Grade 11
Agriculture (30S)

A Course for Independent Study

Manitoba

GRADE 11
AGRICULTURE (30S)

A Course for Independent Study

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Table of Contents

Grade 11 Agriculture

Introduction

Welcome to *Grade 11 Agriculture (30S): A Course for Independent Study*.

As a student in a course for independent study, you have taken on a dual role—that of student and of teacher. As a student, you are responsible for mastering lessons and completing learning activities and assignments. As a teacher, you are responsible for checking your work with the Learning Activity Answer Keys, carefully noting the nature of your errors. Finally, you must work diligently to overcome any difficulties you may encounter.

Importance of Agriculture

Agriculture is a very important activity in Manitoba. It is a primary producer of the foods we consume in Manitoba and has significant economic impact. Agriculture is linked to many other industries within the province, including plant and animal processing, and the production of medicine, clothing, building materials, and numerous other products. Materials such as fuels, herbicides, and machinery are needed to run agricultural operations, as are services including veterinarian services, financial planning, and many others.

Agriculture is not limited to those directly involved in the provision of related services. Every Manitoban is a consumer of foods, medicines, and clothing, and therefore is affected by agricultural issues. The production and quality of farm commodities, urban expansion onto farmlands, conversion to farmland of marshes or parklands previously used for hunting, the use of tax dollars, and numerous other issues affect all Manitobans. Your municipal, provincial, and federal governments also play major parts in all aspects of Manitoba agriculture.

Purpose of the Course

This course provides information about agriculture in Manitoba. Agriculture involves many different dimensions and draws upon the knowledge base of a variety of disciplines. The study of agriculture provides us with knowledge and understanding of agricultural processes, and is also useful in providing information related to career choices. *Grade 11 Agriculture* examines historical perspectives of agriculture in the province, as well as present concerns and trends. The past, present, and future of agriculture are an important part of this course as they relate to Manitoba's economy, social and cultural development, consumer habits, and politics.

Course Description

The course examines the physical and climatic features of Manitoba, the resource base, soil management practices, crop varieties, and plant and animal science. Specialized agricultural terms are in **bold-face** type. Definitions for these terms are located in the Glossary, which is found at the end of the course.

The course aims to strengthen positive attitudes towards the responsible and sustainable use of existing resources. *Grade 11 Agriculture* contains four modules, and each module contains lessons, learning activities, and assignments, and concentrates on a particular knowledge area. While the modules are distinct, certain concepts and kinds of information are interrelated across the modules. The four modules are:

Module 1: Manitoba Agriculture: An Overview

Module 2: Soil Science

Module 3: Plant Science

Module 4: Animal Agriculture in Manitoba

The four modules comprise 14 separate lessons. Module 1 has five lessons, Module 2 has three lessons, Module 3 has four lessons, and Module 4 has two lessons.

Module Covers

The module covers include photographs and biographical profiles of significant agricultural pioneers in Manitoba. Read the biographical profile for your own interest. You will not be tested on this material. All of these individuals have been inducted into the Agricultural Hall of Fame in Brandon because of their contributions to various aspects of agriculture.

Course Evaluation

Your final mark for *Grade 11 Agriculture* will be based on the results of the four assignments, a midterm examination, and a final examination.

Your final mark for this course is based on:	**Percentage**
Assignment 1: Facts and Opinions (Module 1, Lesson 5)	10%
Assignment 2: Soil Texture Analysis by Water Separation (Module 2, Lesson 1)	10%
Midterm Examination	30%
Assignment 3: Germinating Seeds (Part I and Part II) (Module 3, Lessons 2 and 3)	10%
Assignment 4: Designing a Model Sustainable Farm (Module 4, Lesson 2)	10%
Final Examination	30%
Total	**100%**

Your Tutor/Marker

If at any time you need to contact your tutor/marker for this course, you may do so by telephone, fax, or mail. To correspond with your tutor/marker, contact the

Independent Study Option (ISO) Tutor/Marker
555 Main Street
Winkler MB R6W 1C4
Fax: 204-325-1719
Toll-Free Telephone: 1-800-465-9915

Examinations

Before completing Module 2, you will need to apply for your midterm examination.

Before completing Module 4, you will need to apply for your final examination. The final examination will emphasize Modules 3 and 4. You will also be expected to apply your knowledge from Modules 1 and 2. Review your lessons and assignments in preparation for each examination.

- If you **are attending school,** ask your school's Independent Study Option (ISO) facilitator to add your name to the ISO examination eligibility list. Do this at least three weeks prior to the next scheduled examination week.
- If you are **not attending school**, check the **Examination Request Form** for options available to you. Fill in this form and mail or fax it three weeks before you are ready to write the *Grade 11 Agriculture* midterm examination and final examination. The address is:

  ISO Registration
  555 Main Street
  Winkler MB R6W 1C4
  Fax: 204-325-1719
  Toll-Free Telephone: 1-800-465-9915

Course Materials

There are no textbooks in this course. There is a package of supplementary learning resources that you should have received with your course materials.

The supplementary learning resources include:

- *Budget Guidelines for a Dairy Enterprise,* April 1998 (Manitoba Agriculture)
- *Eating Well with Canada's Food Guide* (Health Canada) 2007
- *Freedom Five: Livestock Welfare in Alberta,* DVD (Alberta Farm Animal Care)
- *Growing Manitoba* (Agriculture in the Classroom)
- *Guidelines for Estimating Swine Farrow-Finish Costs,* March 1999 (Manitoba Agriculture)
- *Guidelines for Estimating Swine Farrow-Wean Costs to 5 kg,* April 1999 (Manitoba Agriculture)

- *Manitoba Agricultural Review,* 2001 (Manitoba Agriculture)
- *Manitoba Agriculture Statistics*, 2003 (Manitoba Agriculture)
- *Manitoba Official Highway Map* (Province of Manitoba)
- *Seed Identification Chart* (Manitoba Agriculture)
- Selected Highlights from the *State of the Environment: Report for Manitoba 1995: Focus on Agriculture* (Manitoba Environment/Manitoba Conservation)
- *Some See a Farm... We See an Industry* (Manitoba Agriculture)

Other agriculture-related references may be useful to you. Look for these resources in schools, public libraries, and the offices of your local agriculture representative from Manitoba Agriculture.

If your home or school is linked to the Internet, sites related to agriculture should prove useful. Magazines, daily and weekly newspapers, including *The Manitoba Cooperator* (Winnipeg), are excellent sources for a wide variety of information on agriculture.

Radio and television coverage of agriculture events or developments can provide additional information.

Method of Study

While each student develops his or her own method of study, you may want to consider the following suggestions.

Organize your time and your materials.

- When modules are received, place the course pages in a three-ring binder. This should make the handling of the modules easier and more orderly, with less chance of losing pages.

Read and study the lessons.

- When you begin a lesson, read over the objectives. Quickly skim through the lesson to get an idea of the lesson's contents. Take note of any learning activities and assignments.
- You may find it useful to make notes in the margins of your course or in a separate notebook.

Learning Activities

- The learning activities at the end of lessons will help you review and practise what you have already learned. Learning activities are **not** to be sent to your tutor/marker for assessment. Instead, you can check your answers yourself in the Learning Activity Answer Keys located at the end of each module.

Exercises

- There are exercises in some of the lessons. These will help you reinforce, review, and extend the concepts and ideas presented in the lesson. Exercises are **not** to be sent to your tutor/marker for assessment and do not have answer keys.

Assignments

- You are required to submit all assignments to your tutor/marker for evaluation.
- Assignments are included in
  - — Module 1, Lesson 5—Assignment 1: Facts and Opinions
  - — Module 2, Lesson 1—Assignment 2: Soil Texture Analysis by Water Separation
  - — Module 3, Lessons 2 and 3—Assignment 3: Germinating Seeds (Parts I and II)
  - — Module 4, Lesson 2—Assignment 4: Designing the Model Sustainable Farm (Parts A and B)
- Look at each of the assignments at the beginning of the course to see what they involve. Some require prolonged examination of plant growth over a number of weeks. Start thinking about them early in your studies.

  Make sure that you plan your assignments ahead of time. The assignments for Modules 2 and 3 are difficult to do in winter, since you need to collect soil samples and grow plants. These are best completed in early fall or spring.

Guide Graphics

Graphics have been placed inside the margins of the course to identify a specific task. Each graphic has a specific purpose to help guide you.

The significance of each guide graphic is described below.

Learning Activity: You are required to respond to the questions that accompany this graphic.

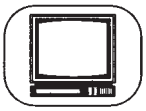
Check the Learning Activity Answer Key: After completing a learning activity, it is important to check your answers.

Exam time: When this graphic appears, it is time to write an examination.

Assignment: This graphic reminds you that you must send an assignment to your tutor/marker for evaluation.

Note: This graphic appears when there is a direction or explanation that you should note carefully.

Reading: This graphic alerts you to read certain pages in the supplementary materials.



Video: This graphic indicates that you are required to view a video on a DVD.

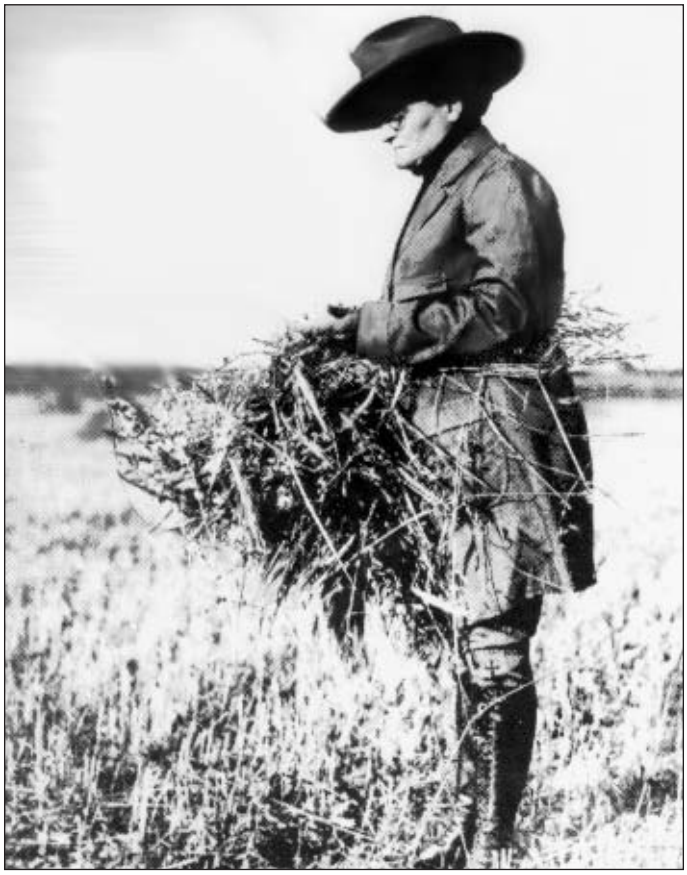
Telephone: This graphic is a reminder to contact your tutor/marker.

Notes

GRADE 11 AGRICULTURE (30S)

Module 1
Manitoba Agriculture: An Overview

Module 1 Profile



E. Cora Hind *
1861–1942

Cora Hind, born in Toronto in 1861 and orphaned at age five, was educated in Flesherton and Orillia. She was determined to become a reporter, in spite of her aunt's wish that she become a school teacher. She mastered the recently invented typewriter and worked for a prestigious law firm for eight years, all the while freelancing as a writer/reporter. In 1901, John Dafoe, editor of the *Winnipeg Free Press*, offered her a position as a market and agricultural reporter.

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*Reproduced with permission of the Manitoba Agricultural Hall of Fame, Inc.

Hind travelled extensively to gather her data from farmers and producers. Few could match the uncanny accuracy of her crop yield projections — not even the skilled agronomists or legions of men in the field.

In 1904, during the West's first major stem rust infestation, grain markets tottered following the American experts' estimate of a mere 35 million bushel crop. By contrast, Hind estimated 55 million: the actual outcome was 54 million!

When Hind totalled her reports, grain exchanges waited nervously. Prices on the international market soared or fell on the release of her figures. In dealing with hundreds of millions of bushels, her margin of error was often less than one percent. She could calm jittery markets, thus protecting the investments of thousands of prairie farmers. The federal government and all the taxpayers' resources could not compete with her skill.

In 1922 Hind was sent to England by the *Free Press* on a mission to help end a British embargo against Canadian cattle. In 1928 she toured Great Britain and the Scandinavian countries as part of a Farmers' Marketing Tour sponsored by the CNR. In 1935 she reported on the global state of agriculture following a world tour.

For her tireless work in the field and the powerful influence she wielded, Hind was the recipient of many honours. In 1935 she received a diploma from the Manitoba Agricultural College, an honorary doctor of law degree from the University of Manitoba, and an honorary life membership in the University Women's Club.

Upon her resignation from the *Free Press*, Hind put her heart into the Red Cross organizations in the prairie provinces. Hind was a genius in her field. She entered a male-dominated world and emerged a champion.

Module 1

Manitoba Agriculture: An Overview

Introduction

Welcome to the fascinating world of Agriculture. In Module 1 you will be introduced to themes, ideas, and concepts related to agriculture in Manitoba. Included in this module is information about geology and geography, animal, plant, and soil resources in the province, the historical development of agriculture in Manitoba, and agricultural trends for the future.

The learning activities and exercises in Module 1, Lessons 1 to 5 are designed to help you learn new material and meet the lesson objectives.

After you have completed each lesson and you feel that you understand the material and have learned the new concepts, complete the learning activity at the end of the lesson. The answer key for the learning activities is found at the end of the module in the Module 1 Learning Activity Answer Key.

Mark your own work and review the material in this lesson, as needed.

Module 1 contains one assignment. The completed assignment is to be sent to your tutor/marker, along with the Module 1 Cover Sheet found at the end of the course Introduction.

Module 1—Outline

Lesson 1: Introduction to Agriculture

Lesson 2: Physical-Climatic Features

Lesson 3: Resources: Renewable and Non-Renewable

Lesson 4: Prairie Agriculture: From Historic Beginnings

Lesson 5: Manitoba: Past-Present-Future

Assignment 1: Facts and Opinions

Module 1 Learning Activity Answer Key

Notes

Lesson 1

Introduction to Agriculture

Student Outcomes

Upon completion of this lesson, you will be able to

- identify, explain, and give examples of ways in which agriculture is
  - — a diversified industry
  - — a constantly changing industry
- identify, explain, and give examples of how agriculture
  - — contributes to the economy and lifestyle of Manitoba
  - — plays a part in your personal life
- use and convert metric and imperial measurements as they relate to the agricultural industry

Introduction

In this lesson you will look at agriculture as an industry — an industry with a proud past, a challenging present, and a promising future. Important topics that will be covered in this lesson include:

- Diversification in Agriculture
- Agriculture and Change
- Agriculture and the Economy
- Agriculture: A Way of Life
- Agricultural Employment Opportunities

The information and ideas presented and developed within each topic will help you better understand and more completely define the term “agriculture.” As well, a basic understanding of the agricultural industry and what it involves will give you a framework for learning throughout this course. You will be able to see where specific information about various aspects of agriculture fits into the larger picture.

Exercise: Diversification in Agriculture

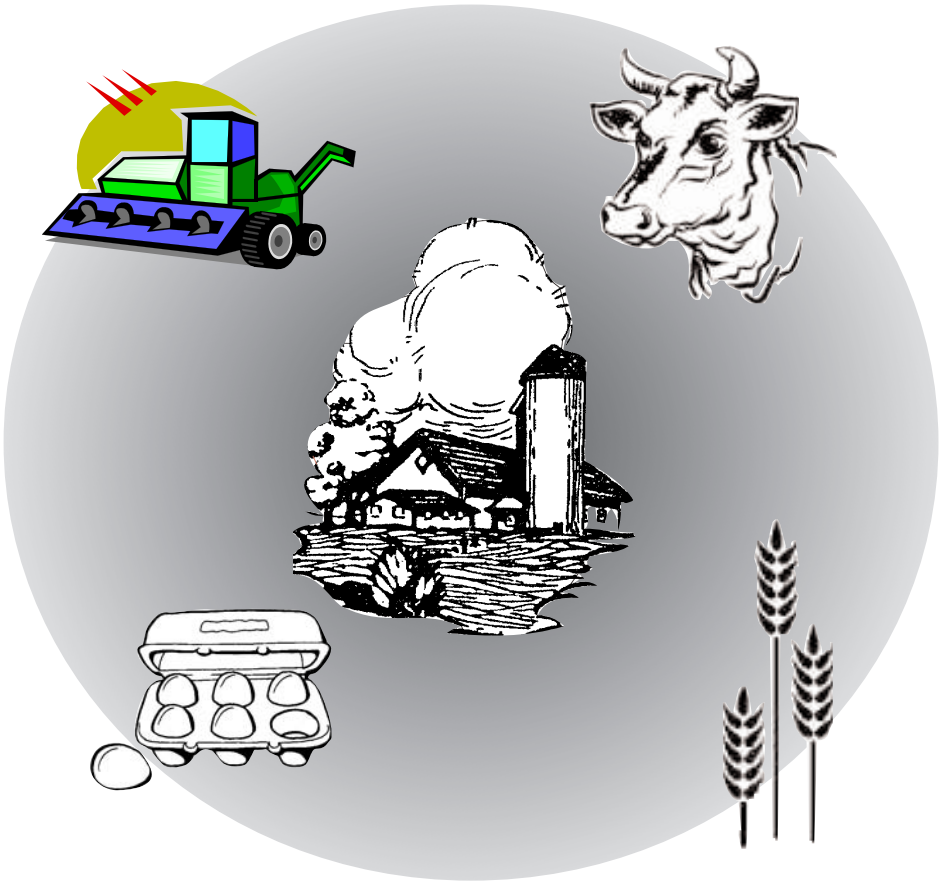
The following exercise will help you fully appreciate the diversity of agriculture. This exercise will not be sent in or graded, so let your creativity soar.

Word Association: Think of the term "agriculture." Time yourself for one minute and write down as many words as you can think of that relate to agriculture. To get you started, here are a few ideas:

cattle, tractors, Brandon Royal Winter Fair, Cargill, meat packing plants, apiarist . . .

Consider the words you have recorded and categorize these words by placing them under the headings below. Feel free to add your own headings if you see other groupings or classifications that apply.

Products	Machinery	Occupations	Processing	Marketing	Agricultural Groups
cattle	tractors	apiarist	meat packing plants	Brandon Winter Fair	Cargill



Diversity of Agricultural Products

The term **agricultural diversification** is used widely in publications or reports about agriculture. In most cases, it refers to the broad range of agricultural products produced.

For a number of decades, Manitoba has had a sound reputation as a producer of high quality beef, wheat and hogs. The competitive nature of world markets, the changing food preferences of consumers, and the number of production options available to farmers as a result of technology and research have resulted in a much greater diversity in crop and livestock production.

Manitoba ranks third (behind Saskatchewan and Alberta) in quantity as a producer of grain crops in Canada, but grows the greatest variety of crops. More than 15 kinds of grain and oilseed crops are grown in the province, including wheat, barley, oats, flax, and canola. Diversity becomes even more evident when one considers that there are over thirty different varieties of wheat grown in the province.

The following chart illustrates the diversity of agricultural products produced in Manitoba. The lists are not complete. Can you add products to any of the categories?

Diversity of Agricultural Products in Manitoba

Dairy Products	Animals	Grains	Specialty Products
milk	elk	corn	dried flowers
cream	cattle	wheat	berries
eggs	goats	rye	honey
yogurt	swine	barley	sunflower seeds
specialty cheeses	poultry	flax	potatoes
	wild game	canola	vegetables
	horses	wild rice	mushrooms
	emu	oats	
		beans	

Components of the Agricultural Industry

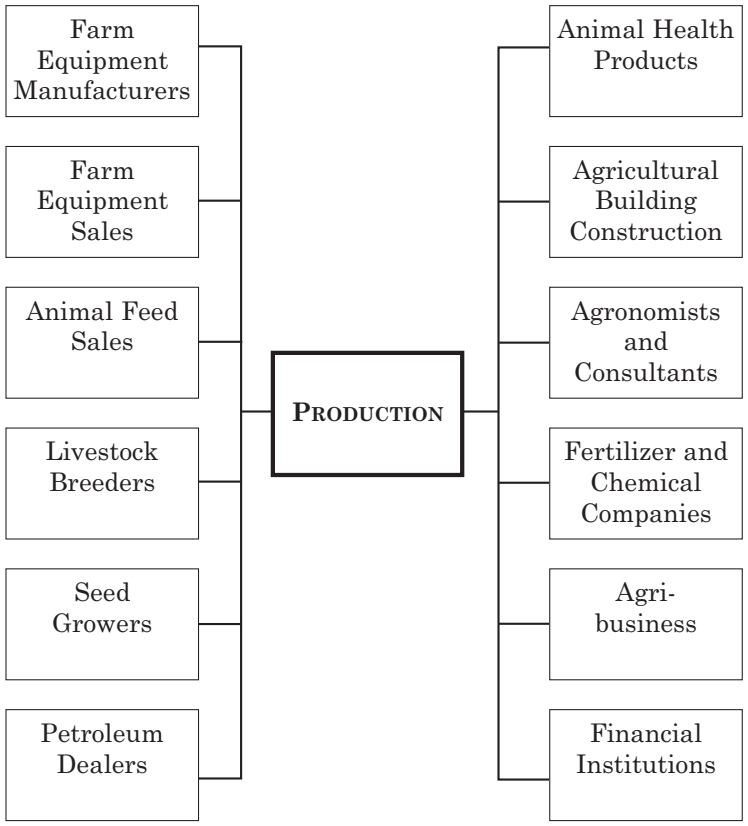
In addition to product diversification, there is also diversity in the components of the agricultural industry. The agricultural industry can be thought of as having at least three distinct yet related parts: **production**, **processing**, and **marketing**. The agribusiness sector is also related to agriculture. The next section will give you a closer look at each of the parts or sectors of the agricultural industry.

Production

Production refers to the growing or raising of a natural item. Primary producers of agricultural products are usually farmers and ranchers, as well as mushroom producers, market garden operators, and those who produce specialty items such as flowers, herbs, spices, and fish. Many examples of agricultural products were listed earlier.

The following chart illustrates some of the agriculture-related industries that support primary production.

Industries that Support Primary Production



Processing

Food processing (value-adding) is a secondary industry that is involved in the manufacturing or refining of a primary product for consumer use. Flour mills and meat-packing plants are examples of secondary food processing industries in Manitoba.

In the past, Manitoba was not a major processor or manufacturer of farm or non-farm products. There were several reasons for this.

- Manitoba's relatively small population did not provide a large enough market for many manufactured goods.
- Manitoba's mid-continent location often makes the transportation costs for manufactured goods prohibitive and the goods too expensive in other markets.

- Manitoba's late entry into the processing business allowed other manufacturing areas of Canada to become well established.
- Transportation subsidies (financial help to farmers) to port by way of "Crow Rate" legislation discouraged local processing of grain products and favoured eastern Canadian processors.

Despite these challenging conditions, the number of secondary industries in the province has increased steadily. Today, agricultural processing plants include alfalfa cube plants, egg processing plants, and substantial hog processing plants. Manitoba processors are exploring new ways of processing and becoming more competitive. Personal and government incentives have encouraged more processing and **value-added activities**. Value-added activities transform the resources or commodities one or more steps beyond the simple extraction or production stage. Converting wheat into flour, crushing canola and refining its oil, or processing meats into specific cuts or specialty products like ham are all value-added activities. Not only are the final returns higher, but there are many spin-off effects of value-added activities. One of the most important of these is more employment opportunities for Manitobans.

Food processors respond to the demands of consumers for new or improved products. Food processors also create new products, which in turn create new consumer demand. Examine this list of food products produced and processed in Manitoba. Can you think of other value-added activities?

Processed Food from Manitoba

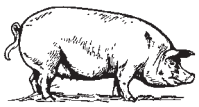
canola oil	sauerkraut	sunflower seeds
flour	ice cream	wheat nut snacks
bread	chocolates	soya bean tofu
noodles	jams and preserves	birdseed
cheese	beef jerky	potato chips

Non-food products can also result from the processing of primary agricultural products. These may be considered as by-products of the agriculture or food industry. Here is a list of some common non-food by-products.

Beef by-products:

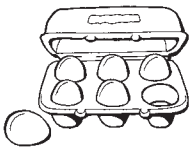
plastic
fine paint brushes
shoes
detergent
pharmaceuticals
piano keys
deodorant
photographic film
glue
perfume

Pork by-products:



weed killers
rubber
floor wax
upholstery
heart valves
insulation

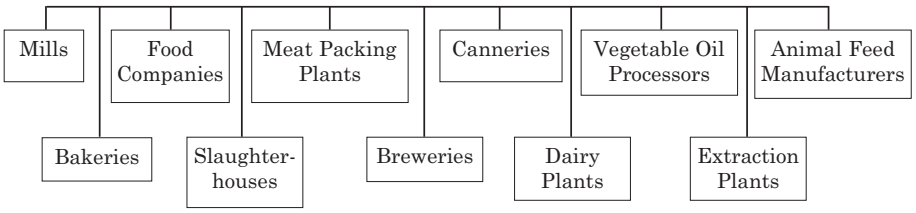
Egg by-products:



shampoo
adhesives
immunization vaccines

Read the following chart. It illustrates some of the agriculture-related industries that process agricultural products.

Industries that Process Agricultural Products



Marketing

Marketing agricultural products consists of marketing primary products and secondary, processed products. Successful marketing depends on the needs and wants of consumers. Product promotion and sales are important aspects of marketing. Promotion includes market research, advertising, and packaging. Transportation can also be considered part of marketing. Getting the product to market is a consideration of the overall marketing strategy.

Have you been tempted to buy a new product because of its visually appealing package? Do you think advertising creates desirable images for products?

Products are marketed in various ways.

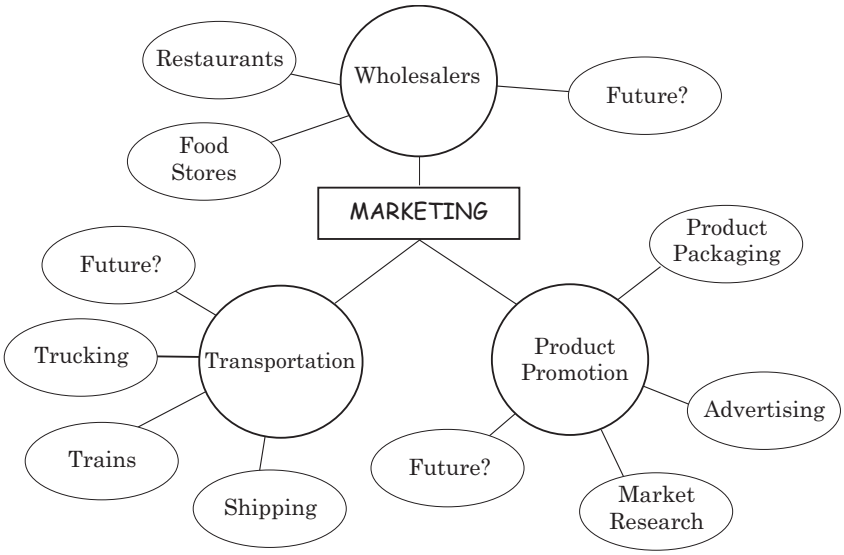
- Some producers sell directly to the consumer. Farmers' markets are a good example of direct marketing from producer to consumer.
- Farmers and ranchers sell their products through government agencies or on the open market.
- Processed products are marketed through food service industries such as restaurants and retail food stores.

Learning Resource Activity

Now that you understand the broad components of the agricultural industry in Manitoba, turn to the learning resource "*Some See a Farm ... We See an Industry*," that accompanied your course materials. Read the colourful brochure to learn about the interesting and unexpected ways that agriculture touches you every day. Don't forget the activity at the back of the brochure!

The following web illustrates some of the agriculture-related industries associated with marketing.

Agricultural Industries Related to Marketing



Producing agricultural products to the point where they are ready for market is a costly venture for the farmer. Decisions about what to produce are often made six to ten months in advance of delivery. To reduce the risk of a possible drop in commodity prices during that time, farmers may enter into an "advance sale" agreement with a buyer. The advance sale can be contracted directly between producer and buyer. More frequently, it is effected through a commodity exchange where many sellers and buyers are "in the market."

The Winnipeg Commodity Exchange (established in 1887 and located at Portage Avenue and Main Street in Winnipeg), has been a significant factor in the western Canadian grain trade. The following article provides a detailed account of its function for farmers and buyers.

While reading the article, note the following vocabulary:

commodity: any product produced for sale

hedging: contracting a future sale of a commodity at a fixed price in order to reduce the risk of fluctuating prices

futures: a contract to buy or sell something at a specific future date, with the quantity and price being specified

commodity exchange: an open market where sellers and buyers can negotiate current or future sales and purchases

After reading the article, answer the following questions:

1. What are the advantages and the disadvantages of hedging?

_____

_____

_____

2. Distinguish between a short hedge and a long hedge.

_____

_____

_____

The Winnipeg Commodity Exchange*

In April, two weeks before seeding begins, the price of flax stands at $400 a tonne. But prices erode all summer long, and by harvest time it's down to $270. What can a farmer do to maximize prices when such a change can occur?

While the industry deplores the fact that the price has fallen by 32.5 percent, one farmer remains content.

Why? He hedged his crop in April at $400 and was insulated from the disastrous price decline. Although this technique of locking in a price is available to everyone, only a few producers, and not all of the processors, take advantage of it.

What's hedging? How does it shield people from price drops? What do hedgers have to do to protect their positions?

Hedging is one of the few tools available to limit the effects of wide price fluctuations. It involves selling a contract to deliver a commodity during some future month at a price determined by today's [projection of future] prices. Producers who hedge will typically hedge 25-50 percent of their expected production during a growing season.

In a way, hedging can be compared to selling a house. Suppose you want to sell your house. It's unlikely that the buyer will pay cash and take possession right away. Instead, you'll likely enter into a sales contract with the buyer. You agree to hand over possession of the house to the buyer at some future date, probably a couple of months into the future. The buyer makes a commitment to pay you an agreed-upon amount of money, a token deposit of "good faith" money, now, and the rest at the time of possession. In one sense, then, this sales contract is a "futures" contract, because it will not be fully executed until some future time.

(continued)

* Emmond, Kenneth D., and Manitoba Education and Training. *Agriculture: A Cornerstone Industry: Senior 3*. Winnipeg, MB: Manitoba Education and Training, 1991: 72-73.

The Winnipeg Commodity Exchange (continued)

A futures contract traded on a commodity exchange is similar in many ways. It, too, is a contract for future execution of a contract. To cement the commitment, both you and the buyer are required to put up about 5 percent of the value of the contract as "good faith" money . . . .

It's important to keep in mind that our far-sighted hedger might not do better than the farmer who did not hedge. For example, the severe drought in 1988 resulted in a shortage of crops. Producers who hedged more than they produced suffered large losses, because they had entered into a contract to deliver something they could not produce. Also, the hedging farmer merely locks in a price for his product. Suppose that the price of flax goes to $500 a tonne instead of falling. The hedger would be stuck with his $400 contract, and would lose the chance to make a $100-a-tonne windfall. It's that chance to make a little more that prevents a lot of producers from locking in a firm price. In fact, most of the "short" hedges on The Winnipeg Commodity Exchange, that is, the hedges made by sellers of futures contracts, are carried out by grain companies, exporters, and others who buy grain from farmers.

There's another kind of hedger, the "long" hedger. Instead of selling contracts on the futures market, the "long" hedger is a buyer. He [or she] wants to lock in today's price to guard against an increase. The buyer of a flax contract might be a flaxseed crusher, who will have to buy flax on the cash market in the future.

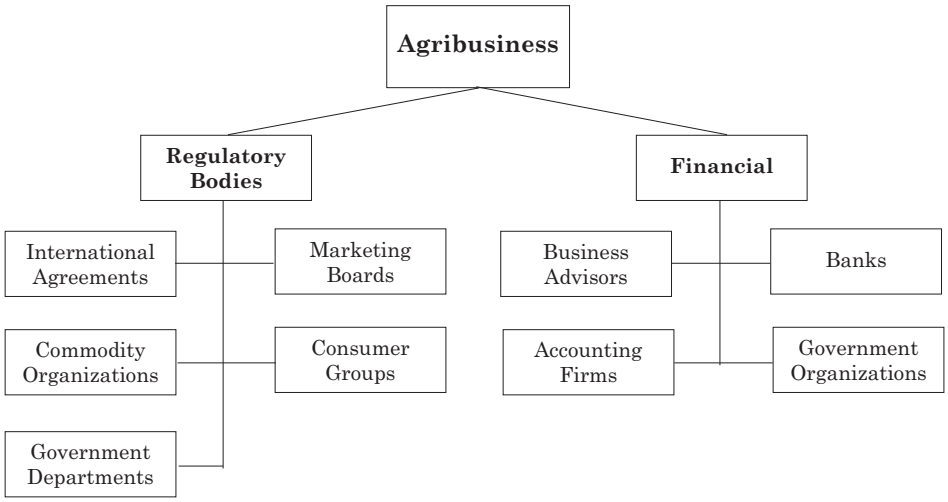
Hedging on the futures markets does not remove the risk of adverse price movements. Rather, it transfers the risk to someone else. Often that other person is a speculator. The speculator willingly takes on the risk in the hope of profiting from future price movements. He or she buys or sells, depending on whether he or she thinks the price will go up or down.

Many observers think there is something immoral about speculating in commodities that involve other people's livelihoods. However, speculators are taking on risks that others wish to avoid. Besides, they have an important role to play on commodity markets. If there were no speculators, every "short" hedger would have to wait for a "long" hedger who was willing to meet his [or her] price before a transaction could take place. But, with enough speculators around, there is a good chance that someone is willing to do business at the hedger's price.

Don't forget to answer the questions on page 16 related to this article

Agribusiness

Another important component of agriculture is the agribusiness sector. The agribusiness sector includes the regulatory bodies, financial institutions, and people that support agriculture. The following chart gives examples of groups and people in this category.



Governments in Agriculture

Governments, both federal and provincial, play a significant role in agriculture. Early in the 20th century, the Canadian government established the Canadian Wheat Board and struck the Crow's Nest Pass agreement with the railways. Governments have surveyed and allocated land for settlement. Their involvement increased during the drought and depression years of the 1930s. At that time, they became involved in finding markets, ensuring fair returns to all producers, and establishing efficient and fairly priced transportation systems to move farm products. These efforts led to the establishment of

- the Prairie Farm Rehabilitation Act (PFRA)
- the Prairie Farm Assistance Act

The government also established a Board of Grain Commissioners (now known as the Canadian Grain Commission). This marketing board sets quota systems for grains and helps to establish International Wheat Agreements.

More recently the federal government's entry into the North American Free Trade Association (January 1, 1994) and the conclusion of the Uruguayan round of the General Agreement on Trade and Tariffs (January 1, 1995) have typified the impact of international trade on all aspects of Canadian society, including agriculture.

Other government actions have included:

- the formation of a Farm Credit Corporation (a lending agency for producers)
- the administration of land bank programs (to assist in intergenerational transfers of land)
- the arbitration of disputes and the supervision of compromises and agreements among farm groups, provinces, and international bodies

Current debates about government involvement in agriculture have addressed the issues of power, initiative, and program development. Differing perspectives say that governments have wielded too much power, not taken enough initiative, made critical errors, or established excellent programs. The great variety among agricultural and non-agricultural interest groups makes it difficult for governments to satisfy everyone. Nevertheless, the complexities surrounding agricultural production, processing, and marketing, along with the relationships among producers and consumers, makes it necessary for governments to continue to exercise certain levels of involvement.

Exercise: Check on your Government's Involvement

One way of discovering the Government of Manitoba's involvement in agriculture is by going to its website and searching for a list of the laws that deal with agriculture.

- If you have access to the Internet, go to this page: <http://web2.gov.mb.ca/laws/search.php>. Type the word "agriculture" in the "Find" box. When you click on the "Go!" button, you will be presented with a Laws of Manitoba list such as the following. Use the list to complete this exercise.
  - — *The Agricultural Producers' Organization Funding Act*
  - — *The Agricultural Productivity Council Act*
  - — *The Agricultural Societies Act*
  - — *The Agrologists Act*
  - — *The Department of Agriculture, Food and Rural Initiatives Act*
  - — *The Manitoba Agricultural Services Corporation Act*
  - — *The Conservation Districts Act*
  - — *The Essential Services Act*
  - — *The Farm Lands Ownership Act*
  - — *The Farm Products Marketing Act*
  - — *The Highways and Transportation Act*
  - — *The Local Government Districts Act*
  - — *The Noxious Weeds Act*
  - — *The Pesticides and Fertilizers Control Act*
  - — *The Planning Act*
  - — *The Public Schools Act*
  - — *The Retail Sales Tax Act*
  - — *The Unconditional Grants Act*
  - — *The University of Manitoba Act*
  - — *The Wildfires Act*

Note: Web pages change with time. So, even though this website address worked at the time that this course was written, it may not be working as you are reading this course. If it does not work, try going to the Government of Manitoba website at <http://www.gov.mb.ca/> and look for the new web page that lets you search the Province's statutes.

- If you **do not** have access to the Internet, use the list on the previous page to help you complete this exercise.

1. Examine the titles of the Manitoba statutes on the previous page and list some activities that are controlled by the laws that are listed. Then sort the items to create categories. One example has been done for you.

Conservation			
Weeds			
Wildfires			
Conservation Districts			
Pesticides			
Fertilizer			

2. Write a conclusion that summarizes the following sentence: When a farmer wants to earn a living, he or she needs to remember that the Manitoba Legislature is part of the decision-making process because

_____

_____

_____

_____

Diversity in Agricultural Employment Opportunities

In this section, you'll examine the diverse employment opportunities that agriculture presents. It is estimated that in Manitoba, 10% of the population is employed in agriculture-related businesses. Take a minute to think of your immediate and extended family and the people in your community who are employed in agriculture-related occupations. List the people and their occupations in the chart below.

People	Occupations

The following information will provide you with a better idea of the diversity of employment opportunities in agriculture.

Employment Opportunities in Agriculture

Agricultural production involves occupations related to the growing of livestock and crops for food and nutrients on the domestic and international markets, such as

- owners, managers of farms, and ranches
- farm labourers
- animal breeders
- pasture managers
- veterinarians
- plant specialists
- soil specialists
- agricultural researchers

(continued)

Employment Opportunities in Agriculture (continued)

Agricultural processing includes occupations involving product packaging, processing, and inspection, such as

- meat processors
- flour millers
- food chemists
- food quality inspectors
- food safety inspectors
- product samplers
- machine operators

Agricultural marketing involves occupations related to the sale, distribution, and promotion of agricultural products and services, such as

- auctioneers
- market researchers
- warehouse personnel
- commodity exchange personnel
- sales staff
- marketing boards
- grain elevator operators

Agribusiness involves occupations related to agriculture including financial services, transportation, supplies, and communications, such as

- building designers and contractors
- chemical and fertilizer sales representatives
- farm equipment dealers
- trucking firms and railway employees
- welders and mechanics
- bankers
- agriculture reporters
- colleges and universities—researchers and trainers

Are you interested in a career in agriculture? Here are some agricultural careers that require post-secondary education.

Agrologists*

Agrologists are graduates of a recognized Faculty of Agriculture or equivalent faculty. They advise, teach, investigate, or publicize the principles and practices of agriculture.

Animal Health Technicians

Animal health technicians assist veterinarians in their private practices or work within industry, research, or government. Courses in veterinary technology are offered by technical institutes and require good academic standing with an emphasis on the sciences.

Economists

Economists in the agricultural field analyze commodities and plan policy. They evaluate the effects of political, socio-economic, and climatic factors on all facets of the industry in order to create agricultural policies and predict markets.

Engineers

Engineers work in areas such as water resource development projects. They use scientific and technical data in designing new machines, developing new ways of using existing machines, and improving the efficiency of resource and energy use.

Landscape Workers

Technical institutes offer programs in horticultural technology to train landscape workers. The work may involve planning the overall concept, preparing the soil, and planting flowers and shrubs according to aesthetic, scientific, and environmental concerns.

Microbiology Technicians

Microbiology technicians test food products for the presence of bacteria and other harmful substances. They ensure that the food is safe to eat. They also test for the presence of desirable substances such as vitamins. Technicians may be employed in food processing, cosmetic, and pharmaceutical companies. The work requires precision and accuracy.

(continued)

* Source: Saskatchewan Education. "Careers That Require Post-Secondary Education." *Saskatchewan Resource Series. Agriculture.* Regina: Saskatchewan Education, 1991. Adapted with permission of Saskatchewan Education.

Pasture Managers

Pasture managers must have skills in horsemanship and livestock management. They must be able to deal with people and have knowledge of animal genetics.

Scientists

Scientists are required in many areas of the agricultural industry where research and development is a constant activity. Biologists, chemists, and microbiologists often work in the food science industry in quality control jobs for dairies, meat processors, and other food processing and manufacturing. Biologists and botanists work in the area of plant and animal genetics. Scientists are also employed in the expanding environmental field. A university degree in a science discipline is required.

Veterinarians

Veterinarians are vital to ensuring that Manitoba maintains healthy livestock and its excellent reputation for providing good, nutritious food. Veterinarians must have a concern for the well-being of animals. They must be observant and relate well to humans and animals. They must also recognize that the constantly changing field of animal medicine requires continuing education throughout their careers.

If you are interested in an agricultural career that requires post-secondary training, discuss course requirements such as biology, chemistry, and physics with your guidance counsellor.

If you are interested in a career in agriculture through post-secondary studies, contact one or all of the following institutions for a list of their programs and courses:

- Assiniboine Community College
- Brandon University
- Red River College
- University of Manitoba
- The University of Winnipeg—Science degrees

Time for Review

As you review the previous pages, make sure that you understand the main points. Be careful to study any new terms and use them in a sentence that will help you remember them and use them correctly.

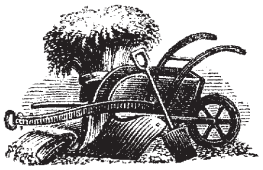
As you have learned, the agricultural industry is a diversified one. The information presented in this lesson illustrates and explains the diversification in:

- the raw products that are produced
- the components of the industry, such as production, processing, marketing, regulatory bodies, and financial institutions
- employment opportunities

As well as being a diversified industry, agriculture is an industry that is constantly changing. Read about agriculture and change below. In other lessons, the changing nature of the industry will become even more evident.

Agriculture and Change

Have you ever watched an old movie about agriculture or looked through a picture album that contained old farm photos? These images from the past show how agriculture has been transformed. Changes in agriculture, however, do not always take generations to evolve. Changes are constantly taking place.



For example, agricultural researchers frequently have new ideas for raw and processed agricultural products to meet the changing demands of consumers and the environment.

In Manitoba, the most important forces of change include competition and the low prices that continually pressure farms to grow bigger to create economies of scale. As a result, farms become increasingly capital-intensive, with greater risk and greater start-up costs.

More processed in Manitoba products are appearing on grocery store shelves every day. Changes within processing, sometimes referred to as “value-added,” occur in the form of the food, food additives, and food preservatives.

New technologies have affected the nature of agriculture in every way — from the speed of specific tasks to the development of new techniques and methods of working. New technologies include the use of specialized computer software programs to guide sowing and harvesting, track commodity prices, and keep farm records.

Technology is one force that is changing agriculture. Multinational corporations and individual farmers are using new technologies to make marketing decisions. Farmers may use home computers to obtain daily hog prices. Sales people for large packing plants enter marketing agreements with buyers in Europe and Asia over the Internet. Global Positioning System (GPS) technology is becoming part of farm management.

A second driving force that is changing agriculture is concern for the environment or **sustainable development**. In particular, topsoil and soil organic matter have been reduced in the past 70 years of farming. While we need to continue to grow food, methods that minimize environmental impacts are being developed. Energy, soil, and water resources are being better managed and conserved in order to sustain agriculture far into the future. People are beginning to recognize that the resource base is being diminished through overuse and environmental misuse.

Sustainable Agriculture, which promotes agricultural progress while protecting the environment, is gaining momentum and changing agricultural production, techniques, and practices. The concept of sustainable agriculture emphasizes that in order for the agricultural industry to survive and flourish it must incorporate:

- financial viability
- safe and healthy food production
- conservation practices

To increase sustainability, Manitoba farmers are planting shelterbelts, practising zero tillage, managing water, maintaining wetlands, reducing the use of pesticides, leaving stubble stands, and diversifying crop rotations.

All efforts towards sustainable agriculture must also factor in costs so that producers end up with a better farm on which to continue to make a living.

Organic farming is one example of an attempt at sustainable agriculture. In Manitoba, out of a total of more than 25 000 farmers, only 100 or so are certified as organic. Organic farming means farming without the use of artificial fertilizers, pesticides, and growth hormones. Organic farming depends on alternative methods for managing pests and maintaining soil quality, generally through increased tillage and labour-intensive crop and livestock management. While incorporating some environmentally beneficial practices, organic farming does not represent a uniformly positive example of soil conservation in Manitoba. Over-tillage and under-fertilizing do occur in organic farming practices.

In addition to new technologies and sustainable agriculture, **research** is a third factor that contributes to the changing nature of agriculture. Manitoba is well known internationally in the area of agricultural research. Some biotechnological research in Manitoba deals with:

- plant and animal breeding
- vaccines, medicines, and diagnostic techniques in veterinary medicine
- the use of biological organisms for use in environmentally friendly fertilizers, herbicides, and pesticides
- incorporation of disease and herbicide resistance into plant genes.

Changes in agricultural production and processing are accompanied by changes in marketing. Changes within agriculture marketing often take place at the institutional level. **Marketing agencies** such as the Canadian Wheat Board re-examine their roles and mandates in response to changes in national and international markets. **International trade agreements** such as the General Agreement on Tariffs and Trade (GATT) are modified and changed as new Free Trade agreements are initiated. Changes in trade agreements and laws have dramatic effects on agricultural marketing practices.

Changes in products, production patterns, processing, marketing, legislation, and trade policies are sometimes greeted with mixed feelings. Some people welcome change and see it as a vehicle for efficiency. Many are overwhelmed by the extent and speed of change.

The following article provides a creative solution to the problem of excess straw on fields. In this example, entrepreneurship and sustainability go hand in hand.

From Straw to Gold*

In conventional grain farming, straw left over after harvesting is often incorporated back into the soil as a means of maintaining organic matter levels. In years of excessive straw production, or in heavy soils where incorporation is difficult (e.g., in the Red River Valley), burning straw or stubble has been a common management practice.

Until three years ago, during late fall evenings, stubble burning caused serious problems for many residents of the Red River Valley, particularly those suffering from asthma. Today, regulations guide the burning of waste straw and burning is restricted to daylight hours and is only allowed when atmospheric conditions are suitable for the proper dispersion of smoke.

Creative approaches for addressing the issue of excess straw on fields are now emerging, including the development of the world's first major strawboard manufacturing plant at Elie, Manitoba.

* Source: Manitoba Environment. *State of the Environment Report for 1997*. Winnipeg: Manitoba Environment, 1997: 43. Reproduced with permission of Sustainable Development.

Isobord Enterprises to Produce Particle Board

Isobord Enterprises Inc. will produce particle board from cereal straw and a non-toxic bonding agent. The product will be free of urea formaldehyde, a major barrier to previous strawboard manufacturing efforts.

The strawboard will be ideal for kitchen countertops, mobile home decking, ready-to-assemble furniture, moulded parts, and laminated flooring.

About 80% of Isobord's production has been pre-sold to large manufacturers in the United States. These manufacturers include Sauder Woodworking of Ohio, the largest ready-to-assemble furniture producer in North America, and VT Industries of Iowa, a major kitchen countertop supplier. Isobord will employ about 100 permanent staff and 100 individuals contracted to collect straw each fall. More than 350 local farmers have formed the Straw Co-op of Manitoba to supply the 200,000 tonnes of straw required annually. Collecting and transporting the straw will create a new industry that is expected to inject $6 million into the economy each year. Isobord is expected to spend about $30 million per year in operating expenses alone.

2005 Update

While this business has had its ups and downs, Isobord Enterprises Inc. is now producing Woodstalk Gold MR Fiberboard. Made from recycled straw and polyurethane resin, this material is a "green" building product.

Agriculture and the Economy

You have learned about agricultural diversification and change. Another important concept to understand is the contribution agriculture makes to the Manitoba economy.

Agriculture is an important industry in Manitoba. However, its importance relative to other primary industries has declined over the years.

Remember: Primary industries deal only with the value of raw products. Agriculture considered in its diversity includes manufacturing, processing, value-added activities, and services. This contribution to the economy is significant.

Statistics from a number of sources indicate that agriculture represented about 11% of all economic activity in the province in 2001. This means that 11% of the **gross domestic product** (**GDP**), the market value of all goods and services produced annually in the province, was directly related to farming activities. For up-to-date statistics, see the *Manitoba Agricultural Review* sent with your supplementary learning resources package.

Labour force statistics also demonstrate the importance of agriculture in the Manitoba economy. In 2001, there were 21 071 farms in Manitoba and approximately 80 000 farm residents, or one in 14 Manitobans. Close to 10% of the total work force was employed in jobs directly related to farm production activities.

This percentage does not include people working in related service industries such as restaurants, supermarkets, financial institutions, or transportation. With these people included, the estimate is much higher. This encompasses a vast range of careers, ranging from farm labourers to research scientists.

Agriculture contributes to the Manitoba and Canadian economies by:

- producing products for sale throughout Canada and the world
- creating opportunities for secondary industries
- providing job and career opportunities

When Manitoba has a bumper crop or when livestock prices are high, farmers are happy and the economy prospers. As farmers' incomes rise they have more money to spend on related equipment, services, and other consumer products they need or wish to buy. Retailers prosper and they in turn have more disposable income to spend. The cycle of spending continues, more jobs are created, and the economy benefits.

Agriculture: A Way of Life

Does agriculture influence the lifestyle of Manitobans? This final section examines how agriculture influences beliefs, attitudes, consumer choices, settlement patterns, and everyday life choices.

Agriculture Influences Beliefs and Attitudes

Agriculture has, directly or indirectly, had an impact on the way you live. Some qualities, beliefs, and attitudes that you may have acquired as a result of living in an agricultural community include:

- a respect for nature and the environment
- an optimistic attitude that tomorrow will be better
- a belief in helping your neighbour
- a belief in hard work

Can you add other qualities, beliefs, or attitudes to this list?

- _____
- _____

Agriculture Affects Consumer Goods and Services

Agriculture greatly influences economic conditions in Manitoba. Economic conditions affect the amount of money that individuals, families, and governments have to spend on goods and services. The "average" annual farm income for 1997 was approximately $36 000.

In good economic times, governments are able to spend more money on health care, facilities programs, education, highways, and social assistance programs. Manitoba residents benefit from these services. In times of economic restraint, governments cut back on some of these services. In good economic times, more jobs are available for people seeking employment. Parents are able to supply their families not only with the essentials of food, clothing, and shelter, but also with additional consumer goods.

The diversity of products on grocery store shelves is a result of the diversity of agricultural products that are produced, processed, and marketed in Manitoba and throughout the world. Manitoba residents are fortunate in the variety and reasonable price of food products they enjoy.

The lifestyle enjoyed by most Manitoba farmers is dependent upon a viable agricultural industry.

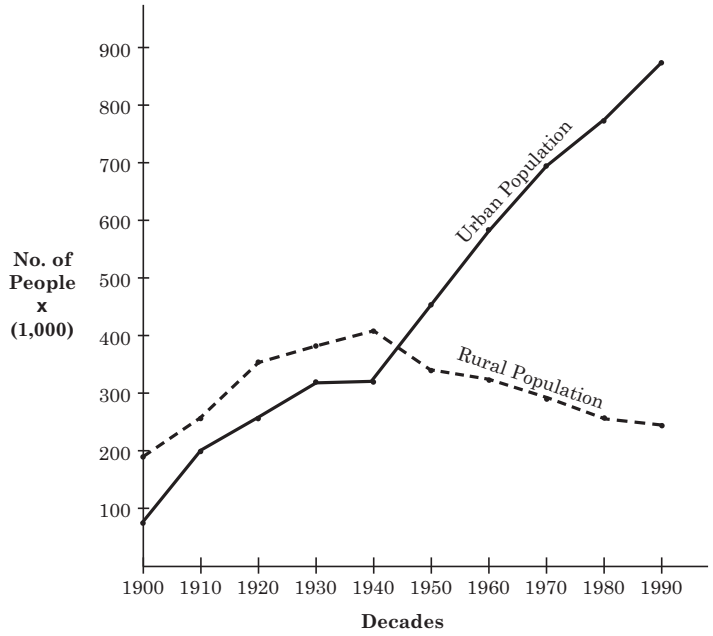
Lifestyle Trends

The main contribution of the modern age to the urban consumer lifestyle is that mass production produces inexpensive food. Canadians on average only spend 11% of their income on food. Thus, consumers can focus their income and time pursuing interests and activities other than basic food needs.

Statistics over the past two decades show a number of trends. One trend has been a gradual movement of the population away from farms and toward large, urban centres.

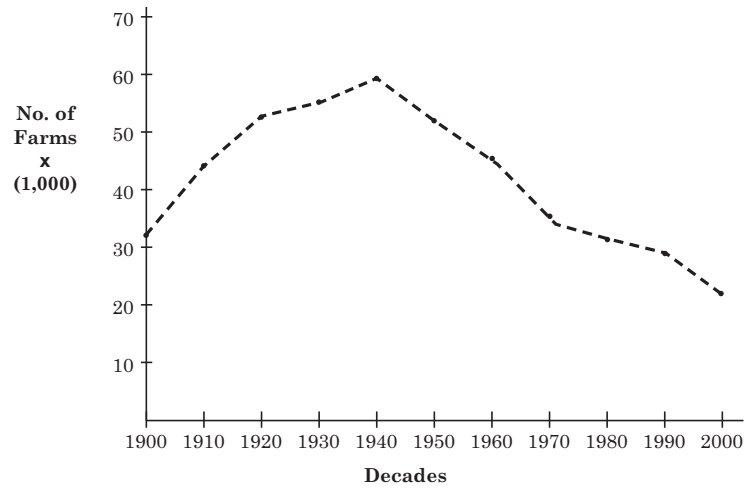
The following chart depicts the gradual decline in rural population and the relative increase in urban population. Note the sharp increase in the urban population between 1940 and 1990.

Trends in Population Movement



There has also been a trend toward larger and fewer farms. The following chart illustrates the gradual decline in the number of farms from the 1940s to the present.

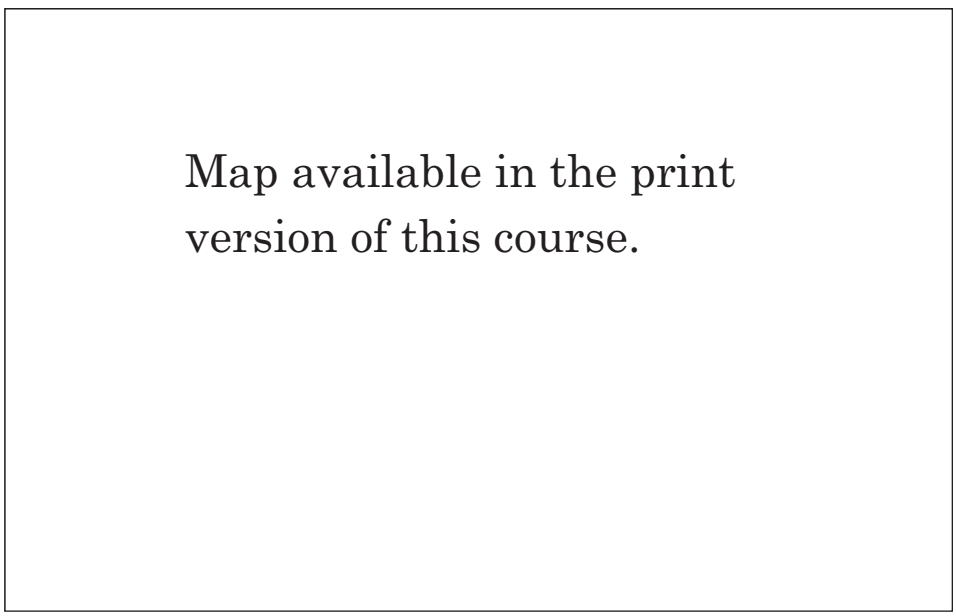
Number of Farms by Decade



Along with the decline in the number of farms is the corresponding increase in farm size. Manitoba farms were established and developed by families. In 1996, over 98% were individual or family operations. There is a general trend towards the formation of legal family partnerships and corporations.

Hutterite colonies make up 0.5% of Manitoba farms. These colonies, which comprise large tracts of land held communally, have long had a presence in the province. The following map shows the location and distribution of Hutterite farms.

The Distribution of Manitoba's Hutterite Colonies in 1992*



Off-farm jobs continue to be an important aspect of life in rural Manitoba. Many individuals supplement their farm-based careers with jobs away from their farm operations. Often, off-farm income is necessary to keep farming operations going in tough economic times. Investment income is also important for many farm families.

Despite their best efforts, many farmers experience social and financial problems associated with farm debt. For instance, over-optimistic expectations brought on by high grain prices in the early 1980s caused many farmers to expand too quickly, to purchase expensive equipment, or to engage in high-risk agricultural ventures. Farm foreclosures were the result for many farmers. It is of some concern that the level of farm debt has continued to climb.

Many Manitoba farmers have found creative solutions to their debt problems. A number of farm families have started "cottage industries." Arts and crafts, jams, preserves, soaps, breads, herbs, dried flowers, market gardens, candles, cosmetics, and specialty items are examples of enterprises in which some farm families are involved. Vacation farms and bed and breakfast homes are features of many rural communities.

Useful Measurements

Regardless of the areas of agriculture in which your interests lie — production, marketing, research, or finance — you will need to be familiar with metric and imperial measurement. You will have to be able to make conversions between the two systems as both are used in the agriculture industry. Examine the metric and imperial conversion tables that follow. Use these tables to answer the conversion questions.

Imperial to Metric Conversion Factors

Imperial Unit	Approximate Conversion Factor (multiply by)	Metric Unit
Weight pound	0.45	kilogram
ton	0.91	tonne
Area acre	0.40	hectare
Linear mile	1.6	kilometre
Agricultural bushels per acre (wheat, peas, beans)	67.25	kilograms per hectare
bushels per acre (oats)	38.11	kilograms per hectare
bushels per acre (barley, buckwheat)	53.80	kilograms per hectare
bushels per acre (canola, mustard)	62.77	kilograms per hectare
pounds per acre (corn, flax, rye)	1.12	kilograms per hectare
tons per acre	2.24	tonnes per hectare

Metric to Imperial Conversion Factors

Metric Unit	Approximate Conversion Factor (multiply by)	Imperial Unit
Weight kilogram	2.20	pound
tonne	1.10	ton
Area hectare	2.47	acre
Linear kilometre	0.62	mile
Agricultural kilograms per hectare (wheat, peas, beans)	0.015	bushels per acre
kilograms per hectare (oats)	0.026	bushels per acre
kilograms per hectare (barley, buckwheat)	0.019	bushels per acre
kilograms per hectare (canola, mustard)	0.018	bushels per acre
kilograms per hectare (corn, flax, rye)	0.016	bushels per acre
kilograms per hectare	0.8	pounds per acre
tonnes per hectare	0.45	tons per acre

Learning Activity 1–1: Measurements and Conversions

The agriculture industry uses a combination of metric and imperial measurements. This unit reflects this practice.

Use the conversion tables supplied on the previous page to calculate the following conversions.

	Imperial		Metric
1.	10 acres	=	_____ hectares
2.	_____ pounds	=	100 kg
3.	100 ton	=	_____ tonnes
4.	60 miles/hour	=	_____ km/hour
5.	60 bushels per acre (barley)	=	_____ kg per hectare (barley)
6.	_____ bushels per acre (wheat)	=	2700 kg per hectare (wheat)
7.	1.9 ton per acre	=	_____ tonnes per hectare

Remember: The answer key for this learning activity is located in the Module 1 Learning Activity Answer Key, located at the end of this module.

Summary

This first lesson has introduced you to ways of looking at agriculture as an industry. Some of these basic understandings are that:

- Agriculture is a diversified industry. There is diversity in production, processing, marketing, and in occupations related to agriculture.
- Agriculture is a changing industry.
- Agriculture contributes to the economy of Manitoba and Canada.

Learning Activity 1–2

A. **Multiple Choice:** Select the best answer for each of the following and place a check (✓) beside it.

1. All of the following, except one, are trends in the agriculture industry. Select the **exception**.

   ____ a. smaller family farms

   ____ b. increased use of technology

   ____ c. increased environmental protection

   ____ d. increased agricultural diversification

2. An example of a primary food product is

   ____ a. potato chips.

   ____ b. beef jerky.

   ____ c. eggs.

   ____ d. canola oil.

3. All of the following except one are involved in the food processing industry. Select the **exception**.

   ____ a. ranches

   ____ b. breweries

   ____ c. flour mills

   ____ d. meat packing plants

4. Agricultural diversification refers to

   ____ a. diversification in agricultural production.

   ____ b. diversification in processing.

   ____ c. diversification in production techniques.

   ____ d. all of the above.

5. The agriculture industry

   ____ a. uses only metric measurements.

   ____ b. uses only imperial measurements.

   ____ c. uses a combination of metric and imperial measurements.

   ____ d. has its own Agritec system of measurements.

6. Degree graduates of a recognized university faculty of agriculture can be called

   ____ a. plant scientists.

   ____ b. agrologists.

   ____ c. agricultural economists.

   ____ d. all of the above.

7. Transportation is most important in this sector of agriculture:

   ____ a. production

   ____ b. processing

   ____ c. marketing

   ____ d. all of the above

8. Government involvement in agriculture is

   ____ a. an often debated topic.

   ____ b. a recent occurrence.

   ____ c. exclusively a provincial matter.

   ____ d. of little concern to the primary producer.

9. An example of "value-added" to a primary food product is:

   ____ a. The consumer price of the primary food product is reduced.

   ____ b. The primary product is processed into a different form.

   ____ c. Animals are fed vitamin supplements in order to increase their weights.

   ____ d. Producers are given subsidies for growing certain crops.

10. An accurate statement would be:

   ____ a. Manitoba's urban/rural population was balanced in 1960.

   ____ b. Manitoba's farm size has continued to decline.

   ____ c. Farm ownership is shifting toward single-family units.

   ____ d. Manitoba agriculture has become increasingly diversified.

B. **Matching:** Select the term from below that best matches each of the following short definitions:

1. the manufacture or refinement of an agricultural primary product _____
2. contracting to sell a commodity at a fixed price some time in the future _____
3. economic activities which relate to or depend on agriculture _____
4. an agency which demonstrates government involvement in agriculture _____
5. protecting the environment at the same time that you promote agricultural progress _____
6. an example of an international trade agreement _____
7. the market value of all goods and services produced annually in the province _____

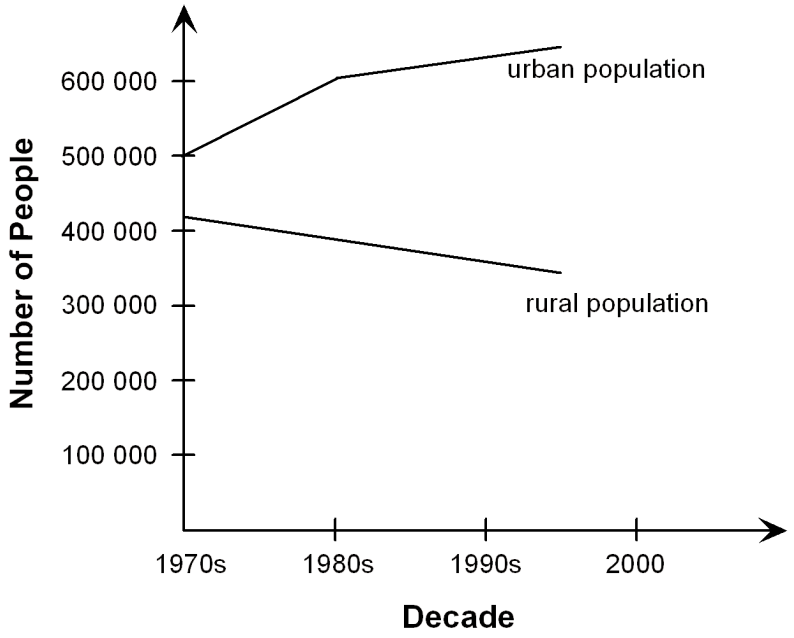
a. by-product
b. GATT
c. food processing or value-added activities
d. GDP
e. hedging
f. sustainable agriculture
g. agribusiness
h. research
i. Canadian Wheat Board
j. cottage industry

C. **True or False:** Based on the chart below, indicate "true" or "false" for each of the following statements:

T F 1. The rate of urban population increase has slowed somewhat.

T F 2. It appears that by the year 2010, urban and rural populations will once more be balanced.

T F 3. Businesses in small towns in rural Manitoba will likely have fewer customers in the future.



Remember to check your answers in the Module 1 Learning Activity Answer Key.