK
JELLY
JUICE
KETCHUP
LIPSTICK
LOTION
PAINT
PAPER
PLASTICS
PUDDING
RUBBER
SAND PAPER
SHOE POLISH
SOAP

SOFT DRINKS
SOUP
STAGE MAKEUP
SYRUPS
TIRES
TOOTHPASTE
VINEGAR
VITAMINS



Corn is a Renewable Resource!



As the number of people on our earth continues to grow, so does the demand for resources (food, water, energy, and building materials). Fortunately, scientists are looking to renewable resources to meet those needs. Since a new corn crop can be grown each year, corn is most definitely a renewable resource.



Some products typically made from petroleum oil, like fuel and plastic, can be made from corn and are more earth friendly. The plastic made from corn, known as PLA, will degrade in compost.



Ethanol, the fuel that can be made from corn, is a cleaner fuel than gasoline. Ethanol is added to most every gallon of gasoline sold in Kentucky to reduce air pollution. Some automobiles, called Flex Fuel Vehicles, can run on fuel with as much as 85% ethanol.



Many racing vehicles have been using ethanol for a long time. NASCAR started using 15% corn ethanol in all of its racing fuel in 2011. While the fuel is better for the environment, they also found that the race cars were performing better than ever.

Test Your Knowledge

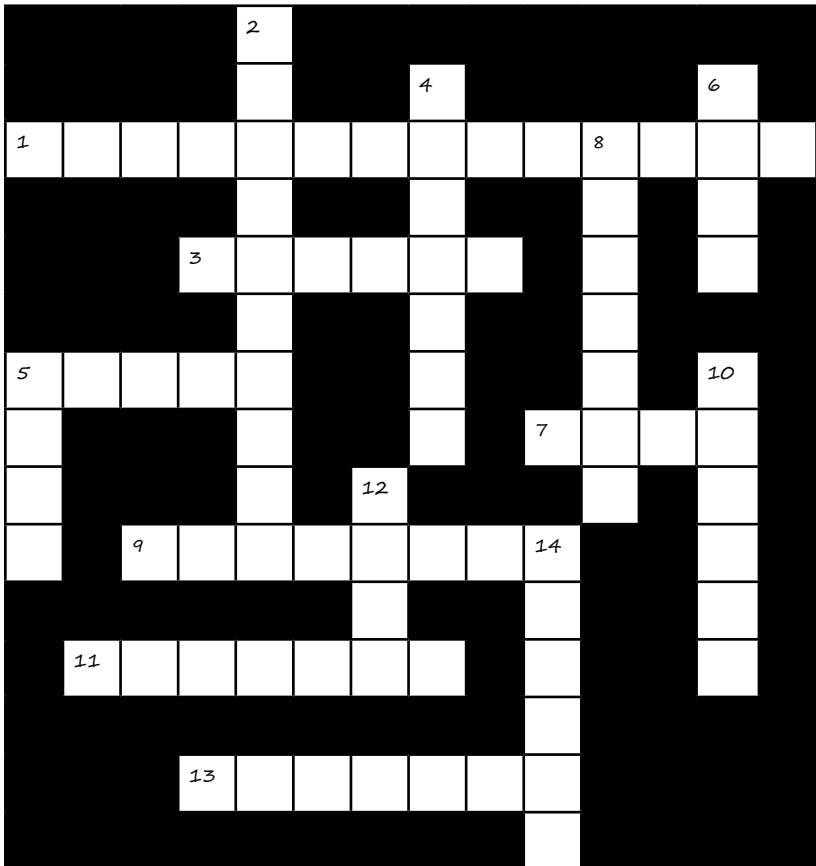
Use what you have read to fill in the crossword puzzle below.
If you get stumped, find the answers at www.kyfarmsfeedme.com.

Across:

1. The process by which a plant makes sugar from sunlight.
3. Another word for grain seed.
5. Ground grain
7. Type of grain livestock eat
9. Grain foods provide vitamins and ____.
11. Machine that harvests grain.
13. PLA is a ____ made from corn.

Down:

2. Flour made from the entire grain kernels is called ____.
4. Farmers must control pests like weeds and ____.
5. Kentucky wheat is planted in this season.
6. Place where flour is made.
8. Fuel made from corn.
10. Grain foods give us ____.
12. Fiber portion of a wheat kernel.
14. Component of the endosperm.





The Kentucky Farms Feed Me Virtual Field Trip Series was developed to bring the experience of Kentucky farms and food production to Kentucky classrooms. This "study guide" serves as a companion to the video field trip titled "Corn, Soybeans and Wheat. Oh, My!"

The video can be viewed online at www.kyfarmsfeedme.com, or you may request a DVD of the entire series at the website or by calling 800-326-0906.

The video series and this companion study guide were funded by Kentucky's grain farmers.

kycorn.org
KENTUCKY CORN
GROWERS ASSOCIATION
www.kycorn.org

 **KENTUCKY**
Small Grain
GROWERS' ASSOCIATION
www.kysmallgrains.org

2013 © KyCGA & KySGGA
PO Box 90, Eastwood, KY 40018