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Production, Processing and Marketing Potential for Rapeseed in the Pacific Northwest

Tony Prato, Agricultural Economist

Depressed markets for traditional crops such as wheat and barley have generated considerable interest in expanding the production, processing and marketing of rapeseed in the Pacific Northwest (PNW). This report evaluates the potential for such expansion. It considers market trends for oilseed products; industrial and edible rapeseed markets; the relationships between oilseed, vegetable oil and oilseed meal markets and their effect on rapeseed production and marketing; domestic and export market potential for PNW rapeseed, and the prospects for expanding oilseed crushing facilities in the PNW.

Market Trends For Oilseed Products

From 1981 to 1986, world oilseed production grew about 16 percent while international trade in oilseed remained relatively constant. During this same period, world consumption of vegetable oil increased 17.4 percent and world exports of palm oil grew 6.7 percent. Although soybean oil still accounted for almost 30 percent of total vegetable oil production, it was estimated to account for only 21 percent of international trade in 1986-87, down from 29 percent in 1982-83. Palm oil increased from 28 to 36 percent of world exports of vegetable oil during the 1981-86 period. Growth in oilseed meal consumption has been slightly below the rate of world population growth.

This CIS is an adaptation of a comprehensive report, *Rapeseed Marketing Study*, written by Michael Harker. The comprehensive report can be obtained from the Clearwater Economic Development Association, Federal Bldg., Suite 229, Moscow, ID 83843. Funding for the comprehensive study was provided by the U.S. Department of Commerce and the Idaho Department of Agriculture through a contract with the Postharvest Institute for Perishables at the University of Idaho.

During the last 5 years, oilseed crush (use) increased by 8.4 percent, oilseed production rose 10 percent and ending stocks of oilseed increased 44.7 percent. Surplus stocks have exerted downward pressure on oilseed prices. Production of palm oil in Southeast Asia has grown rapidly over the past decade. Since palm kernel is perishable and cannot be stored, it must be processed and, shortly thereafter, marketed. To sell the large volumes produced, palm oil has been priced below other vegetable oils. Lower oil prices have in turn contributed to the accumulation of oilseed stocks.

Industrial and Edible Rapeseed Markets

Two major types of rapeseed are produced. One is used in industrial products and the other for human consumption. Industrial rapeseed has a minimum acceptable erucic acid content of 40 percent. The erucic acid content of edible rapeseed cannot exceed 2 percent. Production areas, markets and end uses for both types of rapeseed are different. Recently, Washington and Idaho developed regulations that established separate production districts for edible and industrial rapeseed varieties to avoid cross contamination and to ensure product quality. For the most part, eastern Washington districts are growing edible rapeseed and Idaho districts are producing industrial rapeseed. (For more information, see University of Idaho CIS No. 819, *Rapeseed Production Districts in Idaho*.)

Current U.S. markets for industrial rapeseed can be served with production from 40,000 acres. While this production level could be achieved in northern Idaho, production areas in southeastern Idaho, Arkansas and the Mississippi Delta can also supply this market. Since much of the information regarding the market potential for in-

dustrial rapeseed is proprietary, expanded production of industrial varieties in the PNW will be largely dependent on private marketing initiatives. While current marketing potential for industrial rapeseed appears quite limited, its suitability as a biological source for industrial products indicates good potential for long-term market expansion.

Edible rapeseed and rapeseed oil have a worldwide market which is sufficiently large enough to absorb increased production of PNW rapeseed. The market potential for edible rapeseed depends on how well it can compete in terms of price and quality with other vegetable oils and meals and with animal fats. In terms of quality, rapeseed oil has a lower saturated fat content than many vegetable oils. To the extent that public education or promotion by the industry can persuade U.S. consumers that rapeseed oil is superior for health reasons, rapeseed oil could attain a higher market share than other vegetable oils. Proctor and Gamble is testing this possibility with its Puritan oil and a Canadian firm with its West Canola oil. Both products are made from edible rapeseed.

Although market prices for vegetable oil and oilseed have declined since 1984, rapeseed, rapeseed oil and rapeseed meal have increased their market shares. From 1982-83 to 1986-87, rapeseed's share of the world oilseed market increased from 9.6 to 10.8 percent. Rapeseed oil's share of world vegetable oil consumption increased from 11.9 to 13.2 percent and rapeseed meal's share of world consumption increased from 9.2 to 10.8 percent. Rapeseed oil prices have been comparable to soybean oil prices. However, rapeseed meal prices have been substantially below soybean meal prices because of rapeseed meal's lower nutritive value.

China, Canada and Europe are major producers of rapeseed. Japan, not a major rapeseed producer, purchases significant volumes of rapeseed on the world market to use in its domestic crushing facilities. Since Japan is a major importer of rapeseed, exports to Japan represent a potentially large market for PNW rapeseed.

Because of the economic benefits associated with a crushing industry (e.g., jobs, capital investment and tax revenues), many importing countries have established trade policies and import tariffs that favor importation of raw product at the expense of oil and meal. This has been disadvantageous to the U.S. and Canadian crushing industries, which rely on export markets for their processed agricultural products. In particular, the raw product bias in world markets has reduced North American crushing margins and the profitability of this industry. Current crushing plants seem to be able to cover variable costs but not total costs. This problem has been exacerbated by excess crushing capacity, particularly within that segment of the industry crushing high oil-yielding crops.

Relationships Between Oilseed, Oil and Meal Markets

Oilseed, oil and meal markets are interrelated and complex. The market for edible rapeseed is affected by the demand, supply, price and product characteristics of meal and oil produced from oilseeds, palm kernel and animal fats. Excess world supplies of vegetable oil have kept rapeseed oil prices low. Market conditions and product characteristics of soybean and cottonseed have also impacted rapeseed oil prices. Meal is the primary market for soybean and cottonseed, and oil is the primary market for high oil-yielding seeds such as rapeseed and sunflower. Soybeans yield about 18 percent oil compared to 40 percent for rapeseed and sunflower, but the nutritional value of soybean meal is about 33 percent higher than rapeseed meal. Soybean crush has increased in response to strong meal markets. Since soybean oil is a by-product of the crushing process, supplies of soybean oil have been plentiful, causing edible oil prices to remain low. This situation has adversely affected the profitability of rapeseed because oil is the major product produced from rapeseed.

Domestic and Export Market Potential for PNW Rapeseed

PNW rapeseed can be marketed domestically or exported. Domestic markets for oilseed, oil and meal are very large. In the 1985-86 marketing year, the U.S. consumed almost 14 billion pounds of edible fats and oils of which 90 percent were domestically produced. The PNW is not currently a significant supplier of oilseed, oil or meal. However, the region consumes approximately 256,000 tons of fats and oils per year, and imports about 700,000 tons of soybean meal from the Midwest and about 150,000 tons of rapeseed meal from Canada. Potato processors use 150,000 to 250,000 tons of edible fat and oil, primarily imported palm oil and domestically produced soybean oil, cottonseed oil and beef tallow.

For PNW rapeseed to capture a significant share of the domestic edible oil and meal markets in the PNW or the U.S., two conditions must exist. First, rapeseed oil and meal from the PNW must be priced competitively with oil and meal produced from soybean, palm and cottonseed, as well as rapeseed oil and meal produced in Canada. Second, the PNW must either use existing crushing facilities in Canada, the northern plains or the Midwest, or expand its own oilseed crushing facilities. The crushing facilities closest to the PNW are located in Lethbridge, Alberta, Canada, and Fargo, North Dakota. Rapeseed shipped to the Lethbridge facility would not be subject to Canadian import tariffs. However, the oil produced from this rapeseed would be subject to a U.S. tariff of 7.5 per-

cent, and the meal would have a tariff of 12 cents per pound if these products were imported to the U.S.

Processing PNW rapeseed at Lethbridge or in the two plants located in Fargo would not allow the PNW to capture the income, employment and tax benefits associated with construction and operation of a crushing facility. The profitability of processing PNW rapeseed at the Lethbridge facility and importing the rapeseed oil and meal back to the U.S. could be increased by returning to producers the import tariff on the oil and meal produced from exported rapeseed.

Even though the Fargo plants are located a greater distance from the region than the Lethbridge plant, rapeseed prices net of shipping costs to Lethbridge or Fargo would be similar. This occurs because freight charges for shipping rapeseed to the Fargo plants would be based on lower backhaul rates that exist for grain trucks returning to North Dakota. Currently, the Lethbridge plant is paying about 7 cents per pound more than the Fargo plant. This differential is explained by the fact that transportation costs to the West Coast are higher for the Fargo plants than for the Lethbridge plant.

Until the PNW can construct crushing facilities, it cannot export rapeseed oil and meal. This situation is not especially limiting because major importing countries such as India, Japan and the EEC are more interested in importing the raw product than oil and meal. Japan now accounts for 43 percent of total world imports of rapeseed and its rapeseed imports are increasing. Over 90 percent of Japanese rapeseed imports come from Canada and 98 percent of Japan's total rapeseed imports are edible varieties. Since Japan is interested in diversifying its supply sources for edible rapeseed, the PNW has a potential to serve this market.

Costs and Returns For PNW Rapeseed

The PNW can capture part of the Japanese market provided it can supply rapeseed at prices competitive with Canada. Based on current shipping costs, rapeseed can be moved from Lewiston, Idaho, to Japan in 20-ton containers at a rate of \$51 to \$61 per ton, or 2.5 to 3 cents per pound. Based on the average 1986 rapeseed price paid by Japan (9.6 cents per pound), rapeseed prices, F.O.B. Lewiston, would be 6.6 to 7.1 cents per pound. At 6 cents per pound, producers in the Palouse would earn about \$20 per acre above variable costs when rapeseed yield is 2,000 pounds per acre. When rapeseed sells for 8 cents per pound, return above variable cost is \$60 per acre. This compares to returns above variable costs of about \$250 per acre for 80-bushel-per-acre wheat at the current target price of \$4.38 per bushel.

Unfortunately, farmgate prices of 6 to 7 cents per pound do not cover total production costs. Returns above total costs are negative, -\$87.89 to -\$127.89 per acre for rapeseed yields of 2,000 pounds per acre, and do not become positive until rapeseed yields exceed 2,300 to 2,500 pounds per acre and farmgate prices exceed 10 to 12 cents per pound. If a credit is given to rapeseed for its value in controlling erosion and disease problems, as well as improving soil tilth and moisture absorption/retention, breakeven prices and yields could be lower.

While industry sources indicate Japan would purchase containerized shipments of rapeseed and such shipments would be compatible with current PNW production levels, the Japanese prefer bulk shipments of 30,000 to 50,000 tons because their rapeseed crushing facilities are designed to receive bulk shipments. Until such time as PNW production levels can support bulk shipments to Japan, a viable alternative is to ship the rapeseed to Canada where it can be combined with Canadian rapeseed and exported to Japan. This option allows the PNW to benefit from Canada's bulk handling facilities and allows Canada to benefit from higher quality rapeseed grown in the PNW.

Another way to move PNW rapeseed into international markets is to use the port facilities along the Snake River. One company has already made a small shipment of edible rapeseed to Japan. Should the PNW develop capacity for bulk shipments, it can compete directly with Canada for the Japanese market. Due to lower transportation costs, bulk shipments from the PNW to Japan would increase rapeseed prices in the PNW by .5 to 1 cent per pound.

Mexico provides another potential market for PNW rapeseed. Though currently a small importer of rapeseed, Mexican imports are growing. While Canada's ability to make bulk shipments gives it a cost advantage in serving the Mexican market, the PNW's closer proximity to Mexico should give it a competitive advantage if bulk shipments are used.

Prospects for Expanding PNW Crushing Capacity

Major increases in domestic marketing of PNW edible rapeseed will require a regional, commercial-scale crushing facility. Not only would such a facility allow PNW rapeseed to be processed and marketed in the region, but it would also generate secondary economic benefits in the form of jobs, income and tax revenues.

The financial feasibility of a regional processing facility depends on two factors: adequate markets for oil and meal and sufficient rapeseed production. Prospects are good for marketing rapeseed meal and oil in the region

given current usage. Currently, vegetable oil and meal sell at premium prices in the PNW because of the added expense of shipping these products to the region from the Midwest and Southeast. If rapeseed can be produced and processed in the PNW at prices that are no greater than Midwest or Southeast oil and meal prices plus transportation costs to the PNW, then the region could capture a share of these markets.

Production of rapeseed would have to be expanded before a regional crushing facility would be feasible. A commercial-scale oilseed crushing facility costs a minimum of \$25 million, at current prices, and operates on narrow and highly variable margins. Investors could not be expected to risk capital to construct this type of facility unless they can be assured that regional oilseed production will be sufficient to operate the plant at a profit. The

smallest size commercial plant that would allow the PNW to be competitive with other regions would have a crushing capacity of 300,000+ tons of rapeseed per year. Since current rapeseed yields in the PNW average 2,000 pounds per acre, regional acreage would have to reach 300,000 to 450,000 acres to support a commercial scale plant. A crushing facility is not likely to increase farmgate prices for PNW rapeseed because such prices are determined by international demand and supply conditions.

Smaller specialty markets for rapeseed oil and meal and rapeseed seed offer another potential outlet for PNW rapeseed. Such markets can be served without increasing rapeseed acreage. However, growth in specialty markets would require further research to develop the rapeseed varieties from which specialty products can be produced.

Conclusions

These are the conclusions reached in this study:

1. To compete in domestic and world markets, rapeseed oil and meal must be priced competitively with soybean oil and meal, cottonseed oil and meal and palm oil.
2. Rapeseed oil might command a price premium relative to other vegetable oils if consumers can be convinced of the health benefits of rapeseed oil.
3. To export edible rapeseed to Japan, the PNW must be competitive with Canada.
4. The PNW can export small volumes of edible rapeseed to Japan by using shipping facilities in Canada and along the Snake River.
5. To compete directly with Canada in exporting edible rapeseed to Japan, the PNW will have to develop the capacity to make bulk shipments.
6. While there is a potential domestic market for edible rapeseed produced in the PNW, it is not likely to be realized unless the PNW can be competitive with other producing regions in the U.S. and Canada.
7. To support a commercial-scale oilseed crushing facility in the PNW would require 300,000 to 450,000 acres of rapeseed and the existence of viable markets for rapeseed oil and meal.
8. The profitability of processing PNW rapeseed at the Lethbridge facility could be increased by returning to producers the import tariff on the oil and meal produced from the exported rapeseed.
9. Major expansion of PNW rapeseed production is not likely to occur until net returns for rapeseed increase to the levels provided by more traditional crops such as wheat.
10. Specialty markets for rapeseed oil and meal and rapeseed seed offer a potentially significant, though relatively small, outlet for PNW rapeseed.