15. Lines of Latitude and Agricultural Products

Overview
A slight difference in climate can make a difference in what type of agricultural commodity can be successfully grown in a place. How is this idea illustrated in Minnesota? The United States? The world? Students will explore these questions and develop answers to them in this lesson.

Grade Levels: 9 – 12
Time: Three 45-50 minute class periods. (Each map will be a one day lesson. Each part could be used independently or with one or both of the other parts.)

Minnesota State Standards: Geography
Benchmark: 9.3.2.4.4
Describe patterns of production and consumption of agricultural commodities that are traded among nations.

Prior Knowledge
• Students will need to read and understand latitude/longitude and how latitude is related to climatic regions.
• Students need to know the location of and characteristics of climatic regions.

Objectives
• Students will be able to identify and explain the location of the production regions of selected crops in Minnesota, the United States and around the world.
• Students will be able to describe the variables that allow similar/dissimilar crops to be grown at the same latitude.
• Students will be able to describe the variables that allow similar/dissimilar crops to be grown at different latitudes.
• Evaluate the role the Green Revolution has had on crop production locations.

Materials
• Food for Thought Maps found at http://www.mda.state.mn.us/fft
  ➢ Wheat in MN Counties (2012) (Map 2)
  ➢ Corn for Grain in MN Counties (2012) (Map 4)
  ➢ Soybeans in MN Counties (2012) (Map 6)
  ➢ All Hay in MN Counties (Map 8)
  ➢ Dairy Cows in MN Counties (Map 9)
  ➢ Beef Cattle in MN Counties (Map 11)
  ➢ Hogs and Pigs in MN Counties (Map 12)
  ➢ Sugarbeets in MN Counties (Map 15)
  ➢ Sweet Corn and Green Peas in MN Counties (Map 17)
  ➢ Farmland in MN Counties (Map 25)
  ➢ Farmland Value in MN Counties (Map 26)
  ➢ Minnesota Counties (named) (Map 41)
MN Ag in the Classroom Commodity Cards, one set (Order this free resource at www.mda.state.mn.us/cc)
Handout One: Crop Production Moving North
Computers with internet access to the following websites:
  + USDA NASS QuickStats http://quickstats.nass.usda.gov/
  + USDA NASS Agricultural Census –http://www.agcensus.usda.gov/
  + Food and Agriculture Organization of the United States - http://faostat3.fao.org/faostat-gateway/go/to/home/E
Lesson Links for additional resources at http://www.mda.state.mn.us/fft
  + Outline map of the United States (with latitude lines)
  + World Map (with latitude lines)
  + Minnesota State and County Profiles

Key words
  • Latitude, climatic regions, soil type, commodity

Procedure

Part 1
1. Give each student a copy of the Minnesota Counties (named) map.
2. Create stations using the Minnesota Commodity Card Set. You will not be using Forestry, Nursery and Landscape, Potatoes and Poultry, so you will have 14 cards that students will be looking at.
3. On the Minnesota Counties (named) map, students will copy the numbers on each Commodity Card onto the correct county. Students will need a different color for each commodity. I would suggest they number 7 of the commodities, each with a different color, and then the last 7 number with a color and put a circle around the number. This way they will be able to have 14 different symbols to represent each commodity. They must have a key that they can easily identify the commodities.
4. Once they have put all fourteen commodities on their map have them divide Minnesota into agricultural regions. Note: The Minnesota Commodity Card Set Cover Card identifies the four regions. You can tell students there are four or you can let them discover the regions for themselves.
5. Ask students for geographic reasons that would explain the placement of these agricultural regions. Answers should include soil type, natural vegetation, access to water, climate and lines of latitude.
6. On their map, have students correctly locate, draw and label the following lines of latitude: 43 degrees N., 44 degrees N., 45 degrees N., 46 degrees N and 47 degrees N. For each band of latitude – 43 – 44 degrees N, 44 – 45 degrees N., etc. Have students list what agricultural crop is predominantly grown there. Ask students what hypotheses can you make from this?

Part 2
1. Give each student a blank outline U.S. Map.
2. Using the Online Maps listed and a Goode’s atlas, or one of the USDA Links;
   USDA NASS QuickStats – http://quickstats.nass.usda.gov/
   label where each of the fourteen commodities are grown in the United States.
3. Next, have students correctly locate, draw and label the map with the following lines of latitude: 43 degrees N., 44 degrees N., 45 degrees N., 46 degrees N and 47 degrees N. on the map.
4. On the back of the U.S. map students should briefly explain the spatial distribution of these commodities in the U.S.
5. Does the national pattern match the Minnesota pattern? Students should give 3 – 5 reasons that would explain the pattern they see.
Part 3

1. Give each student a blank world political outline map.

2. Using the Goode’s Atlas Agricultural Product maps or UN Food and Agriculture Organization link http://faostat3.fao.org/faostat-gateway/go/to/browse/Q/*/E (Production) browse the production data for the crops in this lesson. Label where each of the fourteen commodities is grown in the world. Have students label wheat, maize (corn), oats, barley; they are found in the Goode’s atlas. Sugarbeets, soybeans and peas would be found on the UN site.

3. Next, have them correctly locate, draw and label on the map the following lines of latitude: 43 degrees N., 44 degrees N., 45 degrees N., 46 degrees N and 47 degrees N. and 43 degrees S., 44 degrees S., 45 degrees S., 46 degrees S and 47 degrees S.

4. On the back of the world map students should briefly explain the spatial distribution of these commodities around the world.

5. Does the global pattern match the Minnesota pattern? Does the global pattern match the United States pattern? Students should give 3 – 5 reasons that would explain the pattern they see.

6. Students should see that wheat and corn are grown at a variety of latitudes. The efforts of the Green Revolution should be introduced at this point.

This will then segue into lessons on the changes and advances the Agricultural Revolution brought to farming.

Assessment

Each map; Minnesota, United States and/or world should be turned in for completion and to ensure their reasoning illustrates geographic thinking and understanding.
MAPLE GROVE — Planting of major commodity crops is shifting northward in greater amounts than ever before, according to the June 30 Crop Acreage Report from USDA’s National Agricultural Statistics Service.

“This report is particularly useful because it shows in real terms how farming is moving farther north as we see longer growing seasons and other shifts that lend themselves to new production areas. It’s a trend that many have predicted as folks look at climate change impacts on agriculture,” said Bill Bond, executive director of the Minnesota Crop Production Retailers Association. “As we begin to see these shifts, it’s critical for those of us in production agriculture to continue a strong dialogue on what the future might hold — both in terms of new opportunities for production, as well as long-term challenges to meeting consumer demand.”

In the new report, Minnesota followed a trend that stretches across the northern U.S., with the total amount of corn, wheat and soybeans planted in the state reaching a new record high for 2014 at more than 17.3 million acres. This is just the second time the figure has topped 17 million acres statewide in Minnesota — and total combined planting of those crops in the state is up 580,000 acres from 2010 levels.

Record planting in Minnesota was mirrored across traditional commodity production states of the northern plains, as well as areas farther east. The USDA report shows record high planted acreage of combined corn, wheat and soybean crops in Michigan, North Dakota, South Dakota, Ohio, Pennsylvania, New York and Wisconsin.

While the phenomenon of conservation land returning to production could help to explain some of this change, the increase in planting documented by USDA significantly outpaces the reduction in acres set aside for conservation in Minnesota. While total Minnesota enrollment in the Conservation Reserve Program, for example, is down about 340,000 acres since June 2010, planted acres of corn, wheat and soybeans are up by 580,000 acres — a difference of nearly a quarter of a million acres.

“The recent crop report is a reminder of a changing landscape,” said Bond. “This is something our industry should closely follow as we prepare for the coming years and generations.”