30 Years of Exploring Agriculture

AgMag

Agriculture: Helping you every day!

Minnesota Agriculture in the Classroom

Fall • 2015-16

Agriculture is Everywhere!

When you woke up in your bed this morning, you already had your first meet-up with **agriculture**. Somewhere in your bedding and pajamas were probably fibers from cotton plants.

- Did you wash or shower with **soap**? That soap is made from fat from cattle and oil from plants such as palm, corn, and soybeans.
- Did you have cereal, **eggs**, milk, **bacon**, **pancakes**, buttered toast, or juice for breakfast? Thank agriculture again!
- Did you pack a lunch in a **paper** bag, or finish your math by writing on paper? That paper comes from another agricultural crop—trees. Corn and soybeans may go into the **soy ink** in your books.
- Did you ride to school today? The **tires** on your bus, car, or bike are made from the rubber plant, cords from cotton and tallow from cattle. Did you see a windbreak or a sod farm? All of these are agriculture, too.

Agriculture brings us almost everything we eat, wear, or use each day.

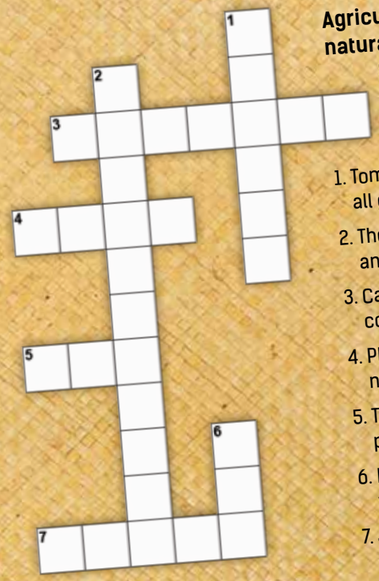
Find teacher guide and student resources at www.mnagmag.org

What is Agriculture?

Yes, agriculture is farming—planting and harvesting fruits and vegetables, raising **livestock** and poultry. But agriculture is more than this. It's the **industry** that grows, harvests and brings us fiber, trees, turf, and landscaping materials.

- Food comes from plants and animals.
- Fiber is the raw material from plants and animals that we use to make cloth, rope, and more. Cotton, linen, silk, wool, sisal, and hemp are fibers.
- Trees give us fiber that becomes lumber, furniture, and firewood; pulp for paper; and hundreds of other things, including turpentine and medicines.
- Turf and landscaping materials include flowers, plants, and turf (sod) for beauty, pleasure and recreation.

CROSSWORD
Natural Resources



Agriculture depends on Earth's natural and renewable resources. Solve the puzzle to find out what kinds of resources are needed by agriculture.

1. Tomatoes, strawberries, and soybeans all grow on these.
2. The surroundings in which plants and animals grow.
3. Car tires, leather, wool, and meat all come from these.
4. Plants are rooted in this and soak up nutrients from it.
5. This gives energy to plant leaves for photosynthesis.
6. Plants take carbon dioxide from this, which they need to grow food.
7. Just like humans, plants and animals need plenty of this to survive.

Photos Courtesy University of Minnesota Agricultural Experiment Station

Agriculture is more than farming!

Agriculture is our nation's largest industry. More than 20 million Americans work in agriculture. They have jobs in:

- **Production:** growing and harvesting plants; raising animals
- **Processing:** changing raw materials into many different things
- **Distribution:** getting the products to us

1. Which part of agriculture does each group of workers below fit into? Label the three groups: production, processing, distribution.

2. Circle a career that interests you. How can you find out more about it?

A _____

- Food safety inspector
- Epidemiologist
- Sawmill worker
- Biochemist
- Food biosecurity specialist
- Food scientist
- Mechanical engineer
- Fashion designer
- Wood scientist
- Nutritionist
- Carpenter
- Meat scientist
- Microbiologist
- Food processors

B _____

- Rancher
- Forester
- Seed grower
- Veterinarian
- Farmer
- Biotechnologist
- Greenhouse manager
- Gardener
- Animal geneticist
- Soil scientist
- Horticulturist
- Entomologist
- Agronomist
- Climatologist
- Plant breeder
- Viticulturist

C _____

- Exporter
- Truck driver
- Highway engineer
- Restaurant owner
- Florist
- Grocer
- Software specialist
- Ship captain
- Pilot
- Pizza delivery driver
- Farmers market vendor
- Food store inspector
- International trade advisor
- Grain merchandiser
- Ad designer/ writer

Celebrating Minnesota Agriculture

Agriculture is Minnesota's second-largest industry, behind manufacturing. Agriculture represents over 342,000 jobs (10% of Minnesota jobs) and billions of dollars in our state. Whether you live in the city or country, it's a sure bet many of your friends or neighbors rely on agriculture for jobs.

What food, fiber, turf/landscape, or forest businesses are in your community? Do you know anyone who works for an **ag business** or on a farm?

A **logo** is a sign or symbol that stands for a company. Circle the ag business logos you might see in your kitchen.

Sequencing

Connect each company/organization to the raw (direct from the farm or soil) and processed products.

Ag Business	Raw Product	Processed Product
1. Gold'n Plump	hogs	packaged chicken
2. Hormel	phosphate (rock ore)	sugar
3. Minn-Dak Sugar	oats (grains)	pickles
4. John Deere	chicken	granola bars
5. Simplot	wool	pepperoni and ham
6. Kemps	sugarbeets	steel farm machinery
7. Pioneer	corn seed	ice cream
8. Gedney	cucumbers	blankets
9. General Mills	milk	ethanol
10. Faribault Woolen Mill	iron ore	plant food and fertilizer

Avian Flu: A Big Challenge for Farmers

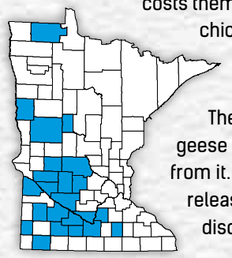
In 2015 bird flu has caused problems for farmers everywhere, including Minnesota. Many poultry flocks have gotten Highly Pathogenic Avian Influenza, or Avian Flu. Minnesota lost more than 9 million turkeys. Here are some answers to questions about Avian Flu.

If chickens and turkeys get sick, will I get sick too?

It isn't likely. This flu has never been found in humans anywhere in the U.S.

What if I eat poultry that has the flu?

Poultry products you buy at the store are completely safe to eat. All poultry flocks are tested for the flu. Any flock that has it is not allowed to enter the food supply. That means it never appears in a store.



= Counties affected by Avian Flu

Why is this flu so bad?

The poultry get very sick and die quickly. Losing birds is stressful for farmers and costs them money. Certain foods like turkey, chicken and eggs may cost more.

How do the birds get sick?

They get it from waterfowl, like geese and ducks, which don't get sick from it. But if one flies over a farm and releases droppings, saliva, or nasal discharge, it can make poultry very sick. The virus gets into the dust and soil around the farm and in barns, and onto people's shoes, clothes, farm equipment, and cars and trucks.

What happens to a farm when the birds get this virus?

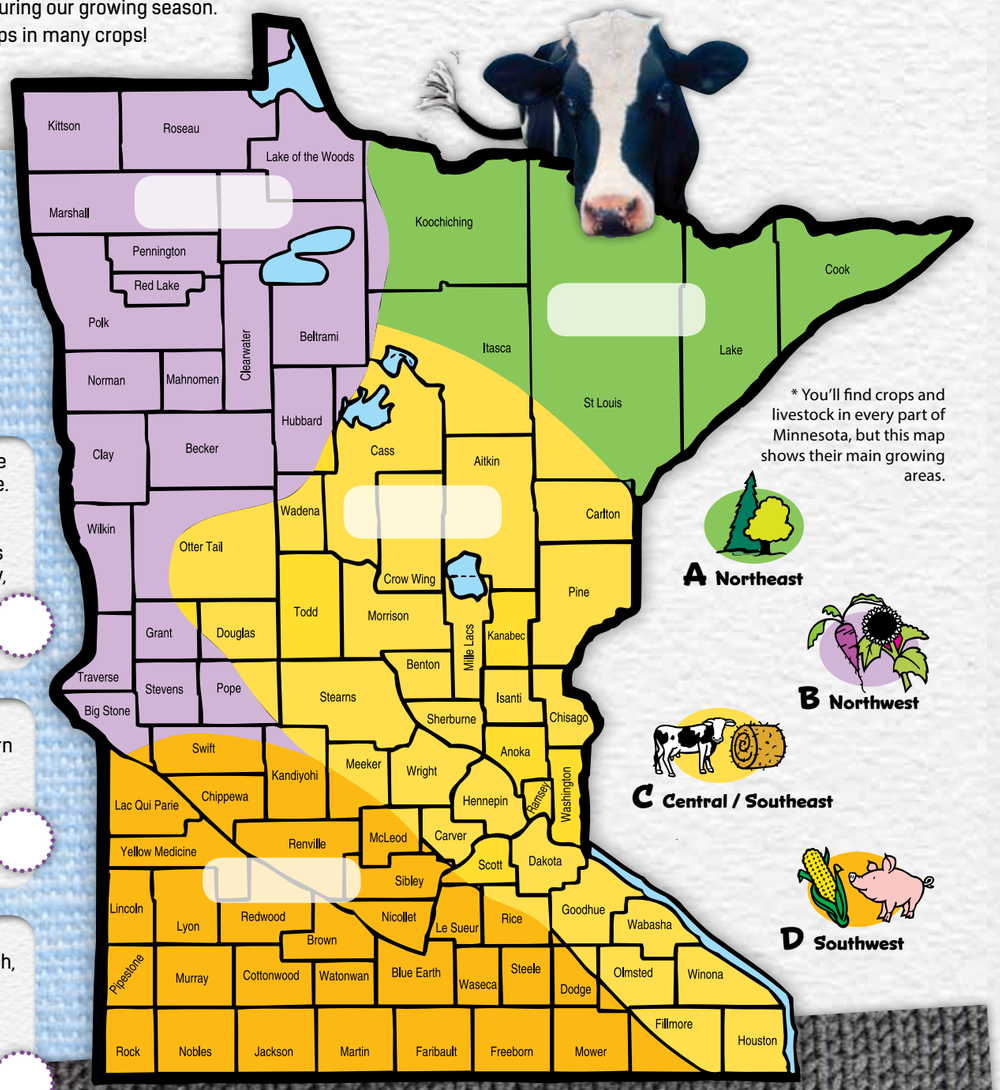
Infected birds must be destroyed so the virus doesn't spread. Barns must be cleaned and sanitized. Then the farm must go through a waiting period before it can raise a new flock.

The main thing to know is: Minnesota's poultry industry and government leaders are working with farmers to prevent this from happening again.

Minnesota Grown

What makes Minnesota such a terrific state for agriculture? Lots of **soil types** and **terrain** that are good for farming, along with the right amount of rainfall during our growing season. All of this makes our state tops in many crops!

What grows where? Check out the map and clues. You'll discover Minnesota's four main growing areas. In which do YOU live?*



* You'll find crops and livestock in every part of Minnesota, but this map shows their main growing areas.

A Northeast

B Northwest

C Central / Southeast

D Southwest

Matching

Match these 4 clues with the names of the growing areas on the right (A, B, C, or D). Write the name of each area in its space on the map.

1. Flat terrain where large machinery can operate. Fertile prairie soils. Less moisture than other areas. Big producer of cash crops such as wheat, oats, barley, soybeans, sunflowers, sugarbeets, dry beans and potatoes.

2. Fertile soils with good moisture. More southern location (longer growing season). Big producer of crops and livestock. Corn, soybeans, cattle, and hogs do well here.

3. Hilly with moisture. Soils vary, including rich, shallow, poorly drained, and sandy. Big producer of hay, pasturelands, dairy cattle, and turkeys. Other livestock and garden crops, too.

4. Rough terrain. Shallow, less-fertile soils. Short frost-free season. High snowfall adds moisture. Big producer of forests, but few field crops.

* Fun Facts *

ONE bushel of whole wheat can yield **64** loaves of bread.

The average potato is 75 to **80%** water.

One bale of cotton makes **215** pairs of blue jeans.

Minnesota is the **TOP** producer in the country of sugarbeets and cultivated wild rice.

More than **80%** of all jobs in Minnesota agriculture are **off** the farm.

An **acre** is about the size of a football field.

Find it on the Map!

1. Find each county with one of its top ag products. Use this code to put colored dots on the map: green for forest products; blue for field crops or cash grains; red for dairy and livestock.

County	Ag Product	County	Ag Product	County	Ag Product
Marshall	Wheat	Martin	Hogs	Koochiching	Paper
Jackson	Soybeans	Morrison	Beef cattle	Aitkin	Bluegrass seed
Wabasha	Green peas	Otter Tail	Bison	Kandiyohi	Turkeys
Clay	Sugarbeets	Anoka	Sod	Pipestone	Sheep
Stearns	Dairy	Polk	Dry beans	Todd	Oats
Faribault	Corn	Roseau	Canola	Sherburne	Potatoes
St. Louis	Wood products	Isanti	Christmas trees	Wright	Honey
Fillmore	Hay	Brown	Sweet corn	Kittson	Sunflowers
Washington	Apples	Norman	Barley	Goodhue	Alpacas

Trivia

Some Minnesota farmers raise these animals for fiber.

Name the animal.

_____

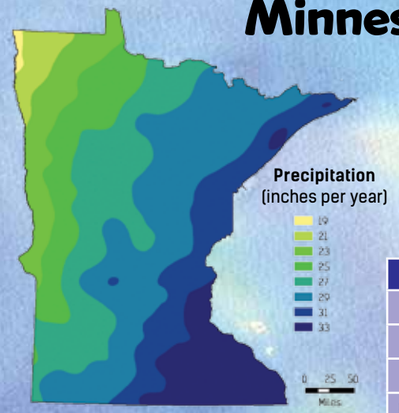
2. Look at your dots. What do you notice about where things grow in Minnesota? Unscramble the letters to discover five things that make each growing area different from the others. (Hint: All the words appear somewhere on pages 4 and 5.)

iosl yptes _____ rraiten _____

thwaeer _____ gingorw saseno _____

llafinar _____

Minnesota Rainfall: What and Where?



Data Source: National Weather Service, MN DNR, Soil & Water conservation Districts, and others; compiled by the MN DNR.

1. Which growing area normally gets the least rainfall each year?

   _____

   Which area gets the most?

   _____

2. Why must farmers understand rainfall patterns when they choose which crops to plant?

3. What happens to farm crops when rainfall is way above normal? Way below normal?

4. Imagine you're a farmer. In which of the four areas would it make the most sense to grow these crops? Write your answers. Then read the clues again (page 4) to check your work.

Crop	Which Growing Area?
Hay and Pastureland	
Sugarbeets	
Corn and Soybeans	
Forest and Pine Trees	
Wheat	

Name the crop

b t u e s g a r e

Unscramble the letters above to name this plant that is sweet.
Polk county leads the way in growing this crop. You'll find it in dozens of foods in your kitchen.

Plant Name: _____

Main Growing Area: _____

State Symbols & Agriculture

Are you symbol savvy? A symbol can take the place of words when it's the right picture or design. You quickly understand what the symbol stands for. The logos on page 3 are examples of company symbols.

When we see the state flag or state seal, we think "Minnesota." A symbol can also be something that is not a design or photo but represents special things about Minnesota. Our state legislature has chosen many items from agriculture as official symbols to represent our state. See some of them below, and test your Minnesota symbol savvy!

State Seal (Adopted: 1861)

What items do you see in the state seal?
Why do you think the artist chose them?
What does "L'Etoile du Nord" mean?

Did you know?

Minnesota has an official state soil type. In 2012 Gov. Dayton signed a bill naming Lester as the official state soil of Minnesota. What is Lester, and where is it found?

State Grain: Wild Rice

Chosen: 1977

This was a staple food of the Ojibwe for centuries. Minnesota produces over half of the world's hand-harvested wild rice. Where does our wild rice grow? What are two ways it's harvested in Minnesota?

State Fruit: Honeycrisp Apple Chosen: 2006

Fourth graders from Anderson Elementary in Bayport lobbied the State Legislature to give us this state apple. Where was this juicy, crisp apple developed?

State Drink: Milk Chosen: 1984

Minnesota cows produce over one billion gallons of milk each year! Name ten milk products you have tasted.

State Tree: Red (Norway) Pine Chosen: 1953

The tallest red (Norway) pine in Minnesota stands 120 feet high and is over 300 years old. Where is it located?

True OR False

Circle the items you think are official Minnesota symbols:

State Song (Hail Minnesota)
Band (The Minnesota State Band)
Gemstone (Lake Superior Agate)
Slogan (The Gopher State)
Butterfly (Monarch)
Photo (Grace)

Name the Symbol

Clue: Thriving in swamps, bogs, and damp woods, they grow slowly, taking 4 to 16 years to produce their first flower. They can live for 50 years or longer. It is illegal to pick them.

State Flower _____

Clue: These large black-and-white water birds have long black bills. Their name comes from a Norwegian word that means "wild, sad cry." Clumsy on land, they are excellent divers, underwater swimmers and high-speed flyers.

State Bird _____

Clue: They inhabit waters in all parts of the state, but mainly the large, cool lakes in northern Minnesota. Their eyes are sensitive to light, so they go to deep, dark waters during the day and move to shallow lake areas at night. A favorite fish lover's food, Minnesota's record catch weighed 17 lbs., 8 oz.

State Fish _____

Minnesota's Early Farmers

Native Americans

Long before immigrants arrived and Minnesota became a state, the Ojibwe (sometimes called Anishinaabe) and the Dakota Native Americans farmed. The Ojibwe lived in the northern lakes and forests. They hunted and fished. They harvested wild berries, other plants, and wild rice. The Dakota settled in the prairie areas in southern Minnesota. Their villages dotted the Mississippi, Minnesota, St. Croix, and Cannon River banks. Dakota men were hunters and warriors; Dakota women were farmers. They grew corn, beans, and squash, a crop trio called the Three Sisters in native lore.

Today, Native Americans honor their agricultural heritage by growing and harvesting traditional crops like hominy (a type of white corn) wild rice, wild berries, maple syrup, buffalo meat products, and use birchbark to make baskets and crafts.

Early Immigrants

Immigrants from Europe began arriving in the early 1800s. They settled on small plots of land and were **subsistence farmers**. They grew just enough food to feed themselves and their farm animals, with some left over to trade for things they needed. It was a hard life, with little money, meager tools, crude homes, and few household goods. Subsistence farmers raised a variety of crops and livestock. Farms that grow a variety of crops are called **diversified farms**. Many farmers at that time planted oats, potatoes, corn, and beans. They kept a cow or two, a few chickens and pigs, and maybe a few sheep.

Free Land ... Westward Rush

The Homestead Act of 1862 provided free land to settlers. To earn 160 free acres, settlers had to live on and farm the land for five years. This brought 75,000 people, mostly from Europe, to Minnesota within three years. The new homesteaders plowed the prairie soil and planted crops, creating many small family farms. Many of the first homes were built from prairie sod. Farm machinery like steel-blade plows, mowers, reapers, and harvesters were invented to help with the work.

Bonanza Farms

Wheat production grew as new railroads connected farms to markets. Between 1875 and 1890, huge **bonanza farms** were created, especially in the Red River Valley. Funded by rich business people from eastern states, wheat farms covered thousands of acres. Hundreds of horses and huge teams of farmhands and machines worked these **specialized farms** (farms that grew mainly one crop). Most of the wheat was shipped to flour mills in Minneapolis.

Eventually, bonanza farms produced so much wheat that a surplus (oversupply) was created. Wheat was no longer profitable. Many bonanza farms were divided and sold, making smaller family farms again. Families began growing corn, oats, and a new hay crop called alfalfa. Some planted fruit trees. Others chose dairy farming, especially in the rolling countryside of southeastern Minnesota.

From earliest Native American farmers to arrivals from another continent—all were pioneers of Minnesota agriculture. Today, there are many kinds of farms in Minnesota, from family farms large and small, to large farms specializing in corn, soybeans, or sugarbeets, to cattle, sheep, poultry, and goat farms, to organic farms, to Native American wild rice sites—even farms raising llamas!

Family homestead, late 1800s

Bonanza farm, late 1800s

Indian family guarding corn from blackbirds.

Sod home, mid 1800s

Photos Courtesy Minnesota Historical Society

Minnesota AgBrags

The U.S. is the world's largest exporter of farm products. Can you name Minnesota's four biggest ag customers? (HINT: These are their flags.)

1. _____
2. _____
3. _____
4. _____

The U.S. sends many kinds of foods to these four countries. Here are some examples (and many of these things are produced in Minnesota):

- **Mexico** imports lots of corn, as well as soybeans, dairy, and pork.
- **Canada** imports fruits and vegetables.
- **China** imports lots of soybeans, mostly as feed for its growing livestock industry.
- **Japan** imports corn and red meat (Japan's small size means it does not have much room for crops and livestock).

Minnesota is the 3rd largest agricultural exporting state in the U.S. Top to bottom, the flags are in order of largest importers. Which country imports the most Minnesota ag products?

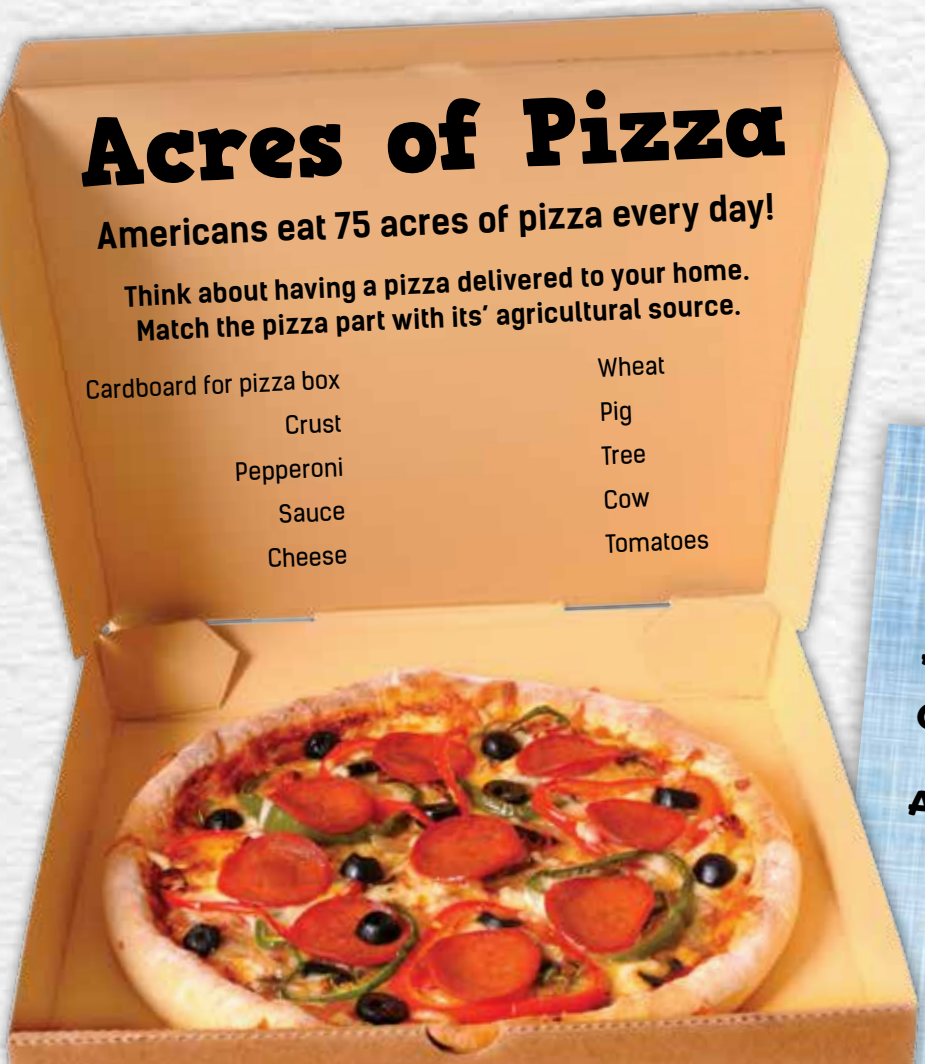
_____

Acres of Pizza

Americans eat 75 acres of pizza every day!

Think about having a pizza delivered to your home. Match the pizza part with its' agricultural source.

Cardboard for pizza box	Wheat
Crust	Pig
Pepperoni	Tree
Sauce	Cow
Cheese	Tomatoes



Quirky Questions

Q. If a rooster laid an egg on a slanted roof, which way would it roll?

A. No way. Roosters don't lay eggs.

Q. What does a Minnesota farmer plow but never plant?

A. Snow

What is it?:
This vegetable's outside is thrown away so the inside can be cooked. But the outside of the inside is eaten and the inside of the inside is thrown away.

Learn about and order our free educational materials at www.mda.state.mn.us/maitc.

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