

# GENERAL AGREEMENT ON TARIFFS AND TRADE

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## CANADIAN GRAIN PRODUCTION AND MARKETING

Prepared as a submission to the GATT Cereals Group in response to Item No. 2 of Joint Study:

"Factual Data, Projections and Exchange of Information permitting each participant to form an opinion on the probable effects on Production, Marketings and Market Access of Commitments offered by the Countries participating in the current Negotiations."

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This paper refers only to grain produced in the Prairie Provinces of Western Canada, the area from which the great bulk of commercial grain supplies are drawn. Cereals produced in other areas of the country tend to be utilized locally with the exception of limited quantities of Ontario Soft White Wheat.

### Summary

In the sixty years since the Praire Provinces were opened to settlement wheat production has fundamentally evolved in line with demands in the international grain trade and producers in Western Canada are basically dependent upon returns from commercial exports of this commodity.

Extreme variation in cereal yields and total production are unavoidable both as between various areas of the Prairie Provinces in the same year and from one year to the next mainly because of fluctuations in the marginal precipitation situation. (See tables 18 and 19.)

In upwards of 60 per cent of the total and drier land areas wheat is grown almost exclusively as the only crop in annual rotation with summerfallow. In this area other cereals do not equal the performance of wheat in economic returns to the producer. The alternative to cereals is fodder which is very considerably less rewarding.

In the northern areas of the Prairie Provinces where moisture supply is more adequate and constant, feed grain production competes with wheat, and both oilseed crops and forage crops occupy significant and increasing land area.

A gradual increase in cultivated area has taken place, as has the amount of summerfallow, with the result that there has been no significant change in land under grains in the post-war period. (See table 2.)

Minor amounts of new land area continue to come under cultivation particularly in the northern settlement fringes, the estimates of potential expansion varying upwards to 2.4 million hectares. Additionally the long-term trend towards increased acreage in summerfallow seems to have halted and in view of improved weed control techniques in the northern areas, the trend may be reversed towards bringing some increase in area available to crops; the potential approximates 2.4 million hectares but producers to date have been skeptical about the advantages of such a shift.

In 1935 the Canadian Government established the Canadian Wheat Board which in 1943 became the sole marketing agency for wheat produced in Western Canada and, in 1949 for oats and barley. The crisis of the 1930's found agriculture in the Prairie Provinces with substantially reduced markets because of protectionism against grain imports in the major markets followed by several years of acute drought, and insufficient resources to maintain land under cultivation. It follows that the 1934-38 period in the attached statistical tables is not representative being abnormally low in yield, crop acreage and production.

Canada has exercised effective supply management over the thirty year period under review by consistently adhering to the following:

1. Commercial storage capacity is maintained at a level adequate to assure supply availability under conditions of much variation in production and marketings but storage capacity is prevented from becoming so large as to be an incentive to production.
2. Assistance to producers has remained small, the only direct subsidy being partial payment of commercial storage cost for wheat, other aids being designed to prevent disastrous income decline while not acting as production incentives.
3. Producer marketings are restricted to the amount of commercial storage space which becomes available as a result of domestic and export sales.
4. Producers are free to exercise their choice in production planning bearing in mind that they receive income only for the amount of cereals that are marketed and must hold supplies additional to marketing authorization at their own expense.
5. Grain is sold at international prices both domestically and for export, and the producer receives only this return for the actual amount he marketed.

Producers have shown willingness to hold large stocks on farms but when faced with contained accumulation they reduced acreage. (See tables 2 and 9.)

Canada has continually been in the forefront of international efforts to further stabilization in the grain trade while seeking to expand the outlets for wheat as evidenced by the following practical measures:

1. A Government organized stock-piling policy on a vast scale between 1940-45 to assist in meeting the urgent needs at the end of the war.
2. Adherence to every International Wheat Agreement since the first Agreement in 1949 and, in accordance with the obligations undertaken, the supply of substantial quantities (849 million bushels) at the maximum during periods that international prices rose above the International Wheat Agreement maximum.
3. The holding of large reserves compatible with changes in the international grain trade and stabilization efforts, at the expense of Canadian producers and the Government.

#### Land use limitations

The present use of land on the prairies of Canada resulted from the experience of farmers under the physical, economic, and institutional conditions prevailing over a period of years. (See tables 1 and 2.) Present use is the result of two main factors: (1) the restrictive influence of a relatively low and variable rainfall (see tables 18 and 19) and (2) the lack of readily accessible markets for the more intensive crops that are adaptable to the climatic environment.

The soils of the prairie region developed under grass in a climate which ranges from semi-arid in the southerly areas to sub-humid in the north. Three major soil-climatic zones have been recognized. The brown soil zone occupies an area of 13.8 million hectares, the dark brown 12.1 million hectares, and the black soil zone 18.6 million hectares. Approximately 60 per cent of the total area is improved. It has been estimated that a further 2.4 million hectares may be improved, mostly in the black soil zone.

The brown soils are characterized by low annual precipitation and high seasonal evaporation. There is a wide variation in crop yields and frequent severe droughts. The major cultivated crop is wheat, produced in a wheat-fallow rotation.

In the dark brown soil zone crop yields are variable but severe drought is somewhat less frequent than in the brown soil zone. Although soil and climatic conditions permit the production of some coarse grains this is primarily a wheat producing area.

In the major part of the black soil zone severe drought is rarely experienced. Outside of the southern portion of this zone, where wheat is usually the predominant crop, coarse grains, including barley for malting, and forages are grown with wheat. The forage crop area has been increasing in recent years in keeping with an increasing livestock population. Oilseed crops have been introduced and are an important source of income to many farmers but the area grown is relatively small. (See tables 4 and 8.) The area seeded to the non-cereal crops varies from year to year depending upon prospective markets and prices not only for the special crop but also for wheat.

Future changes in acreages and crops produced will of course be influenced by markets, prices, and technological changes. It is expected that most changes will take place in the black soil zone. In the semi-arid areas of the brown and dark brown soils grass is the alternative to the production of cereal grains on summer-fallow. However, where grain yields are low because of low rainfall the livestock carrying capacity of grass pastures is also low. An increase in the prices of coarse grains relative to wheat might cause some shift from wheat production on the heavier soils but the change would first cause an increase in production in the black soil zone. There seems to be no reason why wheat will not continue as the dominant crop on the southern prairies.

Summerfallow in the black soil zone has been used extensively for weed control. It has been estimated that this summerfallow area could be reduced by one-half by using selective herbicides. This would allow an additional 2.4 million hectares to be seeded to crops. There is, therefore, a potential increase in crop area in this zone of almost five million hectares, including the 2.4 million hectares which could be improved. While the choice of crops that can be produced in this soil zone is not so limited as in the brown and dark brown soil zones, climate and markets do impose restrictions on changes in the crop production patterns that have become established.

#### Weather and yield variability

The prairie region of Canada has a dry continental type climate. Throughout almost all of the grain growing area, total annual precipitation averages less than 50.8 cms. and for much of the area is less than 38.0 cms. (See tables 18 and 19,) In a large area of southern Saskatchewan and south-eastern Alberta, the average annual precipitation is only slightly in excess of 25.4 cms. and the effectiveness of this amount is reduced by strong summer sunshine and drying winds.

As well as being light, precipitation varies widely from year to year. Monthly precipitation totals also vary widely and are more often in deficit to crop need than in excess. A particular month may have no precipitation over a large part of the area in some years and occasionally may exceed 25.4 cms.

The average frost-free period throughout the greater part of the grain-growing area ranges from 80 to 120 days. Frost damage is more likely to occur in the black soil zone than in the brown and dark brown soil zones.

The frequent severe droughts of the southern prairies results in a wide variation in crop yields. A variation in yield of more than 40 per cent of the long-term average yield is not uncommon, even over relatively broad areas. For the prairie region as a whole, wheat yields during the past 30 years have averaged from less than 7.0 hundred kgs. per hectare to 18.0 hundred kgs. per hectare. (See table 6.) In ten of the eighteen years, 1946 to 1964, the average wheat yield per hectare has been less than the average for the period of 12.6 hundred kgs.

#### Technological impact

Increased use of summerfallow, chemical fertilizers and weed sprays, increased mechanization, and improved seed varieties, are among the crop production techniques that have prevented a decline in yield per acre as the native fertility of the Canadian prairie soils became depleted.

The summerfallow system evolved as a method of storing moisture in the soil and is now an essential practice in grain crop production. Moisture-use studies at Swift Current, Saskatchewan, indicate that 25.4 to 30.5 cms. of water are needed to produce a 10.1 hundred kgs. per hectare crop of wheat. With only 17.8 to 20.3 cms. of rainfall during the growing season, over a large part of the prairies, it follows that a reserve of 7.5 cms. or more is needed to grow a 10.1 hundred kgs. crop of wheat with average rainfall. Summerfallow allows a crop to be produced with what is essentially two years precipitation.

Thirty years ago the summerfallow area was less than two thirds of the wheat area; a large area of wheat and all of the coarse grains were seeded on stubble land. (See table 16.) The summerfallow area steadily increased in size and in 1954 equalled the wheat area for the first time. Since 1954 the area in summerfallow has exceeded the area in wheat. In the most moisture-efficient areas some wheat is still seeded on stubble land but in the semi-arid areas all wheat is seeded on summerfallow. A considerable acreage of coarse grains is seeded on summerfallow as well.

During the period 1958-64 the average yield of wheat seeded on summerfallow was 13.8 hundred kgs. per hectare while that on stubble was 9.0 hundred kgs. (See table 20.) Comparable yields for oats were 17.5 hundred kgs. and 12.8 hundred kgs., and for barley 18.3 hundred kgs. and 12.7 hundred kgs.

The displacement of horses by tractors is the most significant aspect of farm mechanization. In addition to reducing farm labour requirements it has released a large acreage of land formerly used to produce feed for horses. Tractors and other power machinery enable farmers to take advantage of any favourable soil and weather conditions for tillage, seeding, and harvesting operations. Tillage machinery which permits mulch tillage aids in maintaining soil moisture. Improved tillage and spraying machines, and methods, give more effective weed control.

The technological improvements in crop production also includes new varieties of grain that are more rust resistant, earlier maturing, and better quality than earlier grown. A wheat that is resistant to the wheat stem sawfly has been developed for use on the western prairies where this insect is a threat.

Experiments with chemical fertilizers have not showed consistant yield increases on the brown and darn brown soils but results have been promising on the more moisture-efficient black soils. Fertilizer sales in the Prairie Provinces jumped from 151,285 metric tons in 1960 to 444,643 metric tons in 1964. In value sales increased from less than \$13 million in 1960 to almost \$38 million in 1964.

Further developments in the techniques of grain crop production will likely include the use of larger and more efficient machinery and an increase in the use of fertilizer and herbicides. The use of larger machinery will be accompanied by a decrease in farm numbers and an increase in the average size of farm. The use of herbicides and fertilizers may affect the traditional attitude towards summer-fallow, particularly in the black soil zone where it has been used more for weed-control than for moisture conservation.

Changes in the technology associated with production on the farm has made the farmer more dependent upon off-farm sources for his inputs of production. (See table 22.) Tractor fuel, oil, grease, fertilizer, pesticides, herbicides, and equipment are among the items that are purchased in increasingly larger quantities from other industries. Not only have the cash operating expenses increased but there have been shifts in the relative importance of the items that make up the expenses of farm production. In the Prairie Provinces hired labour as a proportion of total farm expenses dropped from 14.0 per cent in 1934-38 to less than 8.0 per cent in 1964, reflecting the reduction in labour requirements. Farm machinery operating costs on the other hand increased from one fifth of the total to one third of the total.

### The marketing system

The major cereals produced in Western Canada - wheat, oats and barley - are marketed under the jurisdiction of the Canadian Wheat Board, an agency of the Government of Canada. The Board controls the delivery of grain from farms into commercial elevator facilities, its movement to central distribution points, and its sale into both the domestic and export markets. Deliveries of grain to the Board are made under permit, and in accordance with quotas established from time to time by the Board. At time of delivery a fixed "initial" price is paid to the farmer on the basis of the particular grade of grain sold to the Board. Since farmers receive payment for grain only at time of delivery to a commercial elevator, and since quotas are regulated in accordance with the storage space available, the quota policy acts as an effective production disincentive in times when supplies are heavy and farmers are obliged to carry relatively large farm stocks for which no income has been received.

All proceeds from Board sales of grain are pooled on an individual grade basis, and when total supplies delivered by farmers during a crop year have been merchandised, any surplus over and above the initial payment and marketing costs are returned to producers in proportion to the quantity of grain each has delivered. Any losses on the operation of a particular pool account are underwritten by the Government of Canada, but such a loss has only been sustained once (\$2 million on an oats pool) since initial payments are normally set below anticipated world market prices for the ensuing year.

The Canadian Wheat Board has sole responsibility for its selling prices, and these are the same to all buyers, domestic or overseas, at any particular time. No export subsidies are employed, either for bulk cereals or cereals products. Basically the prices received by Canadian farmers are the prices their cereals command in the world market in competition with all other suppliers.

### Supply management

Canada's greatest assurance of effective supply management into the future may well be the relative consistency of its policy in the sixty years since opening the Prairie Provinces to settlement whereby direct subsidies and indirect income aids to Western Canada grain producers have remained small and producers received international prices for the grain sold into international and domestic channels.

Another peg to effective supply management is the high degree of support given the Canadian Wheat Board system by producers and farm organizations in the Prairie Provinces as having been established out of their need and being operated in their interest.

The delivery quota system and the stockholding operation are the practical means whereby Canada contributes a measure of marketing and income equity to producers at the same time contributing in no small way to stabilization in the international grain trade while retaining flexibility to seek out opportunities for expanded trade.

Canadian commercial grain storage capacity now approaches 700 million bushels (approximately 17 million metric tons) compared with approximately 400 million bushels (approximately 10 million metric tons) during the 1930's (see table 24). This development has comprised various phases as follows:

- (1) During the war, in view of the dislocated export pattern and in anticipation of subsequent needs, the Government undertook programmes encouraging industry to increase capacity, to establish a large-scale temporary storage, and to pay producers storage for grain held on farms. The latter two production incentive programmes were discontinued by the end of the war.
- (2) In the 1950's the Government authorized special tax incentives for storage construction under which upwards of 100 million bushels increased capacity resulted during the decade.
- (3) In recent years terminal capacity particularly has expanded and further expansion is being encouraged not only in line with larger domestic and export volume, but also to accommodate the increased movement of United States grain via the St. Lawrence Seaway.

Commercial storage capacity in Canada is maintained at a level adequate to handle normal exports plus a reasonably flexible reserve to meet production and marketing fluctuations but sufficiently small so that excess production must be kept on farms at the producer's expense (see tables 9, 10 and 11).

Until 1956 all storage costs incurred by the Canadian Wheat Board for wheat, oats and barley were deducted from producer returns. In 1956 the Government undertook to pay costs for wheat held in commercial storage in excess of 4.85 million tons. Annual payments have varied between \$28 million in 1956 and \$50 million in 1960.

Important as a production disincentive is the Canadian policy that producers receive no storage payments for carrying grain on farms nor do they receive any income from such grain until it is delivered to commercial facilities. Provision does exist for interest free cash advances on some farm stored wheat, oats and barley, to a maximum of \$3,000 to any one permit holder, against the security of



his grain which the producer undertakes to deliver to the Canadian Wheat Board as quotas are authorized. Repayment is made automatically when the borrowing farmer is able to deliver his grain, on the basis of one half of the initial payment for all grain delivered. (For additional details see GATT document Spec(65)70, 8 July 1965.)

In practice this limited cash advance programme provides for working capital at the beginning of the marketing year at the time when delivery opportunities are restricted and the programme minimizes the disparities resulting from uneven quota delivery authorization during the course of a crop year. Only a small percentage of farmers avail themselves of the programme.

Canada places great value on the objectives of the International Wheat Agreement aimed at expanding the freest flow of international trade, and assuring supplies to importing countries and markets to exporting countries at equitable and stable prices.

Except for the 1949 Agreement during which prices were above the maximum, for considerable periods of time, prices in the other four agreements negotiated have fluctuated within the range without going either below the minimum or above the maximum. Canadian stabilization efforts were undoubtedly significant towards obtaining this result favourable to the interest both of exporters and importers. About 70 per cent of Canadian wheat production is exported. Apart from storage needs for other grain, Canada has capacity to store in commercial channels upwards of 11 million tons of wheat. The commercial grain storage plant, capitalized well in excess of \$1 billion, often has grain in it valued well in excess of \$1 billion. Additionally farms occasionally have stored on them just before the harvest of the new crop commences, wheat valued well in excess of \$0.5 billion for which no income has been received and which the producer must store at his own expense. This means that each farmer in Western Canada, in certain years, is carrying an inventory of wheat alone on his farm above \$2,500 at his own expense and in commercial facilities is upwards of \$5,000 of his wheat on which he has received an initial payment and can expect to receive the balance over the next ten months. This situation prevails just prior to commencing his harvest and the new marketing year for which again he has no guarantee of the amount he may be able to market.

In the short run, namely from year to year, producers have practically no control over yield although over the longer period there appears to be a trend towards increased yield. Regional and annual yield variation is tremendous, one year occasionally producing only half the amount of the previous year and variations of one third to one half being common.

Canadian producers, aware of the variations possible both in volume of production and volume of allowable marketings are quite prepared to accumulate relatively large stocks on their farms and carry these at their own expense. However, producers respond sensitively to marketing opportunities and finally curtail production when all other avenues of economic choice have been exhausted.

The impact of the marketing quota delivery system as an effective instrument in limiting production is vividly illustrated in the Canadian experience between the years 1953 and 1958 which were characterized by large international supplies of wheat and restricted commercial marketing opportunities. (See table 14) Canada also entered this period with large supplies of all cereals following a succession of years with climatic conditions favourable to production.

In the face of the continuing accumulation of wheat supplies and the limited delivery quota opportunities, this is what the Prairie Province producers did:

- (1) Faced with a wheat carryover on their farms in excess of 6 million tons, they reduced their wheat acreage from 10.0 million hectares in 1954 to 8.9 million hectares in 1955 with further reductions in subsequent years. (See tables 2 and 9).
- (2) Hastened the trend towards maintaining a greater percentage of cultivated land in summerfallow.
- (3) Increased land use for oilseed crops, hay and pasture while maintaining coarse grain acreage.
- (4) Increased livestock production.

The net result of all these efforts was a sharp drop in farm income from wheat and a decline in total farm income.

Over the past five years wheat marketing opportunities have increased. Wheat acreage has increased significantly as has production, whereas barley acreage has declined to the point that total production of this crop is less, even though the Eastern Canadian market for feed grain is expanding continually.

The accumulation of large stocks accompanied by production incentive policies can only present a distinct threat to the international stability of the wheat trade. Canadian supply management has used the combination of its large stockholding operation together with marketing controls in such manner as can only have been helpful both to importers and other exporters while attempting in some measures to insulate Canadian producers from the severest fluctuation in the international trade.