

RAPESEED PRODUCTION AND RESEARCH IN CHILE

By Nilo Lizama and Vital Valdivia
Instituto de Investigaciones Agropecuarias
Casilla 5427, Santiago - Chile

The rapeseed crop that was introduced in Chile in 1956 has become the major oilseed crop. At present about 75% of the oilseed produced is from rapeseed (Table 1).

TABLE 1

AREA PLANTED AND PRODUCTION OF RAPESEED AND SUNFLOWER IN CHILE AND THEIR RELATIVE IMPORTANCE IN THE TOTAL PRODUCTION. 1955-1975.

Year	Rapeseed		Sunflower		Production	
	1	2	1	2	Sunflower %	Rapeseed %
1954-55	0.09	0.1	28.3	38.7	99.6	0.4
1959-60	35.8	37.4	52.1	48.5	56.5	43.5
1964-65	57.6	65.8	32.0	43.5	39.8	60.2
1969-70	53.7	63.9	20.2	27.2	29.8	70.2
1974-75	45.5	56.1	13.3	17.2	23.5	76.5

1 Area (1000 ha)

2 Seed Production (1000 ton)

Source: ODEPA.

The production is concentrated in the southern area located between 37° and 41° South latitude. The common rotation in this zone is pasture, rapeseed and cereals (wheat, oats). It has been demonstrated that wheat planted after rapeseed in rotation produce a higher yield.

Both winter and spring varieties of *Brassica napus* are grown. About 60% of the total rapeseed area is planted with spring rape in spite of the winter rape having the highest yield potential. However, spring rape has the advantage of being a crop with less problems of diseases and weeds and in addition occupies the soil a shorter period.

Most of the winter rape is planted in March and April. Later plantings (May and June) are more susceptible to the hazards from frost heaving caused by freezing soil. Usually it is planted on summer fallow. The crop is harvested in January. The most popular cultivar is Matador from Swedish origin.

Spring rape is planted in August and September and harvested in February. Norin 16, from Japan, is the most important cultivar.

Both Matador and Norin 16 have been considerably altered in yield, oil content and uniformity from the original introductions. They are very well adapted and both have a high genetic capacity for seed yield and oil content.

The average annual yield is between 1300 and 1500 Kg/ha (Table 2). However, with efficient farming practices the yields can be over 3000 Kg/ha and in experimental plots yields of more than 4000 Kg/ha are obtained.

TABLE 2

AREA, YIELD AND PRODUCTION OF RAPESEED IN CHILE, 1956 through 1976.

Year	Area hectares	Yield Kg/ha	Production metric tons
1956	6,000		2,100
1960	29,500	1110	32,800
1965	61,800	1140	70,500
1970	49,400	1660	75,100
1975	59,580	1200	61,393
1976	53,680	1340	71,496

The problems in rapeseed production are of cultural and management nature besides the plant breeding problems.

The most important management problems are: poor seedbed preparation, weeds, insufficient fertilization and late plantings. Since rapeseed is usually planted after a grass pasture a good and anticipated seedbed preparation is very important to control weeds and to increase the level fertility of the soil.

The recommendation for fertilization is a minimum of 150 Kg/ha of P_2O_5 and 90 Kg/ha of N. Failure to apply adequate levels of these nutrients may result in low yields since nearly all the rapeseed is seeded in a volcanic ash soil called "trumao" which needs a high level of fertilizers for optimum yields.

The problems related to plant breeding are: high yield of seed and oil, low erucic acid, improved meal quality, earlier, uniform maturity, resistance to frost heaving and resistance to Gloesporium concentricum or anthracnose.

The Instituto de Investigaciones Agrícolas (INIA) of the Ministry of Agriculture conducts rapeseed research at its experimental stations that serve the main agricultural zones of Chile. Rapeseed research is concentrated at Carillanca Experimental Station, a southern station located near Temuco. Yield trials with introduced varieties, investigations of the best management practices and a breeding program are areas of research.

As a result of the evaluation of foreign varieties, the Canadian cultivars Oro and Tower have been incorporated in the list of recommended varieties. Although these varieties yield less than Norin 16 under Chilean conditions, it is well known that they have improved quality features (Table 3). At the same time some improved adapted strains have begun to emerge from the breeding program (Table 4).

TABLE 3

YIELD, OIL AND ERUCIC ACID CONTENT OF THREE INTRODUCED SPRING RAPESEED VARIETIES. EXPERIMENTAL STATIONS LA PLATINA, QUILAMAPU AND CARILLANCA. 1973-1974.

Variety	Yield Kg/ha	Oil %(*)	Erucic acid %
Midas	2750	50.1	3.5
Tower	2640	49.0	0.0
Oro	2730	48.5	1.0
Norin 16	3230	50.2	40.2

(*) Dry Matter Basis

TABLE 4

YIELD, OIL, ERUCIC ACID AND GLUCOSINOLATE CONTENT OF SOME RAPESEED STRAINS TESTED AT 5 LOCATIONS IN 1977-1978

Strains and variety	Yield Kg/ha	Oil %(*)	Erucic acid %	Glucosinolate Tes-Tape rating (**)
Pt. 751546	2370	37.8	0	0.4
Pt. 741528	2400	35.8	0	0.7
Pt. 741532-115	2600	35.6	0	0.8
Norin 16	2370	37.9	40	1.8
Tower	1580	36.1	0	0.4

(*) Determinations made with a laboratory press

(**) Average of 3 determinations with Tes-Tape on the 0 to 3 scale;
0 represent no color change

In winter rape we expect to commence in 1979 with the gradual replacement of the high erucic acid Matador variety with a low erucic acid foreign variety. At present, Quinta and Primor are the cultivars that have shown the best adaptation. In two or three years we expect to have a Chilean low erucic variety better than Matador in quality and agronomic performance (Table 5).

TABLE 5

YIELD, OIL AND ERUCIC ACID CONTENT OF WINTER RAPE CULTIVARS TESTED AT 4 LOCATIONS IN 1977-1978

Variety	Yield Kg/ha	Oil %(*)	Erucic acid %
Quinta	2402	39.8	0
Primor	2207	39.9	0
75/50153	2675	40.8	10
Matador	2378	40.3	35

(*) Determinations made with a laboratory press

Further improvement in winter rape call for low glucosinolate, anthracnose resistant variety and other characteristics that can be incorporated into the new varieties such as shorter straw, resistance to lodging, resistance to frost heaving and perhaps thinner hull yellow seed.

There is no doubt that with improved varieties and with better cultural practices there will be a substantial increase in both yield per hectare and number of hectares devoted to rapeseed. And this is the only possibility for Chile to decrease the level of imported edible vegetable oils.