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Rapeseed Cultivation and Usage

ABSTRACT - Rapeseed, an oil-producing crop that was cultivated in pre-Christian times in India and the Orient but was generally given up, has again become an important source of protein oil and meal. In Canada, now the leading export producer, rapeseed output is surpassed only by wheat, oats, and barley. Cultivation and processing as well as the history of this crop are discussed.

Sister M. Dolores Ahles*

Agricultural history indicates that the rapeseed crop was cultivated as early as 2000 B.C. in India and introduced into Japan and China around 35 B.C. Europe produced some rapeseed in the thirteenth century. However, production lapsed and apparently did not recover until around the time of World War II.

Currently China and India yield the largest crops but export very little. In Europe the chief production centers are East and West Germany, France, Poland and Sweden. Canada has held the world record as exporter of rapeseed since 1961. Chief importers include parts of Asia, Europe and Africa.

In Canada production of rapeseed on a large scale began in the 1940's. By 1968-69 the yield was at a rate of 6,500,000 bushels annually. This crop is now surpassed in Canada only by wheat, oats and barley. It is sometimes referred to as the "Cinderella" crop. By 1971-72, the acreage in Saskatchewan alone was about 3,000,000 bushels. Varieties of *Brassica napus* and *B.campestris* yield from 1,500 to 2,500 lbs of seed per acre in parts of Manitoba, Saskatchewan and Alberta.

Rapeseed crops require fertile, well-drained soil and thrive best in climates having sunny days and cool nights. Dry weather is required at harvest time. Crop rotation is important, alternating the rapeseed with small grains, but not with other species of rape, mustards or sunflower. Canada's prairie provinces have been found ideal for rape cultivation.

In the orient rapeseed oil was once used extensively for illumination, and some writers assert that it is still being utilized to light some rooms in the emperor's palace in Tokyo. This is perhaps only by way of oriental tradition, but it is a well-established fact that uses are multitudinous. Oils extracted from the seeds compete in world markets with oils of soybean, peanut, corn, cottonseed, olive, safflower, mustard, palm, and coconut. The oil is obtained by crushing the seeds under great pressure to separate it from the pulp or meal. Rapeseed produced in western Canada contains an average of 43 percent oil. This oil averages about 0.5 percent free fatty acids and a high percentage of iodine. Oil must be refined to remove impurities. High grade oils are used for cooking, salad dressings, manufacture of margarine and other shortenings. Crude oils are utilized in the production of lubricants, rubber products, soaps, emulsifying agents and resins.

Processing of rapeseed to remove oil must be done under carefully controlled conditions of heat and moisture. Unless so done, protein content of the meal is reduced and its nutritive value is diminished.

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The composition of rapeseed meal is approximately 36 percent protein, 2 percent ether extract, 12 percent crude fiber and 50 percent other substances. Amino acids compare favorably with those of soybean meal. Levels of minerals and vitamins are comparable, but nutritional value of the seed is affected by soil, fertility, moisture and climatic conditions. The energy value of rapeseed meal is about 87 percent lower than that of soybean meal. However, this varies greatly with the digestibility factor for different animals.

Rapeseed meal is used as fodder for ruminants and poultry. When supplemented with other food sources it can be used for a variety of animals. Recommended rapeseed content of rations for young chicks and turkeys is 15 percent; for laying and breeding chickens 5 percent, and for breeding turkeys 10 percent. Poultry meal is enriched with stabilized fats to increase metabolizable energy. Lysine is an essential amino acid in poultry rations. It is present in rapeseed meal, but at a slightly lower level than in soybean. However, rapeseed meal is a better source of phosphorus, selenium, zinc and magnesium, than is soybean. The latter has a slightly higher potassium content.

Rapeseed with high erucic acid content is considered by some researchers as undesirable for fodder. They maintain that this acid has a deleterious effect on growth of animals. However, other animal nutritionists disagree and maintain that erucic acid is not responsible for stunted growth, but rather this factor is due to imbalance of the saturated fats. Breeding experiments have resulted in the production of species of rapeseed with low erucic acid content and since about 1971 Canada has concentrated on the production of *Brassica napus* varieties *Oro* and *Zephr*.

Insect control is an important aspect in the cultivation of rapeseed. Flea beetles can be controlled readily by spraying with proper insecticides. The turnip beetle, *Entomoscylis americana* feeds only on plants of the mustard seed family (Crassicae), and can ruin a rapeseed crop unless controlled. Red-backed cutworm, *Euxoa ochrogaster*, is a serious pest. Stems are cut off below the surface. Here too, infestation can be controlled by use of insecticides.

Several fungal diseases are problematic. Among these are white rust, *Albugo candida*, downy mildew, *Peronospora parasitica*, black spot, *Alternaria brassica* and *A. raphani*, ringspot, *Mycosphaella brassiciola* and stem rot, *Sclerotinia sclerotiorum*. All of these can be controlled by crop rotation, preferably long term rotation with grain crops such as wheat, oats and barley. Seeds can also be treated with fungicides before sowing. This has, in general, been successful. The best method of control is the use of disease-resistant strains, some of which have been developed in the last 10 years, especially varieties of *Brassica napus*.

No area of the United States has developed rapeseed on

a large scale. About 2,500,000 lbs of the seed is imported annually for the manufacture of rubber products, lubricants, and brake fluid.

Some Minnesota farmers sow rapeseed mixed with oats to provide early spring pastureland. Small acreage of oilseed rape is grown in Minnesota primarily for bird seed and bee pasture. *Brassica napus* is about 70 percent self-pollinated and 30 percent cross-pollinated. Therefore, insects such as the honeybee help increase crop yield. Rape honey is less flavorful than clover honey. It granulates readily and is not recommended for over-wintering bees. Processors blend rape and clover honey to improve flavor and firmness.

There are many possibilities for the rapeseed crop. Some farmers have begun to utilize rapeseed meal, as well as the straw, for field fertilizers. Researchers indicate that several species of *Brassica* may be utilized for industrial production of erucic acid. Whatever the future holds, the rapeseed crop is destined to hold its own in agricultural production in many areas of the world.

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