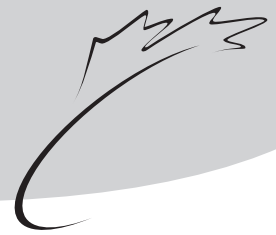




# Bi-weekly Bulletin

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## MUSTARD SEED: SITUATION AND OUTLOOK

Canada is the dominant exporter and it is normally the second largest producer of mustard seed in the world. The value of Canadian mustard seed exports reached \$93 million in 2001-2002. Although the Canadian seeded area for 2003-2004 is expected to be similar to 2002-2003, total production, including yellow, brown, and oriental types, is forecast to increase, assuming normal growing conditions, lower abandonment and higher yields. Average prices are expected to decrease from 2002-2003, but remain relatively high compared to historical levels. This issue of the *Bi-weekly Bulletin* examines the situation and outlook for mustard seed.

### WORLD

#### Production and Trade

India produces the bulk of world mustard seed. However production data for India, as well as two other significant producers, Pakistan and Bangladesh, is not available since these countries combine the production data for mustard seed and rapeseed. Unofficial estimates for mustard seed production in these countries are about 2.5 million tonnes (Mt) for India and about 150,000 tonnes (t) each for Pakistan and Bangladesh. Mustard seed produced in India, Pakistan and Bangladesh, as well as in other Asian countries, is mainly crushed for oil. Excluding these three countries, mustard seed production has increased from 357,000 t in 1991-1992 to a peak of 592,000 t in 1999-2000. Production dropped sharply during the next two years, mainly because of lower production in Canada, to a low of 360,000 t for 2001-2002, before increasing to 466,000 t for 2002-2003.

Mustard seed exports have increased from 180,000 t in the early 1990s to a peak of 284,00 t in 1996. Exports were 226,000 t in 2001, the latest year for which world trade statistics are available. Canada dominates world mustard seed exports, accounting for about 70% of total world exports. Exports from the Netherlands and Germany are re-exports of imported seed. The only other significant exporters are the Czech Republic, Hungary and Russia. The top five importing countries, Bangladesh, the United States (US), Germany, France and

Netherlands, account for about 80% of world imports.

### CANADA

#### Production

The three types of mustard seed produced in Canada are yellow (*Sinapis alba*), brown, and oriental (both *Brassica juncea*). Mustard seed can be grown on most soil types, but is best adapted to the brown and dark brown soils. Soils prone to crusting and dry, sandy soils are not recommended. All mustard seed types tolerate drought conditions better than canola. Mustard seed fits well in a rotation with cereal grains. Yellow mustard seed requires 90-92 days to mature, brown 85 days and oriental 86-88 days. Seedlings are quite tolerant of frost. Therefore, early seeding is recommended to avoid flowering during the hottest part of the summer, thereby improving yields.

Canadian mustard seed production has been variable during the past 10 years, ranging from a low of 105,000 t in 2000-2001 to a high of 319,000 t in 1994-1995. For 2001-2002 and 2002-2003, average yields were lower than normal and abandonment rates were higher than normal due to drought in most growing areas. However,

production increased in 2002-2003, as compared to 2001-2002, due to a sharply higher seeded area. Saskatchewan dominates Canadian mustard seed production with 81% of the production in 2002-2003, followed by Alberta at 12% and Manitoba at 7%.

Production by type varies from year to year depending on price prospects for each type of mustard seed. For 2002-2003, production increased from 2001-2002 for all three types. Oriental mustard seed generally has the

### WORLD: MUSTARD SEED PRODUCTION

|                           | 1999<br>-2000 | 2000<br>-2001 | 2001<br>-2002 | 2002<br>-2003 | 2003<br>-2004 <sup>f</sup> |
|---------------------------|---------------|---------------|---------------|---------------|----------------------------|
| .....thousand tonnes..... |               |               |               |               |                            |
| Canada*                   | 306           | 202           | 105           | 154           | 230                        |
| Nepal                     | 120           | 123           | 132           | 135           | 125                        |
| United States **          | 22            | 17            | 19            | 56            | 65                         |
| Russia                    | 43            | 33            | 28            | 28            | 30                         |
| Myanmar                   | 13            | 21            | 30            | 30            | 25                         |
| Czech Republic            | 45            | 14            | 19            | 34            | 25                         |
| China                     | 20            | 25            | 13            | 13            | 15                         |
| Romania                   | 8             | 1             | 4             | 4             | 4                          |
| Germany                   | 4             | 4             | 4             | 4             | 4                          |
| Slovakia                  | 5             | 2             | 2             | 3             | 3                          |
| Other                     | 6             | 4             | 4             | 5             | 5                          |
| <b>World</b>              | <b>592</b>    | <b>446</b>    | <b>360</b>    | <b>466</b>    | <b>531</b>                 |

Note: India, Pakistan and Bangladesh are important producers, but mustard seed production data for these countries is not available as it is combined with rapeseed production data.

<sup>f</sup>: forecast, AAFC, February 2003

Source: FAO, except \*Statistics Canada, \*\*USDA - February 2003

highest yield. The yields of brown and yellow mustard seed are about 5% and 20% lower than oriental, respectively. Since the costs of production are similar for all types, prices for brown mustard seed have to be about 5% higher and for yellow mustard seed about 25% higher compared to oriental mustard seed to encourage production of the brown and yellow types rather than the oriental type.

The quality of the 2002-2003 crop was lower than normal. According to a survey conducted by Saskatchewan Agriculture, Food and Rural Revitalization, about 44% of the mustard seed in that province graded 1 Canada (normally 78%), 32% graded 2 Canada (16%), 16% graded 3 Canada (4%) and 8% graded 4 Canada and Sample (2%).

### Uses

Mustard seed is a nutritious food ingredient. Its high protein content of 28-36% is of particular interest when used in processed meats. The oil in mustard seed inhibits growth of certain yeasts, molds and bacteria, which enables mustard seed to function as a natural preservative and extends the shelf life of finished foods.

Yellow mustard seed is suitable for a wide range of applications, including dry milling for flour, wet milling for mustard pastes, and whole ground seed for spice mixes, meat processing and other food products. It is the type of mustard seed used for processing into the North American hot dog mustard, which uses the whole seed for a milder product. In processed meats, it is used as a binder and a protein extender, and to enhance the flavour. It is also used in mayonnaise and salad dressings. Dry milled flour is used for condiments and as an ingredient in compounded products. Since there are several varieties of yellow mustard seed grown in Canada, there is a range of mucilage contents available, allowing processors to blend varieties to reach a standard viscosity. Mucilage is a gummy substance found in the seed coat of yellow mustard seed. It absorbs water, keeps meat dry and is a binding and thickening agent in meat and soup. Yellow mustard seed can also be ground for use as an ingredient for the prepared meat industry, where it contributes to total protein. As well, the gelling of the mucilage increases water absorption into the product, which provides enhanced economy and improved efficiency in the smooth moulding of shaped products. Heat inactivated (spice heat removed) whole ground seed is used as an ingredient in many food products providing colour, flavour, viscosity and emulsification. The oil content of yellow mustard seed is about 27%.

Brown mustard seed is ground into flour which is used to produce a hot mustard used in

European products. The flour is also used in mayonnaise, salad dressing and sauces. The oil content of brown mustard seed is about 36%.

Canadian oriental mustard seed varieties have been bred for specific levels of oil and volatility to meet alternative market requirements. High volatility, high oil content oriental mustard seed varieties are suitable for the oilseed demand in the Indian sub-continent, while low volatility, low oil content mustard seed varieties are suitable for dry milling purposes. Stronger flavoured oriental mustard seed varieties are also available if the miller or processor requires it. There are oriental mustard seed varieties grown in Canada that have oil contents as high as 50%, although the average oil content is about 39%.

### Marketing

All of the mustard seed produced in Canada is sold on the open market to dealers. There are about twenty dealers across the Prairie provinces who buy, clean, and ship mustard seed to domestic and export markets. Mustard seed is shipped both bulk and in containers, depending on the volume shipped and the destination. Deliveries to domestic and US customers are in bulk in trucks or in containers which are carried by trucks or trains. Some mustard seed is grown under production contracts, which guarantee a price for part of the production, and the rest is sold on the spot market.

The Saskatchewan Mustard Growers' Association was formed to advance the production of mustard seed and promote the industry.

The Canadian Special Crops Association (CSCA) ([www.specialcrops.mb.ca](http://www.specialcrops.mb.ca)) establishes trade rules and serves as a forum for exporters, dealers and brokers involved in the industry of trading Canada's pulse and special crops, including mustard seed.

The Canadian Grain Commission administers quality control standards for mustard seed. There are four grades for each type of mustard seed. In addition, mustard seed can be graded "Sample" if it does not meet the specifications for the four grades. Top grades of mustard seed are obtained when seeds are well matured, have good colour with minimal damage, and

are free of seeds from volunteer canola plants and weeds such as cow cockle. For further information, or to access the Official Grain Grading Guide, please visit the CGC website: ([www.grainscanada.gc.ca](http://www.grainscanada.gc.ca))

### Domestic Use

Canadian domestic use, which includes food, seed, dockage and waste, accounts for about 25% of the total use. There are several processors of mustard seed in Canada, concentrating on milling seed for its flour and for condiments. Most of the mustard seed processed in Canada is the yellow type, however some brown and oriental types are also milled mainly to be blended with yellow mustard flour for customers who want a spicier product. Statistics on domestic use are not available. Therefore, domestic use is calculated as a residual after deducting exports and carry-out stocks from total supply.

### Exports

Canadian mustard seed exports are mainly in the bulk, unprocessed form. Europe (mainly Belgium, Netherlands, Germany, France and the United Kingdom), Asia (mainly Bangladesh, India, Japan, Thailand and South Korea), and the US account for the majority of

| WORLD: MUSTARD SEED EXPORTS                                                                                                      |            |            |            |            |            |
|----------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|------------|------------|
| <i>calendar year</i>                                                                                                             | 1997       | 1998       | 1999       | 2000       | 2001       |
| .....thousand tonnes.....                                                                                                        |            |            |            |            |            |
| Canada*                                                                                                                          | 161        | 168        | 160        | 159        | 152        |
| Czech Republic                                                                                                                   | 15         | 12         | 23         | 34         | 17         |
| Germany                                                                                                                          | 7          | 7          | 7          | 11         | 11         |
| Russia                                                                                                                           | 20         | 3          | 3          | 26         | 10         |
| Hungary                                                                                                                          | 11         | 17         | 13         | 15         | 8          |
| Netherlands                                                                                                                      | 13         | 13         | 11         | 9          | 7          |
| India                                                                                                                            | 1          | 1          | 1          | 1          | 7          |
| Romania                                                                                                                          | 4          | 5          | 3          | 3          | 4          |
| United States                                                                                                                    | 3          | 3          | 3          | 2          | 3          |
| Other                                                                                                                            | 13         | 4          | 5          | 5          | 7          |
| <b>World</b>                                                                                                                     | <b>248</b> | <b>233</b> | <b>229</b> | <b>265</b> | <b>226</b> |
| WORLD: MUSTARD SEED IMPORTS                                                                                                      |            |            |            |            |            |
| <i>calendar year</i>                                                                                                             | 1997       | 1998       | 1999       | 2000       | 2001       |
| .....thousand tonnes.....                                                                                                        |            |            |            |            |            |
| Bangladesh                                                                                                                       | 45         | 101        | 52         | 57         | 57         |
| United States                                                                                                                    | 59         | 55         | 47         | 51         | 49         |
| Germany                                                                                                                          | 29         | 37         | 40         | 46         | 42         |
| France                                                                                                                           | 31         | 28         | 30         | 31         | 31         |
| Netherlands                                                                                                                      | 23         | 19         | 14         | 16         | 16         |
| Japan                                                                                                                            | 10         | 9          | 10         | 9          | 8          |
| Austria                                                                                                                          | 5          | 6          | 6          | 5          | 4          |
| Poland                                                                                                                           | 1          | 3          | 5          | 6          | 4          |
| Other                                                                                                                            | 27         | 34         | 37         | 37         | 43         |
| <b>World</b>                                                                                                                     | <b>230</b> | <b>292</b> | <b>241</b> | <b>258</b> | <b>254</b> |
| The difference between imports and exports is attributed to the timing of delivery and international classification differences. |            |            |            |            |            |
| Source: FAO except * which is Statistics Canada, February 2003                                                                   |            |            |            |            |            |

the exports. Europe imports mainly brown mustard seed, Asia mainly oriental and the US mainly yellow.

For 2002-2003, Canadian exports are expected to decrease from 2001-2002 due to lower total supply, as higher production was more than offset by lower carry-in stocks. Although US production increased sharply in 2002-2003, Canadian exports to the US are expected to drop only slightly because of increased demand.

In addition to seed exports, some of the mustard seed flour produced in Canada is exported to the US and other markets.

#### Prices

Canadian prices are determined on an export basis because Canada exports about 75% of its production. Therefore, they are highly sensitive to the value of the Canadian dollar in foreign markets. Prices of the yellow type are usually higher than for the brown and oriental types. However, since yields of the yellow type are usually lower, earnings per hectare tend to be similar for all three types over the long-term. Since there is no futures market for mustard seed, prices are negotiated directly between the producer, dealer, and customer based on supply and demand factors for each type of mustard seed. The prices negotiated could be for immediate delivery or for delivery at some future date.

For 2002-2003, prices for No.1 grade brown and oriental mustard seed are expected to average higher than in 2001-2002, because of lower supply of high quality seed for the brown type and higher oil prices for the oriental type. Prices for yellow mustard seed are expected to average lower than in 2001-2002 due to increased production in Canada, the US and Europe. However, the pressure of higher production on No.1 grade prices is expected to be partly offset by lower average quality in Canada. The price spread between grades has widened for all types due to the lower proportion of No.1 grade seed.

#### OUTLOOK

##### World: 2003-2004

World mustard seed production (excluding India, Pakistan, and Bangladesh) is forecast to increase by 14% from 2002-2003 to 531,000 t, due to higher production in Canada.

##### Canada: 2003-2004

Area seeded is forecast to be similar to 2002-2003. Although good contract prices and price prospects for 2003-2004 would normally support increased seeded area for mustard seed, the support is expected to be offset by good price prospects for alternate crops, such

as canola, and limited availability of seed for planting. Due to the dry soil conditions in many mustard seed growing areas of western Canada, average yields are forecast to be below trend, but higher than in 2002-2003.

Assuming normal abandonment rates and normal precipitation during the growing season, production is forecast to increase by 50% to 230,000 t. Production is expected to increase for all three types. Assuming normal growing and harvest conditions, average quality is expected to return to normal. Total supply is forecast to increase by 25%, as higher production is partly offset by lower carry-in stocks. Carry-in stocks, mainly low quality seed, are expected to be low for all three types. Exports and domestic use are forecast to increase because of the higher supply. Carry-out stocks are forecast to increase, with a stocks-to-use ratio of 9%.

The higher supply and a return to normal quality are expected to pressure prices, with average prices decreasing for all three types, but remaining relatively high compared to historical levels. The price spreads between

grades are expected to decrease, assuming a return to normal quality. However, prices are expected to be very sensitive to any production problems due to low carry-in stocks.

The main factor to watch is precipitation during the rest of the winter and, especially, during the spring in the growing areas. If surface soil moisture is low during seeding, the area seeded for mustard seed could be lower than forecast. Since mustard seed needs to be planted shallow because of the small seed size, dry soil surface could encourage some shift to larger seed crops, such as wheat, which can be seeded deeper. Precipitation will also be the main factor to watch during the growing season.

#### Canada: longer-term

There is strong and growing demand for mucilage and plant breeders have responded by developing yellow mustard seed varieties with higher mucilage levels. Two new varieties, Viscount and Andante, have mucilage levels which are about 30% higher than traditional varieties. Work is continuing

### CANADA: MUSTARD SEED SUPPLY AND DISPOSITION

| <i>August-July<br/>crop year</i> | <b>1999<br/>-2000</b> | <b>2000<br/>-2001</b> | <b>2001<br/>-2002</b> | <b>2002<br/>-2003f</b> | <b>2003<br/>-2004f</b> |
|----------------------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|
| Seeded Area (000 ha)             | 280                   | 212                   | 166                   | 289                    | 285                    |
| Harvested Area (000 ha)          | 273                   | 208                   | 158                   | 255                    | 278                    |
| Yield (t/ha)                     | 1.12                  | 0.97                  | 0.66                  | 0.60                   | 0.83                   |
| .....thousand tonnes.....        |                       |                       |                       |                        |                        |
| Carry-in stocks                  | 50                    | 115                   | 105                   | 33                     | 10                     |
| <i>Production:</i>               |                       |                       |                       |                        |                        |
| <i>Yellow</i>                    | 76                    | 59                    | 51                    | 78                     | 105                    |
| <i>Brown</i>                     | 80                    | 48                    | 21                    | 37                     | 65                     |
| <i>Oriental</i>                  | 150                   | 95                    | 33                    | 39                     | 60                     |
| <b>Total Production</b>          | 306                   | 202                   | 105                   | 154                    | 230                    |
| Imports                          | 1                     | 1                     | 3                     | 6                      | 1                      |
| <b>Total Supply</b>              | <b>357</b>            | <b>318</b>            | <b>213</b>            | <b>193</b>             | <b>241</b>             |
| Exports                          | 170                   | 151                   | 168                   | 155                    | 170                    |
| Total Domestic Use               | 72                    | 62                    | 12                    | 28                     | 51                     |
| <b>Total Use</b>                 | <b>242</b>            | <b>213</b>            | <b>180</b>            | <b>183</b>             | <b>221</b>             |
| <b>Carry-out Stocks</b>          | <b>115</b>            | <b>105</b>            | <b>33</b>             | <b>10</b>              | <b>20</b>              |
| Stocks-to-Use Ratio (%)          | 48                    | 49                    | 18                    | 5                      | 9                      |
| Harvested Area (000 ac.)         | 675                   | 514                   | 390                   | 630                    | 687                    |
| Yield (lb/ac.)                   | 999                   | 865                   | 589                   | 535                    | 741                    |
| Production (Mlb)                 | 675                   | 445                   | 231                   | 340                    | 507                    |
| Average producer price *         |                       |                       |                       |                        |                        |
| Yellow \$/t                      | 287                   | 375                   | 1,080                 | 794                    | 507                    |
| \$/lb                            | 0.13                  | 0.17                  | 0.49                  | 0.36                   | 0.23                   |
| Brown \$/t                       | 265                   | 243                   | 485                   | 728                    | 441                    |
| \$/lb                            | 0.12                  | 0.11                  | 0.22                  | 0.33                   | 0.20                   |
| Oriental \$/t                    | 265                   | 220                   | 353                   | 463                    | 397                    |
| \$/lb                            | 0.12                  | 0.10                  | 0.16                  | 0.21                   | 0.18                   |

\* Saskatchewan, No.1 CAN grade

f: forecast, Agriculture and Agri-Food Canada, February 2003

Source: Statistics Canada and AAFC

on developing additional varieties. Producers are not likely to receive premiums for growing varieties with high mucilage levels because there is no way to measure mucilage levels at the plant. The only way that premiums for mucilage are possible is through segregation and identity preservation. However, premiums for high mucilage may not always occur even with segregation and identity preservation if the price of yellow mustard seed is too high, because users of mucilage may switch to substitute products, such as guar gum. Higher mucilage levels are expected to increase demand for yellow mustard seed, as marketers promote the value of the product to end users. There could be one side benefit of increased mucilage levels. Since mucilage draws water into the seed, it might help germination.

Demand for mustard seed is expected to increase during the next decade due to increased population, increased use of spices and increased demand for other uses such as mucilage.

A potential additional use of mustard seed could be for biodiesel. Oil crushed from mustard seed can be used in the production of biodiesel, a fuel for compression engines

coming from biological sources. However, the mustard seed oil price would have to be competitive with alternative sources, such as soyoil and canola oil. Therefore, biodiesel might become a market for low quality mustard seed, when the biodiesel industry develops.

Demand is expected to grow from end users for identity preservation (IP) to ensure specific quality characteristics. IP systems ensure traceability of product from the end-user back to the producer. It involves documentation for each step of production, handling and processing, as well as production, handling and processing standards, and auditing. Although there will be extra cost in an IP system, it will be a marketing tool for Canadian mustard seed.

## CANADA: MUSTARD SEED EXPORTS

| August-July<br>crop year  | 1999<br>-2000 | 2000<br>-2001 | 2001<br>-2002 | 2002<br>-2003 | 2003<br>-2004f |
|---------------------------|---------------|---------------|---------------|---------------|----------------|
| .....thousand tonnes..... |               |               |               |               |                |
| Europe                    | 53            | 55            | 67            | 60            | 62             |
| Asia                      | 62            | 44            | 51            | 50            | 60             |
| United States             | 52            | 49            | 47            | 42            | 45             |
| South and Central America | 2             | 2             | 2             | 2             | 2              |
| Other*                    | 1             | 1             | 1             | 1             | 1              |
| <b>Total</b>              | <b>170</b>    | <b>151</b>    | <b>168</b>    | <b>155</b>    | <b>170</b>     |

\* Middle East, Africa and Oceania

f: forecast, AAFC, February 2003

Source: Statistics Canada

*For periodic updates on the situation and outlook for mustard seed, visit the Market Analysis Division Website for "Canada: Pulse and Special Crops Outlook."*

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## US FARM SECURITY AND RURAL INVESTMENT ACT OF 2002 (FSRIA)

Under the FAIR Act, the national **loan rate** for mustard seed was US\$0.093/lb. Under the FSRIA, it increased to US\$0.0988/lb for 2002-2003 and to US\$0.1019/lb for 2003-2004. For crop years 2004-2007, the loan rate is expected to fall slightly. These rates are for the top grade and there are discounts of US\$0.01-0.05/lb for lower quality seed. The loan rate varies by county and is highest in North Dakota, where for 2003-2004 it ranges from US\$0.1022-0.1082/lb. In Montana, the loan ranges from US\$0.1003-0.1054/lb. The loan rate provides a floor return because if the price is lower than the loan rate, the producer is eligible for a loan deficiency payment. Mustard seed production in the US is mainly in North Dakota and Montana and nearly all of the production is the yellow type. Average prices by state are not available, but the average national prices paid to producers were US\$0.114, 0.114, 0.101, and 0.121/lb (preliminary) for 1998-1999, 1999-2000, 2000-2001 and 2001-2002, respectively. These prices were above the 2003-2004 loan rate except for 2000-2001, which was slightly below the 2003-2004 loan rate. However, the average price for 2000-2001 was above the loan rate for that year. The current producer prices in North Dakota and Montana are US\$0.18-0.22/lb, well above the loan rate. Mustard seed is eligible for the minor oilseeds **direct payment** of US\$0.008/lb. However, this is based on historical seeded area and yields and is theoretically decoupled from the area seeded during the year of the payout. Mustard seed is eligible for the minor oilseeds **target price** support of US\$0.098/lb for crop years 2002 and 2003, and US\$0.101/lb for crop years 2004 to 2007. However, since the target prices are below the loan rate, they are not significant for mustard seed.

Program payments under the FSRIA are expected to support mustard seed production in 2003-2004, although market prices are expected to be above the loan rate. In the longer term, the program payments will especially encourage mustard seed planting in years when prices are low. Therefore, production will be higher than without program payments, which will pressure Canadian prices.

*While the Market Analysis Division assumes responsibility for all information contained in this bulletin, we wish to gratefully acknowledge input from the following:*

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