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PRESENT STATUS AND PROSPECTS OF SUNFLOWER CULTIVATION IN INDIA

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In the Asian continent, after China, India is the second largest sunflower growing country. In India, edible oilseeds are cultivated over an area of 19 million hectares with 17 million tonnes production. Peanut, rapeseed mustard, sunflower, sesame and safflower are the major edible oilseed crops. However, about 75 per cent of the total oilseed production is contributed by peanut and rapeseed mustard. Next only to these crops, in recent years sunflower has emerged as a potential oilseed crop in both rainfed and irrigated farming.

Area and Production:

In the last decade sunflower recorded steady increase in total cultivated area and production (Table 1).

Table 1 Area and production of sunflower in India from 1979–80 to 1988–89

Year	Area ('000 ha)	Production ('000 tonnes)	Productivity. (kg/ha).
1979–80	61.3	31.8	519
1980–81	119.4	66.3	555
1981–82	281.8	159.0	564
1982–83	462.2	229.7	497
1983–84	695.9	299.6	431
1984–85	834.6	439.8	527
1985–86	751.6	280.9	374
1986–87	1022.5	419.9	411
1987–88	1651.3	635.3	385
1988–89	1052.3	396.8	377

Although commercial cultivation started with 61,000 ha in 1979–90, the country witnessed spectacular increase in both area and production in a short period. However, with increase in acreage, the productivity has been low in all the years. During 1988–89 the cultivated area was also less as compared to 1987–88. However, it is estimated that an area of about 1.2 million ha was cropped with sunflower in the last two years.

In India, sunflower cultivation is concentrated in Southern parts. Four states, viz, Karnataka, Maharashtra, Andhra Pradesh and Tamil Nadu account for 99 percent of the total acreage and also production. In all these four major sunflower growing states the productivity ranges from 354 to 558 kg/ha. Cultivation of open pollinated varieties, under rainfed condition, seed filling problem, low inputs of major nutrients, disease pest incidence, continuous cropping of sunflower on the same land are some of the important factors responsible for low productivity. Notwithstanding low productivity since its

introduction, it may be said that sunflower has helped in easing edible oil shortage and raising the socio–economic status of farmers in the country.

Varietal improvement:

Morden (Chernianka–66), EC 68414 (Peredovik) and EC 68415 (Armaviriski–3497) are the important open pollinated varieties under cultivation. However, Morden is the most preferred variety because of its dwarf stature (120–140 cm) and early maturity (85 days). In the last few years, Morden has almost replaced the tall growing and late duration open pollinated varieties, viz., EC 68414 and EC 68415. New populations, viz. CO–1, CO–2, SS–56 and Sury, have been developed but these new cultivars have not made significant impact in replacing Morden variety.

Sunflower is a unique crop in the sense that both open pollinated varieties and single cross hybrids are available for cultivation. Heterosis breeding initiated at University of Agricultural Sciences, Bangalore, resulted in the development and release of BSH–1 hybrid in the year 1980 (Seetharam, 1981). It recorded 25 to 30 per cent increase in seed yield over Armaviriski–3497. According to Seetharam (1982) hybrids impart a few distinct advantages over varieties. These include more production stability, high self fertility, uniform growth and maturity and fair tolerance to diseases.

Release of BSH–1 sunflower hybrid in 1980, gave impetus to the development of new hybrid cultivars in public and private research institutes. As a result, mid–eighties witnessed an area of hybrid sunflower cultivation. Presently, MSFH–1, MSFH–8, MSFH–17 (all developed by MAHYCO Seed Dompany), BSH–1, APSH–11 are the hybrid cultivars under cultivation. Besides, a number of hybrids developed by private seed companies are being evaluated across the country.

Sunflower in the Ninetees:

Sunflower cultivation in India has witnessed many ups and downs in the last two decades. Despite low productivity sunflower is being cultivated because of remunerative price and high net income realised per unit area as compared with other crops. To sustain sunflower cultivation in the coming years, there is urgent need to stabilise yield level at 8 quintals/ha. In this direction, the following priorities in research and development efforts are suggested.

1. Increasing area under hybrid varieties:

As pointed out earlier, one of the reasons for low productivity is due to large scale cultivation of open pollinated varieties under rainfed conditions. Hybrids have high seed yield potential compared with varieites. Presently about 75 per cent of the total sunflower cultivated area is under varietal populations. In the coming years, with a view to increase productivity, large acreage is to be sown with hybrid cultivars under input intensive cultivation to exploit high seed yield potential. Under summer irrigated conditions with hybrid cultivars, yield potential to the extent of 20 to 25 quintals/ha has been realised on farmers' field. India is a vast country with different agro–climatic situations. It may be difficult to saturate entire sunflower area with hybrid cultivars. However, there is a possibility of extending sunflower cultivation with hybrid varieites to the extent of 50 per– cent of the total sunflower area. Development efforts in this direction need to be accelerated to exploit high seed potential of hybrid varieties.

2. Strengthening seed production machinery:

Seed is a key input in increasing production. The existing infrastructure of quality seed production in public and private structure is inadequate to meet the increasing demand for quality seeds of open pollinated and hybrids varieties. There is an urgent need to strengthen seed industries in the country to meet the increasing demand for quality seeds of sunflower. The problem of "pollen theft" owing to bee activity on restorer line only in hybrid seed production plots needs to be solved to increase hybrid seed yield.

3. Development of self–fertile populations and hybrids:

The studies of Robinson (1980), Roath and Miller (1982), George et al (1980), Shivaraju et al (1987) and Swamygowda and GiriRaj (1989) have shown that seed set in sunflower is influenced by environmental factors and that varietal populations have low self–fertility level compared with hybrids. According to Roath and Miller (1982), the ability to set adequate seed under all conditions is important. In major sunflower growing areas of India, in general, bee activity is minimal and as a result expected yield levels are not realised particularly with open pollinated varieties which are predominantly cultivated. Although hand pollination is suggested to overcome the problem of seed filling, under the present condition of extensive cultivation, it may not be a practical proposition. The other alternative is to develop self–fertile cultivars.

4. Breeding for disease resistance:

In India, Alternaria leaf spot and rust are the major diseases on sunflower. Incidence of downy mildew has also been reported in parts of Maharashtra and Karnataka states. BSH–1 sunflower hybrid is resistant to downy mildew and rust. In sunflower germplasm, disease resistant source for Alternaria is not available. Varietal populations are susceptible to rust incidence. Rust resistant genes available in restorers should be utilised in breeding programmes to develop populations resistant or tolerant to rust disease.

5. Diversity in Cultivars:

Morden (OPV) and a few hybrids dominate in sunflower cultivation. This factor is partly responsible for the widespread incidence of diseases in India. Hybrids have been derived from petiolaris cytoplasm. New varieties/hybrids should be developed from different sources to minimise the risk of devastation of crop due to diseases and pests. In the past two years attempts are being made to diversify CMS source. The possibility of utilising CMS–PF and CMS–I in heterosis breeding are being explored. New maintainer and restorer lines have been identified.

In India, sunflower is grown in rainy (June–July), post rainy (September–October) and summer (December–January) seasons. It is necessary to identify high yielding cultivars suitable for different agro–climatic situations. Development of early maturing hybrids (80 to 85 days) is most preferred in multiple cropping system. Attempts should be accelerated to develop early, mid and late cultivars to suit different farming systems.

6. Crop rotation:

In major sunflower growing areas, sunflower is grown every year on the same piece of land without crop rotation. This has resulted in increasing disease intensity. The

farmers need to be educated on crop rotation, balanced application of nutrients and plant protection which would help in maximising sunflower production.

CONCLUSION:

Sunflower has a bright future in India. In the last 2 to 3 years there is a growing interest in sunflower cultivation. It has made significant impact in bridging the edible oil shortage in the country. In the coming years after peanut and rapeseed mustard, sunflower would emerge as a potential oilseed crop of importance in the oilseeds economy of the country.

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ESTADO ACTUAL Y PERSPECTIVAS DEL CULTIVO DE GIRASOL EN INDIA

RESUMEN

El girasol tiene un brillante futuro en India. En los últimos 2 o 3 años hay un creciente interés por el cultivo de girasol. Este ha tenido un impacto significativo en llenar la escasez de aceite comestible en el país. En los años venideros después del cacahuete y la colza, el girasol emerge como un potencial cultivo oleaginoso de importancia en la economía de las oleaginosas en el país.

CONSTATS ET PERSPECTIVES DE LA CULTURE DU TOURNESOL EN INDE.

RÉSUMÉ:

Le tournesol connaitra un avenir brillant en Inde. Au cours des deux à trois dernières années, la culture du tournesol a connu un intérêt grandissant. Cela a eu un impact significatif sur le déficit en huile de consommation en Inde. Dans les années à venir, après l'arachide et le colza, le tournesol apparaitra comme une culture d'importance pour l'économie des graines oléagineuses du pays.