The Potential of Oil Crops On Diverted Wheat Acres

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Introduction

A more diversified agriculture is becoming important on dryland acres of the Columbia Basin. Evaluation of new crops is more imperative as the number of diverted wheat acres increases. Of the crops evaluated to date, oil crops appear to be the best adapted of any crop group other than barley. Selecting a new crop is no easy job, since the new crop must be adapted agronomically and also must have a potential market that is not loaded with surpluses.

All oil crops discussed in this report are not adapted for dryland production in eastern Oregon. However, oil crop production is being encouraged over the nation by an industrial demand for vegetable oils. There are two general markets for these oils; one is for edible oils to be used in cooking oils, margarines, etc; the other is for industrial oils to be used in paints, varnishes, and plastics. Currently, such surplus crops as corn and soybeans are finding some encouraging export markets as edible oils, particularly in Europe. While most of these oils compete with each other, some have unique characteristics which have expanded their own market. Safflower oil, for example, has expanded its market many times in the last five years. In general, there seem to be potential markets both at home and in foreign countries for vegetable oils.

Seed Flax for Oil

Flax has proved to be one of the better adapted oil crops. Flax yields in Oregon have been encouraging compared with the 10-year national average production of 465 pounds per acre. Flax has yielded well in rainfall areas of 16 inches and above. It has not produced economically in lower rainfall areas even on summer-fallow land. Yields of flax grown at the Pendleton Branch Experiment Station and pilot farms during the past five years are shown in Table 1.

Table 1. Average yield of flax

Rainfall	Cropping practice	Years grown	Average yield	Estimated gross return/acre 1/
inches			lbs./acre	
18	Annual cropland	4	806	$42
16	Summer fallow	5	1,221	64
12	Summer fallow	3	560	29

1/ Gross return is calculated from the 1962 forecast price of 5.3 cents per pound.

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Failure to obtain good plant stands limits the amount of flax that is grown. Flax must be seeded in a shallow, firm seed bed. This firmness is difficult to overdo unless the soil is too wet. Flax will germinate and grow in cool temperatures which makes early spring planting possible. Early seeding is desirable, as indicated by the 1960 results shown in Table 2.

Table 2. Yield of seed flax as related to date of seeding, 1960

Date seeded	Yield
	lbs./acre
March 15	1,120
April 1	896
April 16	448
May 2	224

Early March seeding allows plants to take advantage of spring rains and favorable soil moisture. Flax is usually in flower by the first week in June and matures soon after mid-July. Thus, flax can avoid some of the summer hazards of heat and severe moisture stress. The quality of linseed oil from flax has been high under prevailing conditions in the years in which it has been grown.

Safflower for Oil

Safflower, though a new crop in the west, is in fact among the oldest crops known to man. Before recorded history, man discovered the value of safflower flowers as a source of dye to be used for both clothes and food. Safflower has only recently been introduced in the United States as a crop to produce edible oil.

Safflower has been grown experimentally on dryland at Pendleton for eight years. Yields have varied from year to year. Most crops are sensitive to variation in climatic conditions; safflower also seems to vary greatly from season to season.

Table 3. Average yields of the safflower variety, N-10

Rainfall	Cropping practice	Years grown	Average yield	Estimated gross return/acre 1/
inches			lbs./acre	
18	Annual cropland	5	845	$31
16	Summer fallow	8	1,305	49
12	Summer fallow	3	725	27

1/ Gross return is calculated from a current base price of $75 per ton.

Safflower is a crop which requires a long growing season to mature. It is planted early in April and does not mature until early September. Thus, plants experience periods of great moisture stress during their development. In spite of these handicaps, safflower has produced yields under extreme conditions. Oil content within the seeds and oil quality has continued to be high in the years tested.

Rape for Oil

Rape is currently being grown commercially as an oil crop in the Canadian provinces of Manitoba, Saskatchewan, and Alberta. Rape seed oil has a limited use as a valuable lubricant for marine engines and for certain delicate mechanisms. However, the principal use for rape seed oil is found in the market for edible oils.

There are both spring and winter rapes. Rape varieties have been grown experimentally for three years at Pendleton, Oregon.

Table 4. Average yields of Polish rape seed

Growth habit	Rainfall	Cropping practice	Years grown	Average yield	Estimated gross return/acre
	inches			lbs./acre	
Winter rape	16	Summer fallow	1	600	$24
Spring rape	18	Annual cropland	2	282	11
Spring rape	16	Summer fallow	3	704	28
Spring rape	12	Summer fallow	1	229	9

Winter rape appears to have some promise as a winter annual. It is planted in the fall. It grows rapidly early in the spring and is mature by late June. Thus, it avoids the moisture stress of late summer. However, at the current price of $4 per hundredweight, a 600-pound yield would not be enough to make it competitive with barley.

Castorbean for Oil

Commercial acres of castorbeans are being grown in the midwest under contract with processors. Castorbeans have been grown experimentally at Pendleton for three years. Castorbean is a crop which must be grown in row culture, and it requires special harvesting machines. Plants have appeared green and healthy throughout the summer, but they have been difficult to mature. The lower leaves begin drying up by early August and drying conditions continue until harvest. Moisture content within the seed has remained too high for safe storage. High moisture content coupled with low yields does not encourage castorbean production on dryland.

Sunflower for Oil

Sunflowers have not yielded well on dryland. Plants begin to wilt in early July due to moisture stress. This has resulted in small heads and low yields. Sunflower does not appear to have very much promise as a dryland oil crop.

Soybean for Oil

Soybean is another crop which cannot be grown economically on dryland. The best soybean variety yielded 480 pounds per acre on summer-fallow land in a 16-inch rainfall area. While soybeans are not adapted to dryland, they have demonstrated a great yield potential under irrigation in eastern Oregon.

Other Potential Oil Crops

Other plant species are being studied for their potential values as oil crops. Evaluation of new oil crops, such as Cape Marigold and Crambe, is being conducted as the potential value of such plants is identified.

Goals for the Future

Winterhardiness, early maturity, and drought tolerance are desirable plant characteristics for well-adapted crops in the arid wheat lands of Oregon. These characteristics describe winter wheat and suggest why it is such a well-adapted crop. Some of the oil crops mature early or are drought tolerant and show promise as dryland crops. If winterhardiness could be developed in these oil crops, the area of their economic production could probably be enlarged. Safflower, flax, and rape are currently being evaluated for their potential as fall-seeded winter annuals.