Agriculture is fundamental to the lives of all Minnesotans. Not only do we depend upon agricultural products to sustain our bodies, the agricultural economy directly and indirectly employs a large fraction of our labor force and is the basic wealth of many areas and populations. The lifestyles and land uses of agriculture and related businesses have a pronounced geography. Therefore the Minnesota Alliance for Geographic Education is pleased to continue our strong partnership with Minnesota Agriculture in the Classroom in the production of this new edition of the Food For Thought Curriculum. We believe this partnership is especially important because the study of agriculture is essentially interdisciplinary and one cannot understand the geography of Minnesota without knowledge of our agriculture.

There are significant geographical patterns of agricultural commodity production, processing, transportation and consumption. If we are to know who we are we must first know where we are! While agriculture is deeply rooted in specific places, the trade of Minnesota’s commodities is worldwide. The expanding global connections of agriculture have prompted us to create several new lessons focused on them. In addition we have lessons that cover all grade levels. The expansion of the curriculum makes it necessary to put all the maps online. Not only does this enable us to provide more maps, teachers now have access to both color as well as black and white versions of the maps. These maps and lessons are designed to enable students and others to locate themselves amidst the grand mosaic of fields, factories, wind towers, ethanol plants, power lines and roads in Minnesota. It is our hope that this curriculum will create a sense of connection between the residents of urban areas and those engaged in agriculture. It is vital that this connection is taught in schools because today’s students have few, if any, first-hand experiences with farm life and farm families. Furthermore, agriculture is constantly evolving. In addition to providing our staff of life, today’s farmers are engaged in the production of energy for our cars, homes and factories.

The bond between agriculture and culture of Minnesota was recognized by the Minnesota State Legislature in the creation of the new graduation requirements and standards. Now there are agricultural related benchmarks for all grades. In addition students are expected to be able to use maps to understand regions, analyze contemporary lifestyles and make informed locational decisions. The lessons in this guide are specifically developed to enable students to master those cartographic benchmarks.

The geography of Minnesota’s agriculture is fascinating. We hope these maps and lessons spark students’ curiosity and lead them to future explorations of the land and people of Minnesota.

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Introduction

In 1997 Dave Lanegrann and I put our heads together and decided it was important to ‘connect Minnesota agriculture with geography’ to benefit K-12 students and educators. Through a unique and long-lasting partnership, the Minnesota Alliance for Geographic Education (MAGE) and Minnesota Agriculture in the Classroom (MAITC) have embarked on developing lessons focused on maps to help advance literacy about agriculture and geography. Now, some 25+ years later, we are pleased to offer you this 4th Edition of Food for Thought.

Welcome to Food for Thought: Connecting Minnesota Geography with Agriculture. We hope the lessons and maps included in this 4th Edition will inspire interest in the geography of Minnesota agriculture and enrich your curriculum. The maps used to deliver the Food for Thought lessons have been designed specifically to enable students to master the essential skills in the Minnesota Academic Standards for Social Studies/Geography. This curriculum is being offered FREE due to an ongoing commitment of financial resources from both MAGE and MAITC.

This 4th Edition of Food for Thought includes 18 standards-based K-12 lessons. The maps essential to implementing these lessons can all be found online, as a complete color and/or black and white set, and also as a ‘customized’ set for each lesson. You will find all maps and lessons online at www.mda.state.mn.us/fft.

Minnesota should be the same size on all the maps. We encourage you to use all the maps referenced in each lesson, and to consider mixing and matching other maps that might fit the subject of the day or something of personal interest. For example, there is no specific lesson which uses the Emerald Ash Borer or the Gypsy Moth map, but you may find an interesting and effective way to use them.

Several maps on the Color Student Desk Map and in the larger set of master maps have a category called “No date reported.” When the 2012 Census of Agriculture provides digital data files, it also provides explanatory notes about reasons for reporting no data. There are two main reasons why data are not available: (1) the commodity occurs in extremely small amounts and is essentially a zero value or (2) data are withheld to avoid disclosing information about individual farms because there are relatively few producers in the county.

Many of the maps are based on numerical data from the 2012 Census of Agriculture. These maps deliberately display percentages and numbers per square mile. By using “per” numbers we can compare the counties that differ greatly in size. “Per” numbers also allow us to think about each topic in terms of concentrations or densities. Our legends that show percentages or per square mile data consistently use darker shading to represent higher numerical values. This concentration formula can also be misleading. Example: For All Hay (Map 8) the concentration of hay in Koochiching County shows the darkest shading indicating high percentage, yet in total value to agriculture it would not compare to Stearns or other counties with many more acres in production. All maps are based on data sources, which are noted on the maps themselves. We, in turn, bear responsibility for how we have chosen to represent the information. Enjoy!!

Al Withers, Program Director, Minnesota Agriculture in the Classroom
Glossary

alfisol
soils where top layers are moderately high in plant nutrients and organic matter; originally covered by deciduous tree vegetation

bulk gaining industry
an industry in which the final product weighs more or comprises more volume than its inputs

bulk reducing industry
an industry in which the final product weighs less or comprises less volume than its inputs

choropleth map symbols
shade areas (e.g., counties) with light or dark shading depending on numerical data to show concentration or density

commodity
types of crops (plants) or livestock (animals) produced for sale

compass rose
a figure on a map or nautical chart used to display the orientation of the cardinal directions (north, south, east, and west). It is also the term for the graduated markings found on the traditional magnetic compass

conifer forest
vegetation region containing needle-leaved trees that are evergreen and bear cones (e.g., pines, spruces, firs)

consumer
a person who uses goods or services

cooperative
a grouping of farmers who pool their resources, crops, or livestock to improve their bargaining power (i.e. purchases and sales)

data source and date
who collected numerical data; time period when the data occur

deciduous forest
vegetation region containing broad-leaved trees that lose their leaves in autumn (e.g., maples, oaks, elms, basswood)
diversified farming
the practice of producing a variety of crops or animals, or both, on one farm, as distinguished from specializing in a single commodity

export
to sell to other places outside of the area of the country

extensive farming
An agricultural production system that uses small inputs of labor, fertilizers and capital, relative to the land area being farmed. Extensive farming most commonly refers to sheep and cattle farming in areas with low agricultural productivity, but can also refer to large-scale growing of wheat, barley, etc. Nomadic herding is an extreme example of extensive farming

family farm
USDA classifies family farms as “any farm organized as a sole proprietorship, partnership or family corporation”

final products
those which are produced using raw materials

frost-free days
temperatures are above 32°F; number gives an idea of growing season length for plants sensitive to freezing temperature

grid
pattern of lines on a chart or map, such as those representing latitude and longitude, which helps determine absolute location

ground moraine
landform surface that includes gentle slopes left long ago when glaciers pushed rocks and soil across Minnesota

ice-scoured bedrock
landform in northeastern Minnesota left long ago when glaciers scraped soils and rocks from the ground; tends to include steeper slopes

import
to bring into a place from somewhere else; often used to describe products brought into one country from another

intensive farming
an agricultural production system characterized by higher input use such as capital, labor and pesticides and fertilizers relative to land area. The methods of modern intensive farming include innovation in agricultural machinery and farming methods, genetic technology and techniques for achieving economy of scale
Glossary

key
explains meanings of symbols on a map

lake plain
flat land that long ago in glaciation period was the bottom of a lake

latitude
location on earth in relation to the equator

legend
explains meanings of symbols on a map

natural or native vegetation
the vegetation that was present in the mid-to-late 1800s (before European Americans introduced their agricultural methods) when Minnesota was populated mainly by American Indians

nursery crops
all cultivated plants that are used to enhance the outdoor landscape

outwash plain
flat to gently-sloping landform left long ago when melt water carried sand and soil away from glaciers

organic farm
a type of farm that utilizes methods that maintain and enhance soil fertility, prevent soil erosion, promote and enhance biological diversity, and minimize risk to human and animal health and natural resources

orientation
map symbol that shows where north, south, east, west are on a particular map (see compass rose)

perishability
being subject to decay or spoilage

population density
the amount of people per unit of land

prairie
vegetation region where grasses predominate

precipitation
rainfall and snowfall that provide water for plants and animals

producer
a person or business that makes or provides goods and services

raw materials
materials and products required to make something else

regions
areas that share common characteristics

scale bar
a map symbol that shows how a length on the map relates to the distance in the real world

specialized farming
the practice of concentrating production on a certain product or products. Examples are raising Christmas trees, mushrooms, certain fruits or vegetables, or even dairy. Organic farming can be specialized as well. Specialization offers a greater dependence on the market

stream-dissected land
landform in southeastern Minnesota that includes steeper slopes because erosion by streams and rivers has carved valleys in the landscape; this area was affected least by the movement of glaciers

tillage
scraping or plowing soil to remove weeds or prepare a field for planting a crop

title
a brief summary of a map’s contents

terminal moraine
landform surface that includes steeper slopes left when glaciers stopped movement across Minnesota and dumped irregular piles of soils and rocks

ubiquitous
a resource or raw material available everywhere