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THE STATUS OF SUNFLOWER AS A PROMISING OIL CROP IN EGYPT WITH EMPHASIS ON DISEASE SPECTRUM

Oilseeds, such as cotton seed, soybean, sunflowers, peanut, sesame and safflower seem to offer the cheapest and most promising readily available new source of protein for human foods. Interest in the sunflower plant species Helianthus is stirring in many nations and ranks the second oil crop for production. In Egypt, sunflower was seen as an ornamental plant 100 years ago. As a field crop, it was introduced to Egypt in the late 1940s. Sunflower is a summer crop which does not yield as high a return as cotton, rice, wheat or corn, but it fits into our cropping programme as a quick cash crop, relatively inexpensive to grow.

Due to the rapid increase in the population in Egypt and decrease of the area cultivated to cotton, there was an urgent need to increase domestic supplies of edible oils and commercial production of sunflowers. Table 1 shows sunflower acreages and production in Egypt in 1975 compared with average figures of the last seven years. The projected area devoted to sunflower is estimated to be 250,000 feddans by the end of the year 1980, mainly in the newly reclaimed lands.

As can be seen from Table 1, the area for sunflower production in Egypt began to increase quite significantly after 1968. However, both the area under cultivation and the gross yield showed a sharp decline between 1972 and 1975, which may be attributed to many factors, mainly to disease effect, lack of enough bee hives, shortage of mechanical equipments and shortage of seed crushers. The yearly estimated consumption of edible oil during 1975 is estimated to about

Table 1

Seeded Acreages and Production on Sunflower in Egypt During the Period 1968-1975

Year	Area sown (feddans)[x]	Total production (tons)	Average yield (kg/feddan)
1968	1.8	1184.0	646
1969	11.5	7488.4	652
1970	12.0	8683.9	724
1971	44.0	33269.2	756
1972	26.9	18199.5	677
1973	23.7	14834.1	625
1974	30.5	15981.9	525
1975	28.7	18088.2	632

[x] 1 feddan = 0.42 ha

336,000 tons, of which 89,000 tons are domestic production. The balance which is about 247,000 (73%) were imported from abroad. During 1980, the domestic requirements of vegetable oil is estimated to be 541,131 tons.

The bulk of our sunflower grown in the future will consist of high oil content varieties, and the total amount of yield of edible oil, margarine and feeding stuff for livestock will help our trade balance of payments and benefit the country economically. In Egypt, most of the total acreage is seeded to the domestic white variety Giza I and to the gray striped local varieties used for con-

fectionery purposes. The black-seeded varieties with high oil content developed in the USSR, USA, Romania and Bulgaria were introduced many years ago. Attempts are made every year to import several other varieties of high oil content and several other lines from the world collection to grow them under our local climatic conditions for evaluation.

Sunflower Diseases

When sunflower was first introduced into this country, it was free from serious diseases. As sunflower acreages expanded, however, diseases also increased in number and severity. Rust due to Puccinia helianthi Schw. was first recorded in Egypt by Melchers in 1931. Root-rot incited by Sclerotium bataticola (Taub.) and root-rot caused by Rhizoctonia solani Kuhn were reported on sunflower in 1957. More than 30 diseases have been reported on sunflowers in the literature. We have to contend in Egypt with most of the diseases recorded in the growing countries. Diseases of sunflower, like those of other crops, vary in severity from year to year and from one locality or field to another, depending on environment, causal organism(s), and host resistance. According to the ecological conditions, Egypt is divided into four climatic zones as follows: Upper Egypt, Middle Egypt, Lower Egypt (Delta region) and New lands area (coastal regions). From the year 1973, the author commenced detailed surveys of sunflower diseases in the four zones.

Table 2 indicates the distribution of sunflower disease according to different ecological regions in 1975. This survey showed that rust due to Puccinia helianthi, root and stem charcoal rot incited by Macrophomina phaseolina, and leaf spotting complex associated with several organisms were the most common and widespread diseases during the period 1973-1975. Alternaria alternata, Drechslera spicifera, Drechslera rost-

Table 2

Distribution of Sunflower Diseases According to Different Ecological Regions 1975

Fungi recorded	Upper Egypt	Middle Egypt	Lower Egypt	Coastal regions
Alternaria alternata (Fr.) Keissler.	+	+	+	+
Aspergillus Spp.	-	+	-	-
Curvularia lunata (Wakker) Boedijn.	-	+	+	+
Drechslera rostrata (Drechsler) Richardson & Fraser	-	+	-	-
Drechslera spicifera (Bain) V. Arx.	+	+	+	+
Fusarium Spp.	+	+	+	+
Macrophomina phaseolina (Tassi) Goid.	+	+	+	+
Penicillium spp.	-	+	-	+
Puccinia helianthi Schw.	-	+	+	-
Pythium Sp.	-	+	-	-
Rhizoctonia solani kuhn.	-	-	+	+
Rhizopus arrhis Fisher.	+	+	-	+

Table 2 (cont.)

Fungi recorded	Upper Egypt	Middle Egypt	Lower Egypt	Coastal regions
Sclerotium rolfsii Sacc.	+	+	-	-
Whetzelinia sclerotiorum (Lib) Korf & Dumont.	-	-	-	+
Nematodes Meloidogyne Spp.	-	-	-	+

+ Present
- Absent

rata, Ulocladium septosprum, Ulocladium botrytis Preuse, and Curvularia lunata were isolated from leaf spotting specimens. Head rots from which Rhizopus arrhizus, Alternaria alternata, and Aspergillus sp, were isolated and Southern blight caused by Sclerotium rolfsii were common in some fields but were not considered to be of major economic importance to the industry as a whole. Similarly, complex root rots from which Fusarium oxysporum, F. solani, Rhizoctonia solanti kuhn, Pythium spp. were isolated, and stalk and head rot attributable to Whetzelinia sclerotiorum were observed in isolated fields. In addition to these diseases, root knot nematodes due to Meloidogyne spp. can be considered to cause serious damage to individual plants, particularly in sandy soil, but to be uncommon disease of sunflower. Other diseases reported here included powdery mildew incited by Erysiphe cichoracearum, and damping off from which Pythium spp. and R. solani were isolated. Several attempts have been made to accurately assess

the relative importance of various diseases previously mentioned on sunflower. Charcoal rot and rust are usually regarded as being the most important diseases of sunflower and have been reported to have caused serious loss of yield in Egypt followed by leaf spotting complex.

Birds are reported to be serious sunflower pests in most growing areas in Egypt. Various members of birds of the family Fringillidae, notably Chloris chloris, Spinus spinus, Fringella collels are usually observed in large flocks to attack sunflower fields. They attack sunflowers a week or two before harvest and perch on the heads and pluck seeds, doing heavy damage to the crop. In many fields prior to harvest rats injur crops mostly by climbing the plants to reach sunflower heads.

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