

SUNFLOWER GROWING IN SPAIN

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Sunflower growing for oil production began in Spain in 1963. By 1974 it was grown on about 450,000 ha. Approximately 60% of this area is in Andalucia, in the South of Spain.

The figures for area and production are as follows:

Year	Area (hectares)	Average seed yield (kg/ha)
1963	500	650
1964	1,200	600
1965	4,950	450
1966	6,900	800
1967	25,900	800
1968	38,600	790
1969	71,000	780
1970	136,000	950
1971	300,000	770
1972	344,000	710
1973	434,000	760
1974	450,000	-

Average yield per hectare tended to increase until 1970, then dropped. Lower average yield in subsequent years can be attributed to sowing sunflowers in unsuitable areas in the center of Spain where yields are low, thus reducing the national average.

Partially, the entire area is grown under dryland conditions, without irrigation. Annual production may vary considerably depending on the rainfall each year. The long term average yield is about 800 kg/ha.

The area under sunflowers in Andalucia has probably reached very near its maximum. It is quite possible that the sunflower area in Spain may reach 600,000 hectares, because of increased sowings in the central part of Spain.

Seed quality varies somewhat from year to year. In 1971 the average moisture content at harvest was 6.7%, the average impurities was about 3.5%, and the oil content on the basis of clean dry seed was 49.9%.

In 1972 average moisture in the seed was 6.8%, and the average impurities 4.7%. Oil content on the basis of clean dry seed was 48.3%, protein content was 27.5%, and fiber content varied from 23 to 25%.

THE MARKETING SYSTEM

Sunflower growing in Spain has developed mainly as the result of the activities of private companies and cooperatives. These organizations arrange contracts with the growers, provide them with seed, advance them credits for expenses of producing the crop, provide technical assistance during the crop season, and take delivery of all the seed that the growers produce under these contracts. Minimum prices for seed have been regulated by the government.

AGRONOMIC PRACTICES

The most common rotation is cereals-sunflower, but growers are being advised to sow sunflower not oftener than once in four years.

Sunflowers are normally sown in March-April. Spacing is usually 60 to 80 cm between rows.

A standard recommendation is to apply 50 kg of nitrogen per hectare.

Growers tend to use very high seeding rates, from 10 to 15 kg per hectare. When the plants are in the 2 to 4 true leaf stage, they are thinned by hand. The trend in Andalusia is to sow with semi-precision machines in the very near future, because of rising labour costs.

It is common to cultivate between the rows several times, until the plants become too tall.

Harvesting is in August or early in September, with self propelled combines equipped with adapters („fingers“ to guide the head to the cutting bar).

VARIETIES

The most commonly grown variety is Peredovik. There is also a large area of Smena, and smaller areas of VNIIMK 6540, Record, and others.

All the seed sown by farmers is now produced entirely in Spain. Various companies have their own programmes of mass selection, which they use to maintain and improve the varieties they prefer.

Seed production by the companies is supervised in the field and warehouse by „Instituto Nacional de Semillas y Plantas de Viveros“.

INSECTS AND DISEASES

Insect pests do not seem to have been important. Diseases such as rust (*Puccinia*), rots (*Rhizopus*, *Sclerotinia*, etc.) and others occur, but the most important problem at present is downy mildew (*Plasmopara*).

UNRESOLVED PROBLEMS

It is necessary to improve and adapt agronomic practices such as cultivation, dates of seeding, density of seeding, fertilizer application, irrigation, the use of herbicides, choice of variety, as well as the equipment and techniques for precision seeding, harvesting, etc.

It is important to continue the adaptation and improvement of present varieties to the difficult climatic conditions in our Mediterranean country.

It is necessary to produce varieties adapted to different sunflower zones. For example, much earlier varieties are needed for the center and north of Spain.

It will be necessary in future to work almost exclusively with material resistant to mildew. It is also necessary to prepare for the possible occurrence of new diseases.

The use of hybrids may resolve a series of problems with respect to yield capacity, oil content of the seed, and resistance to various diseases and adverse conditions, etc.

WORK BY SEMILLAS PACIFICO S.A.

We are carrying on mass selection of Peredovik and Smena. We now have 4 selections of these varieties.

In our hybrid programme we are incorporating cytoplasmic male sterility into 581 lines.

Most of these lines have been selfed 5 to 6 times. 336 lines have been backcrossed repeatedly with CMS and 245 have been backcrossed once. This programme is progressing rapidly, as we produce a second generation per year during the winter in the Canary Islands.

We are now testing 128 triple hybrids and 10 simple hybrids resistant to mildew.

We have commercial increase fields of four female lines with cytoplasmic male sterility, and 10 hectares producing mildew resistant hybrids.