

# NEW CROPS FOR OREGON

# Rapeseed

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The opportunity to shift hundreds of thousands of acres into a new crop doesn't come along very frequently; when one does, we shouldn't neglect it. Rapeseed, an oilseed that provides both vegetable oil for human consumption and meal for animal feed, has been touted as one such attractive alternative for Oregon.

This publication examines in a step-by-step fashion the potential for the development of a significant rapeseed industry in Oregon. As is frequently the case, a systematic examination of the situation may serve to temper somewhat the initial enthusiasm.

Section 1 provides a general discussion of the procedure to follow in analyzing alternative crops. Section 2 examines why rapeseed has attracted interest. Section 3 places Oregon rapeseed production within the context of the broader world marketplace for oilseeds.

Section 4 focuses on the viability of rapeseed at the farm level in Oregon. Section 5 is our summary. Section 6 lists some publications that you might find helpful.

## 1. Why the interest in producing alternative crops like rapeseed?

In the last several decades, as agriculture has become a more integrated industry, traditional crop production patterns have been altered in response to supply and demand patterns in national and world markets and to domestic and foreign price programs.

Under today's competitive conditions, the ability to produce a crop is no longer

enough; growers also must be able to sell what they produce. To prosper, producers must anticipate and respond quickly to changing market opportunities.

The search for new crops intensifies when returns from traditional crops are unsatisfactory. Specific new crops develop into viable alternatives in a particular location because of climate, soil types, market access, and the treatment of the crops under government programs.

From the producer's perspective, alternative crops are attractive if they offer greater returns, a more stable source of revenue, or both, through diversifying production.

However, producers should recognize this key point: Because new crops are often characterized by increased learning and management requirements, they may reduce rather than increase the stability of returns. In a general sense, the new crop must be compatible with growers' preferences and with their existing cropping (or work) systems.

In many instances, the expected benefits from introducing alternative crops will extend beyond the farm gate. Local and State governments and private sector groups are interested in these broader linkage effects that a new crop can provide.

These additional benefits may result from both the investment supplied to produce, transport, and process the crop and/or the uses that other industries make of the output produced. Therefore, introducing an alternative crop may provide new income-generating activities and employment opportunities off as well as on the farm.

In our rapeseed example, the potential spillover effects are primarily on the output side. In addition to the on-farm

income earned from rapeseed production, a potential "second-round" effect of increasing PNW rapeseed production would be the development of a rapeseed processing industry.

The growth of this industry could, in turn, provide a potential third-round effect through the expansion of industries (livestock and/or potato processing) that would use the oil and meal produced.

In assessing the value of these benefits to existing industries, it's important to recognize that credit should be allocated only to the extent that an *increase* in the value of production results from the newly available inputs. If, for example, the rapeseed products merely replace current equally priced inputs, there would not be any spread effects to be credited.

Since neither the State, the rapeseed processing industry, nor the livestock or potato industries are likely to be involved in the actual production of the new crop, rapeseed will develop as an important Oregon crop only if it's attractive at the producer level.

In other words, rapeseed production will only succeed if producers are confident they'll earn a return that justifies their decision to produce a new crop and to accept its associated risks.

## 2. Why produce rapeseed in Oregon?

Rapeseed has been cultivated for more than 3,500 years; it has been grown in Oregon for 100 years. It has been used as an edible oil, a fuel oil, a lubricant, and a fodder crop. Over time, two distinctly

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different types of rapeseed have been developed—edible and industrial.

Since the market for industrial rapeseed is limited at this time, we'll focus solely on edible rapeseed; however, there are indications that industrial rapeseed holds great promise for developing new plastics and other products, and that production may increase.

Primarily through the efforts of Canadian researchers, edible rapeseed has been dramatically transformed in the past 30 years. The newly developed varieties, which have been named *Canola* in Canada, have an erucic acid content below 2% in the extracted oil, and they contain 30 micromoles or less of glucosinolates per gram of oil-free meal.

As a result, the oil derived from these "double low" varieties has characteristics that are more attractive for human consumption, and the meal is more valuable as an animal feed.

It was only in 1985 that low-erucic acid rapeseed earned the GRAS ("Generally Recognized as Safe") label from the U.S. Food and Drug Administration and was permitted for human consumption in this country. A limited amount of Canadian rapeseed oil is currently entering the U.S. (10,000 tons oil/month), marketed as salad oil. Until recently, product acceptance was restricted by the requirement of listing "low erucic acid rapeseed" rather than "Canola" on U.S. labels.

Demand is now growing, and the first rapeseed-crushing facility is being established in Tennessee. A small quantity of rapeseed meal is also being imported for use as animal feed, primarily into the Pacific Northwest.

Climate and location are the two major reasons why rapeseed is attracting interest as an alternative crop for Oregon. These are the same reasons why the crop has undergone a dramatic expansion in other geographic areas, primarily Canada and Europe.

Simply stated, rapeseed is one of the few oilseeds that can be grown in the cooler climates of the northern latitudes. Consequently, northern areas that have traditionally imported vegetable oil and meal now have the opportunity to become self-sufficient, or even to export these products.

The climate in the Pacific Northwest is particularly attractive; it's suitable for producing a winter rapeseed crop that ordinarily has a higher yield and quality than the spring rapeseed crop grown in Canada.

In terms of location, local oilseed production would seem to be well placed to satisfy the existing demands within the region for rapeseed products from the livestock sector (meal) and the potato-processing industry (oil).

Currently, imported Canadian Canola meal does enter into poultry and swine rations on a cost-efficient basis; 180,000 tons of meal were used in the Pacific Northwest in 1987-1988. Locally produced meal would have to be priced competitively with this imported meal as well as soybean meal shipped from the Midwest. Only if there were a significant cost savings associated with the local feed source would there be any expansion in the demand by livestock industries.

The Pacific Northwest potato-processing industries are major users of oils and fats. They select the appropriate mix of these products based on price and palatability. At current prices, Canadian Canola oil is competitive with other oils and fats, so it may enter into the mix selected.

It's likely, however, that a greater incentive would be needed to persuade these processors to switch over to rapeseed oil. This new incentive could be growing health concerns among consumers that would lead the processors to switch to a product with lower saturated fat.

The satisfaction of these regional demands for oilseed products with PNW-produced rapeseed is contingent on either shipping the whole seeds to processing facilities in Canada or the Midwest or (more probably) the establishment of a crushing facility within the region.

As we'll discuss in section 3, caution must be emphasized: The world oilseed market is glutted, and there's currently excess crushing capacity in the U.S. oilseed industry.

The recent experience in the upper Midwest should be instructive. Three large sunflower seed-crushing plants were built to meet the demands of a strong export market, but this market disappeared with the increase in European oilseed production—and two of the three plants went bankrupt.

Recent estimates of the cost of a new, large-scale processing facility are in the neighborhood of \$50 million, although a used facility might be available at a much lower cost. Such a facility would require the consistent production of 350,000 acres of rapeseed in the Pacific Northwest each year.

Without a guarantee of that level of production, it would be foolhardy to proceed with the construction of a large-

scale processing facility. A less expensive alternative would be to construct a small-scale facility to process a diversity of crops, such as meadowfoam, walnut oil, hazelnut oil, and rapeseed oil.

In the absence of a regional processing facility, Oregon producers would have to look toward servicing the whole-seed demand from Japan (and potentially Mexico). Oregon is well located to supply these markets, either directly or by transshipping through Canada, which currently has superior exporting facilities.

At present, the Japanese market is dominated by Canadian rapeseed exports, but the Japanese are eager to diversify their sources of supply, to protect themselves from Canadian production shortfalls and (in the long run) to reduce their import costs.

While in the short run the Japanese may be willing to provide a moderate price incentive to encourage production, over the long run they'll purchase Oregon rapeseed only if it's competitive with Canadian production in price, quality, and service.

Another unexplored market is whole-seed feeding. Preliminary research studies in poultry and swine indicate that whole-seed feeding at low levels may be feasible, and possibly desirable, with some types of animals. This market could provide a market floor in early stages of rapeseed acreage increase.

These, then, are the reasons why rapeseed has attracted interest as a potential alternative crop in Oregon. In the next two sections, we'll place rapeseed in a broader international context, then consider it in a narrower farm-level context.

### ***3. Supply and demand trends for oilseeds, particularly rapeseed***

Section 2 focused on the location-related components of the potential demand for a PNW rapeseed crop. While this is a useful first step in examining the attractiveness of the crop, it's necessary to consider rapeseed within the broader context of the complex world market for oilseeds and fats.

World oilseed production through the 1987-1988 crop year expanded by 12% over the previous 5 years, but consumption, as measured by crush, has expanded at a slightly slower rate (up 10%). Since much of the production increase has taken place within importing nations seeking to increase their level of self-



sufficiency, it's not surprising that exports have been static over this period.

The results—until the 1988 drought—had been a growing excess moving into stocks and a steadily declining oilseed prices over this time period. As a result of the drought in the U.S., stocks have declined, and prices have strengthened, but it's not clear how long these improved market conditions will last. Canadian Canola production was not affected by the drought.

Soybeans dominate the world oilseed market, with about 50% of total production and an even greater share of whole-seed and meal exports. Palm kernels (a tree crop) and rapeseed, the two next most important sources of oil, have gained market share. Each has expanded production by about 50% over the past 5 years.

The palm kernel expansion in Southeast Asia reflects an attempt by these nations (primarily Malaysia) to increase export earnings. Palm oil is unique among the competing oils—it can't be stored, so it's forced on the market at whatever price is available. As a consequence, palm oil has depressed the world price for vegetable oils, and it has gained market share in recent years.

Increased rapeseed production, in contrast, has been primarily a function of its favorable treatment within European Economic Community (EEC) agricultural policy. In 1987-1988 alone, EEC production increased by 55% to 5.8 million tons, 26% of world production.

As a consequence of this expanded production, rapeseed has gained market share over the last 5 years within each of the three oilseed related markets—from 9.6 to 11.4% in the whole-seed market, from 11.9 to 13.2% in the vegetable oil market, and from 9.6 to 10.8% in the world meal market.

While the EEC has made the most dramatic recent increase in production and trade, it's not the most important player in the world market. Overall, only 17% of rapeseed production enters international trade because two of the major producers, China and India, produce entirely for their domestic markets.

The Canadians dominate international (as opposed to within-EEC) trade. Over a 25-year period, Canadian rapeseed acreage increased from less than 1 million acres to more than 7 million. While Canada ranks behind China in production, it's the largest exporter (40% of its production is exported).

Japan dominates on the import side and has in recent years received 90% of

its supplies from Canada. European production, which until recently was traded among EEC members, is now entering the world market in competition with Canadian rapeseed, particularly in the Middle East, North Africa, and some Asian countries.

The United States has not been a major participant in the rapeseed market although U.S. imports of Canadian rapeseed oil and meal have been rising in recent years; they totaled 180,000 tons of meal and 120,000 tons of oil in 1987-1988. The U.S. Department of Agriculture doesn't maintain domestic rapeseed production figures, but total production of edible rapeseed doesn't exceed 30,000 tons.

As with other oilseeds, the final demand for rapeseed is not for the whole seed but rather for the two products, oil and meal, derived from the seed. Oilseeds differ in their percentage composition of oil and meal and thus in the degree to which their demand is oil- or meal-driven.

The demand for soybeans, which have a relatively low oil content (18%), is driven primarily by the meal. Rapeseed has an oil content of 40%; therefore, its demand is driven by the oil.

The demand for the various oilseeds is highly interrelated and primarily influenced by price and traditional preferences. These preferences can change over time. In the United States, for example, consumers are becoming increasingly health-conscious in their food selection. Rapeseed oil, because it has the lowest level of saturated fat among competing oils, has the potential to carve out a market niche.

This hasn't occurred to date in either the U.S. or world markets, and rapeseed oil continues to trade at a slightly lower price than soybean oil.

In summary, while the world market situation for oilseeds is currently favorable, that hasn't been the case in the recent past, and it may not be in the future. Competition for markets is likely to be intense, and as a consequence, prices aren't likely to be very attractive unless there's a shift in consumer preference toward rapeseed oil.

#### ***4. How attractive is rapeseed at the farm level?***

As we explained in earlier sections, rapeseed production will expand in Oregon only when individual farmers

adopt the crop. The attractiveness of any crop at the farm level depends on:

- the relative profitability of the individual crop enterprise;
- the compatibility of the enterprise with the farmer's overall production system; and
- the treatment of the crop within current government regulations.

Basically, new crops enter if they can successfully compete with existing crops for currently used resources and/or attract unused resources into production. This practice of comparing the new crop to available opportunities may help to explain why the rapeseed industry will have a difficult time achieving the success in Oregon it has had in Canada, in spite of the fact that the crop appears to grow better here.

Simply stated, rapeseed faces greater competition from other crop opportunities here as compared to Canada. To date, Canada's "Cinderella" crop has rarely exceeded several thousand acres in Oregon.

A recently completed enterprise budget for rapeseed within a summer fallow system in Oregon's north central region (see EM 8367) indicates that producers can cover variable costs with a yield of 1,500 pounds per acre and a price of 6¢ a pound. They can cover variable and fixed costs at 12¢ a pound.

The contract price available to Oregon growers has ranged from 7¢ in fall 1987 to 13¢ in fall 1988. Since the competing wheat and barley crops are in most cases grown within U.S. Government programs, they provide a more stable return over time.

Oregon producers have cited two production concerns as a result of their limited experience with the crop:

- Crop establishment will be difficult in a dry autumn like those we experienced in 1987-1988. This calls into question whether a consistent crop can be grown under dryland conditions in eastern Oregon.
- The narrow harvest window reduces the acreage that any individual grower would allocate to rapeseed.

When considered within the perspective of the overall farming system, however, rapeseed may appear somewhat more attractive:

- Rapeseed production doesn't require any new equipment or complex production techniques—growers can fairly easily add it to their farm plans,



and it provides some measure of diversification.

- There may be some (as yet undetermined) rotational benefits from introducing rapeseed into a farm plan.
- As a nonprogram crop, farmers can grow rapeseed on land that's not a part of their base acreage for program crops. So, for certain producers, the opportunity costs of the land (and perhaps even the labor associated with production) may be low enough to redirect these resources toward producing rapeseed.
- Rapeseed may provide a valuable addition to cash flow for this last group of farmers.

One change that would dramatically alter farmers' evaluation of rapeseed is the proposal to allow rapeseed to be produced on program set-aside acreage (acreage that farmers must leave idle to participate in the commodity programs). While this would greatly expand the potential rapeseed acreage in Oregon, it's not currently receiving serious consideration.

Overall, it would seem that a dramatic increase in Oregon rapeseed production will develop only in response to consistently strong output prices or a major change in the set-aside provision of the current farm legislation. Without these changes, Oregon producers are unlikely to adopt rapeseed on a large scale.

## 5. Summary

In this report, we've outlined how a new crop such as rapeseed can contribute to the overall development of the region in two ways: through increasing employment in the processing sector and through reducing the cost of production or improving the quality of other agricultural products.

In addition to the regional demand for products derived from rapeseed, there's a strong interest in Japan in developing the region as an alternative source of Japanese whole seed imports.

In spite of these apparently attractive market opportunities, the future of rapeseed production in Oregon remains cloudy. The international oilseeds market, although currently strong, is likely to shift back into a situation of oversupply if 1989 weather conditions are more nearly normal.

Satisfying the regional demand for oil and meal with Oregon-produced rapeseed would require the construction of an

expensive crushing facility in the region. Construction is unlikely without the consistent annual production of 350,000 acres—which is certainly feasible but may be difficult to guarantee under dryland conditions.

The alternative whole-seed market in Japan will be quite competitive, and it's unlikely to provide prices as attractive as those currently offered.

A dramatic change in consumer preferences among competing vegetable oils toward the apparently healthier rapeseed oil would change this outlook—it would raise the demand and, therefore, the market price of rapeseed oil.

Some observers believe that the current drought-induced high prices provide an excellent opportunity to encourage domestic rapeseed production and increase U.S. consumer acceptance of the product.

Others remain skeptical that rapeseed oil will ever be able to define a market niche in the United States; therefore, they question the long run viability of rapeseed production in the region.

## 6. For further reading

General information on world oil seed markets can be obtained from the quarterly USDA report, *Oil Crops Situation and Outlook*. More specific regional information on rapeseed is contained in these publications:

**Washington State University,** International Marketing Program for Agricultural Commodities and Trade (IMPACT). Order from IMPACT Center, 104 Hulbert Hall, WSU, Pullman, WA 99164-6214. Include 7.5% tax and 75¢ postage and handling (except on large orders).

**Chaudhry, Asif,** *An Overview of the World Rapeseed Situation*, IMPACT Center, Washington State University, Information Series #6 (Pullman, 1986). \$3.00

**The Pacific Northwest Rapeseed Industry: The Future**, Proceedings of the Conference, Spokane, Wash., Feb. 23-24, 1987. IMPACT Center, Washington State University (Pullman, 1987). \$10.00

**O'Rourke, A. Desmond,** editor, *Rapeseed: The Market—A Practical Approach*, Proceedings of The Pacific Northwest Canola-Rapeseed Conference, Richland, Wash., Feb. 29-Mar. 1, 1988. IMPACT Center, Washington State University (Pullman, 1988).

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**Harker, J. Michael,** *Rapeseed Marketing Study*, Postharvest Institute for Perishables, University of Idaho, GTS Report #85 (Moscow, 1987).

**Prato, Tony,** *Production, Processing and Marketing Potential for Rapeseed in the Pacific Northwest*, College of Agriculture, University of Idaho, Current Information Series #818 (Moscow, 1988). 35¢

**Schermerhorn, Richard,** *International Market Potential: Rapeseed, Rapeseed Oil, and Rapeseed Meal*, unpublished background document for Harker, J. Michael, GTS Report #85 (Harker, above). Postharvest Institute for Perishables, University of Idaho (Moscow, 1987).

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**Cross, Tim, Russ Karow, and Mike Stoltz,** *Enterprise Budget: Rapeseed, North Central Region*, Oregon State University Extension Service publication EM 8367 (Corvallis, 1988). No charge for single copy; order from Tim Cross, Dept. of Agricultural and Resource Economics, OSU, Corvallis, 97331-3601.



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