

## Why Ag In the Classroom?

In times past, people were very aware of the role agriculture played in their lives. It meant survival! Nearly everyone—men, women and children—worked the land.

Agriculture still means survival. That will never change. But as time goes on, fewer and fewer people have close contact with farming. They're not aware of their own—and the nation's—total dependence on agriculture. Think about it:

- Less than two out of 100 Americans work in production agriculture (farming). This small group meets the food and fiber needs of the nation as well as many people abroad.
- Agriculture, along with its related occupations, is the nation's largest industry. It generates billions of dollars each year; one out of every five jobs depends on it in some way. It has massive impact on the American economy, greatly influences the U.S. international balance of trade and directly affects the number of jobs here at home.

Our citizens must be agriculturally literate in order to make responsible decisions affecting this giant lifeline. Building that literacy in consumers and leaders is what Ag in the Classroom is all about.

## Academic Standards Connection

The student Minnesota AgMag and other educational materials from Minnesota Agriculture in the Classroom can meet many of the new academic standards. These materials can serve as a wonderful "real life" connection and supporting piece as you incorporate the standards into your classroom activities. Here are a few examples of potential connections:

### Minnesota Academic Standards Alignment

#### K-12 Academic Standards in Social Studies

1. (Grade 6, Economics Strand, Fundamental Concepts Sub-strand, Standard 5) Benchmark: Describe the movement of goods and services, resources and money through markets in a market-based economy.

2. (Grade 6, History Strand, United States Sub-strand, Standard 23) Benchmark: Identify the major Minnesota political figures, ideas and industries that have shaped or continue to shape Minnesota and the United States today.

#### Minnesota K-12 Academic Standards in Science

1. (Grade 5, Earth and Space Science, Human Interactions with Earth Systems, Standard 1) Benchmark: Compare the impact of individual decisions on natural systems.
2. (Grade 5, Life Science Strand, Human Interactions with Living Things Sub-strand, Standard 1) Benchmark: Give examples of beneficial and harmful human interaction with natural systems.

#### Common Core/Minnesota K-12 Academic Standards in English Language Arts

1. (Grade 4, Reading Informational Text Sub-strand, Key Ideas and Details Standard) Benchmark: Explain events, procedures, ideas or concepts in a historical, scientific or technical text, including what happened and why, based on specific information in the text.

#### Minnesota K-12 Academic Standards in Math

1. (Grade 4, Number & Operation Strand, Standard 1) Benchmark: Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction and multiplication of multi-digit whole numbers.
2. (Grade 5, Algebra Strand, Standard 1) Benchmark: Create and use rules, tables, spreadsheets and graphs to describe patterns of change and solve problems.

## About Your AgMag

Your AgMag is distributed primarily to teachers in grades studying Minnesota (usually fourth or sixth). If the magazine fits better into the curriculum program at another grade level, we encourage you to pass the material on to the appropriate teachers.

Offered at no cost to you, the AgMag is a product of Minnesota Agriculture in the Classroom. You'll receive three issues this school year: October, January and March.

### MINNESOTA AGRICULTURE IN THE CLASSROOM

Al Withers, Program Director

Sue Knott, Education Specialist

Go to [www.mda.state.mn.us/maitc](http://www.mda.state.mn.us/maitc) for:

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This second issue of your AgMag is designed to help you:

- introduce a basic agricultural production cycle: producing, processing, distributing, marketing, consuming
- highlight the plant and animal connection
- offer expanded information about the pork industry and the pork production cycle
- present information about world population and world hunger, and the challenges they present for agriculture
- offer insights about how Minnesota's landscape is changing over time
- continue to introduce students to ten plants that have been designated by a panel of experts as most shaping our state
- reinforce awareness of Minnesota's world connections through agricultural exports.

## Integration

Your AgMag materials are created by experienced classroom teachers. An Editorial Review Committee provides content ideas and reviews each issue.

Some teachers use the magazine as a separate lesson; others integrate magazine content into specific areas of the curriculum. The subject matter and skills listed will help you select appropriate agriculture activities to integrate into other curriculum areas.

**Language Arts, Reading Literacy:** Use the articles and activities to develop a variety of skills: webbing, outlining, non-fiction reading, reading for the main idea, vocabulary development (bold words throughout, pretest/post-test, activities throughout the AgMag, reproducible pages in Teacher Guide).

**Creative Writing:** Examples: Stories from the points of view of plants or animals that depend on humans; predictions for the future of agriculture; letters to children in other countries, with descriptions about agriculture here and questions about agriculture there.

**Social Studies, History:** Social Studies appear everywhere in the AgMag. See especially More Mouths to Feed and Agriculture: The Heart of Survival, page 6 and How has agriculture changed Minnesota's landscape? on page 7. In the Teacher Guide, see pages 3 through 5.

**Geography, Map Skills:** AgMag pages 7 and 8 and Teacher Guide page 5.

**Science:** See Plants and Animals, page 3; How has agriculture changed Minnesota's landscape? page 7.

**Math:** See graphs and activities pages 6, 7 and 8.

## In This Guide: Don't Miss...

- SHOW WHAT YOU KNOW pretest and post-test on page 6. Check your students' knowledge of key agricultural concepts before and after reading the AgMag!
- Discussion prompts, background information, extended activities and answers.
- Four reproducible activities: Inventors and Inventions (page 3); Why are They Hungry? (page 4); Minnesota Connections (page 5); Show What You Know (page 6).

## Glossary

Some words in your AgMag may be unfamiliar to your students. These words often appear in bold type or in italics. Many are defined in the articles. Words you might wish to pre-teach are: **consumers, interdependent** (cover); **raw materials, natural and renewable resources, agriculture cycle, livestock, manure** (pages 2-3); **farrow to finish, weaned, rations, by-products**, (pages 4-5); **developed country, less-developed country** (page 6), **forage, hybrids, legume** (page 7).

## Discussion Prompters

Cover (Social Studies)

1. What makes "Agriculture, the Land, and You" a good title for this page? (Each of the products mentioned in the article and many

shown in the photos started out with a connection to the land, the soil. They end up being used by people.)

2. What connections to agriculture do you see in these photos? (Christmas trees, clothes in store, sports uniforms, wooden gym floor, ball, soybeans, backpack materials and more.)

**Student Pages 2 and 3** (Social Studies, Science, Economics)

1. How many things in your classroom came from agriculture?
2. What have you eaten or worn today that came from an animal? A tree or plant? The soil? From pigs? Corn or soybeans?
3. Why do we say agriculture depends on natural and renewable resources? (*The agricultural products that are produced, processed and distributed are all dependent on soil, sun, air and water in some way. Animals and plants are considered renewable resources.*)
4. What foods do NOT come from plants and animals? (*Mushrooms and yeast are fungi, not plants.*)

**Student Pages 4 and 5** (Science, Social Studies)

1. The hog industry is a huge part of animal agriculture in Minnesota and many other places. China is the world's leading producer; the U.S. is second. Why is the Midwest such an important region for hog farming? (*Because the rations fed to pigs are usually based on corn, soybeans and barley. These crops are grown heavily in the Midwest.*)
2. Most hog farmers keep clean, modern buildings to raise their animals, rather than letting them roam outdoors. What are some of the risks for pigs being raised outdoors? (*Pigs can be harmed by hot and cold weather, sunburned by too much sunlight and attacked by animal predators.*)
3. Rules for inspecting pork are set by the United States Department of Agriculture (USDA). All pork sold in retail shops has been inspected. Look for the Passed and Inspected by USDA seal to know the pork is wholesome and free from disease. What do we have to do to make sure our pork is safe to eat? (*Keep it properly frozen or refrigerated, touch it only with clean hands, counters and utensils, cook it to proper temperatures, refrigerate leftovers promptly.*)

**Student Page 6** (Social Studies)

1. What does the population trend of the future (more people in cities and less-developed countries) mean for agriculture? (*Production must keep increasing in order to feed everyone. Transportation and distribution will be even more important than they are today. Growing urban populations will use resources in greater quantities than their fewer rural neighbors who produce the food. Conserving land, water and energy resources and using new technologies to increase production will grow in importance. Marketing new products will continue to be a growing business.*)
2. Because of war, drought, political instability, high food prices, poverty and joblessness, hunger now affects one in six people in the world. (Estimate is from the United Nations.) How can we help hungry people? Don't forget, there is hunger in the United States and Minnesota, too.

**Student Page 7** (Social Studies, History)

1. The map shows the top producing counties for corn, soybeans and alfalfa. What do you notice about the areas where each is grown? Most of these areas were originally covered by prairie grasses. What do they look like today? (*They are production agriculture areas, with livestock and crop operations dotting the landscape.*)
2. Why does southern Minnesota have a longer growing season than other areas of the state? (*Its location farther south gives it slightly warmer weather, allowing for a longer growing season.*)
3. Why are hybrids so important in crop production? (*Hybrids are developed from crossbreeding and cross pollinating different plants with the goal of improving them. For example, plant breeders develop hybrids that can resist drought, grow in harsher weather, produce greater yields, etc. Breeding for desired characteristics greatly improves crops.*)

# Inventors & Inventions

## Word Bank:

Thomas Edison  
 Louis Pasteur  
 Charles Birdseye  
 John Deere  
 Cyrus McCormick  
 Samuel Morse  
 Charles Goodyear  
 Alexander Graham Bell  
 Rudolph Diesel

## Circle which came first

pasteurized milk or tv dinners  
 gasoline engine or steam engine  
 telephones or tractors  
 canned foods or frozen foods  
 electric lights or telegrams  
 vacuum milkers or pasteurized milk

Many inventors and inventions have changed agriculture. Fill in the missing inventors. How is the name sometimes the clue? How can you find answers you do not know?

Invention	Inventor	Year
Canned Foods	Nicolas Appert	1787
Cotton Gin	Eli Whitney	1793
Steam Locomotive	Richard Trevithick	1804
Reaper	_____	1834
Refrigerator	Jacob Perkins	1834
Steel Plow	_____	1836
Vulcanized Rubber	_____	1839
Telegraph	_____	1840
Gas Engine	Jean Lenoir	1860
Pasteurization	_____	1864
Margarine	Hippolyte Mourles	1869
Barbed Wire	Joseph Glidden	1873
Telephone	_____	1876
Vacuum Milking Machine	Anna Baldwin	1878
Electric Light	_____	1879
Internal Combustion Engine	_____	1892
Tractor	Benjamin Holt	1904
Frozen Food Process	_____	1925

**NOTE:** Lay a piece of plain paper across the answers to block off the lower part of this sheet before photocopying. Invite students to use the resulting blank space to write about things they think are really cool inventions or things they wish could be invented.

## ANSWERS: AgMag

### Cover

#### Take a closer look!: Soybeans

#### Agriculture Cycle, p. 2

- Producing
  - Processing
  - Distributing
  - Marketing
  - Consuming
- Photos top to bottom: 1, 5, 2, 4, 3
  - Products with more steps use more energy, especially in processing. Example: Fresh potatoes are picked, cleaned, graded, packaged and ready for consumers. Potato chips add slicing, baking or frying, seasoning and inspection to the cycle.
  - Sun, air, water and soil are the resources from which all agricultural products develop.

#### Makin' Bacon and More, p. 5

1. B 2. C 3. D 4. E 5. A

#### Think and Discuss, pg. 5

- More hogs are produced in states that raise corn and soybeans because those grains are main hog foods.
- Pigs were first brought into the area that became the United States by Spanish explorers and by early European colonists.

#### More Mouths to Feed, p. 6

The world gains about 9,000 people per hour and 216,000 each 24-hour day.

**What's Ahead?** The population growth will be much faster in less developed countries.

**Superstorm Sandy:** Agriculture was needed immediately after Superstorm Sandy to provide food, clothing, shelter, medicines, bandages, fuel for emergency vehicles, clean up supplies and more.

**Why might food grown in a country not stay in that country?**

Exporting food is big business in many parts of the world. If money can be made by selling locally grown food to others, it may not be readily available to local people.

#### How has agriculture changed Minnesota's landscape?, p. 7

Can you name the plant? Corn, alfalfa, soybeans

## ANSWERS: Teacher Guide

### Inventors and Inventions

Missing inventors, in order: Cyrus McCormick, John Deere, Charles Goodyear, Samuel Morse, Louis Pasteur, Alexander Graham Bell, Thomas Edison, Rudolph Diesel, Charles Birdseye.

**Which came first:** pasteurized milk, steam engine, telephones, canned foods, telegrams, pasteurized milk.

### Why Are They Hungry?, p. 6

**Across:** 5. transportation; 10. crop; 12. drought; 13. spoiling.

**Down:** 1. stealing; 2. wars; 3. government; 4. poverty; 6. storage; 7. trade; 8. processing; 9. floods; 11. pests.

### Show What You Know, PreTest/Post-Test

1. producing, processing, distributing, marketing, consuming  
 2. b 3. c 4. b 5. b 6. a 7. c 8. b 9. b

# Agriculture in a Hungry World

## Why Are They Hungry?

There is enough food to feed everyone in the world. So why are some people starving? They simply can't get the food they need. Solve the crossword puzzle and you'll see some of the reasons food does not reach people who need it in many parts of the world.

List some places you've been hearing about in the news where people suffer from hunger. What are some reasons their needs are not met?

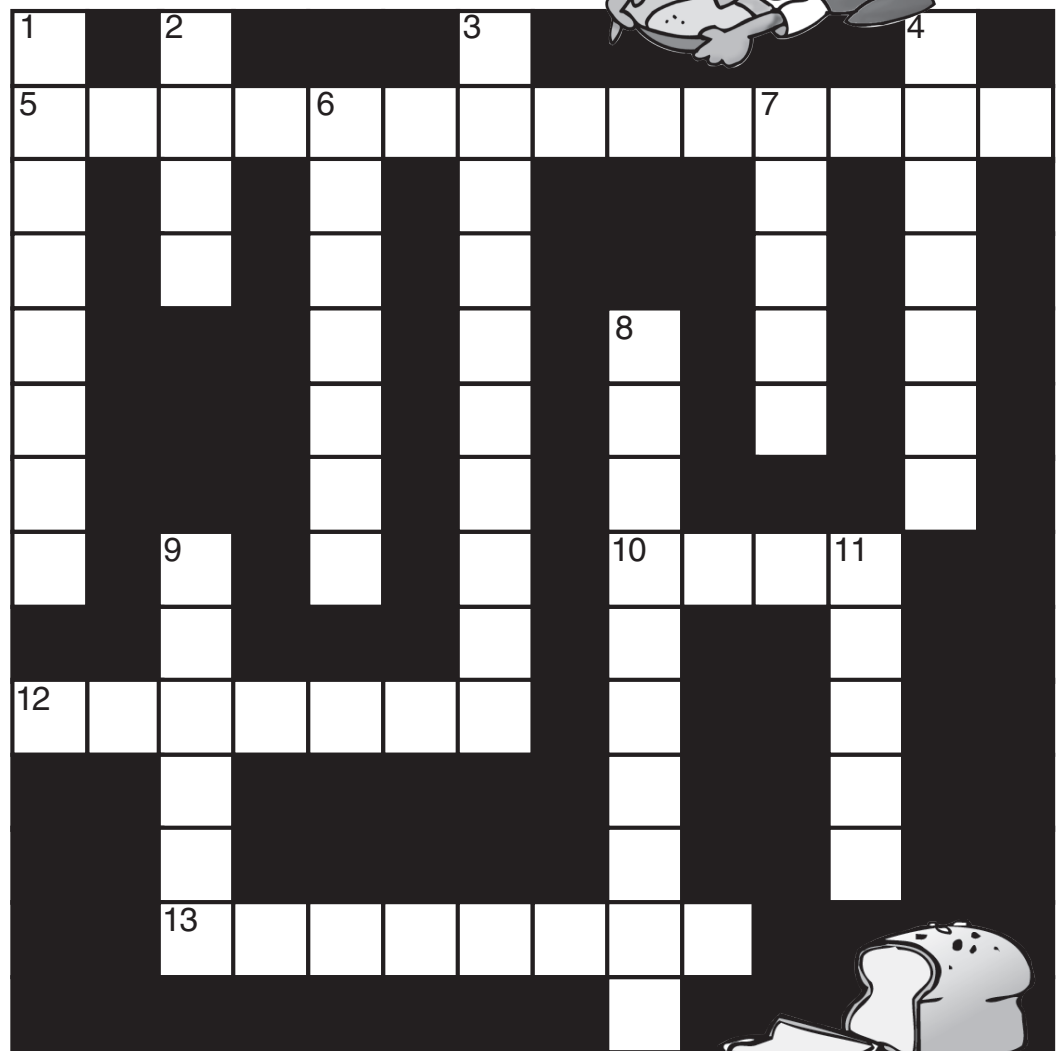


### ACROSS

- 5 Reliable ways of moving things from place to place
- 10 Poor growing season; \_\_\_ failure
- 12 Too little rain to grow crops
- 13 Rotting and molding

### DOWN

- 1 Robbing
- 2 Fighting in or among nations
- 3 Leaders of a country
- 4 Too little money
- 6 Clean, dry places to keep food
- 7 Buying and selling between countries
- 8 Changing raw products into forms we can use
- 9 Overflowing of rivers and streams
- 11 Insects and rodents



### What's Your Ecological Footprint?

How many Planet Earths would be needed if everyone lived like your family does? Take the online quiz with your family at Earth Day Network:

[www.myfootprint.org](http://www.myfootprint.org)

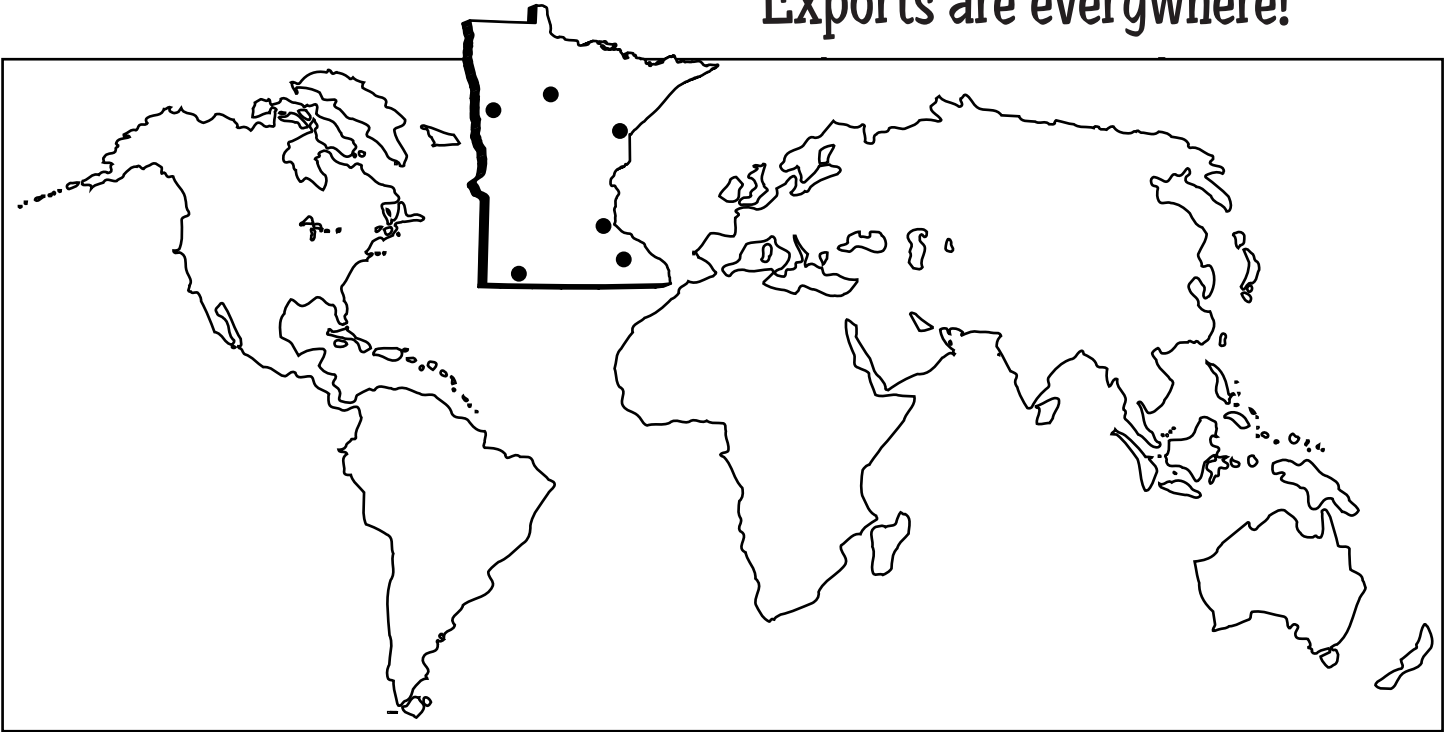


Food supplies are hurt when certain things happen. Sometimes land and water quality goes down. Pollution, natural disasters like floods, droughts, insects and over-planting one kind of crop can cause this damage. Sometimes people don't have the technology to produce and protect crops.

*It takes all the world working together to solve hunger problems.*

# Minnesota Connections

## Exports are everywhere!



**M**illions of dollars worth of agriculture products are exported from Minnesota each year. Our exports help feed and clothe people around the world. They bring dollars to our producers, provide thousands of jobs and are a big contribution to our state's economy.

You may need a Minnesota map and a world map to locate these places. The dots on your Minnesota map mark each of the communities named below. How many of the Minnesota locations do you know before you look at a state map? Getting to know our state is fun and interesting!

- |  |  |  |
|--|--|--|
| <p>a. Paper from a mill near Duluth is sold in a paper goods store in Mexico.<br/><b>Draw a colored arrow from Duluth to Mexico.</b></p> | <p>c. Pork from a farm near Rochester is served at a wedding in Japan.<br/><b>Draw a colored arrow from Rochester to Japan.</b></p>    | <p>e. Turkeys from Worthington are sold to a restaurant in Canada.<br/><b>Draw a colored arrow from Worthington to Canada.</b></p>                                       |
| <p>b. Lumber from the Bemidji area is used to build a house in Hong Kong.<br/><b>Draw a colored arrow from Bemidji to Hong Kong.</b></p> | <p>d. Flour milled in Minneapolis is used to make bread in Colombia.<br/><b>Draw a colored arrow from Minneapolis to Colombia.</b></p> | <p>f. Sugar from sugarbeets grown near Moorhead in the Red River Valley is sold at a grocery store in Germany. <b>Draw a colored arrow from Moorhead to Germany.</b></p> |

*These are just a few of the things we export to countries around the world. While exports are going out, guess what's coming in? Products from all the world are being imported into our state. They bring great variety to our lives because we can have and use things that are not produced in Minnesota.*

*They also make it possible for us to take advantage of more tropical growing seasons. We can enjoy fresh fruits and vegetables during the long, cold winter when our own fields, gardens and orchards are not producing.*

What is your favorite food that is imported into Minnesota from another country? \_\_\_\_\_  
Where does it come from? \_\_\_\_\_

**Note to Teachers:**

You are encouraged to send the Pretest and Post-test results to Ag in the Classroom to help document student learning. Use the attached postage-paid evaluation card.

Name \_\_\_\_\_

Check one  Pretest  Post-test

## Show What You Know!

*Take this short quiz before you read your AgMag, then again after reading the magazine. See the improvement!*

1. Name five steps in an agriculture cycle.

a. \_\_\_\_\_ b. \_\_\_\_\_ c. \_\_\_\_\_ d. \_\_\_\_\_ e. \_\_\_\_\_
2. These are the source of food for every other living thing.

a. animals                                      b. plants                                      c. fungi
3. More than half the world's population depends on this plant for a daily meal.

a. wheat                                      b. corn                                      c. rice
4. How many people are living in the world today?

a. over three million                      b. about seven billion                      c. over twenty million
5. Pork includes

a. legs, thighs and drumsticks.  
b. bacon, ham and pepperoni.  
c. T-bone steaks and hamburger.
6. Alfalfa is a flowering plant grown for

a. hay.                                      b. lawn and sports field turf.                      c. garden flowers.
7. An average pig litter is

a. 3-4 piglets.                                      b. 4-8 piglets.                                      c. 10-14 piglets.
8. The world's less-developed countries include

a. Japan and Australia.  
b. Bangladesh and Uganda.  
c. United States and Canada.
9. More than half of the world's food comes from only four crops. They are wheat, rice,

a. soybeans and oats.  
b. corn and potatoes.  
c. sugarbeets and peanuts.