

# Cultivation of Oilseed Crops in Finland, 1988

Katri PAHKALA (1), Erkki RYTSÄ (2) and Jukka HOLLO (2)

(1) Finnish Agricultural Research Centre  
Department of Crop Science, SF-31600 Jokioinen

(2) Raisio Group, P.O. Box 101 SF-21201 Raisio

## The Oilseed Crop

Spring turnip rape and spring rape are the oilseed crops grown in Finland. The area in these crops has increased during the 1980s from 55.000 to 86.000 ha and covered 4% of the total cultivated land in 1988. The total yield has varied between 69 and 124 mill.kg (Fig. 1). There are some 10.000 farmers in the country who grow oilseed and the average size of their rape fields is 7-8 ha.

In 1988, the harvested area was 85.000 ha, consisting of 97% turnip rape and 3% rape. The mean yield was 1410 kg/ha. It was somewhat below normal because the summer was very dry.

The statutory quota for rape seed production was fixed at 115 mill.kg in 1988-1990. This means that the area under cultivation should be 75.000 ha yearly, if the yield is to be 1500 kg/ha.

The price paid to the farmer depends on the chlorophyll content, moisture and purity of the seed yield. At the basis price level, the chlorophyll content of the oil is between 30 and 40 mg/kg, the seed moisture 9% and the seed purity 98%. The average chlorophyll content of the total yield according to the oil milling industry was 11,6 mg/kg in 1986, and 29,1 mg/kg in 1987. The average purity of the total yield was 96,8% and 96,6% respectively. The basic price in 1986 and 1987 was Fim 3,79 and Fim 3,9 in 1988.

## Varieties

The cultivated varieties of spring rape are of the 00-type. The main rape variety is Topas (Sv) but also Varma (Hja) and Karat (Sv) are grown. They yield 1800 kg/ha on average and have a growth period of 124 days. The cultivation of spring turnip rape is less precarious, and the number of varieties is also greater (see Fig. 2). The main

variety cultivated in 1988 was Emma (WW, 0-type), although the percentage of the better quality 00-types Kova (Sv) and Valtti (Hja) is increasing. They are less reliable in a poor year (such as 1987) than Emma.

## Present-day Cultivation Techniques

Turnip rape is sown during the second or third week of May. In Southern Finland, the average sowing date is May 17th. Fields ploughed the previous autumn are harrowed 1-2 times and sown with a combi-spreader, which places the fertilizer close to the seed row. Rows are spaced at 12,5 cm intervals and the sowing depth is 3 cm. The recommended seed volume is 6-12 kg/ha for turnip rape and 8-15 kg/ha for rape. Smaller amounts are recommended if conditions permit. The fertilizers are compound products containing trace and side nutrients in addition to the main nutrients. Fertilizers are selected according to soil potassium and phosphorous status. The amount of nitrogen is 80-140 kg/ha.

Oilseed crops are combined when the plant stand has ripened sufficiently. The ideal moisture content of seed for combining is 15-18%, although the percentage is normally 20-25. The yield is dried on the farm at 7-9% moisture, and delivered to the buyer either immediately or later in winter. If the yield is delivered straight from the field to a mill, it is precleaned and dried there.

## Plant Protection

The seeds are coated with isofenphos against the damage caused by flea beetles (*Phyllotreta* spp.) during the cotyledonous stage. Blossom beetle (*Meligethes aeneus*) is controlled with a proper insecticide 1-2 times before flowering. Synthetic pyrethroids, cypermethrin, deltamethrin and permethrin are the most common insecticides used.

Fig. 1: The Sowing Area, total yield and the yield per hectare in Finland. 1970-1988

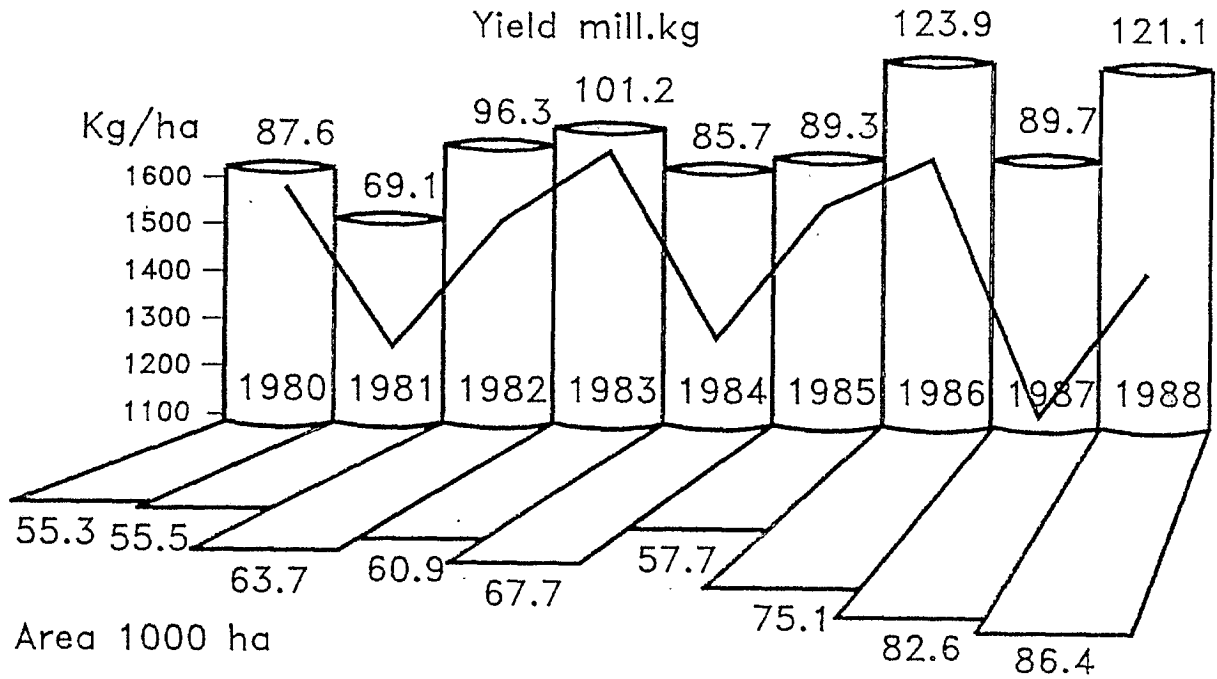


Fig. 2: The Yield of spring turnip rape in 1980-1987, and separately in 1987 compared with Emma. Official Variety Tests.

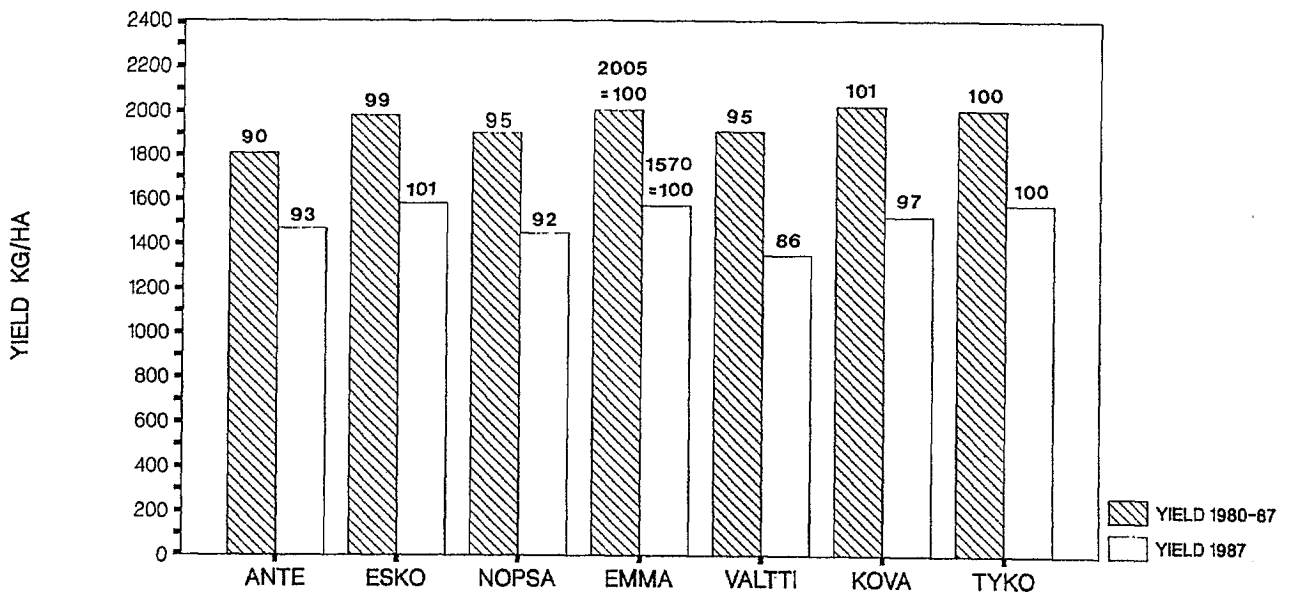
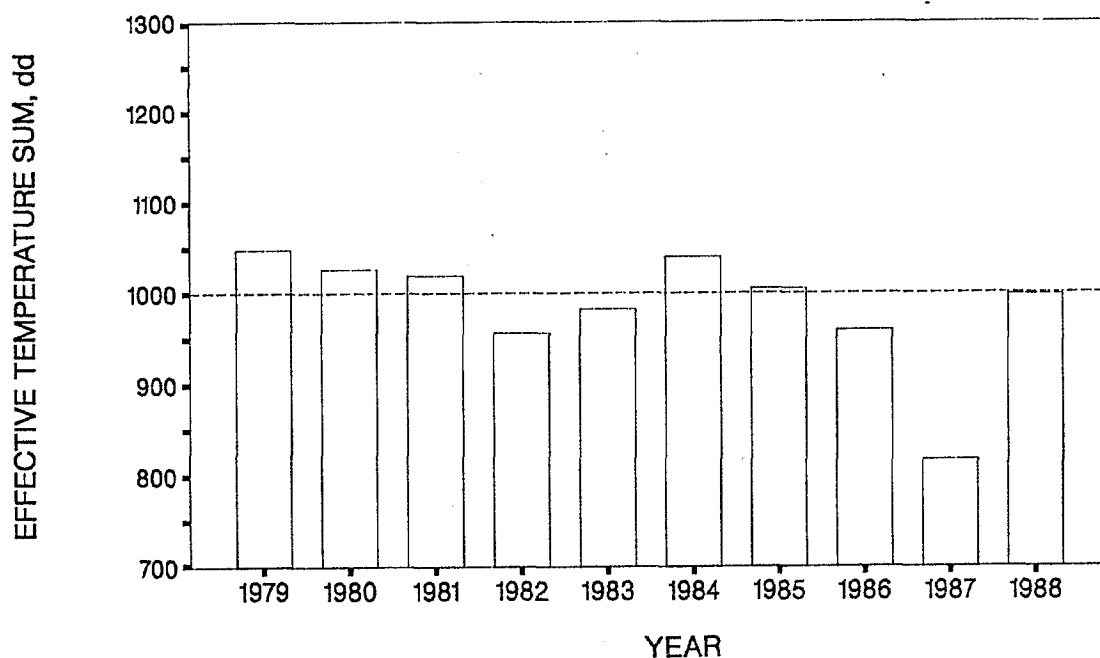


Fig. 3: Effective temperature sum (>5°C) for the ripening of spring turnip rape varieties Ante, Emma and Span. Official Variety Tests, 1979-1988.



For the control of broad-leaved weeds and grass weeds about 50% of the oilseed crops were sprayed with herbicides in 1987. The most harmful grass weed species, couch grass (*Elymus repens*) and wild oats (*Avena fatua*), are controlled with fluazifop-butyl or sethoxydim. *Chenopodium album*, *Galeopsis speciosa* and *Stellaria media*, the most detrimental broad-leaved species, are controlled with metazachlor or trifluralin.

During the rainy years of 1984 and 1987, plant diseases caused great damage locally. The most common diseases in rapeseed samples collected after flowering have been stem rot caused by *Sclerotinia sclerotiorum*, greymold caused by *Botrytis cinerea*, downy mildew caused by *Peronospora parasitica*, clubroot caused by *Plasmodiophora brassicae*, and stem base lesions caused by *Rhizoctonia solani* (Hannukkala, 1988).

#### Cultivation Requirements and Limiting Factors

Spring oilseed crops are well adapted to our conditions despite the fact that they are at their extreme border of cultivation. Regardless of the rather considerable variation in yield, no total crop failure has occurred with spring sown oilseed crops throughout the period of continuous cultivation which began in 1976. Turnip rape ripens and

produces a satisfactory yield during both cool and rainy summers (Fig. 2). Effective use of the large amount of radiation available during early summer is possible, provided that the minimum temperature is not too low. The effective temperature sum required for the ripening of spring turnip rape varies each year (Fig. 3).

The experiences of 1987, however, showed that turnip rape will ripen even if the effective temperature sum is 817°C from sowing to harvest time, which is 172°C below normal (Pahkala and Sovero, 1988). In the case of rape, however, cool summers cause substantial losses in quality and yield as the growing period in Finland is approximately two weeks longer than that of turnip rape.

With regard to yield formation, favourable weather factors include high temperatures just before sowing, high levels of radiation at the end of flowering and at the start of pod development. Bright, cool weather at the end of ripening and during harvesting ensures successful threshing. Detrimental factors are heavy rains after emergence and during the vegetative stage. A deficiency of water at the end of flowering and beginning of pod development decreases yield. Cool weather during the autumn lengthens the development time of pods and increases yield.

### Research

The cultivation techniques and quality problems of oilseed crops are being investigated by the various departments and at the research stations of the Agricultural Research Centre, as well as at the University of Helsinki. In some projects, partial funding has been provided by oil mills, which also conduct their own research and consultation projects.

A project called "Improvement of Oilseed Culture" has been going on since 1985. It is financed by the Ministry of Agriculture and three

oil mills. The research consists of cultivation and seeding techniques, crop rotation, crop protection, fertilizing and varieties of oilseed crops.

Earlier research has also been conducted on the cultivation of other oilseed crops such as mustard, poppy, sea kale, camelina, linseed, sunflower and evening primrose. The most successful crops have been the varieties of mustard (*Sinapis alba*, *Brassica juncea*) that are cultivated for oil and spices. Production of earliest varieties of poppy (*Papaver somniferum*), sunflower (*Helianthus annuus*) and linseed (*Linum usitatissimum*) has proved possible in southern Finland.

---

### REFERENCES

HANNUKKALA A., 1988. - Diseases of Rapeseed in Finland. - *GCIRC-Bulletin 4*, p. 23-25.

PAHKALA K. and M. SOVERO. - The Cultivation and Breeding of Oilseed Crops in Finland. - *Ann. Agr. Fenn.*, 27, p. 199-207.