



BRIEFING

Briefing No. 56

November 2005-Revised

Flaxseed

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Background

Flaxseed, *Linum usitatissimum* L., is an ancient crop used both for its fiber and its edible seed. Flaxseed is generally referred to as “linseed” outside of North America, where the name flax refers only to the fiber form of the crop used for the linen textile industry. Flaxseed is said to have originated in the Mediterranean region of Europe. Stone Age dwellings in Switzerland contained remnants of flax and ancient Egyptians made some of their finer linens (often used to wrap mummies in tombs) from flax fiber. In the United States, early colonists grew flax for home use. Commercial flax production for fiber in the United States began in 1753.

Flax is an annual oilseed that only accounts for approximately one

percent of the world’s oilseed supplies. It is used in industrial applications, for human consumption, and as a component in livestock feed.

Two main types of flax grown throughout the world: seed flax and fiber flax. Seed flax is grown for the oil in its seed. Linseed oil, a primary product of seed flax, is obtained by compressing the flaxseed and the application of a petroleum solvent. It is a non-edible drying oil used for manufacturing paints, varnishes linoleum, printing ink, oilcloth, putty, and plastics. Linseed oil production results in residual products such as linseed meal, livestock feed, and flaxseed stems that are used to make paper products such as cigarette paper.

The Agricultural Marketing Policy Center would like to acknowledge the support provided by Fort Peck Community College for this project.

This publication is a product of a collaborative research project between Fort Peck Community College and the Agricultural Marketing Policy Center.

Figure 1: Percentage of World Flaxseed Production by Country: 2004

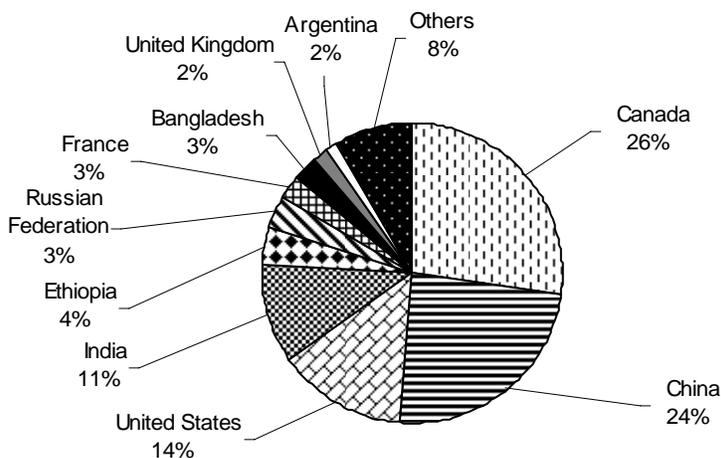


Table 1: World Flaxseed Production, Historical

Year	Production in Metric Tons
1993	2,190
1994	2,456
1995	2,525
1996	2,478
1997	2,279
1998	2,746
1999	2,695
2000	2,061
2001	1,901
2002	1,990
2003	2,121
2004	1,903

Table 2: United States Flaxseed Production, Acreage and Production

Year	Acreage		Production		
	Planted (000)	Harvested (000)	Yield (bu)/acre	Total (000) bushels	Metric Tons
1993	206	191	18.2	3,482	80,488
1994	178	171	17.1	2,922	67,543
1995	165	147	15	2,212	51,131
1996	96	92	17.4	1,602	37,031
1997	151	146	16.6	2,420	55,939
1998	336	329	20.4	6,708	155,057
1999	387	381	20.6	7,864	181,779
2000	536	517	20.8	10,730	248,027
2001	585	578	19.8	11,455	264,786
2002	784	703	16.9	11,863	274,216
2003	595	588	17.9	10,516	243,081
2004	523	516	20.3	10,471	242,040

Production

*World*¹: In 2004, world flaxseed production was about two million metric tons. Flaxseed is produced in over 47 different countries. Canada, China, and the United States typically combine to produce nearly 64 percent of total world flaxseed output (Figure 1).

Annual flaxseed production has been relatively stable in recent years, averaging about two million metric tons between 2000 and 2004. Over the past two decades, flaxseed world production peaked at 2.7 million metric tons in 1998 and experienced a low of 1.90 million metric tons in 2001 (Table 1).

United States: The United States produced approximately 14 percent

of world flaxseed output in 2004. In the United States, the total acreage planted to flaxseed has fluctuated widely over the last 12 years. The area planted to flaxseed in the United States was 206,000 acres in 1993 and decreased substantially to only 96,000 acres in 1996. Since 1996, the area planted to flaxseed increased steadily to a high of 784,000 acres in 2002 but dropped to 523,000 in 2004 (Table 2).

Montana: Montana is a relatively minor producer of flaxseed, accounting for about three to four percent of total United States production in recent years. Flaxseed production in Montana reached a peak of 7,905 metric tons in 2004, up from a low of 2,160 metric tons in 2001 (Table 3).

Montana’s share of total United States flaxseed production was just over four percent in 1999, but fell to approximately 1.5 percent in 2001 and 2002 when Montana yields were drought impacted. Since 2002, however, Montana’s share has increased to just over three percent in 2004 (Figure 2).

Domestic Competition: In addition to producers in other countries, Montana flaxseed producers must compete with other states for the United States flaxseed market. North Dakota is the major flaxseed producer in the United States and accounts for 93 percent of U.S flaxseed acreage.

¹ The data on world production of flaxseed was obtained from the FAOSTAT database of the Food and Agriculture Organization of the United Nations, which is compiled on a calendar year-basis. Marketing year and crop year information may yield somewhat different numerical results.

Table 3: Montana Flaxseed Production, Historical Production

Year	Acreage		Production		
	Planted (000)	Harvested (000)	Yield (bu) acre	Total (000) bushels	Metric Tons
1999	21	20.5	16	328	7,582
2000	16	14	14	196	4,561
2001	14	12	15	180	4,161
2002	17	15	13	195	4,507
2003	17	17	13	221	5,108
2004	20	19	18	342	7,905

Figure 2: Montana's Share of United States Total Flaxseed Production

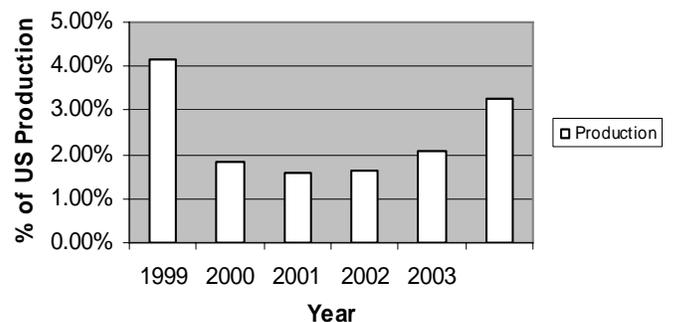


Figure 3: Percent of United States Flaxseed Planted Acreage by State: 2004

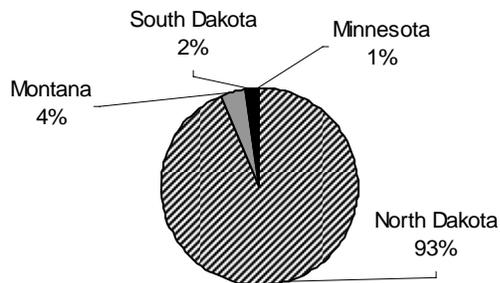
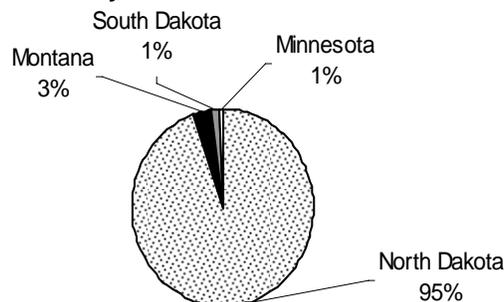


Figure 4: Percent of United States Flaxseed Production by State: 2004



Montana accounts for four percent of flaxseed acreage and three percent of flaxseed production in the United States (Figures 3 and 4).

Consumption

Flax has generally been utilized for production of linseed oil. Linseed oil is not used for human consumption because it contains high amounts of fatty acids and has a higher chance of going rancid than several other vegetable oils. It is also unstable at high temperatures. Linseed oil is strictly used in industrial processes. Human consumption of flaxseed has recently increased. Recent research has led to the development of edible vegetable oil-type flaxseed or “Linola.” The new lines of flaxseed that have been developed into

“Linola” oil contain less fatty acid and have more useful properties for human consumption. Flaxseed consists of 27 to 32 percent protein and 37 to 47 percent of total dietary fiber.

Flaxseed has been used as food for centuries in Asia, Europe, and Africa. Flax is beneficial to humans and animals alike because it has a very high content of alpha linolenic acid, a high percentage of dietary fiber (both soluble and insoluble), and the highest content of plant “lignans” of all plant or seed products used for human food. Lignans appear to be anti-carcinogenic compounds.

Some uses of flax for human consumption include ready-to-eat breakfast cereals, breakfast drinks, salad dressings, salad toppings, biscuits, crackers, soups, bagels, and

cakes. Flaxseed flour is used commercially in breads in the United States. Recent studies have shown that when flaxseed is eaten regularly and in moderate amounts, flaxseed improves regulation of the intestinal system, moderately reduces low-density lipoprotein (LDL) cholesterol, and increases urinary lignan formation and excretion.

Imports

In recent years, about 51 percent of world flaxseed production has been traded internationally. About 970,000 metric tons of world flaxseed production was traded on international markets in the 2003 crop year.

Table 4: Major World Flaxseed Importing Countries, 2003

Country	World Rank	Metric Tons
Belgium	1	476,859
Germany	2	174,867
United States	3	100,935
France	4	35,427
Netherlands	5	33,820
Japan	6	21,207
Egypt	7	20,641
Canada	8	19,973
Italy	9	14,153
United Kingdom	10	10,839
Others		57,125
World Total		965,846

Table 5: Major World Flaxseed Exporting Countries, 2003

Country	World Rank	Metric Tons
Canada	1	689,714
Belgium	2	111,110
United States	3	67,220
France	4	26,491
United Kingdom	5	21,655
Netherlands	6	13,495
China	7	12,583
Germany	8	8,392
Russian Federation	9	6,626
Czech Republic	10	4,136
Others		16,848
World Total		978,270

Figure 5: Percent of World Flaxseed Imports by Country: 2003

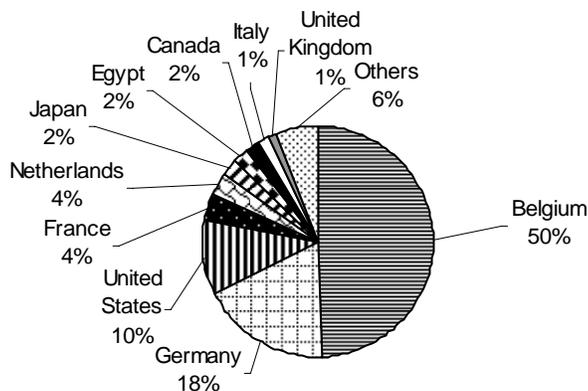
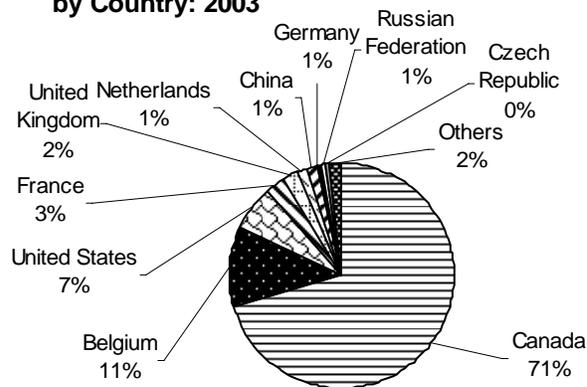


Figure 6: Percent of World Flaxseed Exports by Country: 2003



In the 2003 crop year, the three largest importing flaxseed countries were Belgium, German, and the United States (Table 4). Collectively, these three countries account for around 78 percent of world flaxseed trade. Other flaxseed imports were widely spread, with 93 other countries reporting imports of flaxseed in 2003. The United States imported approximately 10 percent of total world flaxseed imports (Figure 5).

Exports

The United States exported 67,220 metric tons of flaxseed in 2003, accounting for approximately 25 percent of total United States production and seven percent of total world flaxseed exports (Table 5). Canada is the world's leading exporter of flaxseed. Canada, Belgium, and the United States jointly accounted for approximately 89 percent of the world's flaxseed exports in 2003 (Figure 6).

Summary

World production of flaxseed has been around two million metric tons in recent years. About 51 percent of

world production is traded on international markets. The United States accounts for about 14 percent of world flaxseed production and about seven percent of world exports. Flaxseed imports into the United States were about 100,935 in 2003. In recent years, Montana produced approximately four percent of total flaxseed output in the United States. In the 2004 crop year, production of flaxseed in Montana hit a record high of approximately 7,905 metric tons.

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