

EGYPTIAN SUNFLOWER HYBRIDS AND SUNFLOWER FUTURE IN EGYPT

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Abstract :

EGYPT is facing a severe shorting in edible oil production . Sunflower performed very good under Egyptian condition either in Summer (all over the country) or late summer and winter Season (Upper Egypt). The seed imported every year from a broad which cost more than LE 3-4 melion. Morover, this budget increase every year according to, seed price, Cultivated area and infilation rate, which reflected negatively on edible oil price. To produce locally our own seed. efforts had been concentrated during last .12 years to release A,B and RF Lines with high combining ability . In 1992 we have successeed to produce the first pure Egyptian Sunflower hybrids using our breeding materials. 22 hybrids were tested and evaluated Comparing with the imported hybrids e.g. IBH 166 and Pioneer 6480 Five out of 22 hybrids over yielded the checks in seed yield and oil percent. Those hybrids are in final step for registration to replace the imported one. The relase of local hybrids will enhance greatly sunflower Cultivation and open the door for brighten Sunflower future.

Introduction :

In Egypt, the national production of some food stuff is not sufficient to meet the people consumption. The gap size between national production and consumption of those commodities differ from one to other. The big gap was estimated for edible oil. The estimation of national production from edible oil was 116, 102 and 98.000 MT in 1991 , 1992 and 1993 respectively, while the total consumption estimation was 857, 836 and 843.000 MT. The difference between national production and consumption Covered through importation from international market, which cost hundreds melion of hard currency.

To decrease the gap between production and consumption of edible oil, a great effort was paid by Egyptian scientist to Cultivate sunflower mainly for edible oil industry, due to its wide adaptability and high oil Content with high quilt Moreover, the remaining Cake after oil extraction is a rich source of protein for animal ration.

A successful ark has been done to identify the suitable Sunflower hybrids to Egyptian Condition through testing and evaluating several hundreds of hybrids from different . In institutions and Companies . Since there is no seed production in Egypt, the seed of recommended hybrids imported every year which cost more than LE 3-4 melion, this fund

increases every year according to international seed price, Cultivated area and inflation rate which has a negative effect on production cost and edible oil selling price .

In order to minimize the production cost and increase the net return to encourage the farmers to cultivate sunflower. it is very essential to have our own sunflower hybrids. So that, efforts had been concentrated during last 12 years to achieve this important goal i.e., Release pure Egyptian sunflower hybrids suitable to Egyptian condition .

Since the sunflower breeding materials owned by private companies, and there is no International Center pay attention to sunflower breeding to assist breeding program in developing countries. so that Egyptian breeding program during last 12 years aimed to obtain A,B and RF Lines .

Materials and Methods .

To release a pure breeding materials along with A, B and RF Lines, the following techniques were applied .

1- Build up a synthetic populations to be used as a source of new germoplasms .

2- Carry out some crosses to increase the genetic variability .

1- Build up a synthetic populations .

Nine synthetic populations were built using the available Sunflower hybrids and open pollinated varieties. In 1980 and 1981 seasons twenty hybrids and varieties were divided into groups on basis of :

- each group included at least of 7 varieties and hybrids .

- each variety and hybrid represented one time in each group .

The following techniques was applied

Tech.1. an equal amount of seed from assigned varieties and hybrids were mixed together carefully .

Tech.2. A suitable number of plants from each variety and hybrids were manually emasculated and bagged . All possible Combination of crosses were made between the twenty varieties and hybrids.

-The hybrid seed were grouped according to the previous basis .

- The following steps were applied on all groups resulted from both techniques .

- The mixed seed of each group was sown separately in isolated area or under cages.

Random pollination take place within each group using bee hives.

- Each group harvested as a bulk. This step was repeated for three successive years .

- In fourth year individual plant selection take place depending on vegetative characters .

Self pollination was made for fertile plants while male sterile plants were crossed with open pollinated varieties (plant to plant) .

- Each selected plant (fertile or cms) was harvested separately and sown in a single row next Season.

- Self pollination was repeated in fertile plants progenies to increase their homogeneity and Back cross homogeneous progenies of CMS with their Corresponding parents

- The former step repeated and pure inbred fertile lines and CMS lines Similar to their fertile parent (i.e. A and B lines) were released .

- specific and General Combining ability for the obtained inbred lines (fertile and CMS) were estimated .

- RF gene was transferred to the fertile inbred lines which showed a high value of specific and General Combining ability with CMS lines .

-The obtained lines A.b and RF were used for the first time to produce 22 hybrids in 1992 season and evaluated in 1993 .

Table (1) represent the data of those hybrids Comparing with Commercial ones pioneer 6480 and IBH166 .

It is clearly appear from this data that 5/92, 7/92, 4/92 and 20/92 produced higher seed. and oil yield than checks pioneer 6480 and IBH 166 .

- Sunflower Crosses.

Due to the limited genetic variability available at hand 20 crosses between the two extreme parents i.e tall vs short and late mature vs early mature .

This crosses were made without emasculation depending on selfincompelability in sunflower. In F1 generations self pollination made to the plants which showed the dominant vegetative character of the male parent.

Sunflower Future

Due to high intensified Agriculture System applied in Egypt and severe Competition between sunflower and other Summer crops as Maize, Cotton and Rice. The research program aimed to penifit from the acheivement of other crops, as releasing early maturing rice varieties which offer oportunity to Cultivate short Season Sunflower varieties, before transplanting short season rice varieties. In addition, Cultivating Sunflower after harvesting of early plantation of suger beat and before maize . The crops arrangement have been tested and demonstrated to the farmers This Crops sequences will increase farmers total net return. Moreover, in upper Egypt, where suger cane major area is there, Sunflower was success fully intercropped with first planfation as will as ratoon . Sunflower was intercropped with winter tomato in those governorate. This system protect suger cane seedling and tomato from frost which usually happened during December and January, in addition it will decrease the production cost of tomato, since the farmers used to protect tomato by Covering it with straw. The results of this system are improvement of tomato yield in quantity and quality and Sunflower seed yield which increase the net return.

The Government efforts are concentrated, through extension staff to apply those systems to increase national Sunflower seed production Releasing of local hybrids seed Suitable to all this situations will assist to increase self sufficient rate and make Sunflower Future in Egypt more brightening.

References :

Fick , G. N. (1978).

Breeding and Genetics. " Sunflower Science and Technology , 279 - 330 . 1978 " American Society of Agronomy Crop Science Society of America, Madison, Wisconsin, U.S.A.

Oil Seeds World Markets and Trade. (1994) .

United States Departments of Agriculture. Foreign Agriculture Service. Circular Series, Fop 1 - 94 . January - 1994 .

Table (2) : Local Hybrids Trial
Seed yield kg/ha. and oil content
1993

Hybrids	Seed yield (kg/ha.)		Average	Oil %	Oil yield (kg/ha)
	Sakha	Nubaria			
1/92	2004	2489	2246	38	854
2/92	2069	1584	1826	42	767
3/92	2143	2760	2451	39	956
4/92	2740	3485	3113	45	1400
5/92	3492	3840	3666	39	1430
6/92	2424	2945	2685	41	100
7/92	3269	3115	3192	40	1277
8/92	1253		1253	39	489
9/92	2580		2580	39	1006
10/92	2813	3005	2909	39	1145
11/92	2695	2383	2539	39	990
12/92	2155	2503	2329	42	978
13/92	1480		1480	43	636
14/92	1339		1339	40	536
15/92	2244	2990	2612	34	886
16/92	2832		2832	36	1020
17/92	2419	2693	2556	36	920
18/92	2765		2765	35	968
19/92	2275	3317	2796	43	1202
20/92	3557	2657	3107	40	1243
21/92	1764	2647	2205	37	816
22/92	2042	2767	2405	38	914
Pioneer 480	2203	1960	2082	36	791
IBH 166	2537	3631	3084	37	1141
Average	2379	2620	2600	39	1014

LSD 5%

420

545

CV %

12.01

14.18