

# Microeconomics

## Chapter 16W

### IN THIS CHAPTER YOU WILL LEARN:

- 16W.1** That in the short run there is significant price and income instability in the agricultural sector.
- 16W.2** The effects of subsidies, price supports, and price ceilings in agriculture.
- 16W.3** About criticism, politics, and reforms in the agricultural sector in Canada.

# Canadian Agriculture: Economics and Policy

If you eat, you are part of agriculture! In Canada, agriculture is economically important for several reasons:

- Agriculture accounts for about 1.5 percent of gross domestic product (GDP). Consumers spend about 10 percent of their personal consumption expenditures on food.
- Agriculture is an industry that, in the absence of government farm programs, is a real-world example of the perfect-competition model (Chapter 7). The industry consists of many price-taking firms selling virtually standardized products and can be understood by applying the supply and demand tools of competitive markets.

## 16W.1 ECONOMICS OF AGRICULTURE

Agriculture provides evidence of the intended and unintended effects of government policies that interfere with the forces of supply and demand. Farm policies are excellent illustrations of Chapter 16's special-interest effect and rent-seeking behaviour. Agriculture reflects the increasing globalization of markets. In recent decades the economic ups and downs of Canadian agriculture have been closely tied to Canadian access to world markets. Canada's agricultural exports totalled \$31.5 billion in 2006, amounting to 6.9 percent of total Canadian merchandise exports. These realities justify a full chapter on agriculture. Specifically, we want to examine the problems in agriculture that have resulted in government intervention, the types and outcomes of that intervention, and recent major changes in farm policy.

Over the years, Canadian farmers have faced severely fluctuating prices and periodically low incomes. Agriculture has always been a risky and difficult business. There are actually two separate problems: the **short-run farm problem** of year-to-year fluctuations in farm prices and incomes and the **long-run farm problem** of the declining agricultural industry.

### Short-Run Problem: Price and Income Instability

The short-run farm problem is the result of (1) an inelastic demand for agricultural products, combined with (2) fluctuations in farm output, and (3) shifts of the demand curve for farm products.

#### INELASTIC DEMAND FOR AGRICULTURAL PRODUCTS


In industrially advanced economies, the price elasticity of demand for agricultural products is low. For farm products in the aggregate, the elasticity coefficient is between .20 and .25. These figures suggest that the prices of agricultural products would have to fall by 40 to 50 percent for consumers to increase their purchases by a mere 10 percent. Consumers apparently put a low value on additional farm output compared with the value they put on additional units of alternative goods. Why is this so? Recall that the basic determinant of elasticity of demand is substitutability. When the price of one product falls, the consumer tends to substitute that product for other products whose prices have not fallen. But in relatively wealthy societies the substitution effect for food is very modest. Although people may eat more, they do not switch from three meals a day to, say, five

or six meals a day in response to a decline in the relative prices of farm products. Real biological factors constrain an individual's capacity to substitute food for other products.

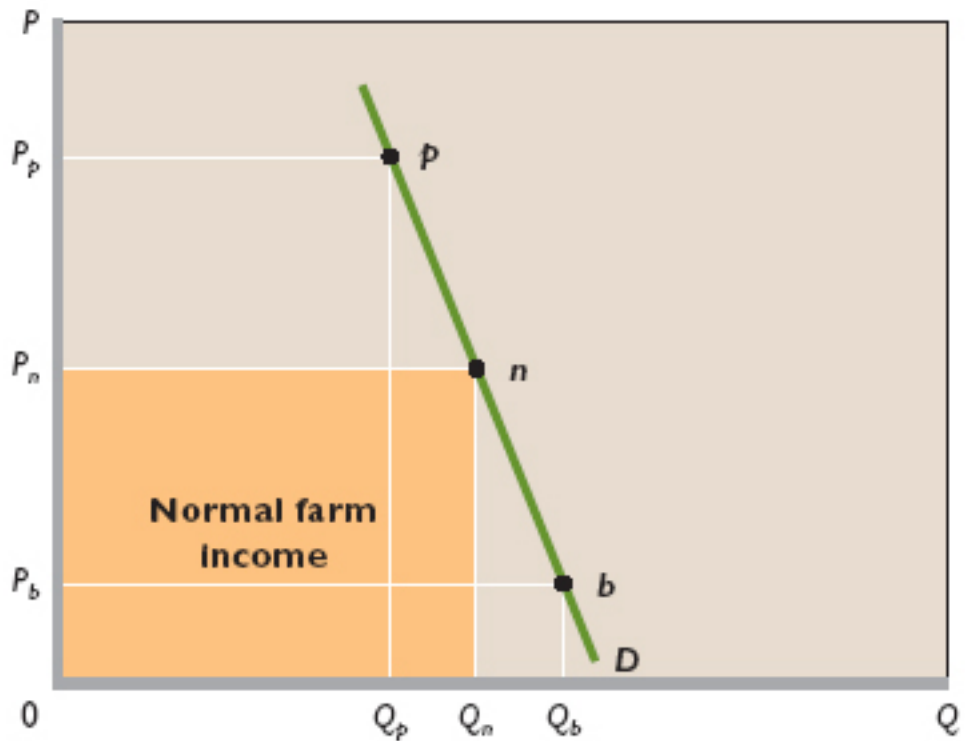
The inelastic agricultural demand is also related to diminishing marginal utility. In a high-income economy, the population is generally well-fed and well-clothed; it is relatively saturated with the food and fibre of agriculture. Consequently, additional farm products are subject to rapidly diminishing marginal utility. It takes very large price cuts to induce small increases in food and fibre consumption.

### FLUCTUATIONS IN OUTPUT

Farm output tends to fluctuate from year to year, mainly because farmers have limited control over their output. Floods, droughts, unexpected frost, insect damage, and similar disasters can mean poor crops, while an excellent growing season means large crop yields. Such natural phenomena are beyond the control of farmers, yet those phenomena exert an important influence on output. In addition to natural phenomena, the highly competitive nature of agriculture makes it difficult for farmers to control production. If the thousands of widely scattered and independent producers happened to plant an unusually large or an abnormally small portion of their land one year, an extra-large or a very small farm output would result even if the growing season were normal. Curve D in Figure 16W-1 suggests the inelastic demand for agricultural products. Combining that inelastic demand with the instability of farm production, we can see why farm prices and incomes are unstable. Even if the market demand for agriculture products remains fixed at D, its price inelasticity will magnify small changes in output into relatively large changes in farm prices and income. For example, suppose that a "normal" crop of  $Q_n$  results in a "normal" price of  $P_n$  and a "normal" farm income represented by the green rectangle. A very large crop or a poor crop will cause large deviations from these normal prices and incomes because of the inelastic demand. If a good growing season occurs, the resulting large crop of  $Q_b$  will reduce farm income to that of area  $OP_b bQ_b$ . When demand is inelastic, an increase in the quantity sold will be accompanied by a more-than-proportionate decline in price. The net result is that total revenue, that is, total farm income, will decline disproportionately.



**FIGURE 16W-1** The effects of changes in farm output on agricultural prices and income. Because of the inelasticity of demand for farm products, a relatively small change in farm output (from  $Q_n$  to  $Q_p$  or  $Q_b$ ) will cause a relatively large change in agricultural prices (from  $P_n$  to  $P_p$  or  $P_b$ ). Farm income will change from the brown area to the larger  $OP_pP_nQ_p$  area or to the smaller  $OP_bP_nQ_b$  area.



Similarly, a poor crop caused by, say, drought will boost total farm income to that represented by area  $OP_pQ_p$ . A decline in output will cause a more-than-proportionate increase in price and in income when demand is inelastic. Ironically, for farmers as a group, a poor crop may be a blessing and a large crop a hardship. With a stable market demand for farm products, the inelasticity of that demand will turn relatively small changes in output into relatively larger changes in farm prices and income.

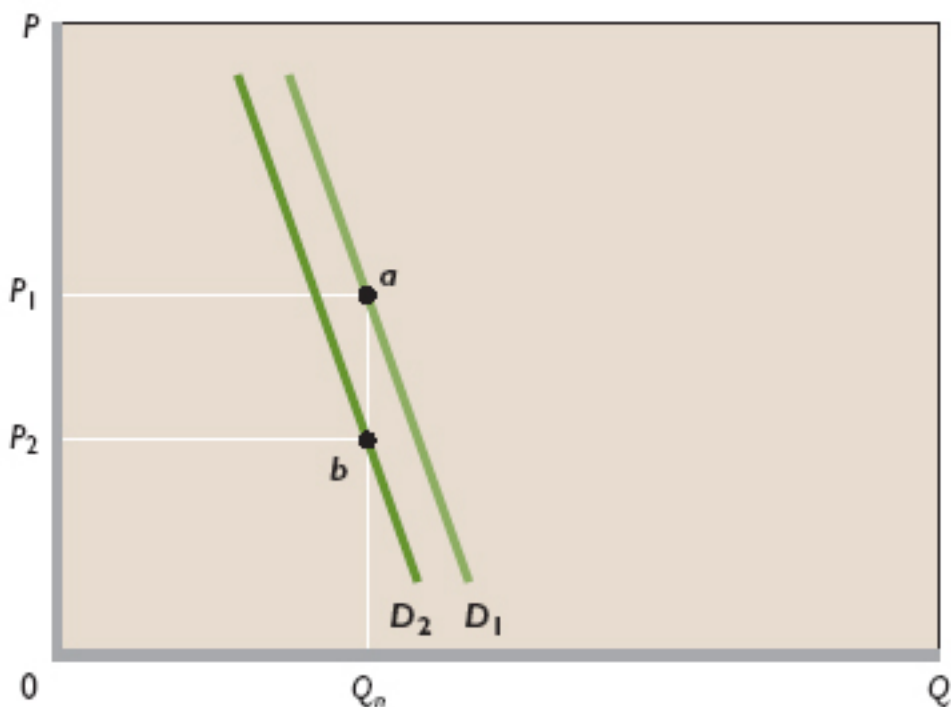
### FLUCTUATIONS IN DEMAND

The third factor in the short-run instability of farm income results from shifts in the demand curve for agricultural products. Suppose that somehow agricultural output is stabilized at the normal level of  $Q_n$  in Figure 16W-2. Now, because of the inelasticity of the demand for farm products, short-run changes in the demand for those products will cause markedly different prices and incomes to be associated w

A slight drop in demand from  $D_1$  to  $D_2$  will reduce farm income from area  $OP_1aQ_n$ . A relatively small decline in demand gives farmers significantly less income for the same amount of farm output. Conversely, a slight increase in demand—as from  $D_2$  to  $D_1$ —provides a sizable increase in farm income for the same volume of output. Again, large price and income changes occur because demand is inelastic.

It is tempting to argue that the sharp declines in farm prices that accompany a decrease in demand will cause many farmers to close down in the short run, reducing total output and alleviating the price and income declines. But farm production is relatively insensitive to price changes in the short run because farmers' fixed costs are high compared with their variable costs. Interest, rent, tax, and mortgage payments on land, buildings, and equipment are the major costs faced by the farmer. These are fixed charges. The labour supply of farmers and their families can also be regarded as a fixed cost. As long as they stay on their farms, farmers cannot reduce their costs by firing themselves. Their variable costs are the costs of the small amounts of extra help they may employ, as well as expenditures for seed, fertilizer, and fuel. As a result of their high proportion of fixed costs, farmers are usually better off working their land even when they are losing money, since they would lose much more by shutting down their operations for the year. Only in the long run will it make sense for them to exit the industry.

**FIGURE 16W-2** The effect of a demand shift on agricultural prices and income. Because of the highly inelastic demand for farm products, a small shift in demand (from  $D_1$  to  $D_2$ ) for farm products can drastically alter agricultural prices ( $P_1$  to  $P_2$ ) and farm income (area  $0P_1aQ_n$  to area  $0P_2bQ_n$ ), given a fixed level of production  $Q_n$ .



Why is agricultural demand unstable? The major source of demand volatility in Canadian agriculture springs from its dependence on world markets. The incomes of Canadian farmers are sensitive to changes in weather and crop production in other countries: better crops abroad mean less foreign demand for Canadian farm products. Similarly, cyclical fluctuations in incomes in the United States, Europe, or Southeast Asia, for example, may shift the demand for Canadian farm products. Changes in foreign economic policies may also change demand. For instance, if the nations of Western Europe decide to provide their farmers with greater protection from foreign competition, Canadian farmers will have less access to those markets and demand for Canadian farm exports will fall.

International politics also add to demand instability. Changing political relations between Canada and the United States and Canada and Russia have boosted exports to those countries in some periods and reduced them in others. Changes in the international value of the Canadian dollar may also be critical. Depreciation of the Canadian dollar increases the demand for Canadian farm products (which become cheaper for foreign markets), whereas appreciation of the Canadian dollar diminishes foreign demand for Canadian farm products.

To summarize, the increasing importance of exports has amplified the short-run instability of the demand for Canadian farm products. Farm exports are affected not only by weather, income fluctuations, and economic policies abroad but also by international politics and changes in the international value of the dollar. (Key Question 1)

## Long-Run Problem: A Declining Industry

Two other characteristics of agricultural markets explain why agriculture has been a declining industry (see Table 16W-1):


- Over time, the *supply* of farm products has increased rapidly because of technological progress.
- The *demand* for farm products has increased slowly, because it is inelastic with respect to income.

Let's examine each of these supply and demand forces.

Table 16W-1 – THE DECLINING FARM POPULATION, SELECTED YEARS, 1920 – 2001

**TABLE 16W-1** THE DECLINING FARM POPULATION, SELECTED YEARS, 1920-2001

Year	Farm population, millions	Percentage of the total population
1920	3.18	36.6
1929	3.26	32.2
1933	3.24	30.3
1941	3.15	27.4
1951	2.91	20.8
1961	2.13	11.7
1971	1.49	6.9
1981	1.08	4.4
1991	0.88	3.2
2001	0.73	2.4

Source: O.J. Firestone, *Canada's Economic Development 1867-1953* (London: Bowes & Bowes, 1958), p. 60, Statistics Canada, Census of Canada, 1931-1991, and Statistics Canada, Census of Canada 1996. 

### TECHNOLOGY AND SUPPLY INCREASES

A rapid rate of technological advance has significantly increased the supply of agricultural products. This technological progress has many roots: the mechanization of farms, improved techniques of land management, soil conservation, irrigation, development of hybrid crops, availability of improved fertilizers and insecticides, polymer coated seeds, and improvements in breeding and care of livestock. The amount of capital used per farm worker increased 15 times between 1930 and 1980, permitting a fivefold increase in the amount of land cultivated per farmer. The simplest measure

of these advances is the increasing number of people a single farmer's output will support. In 1820 each farm worker produced enough food and fibre to support four people; by 1947, that number had risen to about 13. By 2005 each farm produced enough to support 105 people. Unquestionably, the physical volume of farm output per unit of farm labour in agriculture has risen spectacularly. Over the last 50 years, this physical productivity in agriculture has advanced twice as fast as in the non-farm economy.

Most of the technological advances in agriculture have not been initiated by farmers, but rather are the result of government-sponsored programs of research and education and the initiative of farm machinery producers. Experiment stations, educational pamphlets issued by Agriculture and Agri-Food Canada, and the research departments of farm machinery, pesticide, and fertilizer producers have been the primary sources of technological advances in Canadian agriculture.

## LAGGING DEMAND

Increases in demand for agricultural products, however, have failed to keep pace with technologically created increases in the supply of the products. The reason lies in the two major determinants of agricultural demand: income and population.

**Income-Inelastic Demand** In developing countries, consumers must devote most of their meagre incomes to agricultural products—food and clothing—to sustain themselves. But as income expands beyond subsistence and the problem of hunger diminishes, consumers increase their outlays on food at ever-declining rates. Once consumers' stomachs are filled, they turn to the amenities of life that manufacturing and services, rather than by agriculture, provide. Economic growth in Canada has boosted average per capita income far beyond the level of subsistence. As a result, increases in the incomes of Canadian consumers now produce less-than-proportionate increases in spending on farm products.

The demand for farm products in Canada is *income-inelastic*; it is quite insensitive to increases in income. Estimates indicate that a 10 percent increase in real per capita after-tax income produces about a 2 percent increase in consumption of farm products. That means a coefficient of income elasticity of .2 ( $= .02/.10$ ). So, as the incomes of Canadians rise, the demand for farm products increases far less rapidly than the demand for products in general.

**Population Growth** Once a certain income level has been reached, each consumer's intake of food and fibre becomes relatively fixed. Thus, subsequent increases in demand depend directly on growth in the number of consumers. In most advanced nations, including Canada, the demand for farm products increases at a rate roughly equal to the rate of population growth. Because Canadian population growth has not been rapid, however, the increase in Canadian demand for farm products has not kept pace with the rapid growth of farm output.

## GRAPHICAL PORTRAYAL

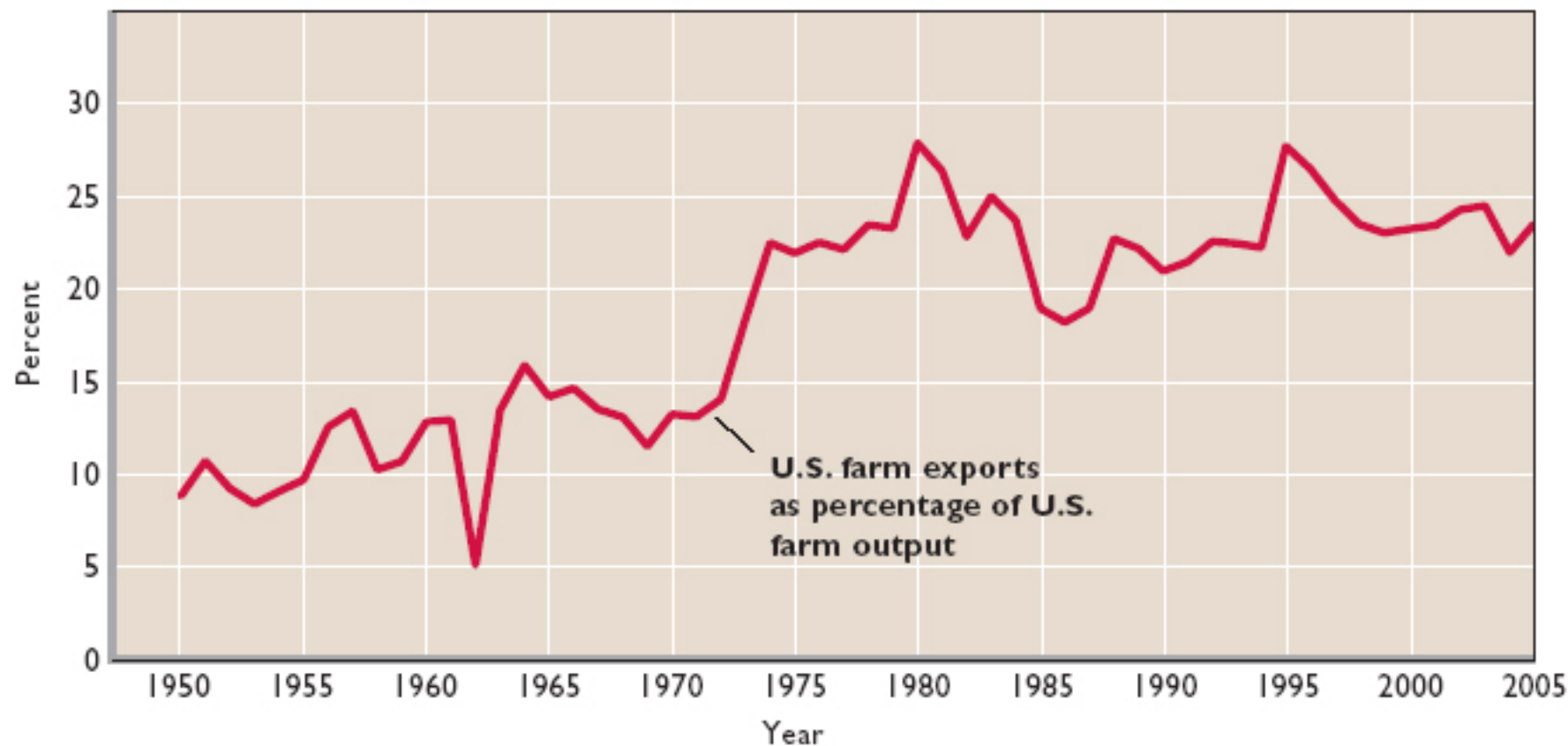
The combination of an inelastic and slowly increasing demand for agricultural products with a rapidly increasing supply puts strong downward pressure on farm prices and income. Figure 16W-3 shows a large increase in agricultural supply accompanied by a very modest increase in demand. Because of the inelasticity of demand, those modest shifts result in a sharp decline in farm prices, accompanied by a relatively small increase in output, so farm income declines. On the graph, we see that farm income before the increases in demand and supply (measured by rectangle  $OP_1aQ_1$ ) exceeds farm income after those increases ( $OP_2bQ_2$ ). Because of an inelastic demand for farm products, an increase in supply of such products relative to demand creates a persistent downward pressure on farm income.

## CONSEQUENCES

The actual consequences over time have been those predicted by the perfect-competition model. The demand and supply conditions just outlined have increased the *minimum efficient scale (MES)* in agriculture and reduced crop prices. Farms are too small to realize productivity and take advantage of economies of scale have discovered that their average total costs exceed the (declining) prices for their crops. So they can no longer operate profitably. In the long run, financial losses in agriculture have triggered a massive exit of workers to other sectors of the economy, as evidenced by the declining farm population in Table 16W-1. They have also caused a major consolidation of smaller farms into larger ones. A person farming, say, 240 hectares of corn three decades ago is today likely to be farming two or three times that number of acres. Huge corporate firms called **agribusiness** have emerged in some areas of farming such as potatoes, beef, and poultry.

Traditionally, the income of farm households was far below that of non-farm households, but that has changed in the past decade. Out-migration and consolidation have boosted net farm income per farm household, as has the increasing number of members of farm households who are taking jobs in nearby towns and cities. As a result, the average income of farm households has increased relative to the income of non-farm households. Presently, the average incomes of the two groups are very similar. (Key Question 3)

**FIGURE 16W-3** U.S. farm exports as a percentage of farm output, 1950–2005. Exports of farm output have increased as a percentage of total farm output in the United States. But this percentage has been quite variable, contributing greatly to the instability of the demand for U.S. farm output.



Source: U.S. Department of Agriculture and Federal Reserve Bank of St. Louis.

As Global Perspective 16W-1 shows, poor nations have much higher percentages of their labour forces in agriculture than do Canada and other industrialized nations.



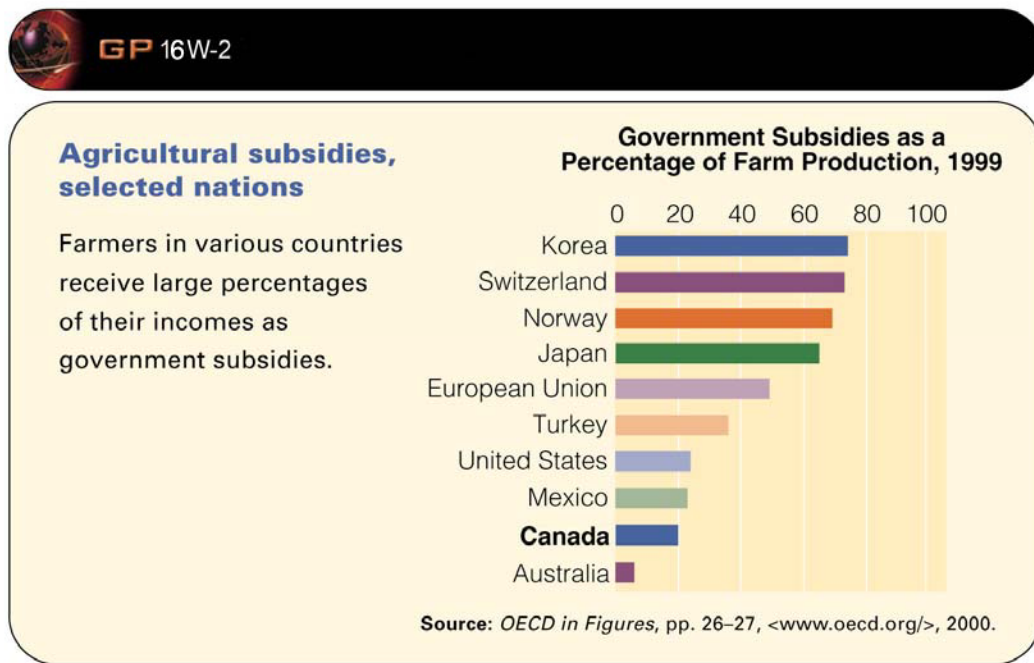
## QUICK REVIEW

- Agricultural prices and incomes are volatile in the short run because an inelastic demand converts small changes in farm output and demand into relatively larger changes in prices and income.
- Technological progress has generated large increases in the supply of farm products over time.
- Increases in demand for farm products have been modest in Canada, because demand is inelastic with respect to income and because population growth has been modest.
- The combination of large increases in supply and small increases in demand has made Canadian agriculture a declining industry.

## ECONOMICS OF FARM POLICY

The Canadian government has subsidized agriculture since the 1930s with a farm program that includes (1) support for farm prices, income, and output; (2) soil and water conservation; (3) agricultural research; (4) farm credit; (5) crop insurance; and (6) subsidized sale of farm products in world markets. However, the typical farmer and the average politician both have viewed the farm program as primarily a program to prop up prices and income, and it is this price-support aspect of farm policy that we will explore. Between 1990 and 2004, Canadian farmers received an average of

over \$1 billion of subsidies each year. As indicated in Global Perspective 16W-2, farm subsidies are common in many nations.



## Rationale for Farm Subsidies

A variety of arguments have been made to justify farm subsidies over the decades:

- Although farm products are necessities of life, many farmers have relatively low incomes; so they should receive higher prices and incomes through public help.
- The “family farm” is a fundamental Canadian institution and should be nurtured as a way of life.
- Farmers are subject to extraordinary hazards—flood, droughts, and insects—that most other industries do not face. Without government help, farmers cannot fully insure themselves against these disasters.
- While farmers face perfectly competitive markets for their outputs, they buy inputs of fertilizer, farm machinery, and gasoline from industries that have considerable market power. Whereas those industries are able to control their prices, farmers are at the mercy of the market in selling their output. The supporters of subsidies argue that agriculture warrants public aid to offset the disadvantageous terms of trade faced by farmers.

## 16W.2 The Economics of Price Supports

Canadian agricultural policy in the past has aimed at stabilizing agricultural prices at levels that result in higher incomes for farmers. The main tools used in agricultural stabilization are marketing boards and **price supports**, government-supported minimum prices.

### Marketing Boards

Two types of agricultural marketing boards exist. One aims to increase prices by regulating supply, the other acts as a marketing agency for producers.

#### HISTORICAL BACKGROUND

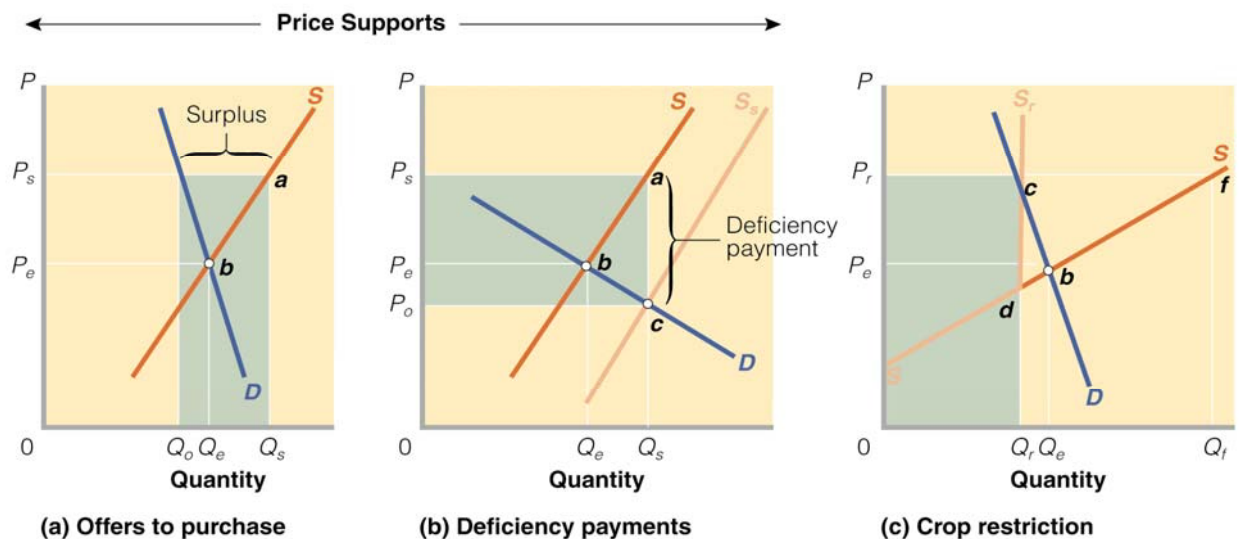
During the Great Depression of the 1930s, many farmers believed they were no match for concentrated agribusiness. The general belief was that the small farmer faced low offer-to-buy prices from processors, and farmers could not successfully withhold their produce to force up the price. The political pressure from farmers led to the passing of the Natural Products Marketing Act in 1934, which set up the Federal Marketing Board. This board could delegate its power to local producers' boards, and its most important power was controlling sales of agricultural products. The federal law was struck down by the courts on the grounds that regulation of trade within Canada came under provincial jurisdiction. Several provinces, starting with British Columbia in 1936 and Ontario in 1937, passed laws allowing already functioning marketing boards to continue under provincial authority. By 1940 all provinces had farm marketing legislation in force except for Quebec, which passed such legislation in 1956. The main purpose of these marketing boards was supply management: the maintenance of prices at board-determined levels through control of product supply.

In 1935 the **Canadian Wheat Marketing Board** was created. As of 2006 it still had complete control over the price and marketing of western wheat. When farmers deliver their wheat to the Wheat Board, they receive an initial payment per bushel that is 75 percent of the expected average selling price. This is in effect a floor price and is set low enough that the Wheat Board is reasonably able to sell the wheat at least at that price. The producers subsequently get the full

average selling price the Wheat Board is able to get on the domestic and international markets, less transportation costs, storage costs, and administrative expenses. Farmers get the average price the Wheat Board is able to realize over the course of the year. A farmer thus does not have to worry what the price is the day the crop is delivered to the Wheat Board.

Marketing boards aim to stabilize agricultural prices at a level that ensures higher incomes to farmers. This can be accomplished through price supports.

**FIGURE 16W-4** PRICE SUPPORTS AND CROP RESTRICTION



Panel (a): Offers to purchase result in surpluses. Panel (b): Deficiency payments or subsidies do not result in surpluses. Panel (c): Crop restriction results in neither surpluses nor government payments. All costs (the higher price) are borne by consumers.

There are two basic methods of supporting prices above their market equilibrium values:

(1) offers to purchase and (2) deficiency payments.

## Offers to Purchase

A marketing board can increase farm income by ensuring that the price farmers get for their produce does not fall below a specified minimum. In Figure 16W-4(a) let's assume that the floor price—or, as it is commonly called, the support price—is  $P_s$ . Then the major effects are as follows:

- **Surplus output** The most obvious result is product surplus. Consumers are willing to purchase only  $Q_o$  units at the supported price, while farmers will supply  $Q_s$  units. The government must buy the surplus ( $Q_s - Q_o$ ) to make the above-equilibrium support price effective. The surpluses are undesirable on two counts. First, their very existence indicates a misallocation of the

economy's resources. Government-held surpluses mean that the economy is devoting too many resources to the production of commodities that, at existing supported prices, are not wanted by consumers. Second, the storing of surplus products is expensive, adding to the cost of the farm program and, ultimately, to the consumer's tax bill. For example, in the late 1950s the federal government accumulated more than 45 million kilograms of butter as it tried to maintain an above-equilibrium price. The solution was to convert the butter into butter oil, which the government then sold abroad at half the butter price.

- **Loss to consumers** Consumers lose because they pay a higher price ( $P_s$  rather than  $P_e$ ) and consume less ( $Q_o$  rather than  $Q_e$ ) of the product. They also pay higher taxes to finance the government's purchase of the surplus. In Figure 16W-4(a), this added tax burden will amount to the surplus output  $Q_o - Q_s$  multiplied by its price,  $P_s$ . Storage costs add to this tax burden. Unfortunately, the higher food prices fall disproportionately on the poor because they spend a larger portion of their incomes on food.
- **Gain to farmers** Farmers gain from price supports. In Figure 16W-4(a), gross receipts rise from the free market level of  $OP_ebQ_e$  to the larger supported level of area  $OP_saQ_s$ .

## Deficiency Payments

**Deficiency payments**, another method of price supports, are subsidies that make up the difference between the market price and the government-supported price. In Figure 16W-4(b) suppose that the support price is  $P_s$ . Also, as before, at price  $P_s$  farmers expand production from  $Q_e$  to  $Q_s$ . However, with demand as shown by  $D$ , consumers will only buy  $Q_s$  if the price is  $P_o$ . The government arranges for this to be the market price by simply subsidizing production by the amount  $P_o - P_s$ . The government makes a deficiency payment to each producer equal to  $P_o - P_s$  times the quantity sold.

The total consumer expenditure is  $OP_o cQ_s$ , total government expenditure is  $P_o P_s ac =$  deficiency payment times  $Q_s$ . The producers are still on the original supply curve  $S$ . However,  $S_s$  is the supply curve as seen by the consumer and is created by the deficiency payment. When we analyze the economic effect of these payments, two considerations arise.

## ELASTICITY OF SUPPLY AND DEMAND

The incidence of the subsidy, like the sales tax, depends on the elasticity of the supply and demand curves. In Figure 16W-4(b), the combined effects of the elastic demand curve in the price range  $P_oP_s$  and the inelastic supply curve result in the subsidy going mostly to the producer: the producer gets  $P_eS_s$  of the deficiency payment, the consumer only  $P_eP_o$ . The effect of elasticity on the incidence of a subsidy is precisely the same as that of a sales tax.

### COMPARING OFFERS TO PURCHASE AND DEFICIENCY PAYMENTS

Assuming, as we have done, that  $P_s$  is the same in both Figures 16W-4(a) and (b), farmers will benefit equally from the two programs: their total income will be  $OP_s aQ_s$  in each case. Consumers prefer deficiency payments since they receive a large amount of output ( $Q_s$ ) at a low price ( $P_o$ ). This compares with a high price ( $P_s$ ) and small quantity ( $Q_o$ ) under a program of offers to purchase. But when the subsidies of taxpayers to farmers (the green areas) are taken into account, we find that total payments by the public (consumption expenditures plus tax-financed subsidies) to farmers are identical under both programs:  $OP_s aQ_s$ .

Offers to purchase and deficiency payments have one main difference. Offers to purchase result in government-held surpluses that can be costly to store. While it might be desirable to have some reserve stocks as a buffer against a year or two of crop failures, it is quite another matter for government to spend hundreds of millions a year simply to store large surpluses of farm commodities.

### RESOURCE OVERALLOCATION

A more subtle cost exists in both offers to purchase and deficiency payments. Society loses because price supports contribute to economic inefficiency by encouraging an over-allocation of resources to agriculture. A price floor ( $P_s$ ) attracts more resources to the agricultural sector than would the free market price ( $P_e$ ). In terms of Chapter 7's perfect competition model, the market supply curve in Figure 16W-4 represents the marginal costs of all farmers producing this product at various outputs  $Q_o$ . An efficient allocation of resources occurs at point b, where the market price  $P_e$  is equal to marginal costs. The output  $Q_e$  reflects that efficient allocation of resources.

In contrast, the output  $Q_s$  associated with the price support  $P_s$  represents an over-allocation of resources; the marginal cost of the extra production exceeds its marginal benefit to society. Society incurs an efficiency loss from the price-support system.

## ENVIRONMENTAL COSTS

We know from Figure 16W-4 (a) and (b) that price supports lead to additional production. Although some of this extra output may require additional land, much of the added production comes from greater use of fertilizer and pesticides. Those pesticides and fertilizers pollute the environment (for example, groundwater) and pose health risks to farm-workers and to consumers as residues in food. Research shows a positive relationship between the level of price-support subsidies and the use of agrichemicals.

Farm policy may also cause environmental problems in less obvious ways. First, farmers benefit from price supports only when they use their land consistently for a specific crop such as corn or wheat. This creates a disincentive to practise crop rotation, which is a non-chemical technique for controlling pests. Farm policy thus discourages the substitution of non-chemical for chemical pest control.

Second, an increase in the price of a product will increase the demand for relevant inputs. In particular, price supports for farm products increase the demand for land. The land that farmers bring into farm production is often environmentally sensitive marginal land such as steeply sloped, highly erodable land or wetlands that provide wildlife habitat. Similarly, price supports result in the use of more water for irrigation, and the resulting runoff may contribute to soil erosion.

## INTERNATIONAL COSTS

The costs of farm price supports actually go beyond those indicated by Figure 16W-4. Price supports generate economic distortions that cross national boundaries. For example, price supports make the Canadian agricultural market attractive to foreign producers. But inflows of foreign agricultural products would increase supplies in Canada, aggravating the problem of surpluses. To prevent this from happening, Canada is likely to impose import barriers in the form of tariffs or quotas. These barriers often restrict the output of more efficient foreign producers, while simultaneously encouraging more output from less efficient Canadian producers. The result is a less efficient use of world agricultural resources.

Similarly, as Canada and other industrially advanced countries with similar agricultural programs dump surplus farm products on world markets, the prices of such products are depressed. Developing countries—heavily dependent on world commodity markets for their incomes—are hurt because their export earnings are reduced. Thus, Canadian price supports for wheat production have imposed significant costs on Argentina, a major wheat exporter. (Key Question 7)

## Reduction of Surpluses

Figure 16W-4 (c) suggests that programs designed to reduce market supply (shift S leftward) or increase market demand (shift D rightward) would help boost the market price toward the supported price  $P_s$ . Further, such programs would reduce or eliminate farm surpluses. The Canadian government has tried both supply and demand approaches to reduce or eliminate surpluses.

### RESTRICTING SUPPLY

Until recently, public policy focused mainly on restricting farm output. In particular, **crop restriction** accompanied price supports. In return for guaranteed prices for their crops, farmers had to agree to limit the number of hectares they planted in that crop. The government first set the price support and then estimated the amount of the product consumers would buy at the supported price. It then translated that amount into the total number of planted hectares necessary to provide it.

These supply-restricting programs were only partially successful. They did not eliminate surpluses, mainly because reduction of land under cultivation did not result in a proportionate decline in production. Some farmers retired their worst land and kept their best land in production. They also cultivated their tilled land more intensively. Superior seed, more and better fertilizer and insecticides, and improved farm equipment were used to enhance output per hectare. Nevertheless, the net effect of crop restriction undoubtedly was to reduce farm surpluses and their associated costs to taxpayers.

### BOLSTERING DEMAND

Government has tried several ways to increase demand for Canadian agricultural products.

**New Uses** Both government and private industry have spent large sums on research to create new uses for agricultural goods. The production of “gasohol,” which is a blend of gasoline and alcohol

made from grain, is one such attempt to increase the demand for farm output. A less significant example is the use of soybeans to replace wax in producing crayons. Most experts conclude that such endeavours have been only modestly successful in bolstering the demand for farm products.

**Domestic and Foreign Demand** The government has also created a variety of programs to stimulate domestic consumption of farm products. For example, the federal government spends millions of dollars each year to advertise and promote global sales of Canadian farm products. Furthermore, Canadian negotiators have pressed hard in international trade negotiations to persuade foreign nations to reduce trade barriers to the importing of farm products. The government's supply-restricting and demand-increasing efforts have helped reduce the amount of surplus production, but they have not succeeded in eliminating surpluses.

## QUICK REVIEW

- Marketing boards aim to stabilize agricultural prices at levels that ensure higher incomes to farmers.
- Price supports are government-imposed price floors (minimum prices) on selected farm products. Price supports can be achieved through (1) offers to purchase, (2) deficiency payments, or (3) crop restrictions.
- Price supports cause surplus production; raise farm income; increase food prices to consumers; and cause an overallocation of resources to agriculture.
- Domestic price supports encourage nations to erect trade barriers against imported farm products and to dump surplus farm products on world markets.

## 16W.3 CRITICISM AND POLITICS

Let's examine some of the key criticisms of the agricultural subsidies.

### SYMPTOMS, NOT CAUSES

The subsidy strategy in agriculture was designed to treat the symptoms, not the causes, of the farm problem. The root cause of the problem was a misallocation of resources between agriculture and the rest of the economy. Historically, the problem has been one of too many farmers. The effect of that misallocation has been relatively low farm income. For the most part, public policy was oriented toward supporting farm prices and incomes rather than toward fixing the resource allocation problem itself.

Further, price and income supports have served to keep people in agriculture who otherwise would have moved to non-farm occupations. That is, the price and income orientation of the farm program has slowed the reallocation of resources necessary to resolve the long-run farm problem.

### MISGUIDED SUBSIDIES

Price supports and subsidy programs have traditionally benefited those farmers most who need them least. If the goal of farm policy is to raise low farm incomes, it follows that any program of federal aid should be aimed at farmers with the lowest incomes. But the poor, low-output farmer does not produce and sell enough in the market to get much aid from price supports. Instead, the large corporate farm reaps the benefits by virtue of its sizable output.

Furthermore, an income-support program might better be geared to people than to products. Most economists say that, on equity grounds, direct income subsidies to struggling farmers are highly preferable to indirect price-support subsidies that go primarily to large, prosperous farmers. Better yet, say some economists, would be transition and retraining support for farmers willing to move out of farming into occupations and businesses in greater demand.

A related point concerns land values. The price and income benefits that farm programs provide tend to increase the value of farmland. By making crops more valuable, price supports make the land itself more valuable. Sometimes that tendency is helpful to farmers, but often it is not. Farmers rent about 50 percent of their farmland, mostly from well-to-do non-farm landlords. Thus, price supports become a subsidy to people who are not actively engaged in farming.

### POLICY CONTRADICTIONS

Because farm policy has many objectives, it often leads to contradictions. Whereas most subsidized research is aimed at increasing farm productivity and the supply of farm products, crop restriction programs require that farmers take land out of production to reduce supply. Price supports for crops mean increased feed costs for ranchers and high consumer prices for animal products. Tobacco farmers are subsidized at a time when serious health problems are associated with tobacco consumption. Conservation programs call for setting aside land for wildlife habitat, while price supports provide incentives to bring such land into production.

## The Politics of Farm Policy

In view of these criticisms and inconsistencies, we might ask why Canada continued its price-support program for major crops for so many decades and still continues it for some farm product today. Why did it take so long for the government to restore free markets for at least some farm products?

### PUBLIC CHOICE THEORY REVISITED

Public choice theory (Chapter 16) helps us answer these questions. Recall that rent-seeking behaviour occurs when a group (a labour union, firms in a specific industry, or farmers producing a particular crop) uses political means to transfer income or wealth to itself at the expense of another group or of society as a whole. And recall that the special-interest effect involves a program or policy from which a small group receives large benefits at the expense of a much larger group whose members individually suffer small losses. Both rent-seeking behaviour and the special-interest effect help explain the politics of farm subsidies.

Suppose a certain group of farmers, say, egg producers or dairy farmers, organize and establish a well-financed political action committee (PAC). The PAC's job is to promote government programs that will transfer income to the group (this is rent-seeking behaviour). The PAC vigorously lobbies members of Parliament to enact or to continue price supports and import quotas for eggs and milk. The PAC does this in part by making political contributions to sympathetic legislators. Although egg production is heavily concentrated in a few provinces, the egg PAC will also make contributions to legislators from other provinces to gain support. How can a small interest group like egg or milk producers successfully lobby to increase its own income at the expense of society as a whole? Because, even though the total cost of the group's programs might be considerable, the cost imposed on each individual taxpayer is small (this is the special-interest effect). Taxpayers are likely to be uninformed about and indifferent to such programs, since they have little at stake. Unless you raise your own chickens to provide your family's egg supply, you probably have no idea how much these programs cost you as an individual taxpayer and consumer and therefore do not object when your member of Parliament votes for, say, a price support program for eggs. Thus, there is little or no lobbying to counter the PAC's efforts.

Public choice theory also tells us that politicians are likely to favour programs that have hidden costs. As we have seen, that is often true of farm programs. Our discussion of Figure 16W-4 indicated that price supports involve not simply a transfer of money from taxpayer to farmer but costs that are hidden as higher food prices, storage costs for surplus output, costs of administering farm programs, and costs associated with both domestic and international misallocations of resources. Because those costs are largely indirect and hidden, farm programs are much more acceptable to politicians and the public than they would be if all costs were explicit.

## CHANGING POLITICS

In spite of rent seeking, special interests, and logrolling, a combination of factors has led to a change in the politics of farm subsidies.

**Declining Political Support** As the farm population has declined, agriculture's political power has weakened. The farm population was about 30 percent of the general population in the 1930s, when many Canadian farm programs were established; now it is less than 2 percent. Urban members of Parliament now constitute a majority over their rural colleagues. An increasing number of them are critically examining farm programs for their effect on consumers' grocery bills as well as on farm incomes. Also, more farmers themselves are coming to resent the intrusion of the federal government into their farming decisions.

**World Trade Considerations** Canada is one of the countries that has taken the lead to reduce barriers to world trade in agricultural products. That has also contributed to the more critical attitude toward farm subsidies and particularly price supports. The nations of the European Union (EU) and many other nations provide support for agricultural prices. And, to maintain their high domestic prices, they restrict imports of foreign farm products by imposing tariffs (excise taxes) and quotas (quantitative limits on imports of foreign goods). They then try to rid themselves of their domestic surpluses by subsidizing exports into world markets.

The effects on Canada are that (1) trade barriers hinder Canadian farmers from selling to EU nations, and (2) subsidized exports from those nations depress world prices for agricultural products, making world markets less attractive to Canadian farmers.

Perhaps most important, farm programs such as those maintained by the EU and Canada distort both world agricultural trade and the international allocation of agricultural resources.

Encouraged by artificially high prices, farmers in industrially advanced nations produce more food and fibre than they would otherwise. The resulting surpluses flow into world markets, where they depress prices. This means that farmers in countries with no farm programs—many of them developing countries—face artificially low prices for their exports, and that signals them to produce less. Overall, the result is a shift in production away from what would occur based on comparative advantage.

Recognizing these distortions, in 1994 the 128 nations then belonging to the World Trade Organization (WTO) agreed to reduce farm price-support programs by 20 percent by the year 2000 and to reduce tariffs and quotas on imported farm products by 15 percent. Larger, more significant, reductions of farm subsidies and agricultural tariffs are part of the agenda of the most recent round of trade negotiations (the Doha Round). But reaching agreement on those reductions have proved difficult. As of mid-2006, negotiations over these issues were stalled.

## QUICK REVIEW

- Farm policy in Canada has been heavily criticized for delaying the shift of resources away from farming, directing most subsidies to wealthier farmers, and being fraught with policy contradictions.
- The persistence of price supports can largely be explained in terms of rent-seeking behaviour, the special-interest effect, political logrolling, and other aspects of public choice theory.
- Recently, the politics of farm subsidies has changed as a result of the declining political power of farmers and world trade considerations.

## THE LASTword

### The Risky Business of Farming is Becoming a Little Less Risky

**Farmers now have a number of options to reduce the risks associated with fluctuating agricultural prices.**

The short-run instability of agricultural prices and farm income create considerable risk in agriculture. Some farm programs reduce the risk of farming for many farmers. But these programs are limited to certain crops. Fortunately, several private techniques for managing risk have become commonplace in agriculture. The purpose of these measures is to “smooth” income over time, “hedging” against short-run output and price fluctuations. Hedging is an action by buyers or sellers to protect against a change in future prices prior to an anticipated purchase or sale.

Farm risk-management techniques include:

- **Futures markets.** In the futures market, farmers can buy or sell farm products at prices fixed

now, for delivery at a specified date in the future. If the price falls, farmers will still obtain revenue based on the higher price fixed in the futures market. If the price rises, the buyer will benefit by getting the farm commodity at the lower fixed price in the future contract.

- **Contracting with processors.** In advance of planting, farmers can directly contract with food processors (firms such as ethanol plants and feed lots) to assure themselves of a fixed price unit of their farm or ranch output.
- **Crop revenue insurance.** Farmers can buy crop revenue insurance, which insures them against gross revenue losses resulting from storm damage and other natural occurrences.
- **Leasing land.** Farm operators can reduce their risk by leasing some of their land to other operators who pay them cash rent. The rent payment is stable, regardless of the quality of the crop and crop prices.
- **Non-farm income.** Many farm households derive substantial parts of their total income from off-farm income, such as spousal work and agricultural investments. These more stable elements of income cushion the instability of farm income.

Although farming remains a risky business, farm operators have found creative ways to manage the inherent risk of price and income instability.

*Question: What are some of the innovative ways that farmers have reduced the risks of price and income instability?*

## CHAPTER SUMMARY

### 16W.1 Economics of Agriculture

- In the short run, the highly inelastic nature of agricultural demand translates small changes in output and small shifts in domestic or foreign demand into large changes in prices and income.
- Over the long run, rapid technological advance, together with a highly inelastic and relatively slow-growing demand for agricultural output, has caused agriculture to be a declining industry.

### 16W.2 Economics of Price Supports

- The use of price floors or price supports has many economic effects: (a) surplus production occurs, (b) the incomes of farmers are increased, (c) consumers pay higher prices for farm products, (d) an overallocation of resources to agriculture occurs, (e) society pays higher taxes to finance the purchase and storage of surplus output, (f) pollution increases because of the greater use of agrichemicals and vulnerable land, and (g) other nations bear the costs associated with import barriers and depressed world agricultural prices.

- Government has pursued with limited success programs to limit agricultural supply and increase agricultural demand to reduce the surpluses associated with price supports.

### 16W.3 Criticism, Politics, and Reform

- Economists have criticized farm policy for (a) confusing symptoms (low farm incomes) with causes (excess capacity), (b) providing the largest subsidies to high-income farmers, and (c) creating contradictions among specific farm programs.
- The persistence of agricultural subsidies can be explained in terms of public choice theory and, in particular, in terms of rent-seeking behaviour and the special-interest effect.
- Political backing for price supports and crop restriction programs has eroded for several reasons: (a) The number of farmers, and thus their political clout, has declined dramatically relative to the number of urban consumers of farm products, (b) farm subsidies have received close scrutiny due to efforts to eliminate the federal budget deficit, (c) successful efforts by Canada to get other nations to reduce their farm subsidies have altered the domestic debate on the desirability of Canadian farm subsidies.

## TERMS AND CONCEPTS

**short-run farm problem** The sharp year-to-year changes in the prices of agricultural products and in the incomes of farmers, p. 2

**long-run farm problem** The tendency for agriculture to be a declining industry as technological progress increases supply relative to an inelastic and slowly increasing demand, p. 2

**agribusiness** Large corporate firms in farming, p. 8

**price supports** Government-supported minimum prices for agricultural products, p. 11

**Canadian Wheat Marketing Board** A board that maintains the price of wheat at board-determined levels through the control of product supply and that acts as the marketing agency for wheat producers, p. 11

**deficiency payments** Subsidies that make up the difference between market prices and government-supported prices, p. 13

**crop restriction** In return for guaranteed prices for their crops, farmers agree to limit the number of hectares they plant in that crop, p. 16

## STUDY QUESTIONS

- 1. Key Question** Carefully evaluate: "The supply and demand for agricultural products are such that small changes in agricultural supply result in drastic changes in prices. However, large changes in farm prices have modest effects on agricultural output." (Hint: A brief review of the distinction between supply and quantity supplied may be helpful.) Do exports increase or reduce the instability of demand for farm products? Explain.
2. What relationship, if any, can you detect between the fact that the farmer's fixed costs of production are large and the fact that the supply of most agricultural products is generally inelastic? Be specific in your answer.
- 3. Key Question** Explain how each of the following contributes to the farm problem:
  - a. the inelastic demand for farm products
  - b. the rapid technological progress in farming
  - c. the modest long-run growth in demand for farm commodities
  - d. the volatility of export demand
4. The key to efficient resource allocation is shifting resources from low-productivity to high-productivity uses. In view of the high and expanding physical productivity of agricultural resources, explain why many economists want to divert additional resources from farming to achieve allocative efficiency.
5. Explain and evaluate: "Industry complains of the higher taxes it must pay to finance subsidies to agriculture. Yet the trend of agricultural prices has been downward while industrial prices have been moving upward, suggesting that on balance agriculture is actually subsidizing industry."
6. "Because consumers as a whole must ultimately pay the total incomes received by farmers, it makes no real difference whether the income is paid through free farm markets or through price supports supplemented by subsidies financed out of tax revenue." Do you agree?
- 7. Key Question** Explain the economic effects of price supports. Explicitly include environmental and global impacts in your answer. On what grounds do economists contend that price supports cause a misallocation of resources?
8. Use supply and demand curves to depict equilibrium price and output in a competitive market for some farm product. Then show how an above-equilibrium price floor (price support) would cause a surplus in this market. Demonstrate in your graph how government could reduce the surplus through a policy that (a) changes supply or (b) changes demand. Identify each of the following actual government policies as primarily affecting the supply of or the demand for a particular farm product: crop restriction, government buyout of dairy herds, export promotion.
9. Do you agree with each of the following statements? Explain why or why not.

- a. "The problem with Canadian agriculture is that there are too many farmers. This is not the fault of farmers but the fault of government programs."
  - b. "The federal government ought to buy Canadian farm surpluses and give them away to developing nations."
  - c. "All industries would like government price supports if they could get them; agriculture received price supports only because of its strong political clout."
10. What are the effects of farm subsidies such as those of Canada and the European Union on (a) domestic agricultural prices, (b) world agricultural prices, and (c) the international allocation of agricultural resources?
11. Use public choice theory to explain the persistence of farm subsidies in the face of major criticisms of these subsidies.

## INTERNET APPLICATION QUESTIONS

1. Agriculture and Agri-Food Canada at [www.agr.gc.ca/pol/pub/rb/pdf/rb\\_na\\_integ\\_e.pdf](http://www.agr.gc.ca/pol/pub/rb/pdf/rb_na_integ_e.pdf) provides an overview of the North America integration of agri-food. What are the "Key Facts" of this integration process?