Chickpea production in Yugoslavia and efforts for its improvement

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Chickpea production in Turkey

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SUMMARY - Chickpea is cultivated in large areas and has become an important export item in recent years in Turkey. Traditional methods are still used in chickpea cultivation. Chickpea research studies have been undertaken by several agricultural research institutes. As the outcome of research studies, some varieties have been registered. The main problems constraining the chickpea production are the lack of registered varieties for every ecological region and ascochyta blight disease.

RESUME - "La production du pois chiche en Turquie". La superficie cultivée en pois chiche en Turquie est trés grande et cette culture a pris une place importante dans les exportations au cours des dernières années. Les techniques de culture sont encore trés traditionnelles. Plusieurs instituts de recherche agronomique conduisent des recherches sur le pois chiche. Un de leurs résultats a été l'obtention de plusieurs variétés. Le principal problème limitant la production du pois chiche est le manque de variétés adaptées à chaque région écologique et résistantes à l'anthracnose.

Introduction

Turkey has 17,861,356 hectares land of field crops in which food legumes with 1,722,921 hectares share 10% and chickpea is second to lentil in area and production (Anon., 1988).

Considering the foreign trade of Turkey, chickpea has become an important export item in recent years (Table 1) (Anon., 1976-1986). Being one of the three crops considered in the Project of Limiting Fallow Lands (NAD), chickpea has received particular attention and large additional areas are coming under its cultivation, every year (Table 2) (Anon., 1987).

As for its distribution in Turkey, it is grown almost in all regions in the country but the cultivation is mainly concentrated in the Central North region and followed by Mediteranean, South East, Central South, Aegean, Central East, North East, Black Sea and Marmara regions (Table 3) (Fig. 1) (Anon., 1987).

Generally, kabuli-type chickpea is preferred and there are a number of ways in which chickpea is used in Turkish kitchen, starting from chickpea bread, main dishes, humus, pastry, etc., to garnish in meat plates and rice. Besides, it is also consumed as snacks in various forms including the sweetened ones.

Chickpea cultivation in turkey

Chickpea is cultivated in spring but there is a potential of winter sowing in coastal areas and South Eastern parts of Turkey. The possibility of winter sowing completely depends on improving the ascochyta blight and cold resistance in the cultivars.

Farmers usually broadcast the seeds and cover them by soil afterwards. Sowing by drills is not common. There have been efforts for mechanized sowing particularly in the transitional region. A simple attachment has been developed at Izmir for use with tractors (Acikgöz, 1987). The seed drills used for other crops such as wheat or cotton can also be used for sowing chickpea, but they are not common yet. Weeding and harvesting are still manual. Combines are only used in state farms and research stations.

Problems in chickpea production

Although Turkey is the third biggest chickpea producer in the world, the average yield of the crop is not as high as it should be. The main yield limiting factors are the lack of the registered varieties for every ecologi-

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Table 1. Quantity and value of chickpea export from Turkey in 1978-1987.

Year	Quantity (tons)	Value (1000 $)
1978	20 635	16 545
1979	45 352	32 184
1980	88 535	35 721
1981	172 083	67 444
1982	156 322	65 196
1983	163 808	60 824
1984	159 280	63 337
1985	189 045	84 218
1986	248 407	98 311
1987	369 357	98 851

Table 2. Area sown, production and yield of chickpea in Turkey (1978-1987).

Year	Area sown (ha)	Production (tons)	Yield (kg/ha)
1978	168 000	205 000	1220
1979	200 000	225 000	1125
1980	240 000	275 000	1146
1981	200 000	235 000	1175
1982	245 000	280 000	1143
1983	334 000	290 000	867
1984	345 000	335 000	971
1985	399 000	400 000	1003
1986	534 000	630 000	1180
1987	655 324	725 000	1106

Table 3. Area sown and production of chickpea by regions (1987).

Region	Area sown (ha)	Production (tons)	Yield (kg/ha)
Central North	131 668	167 988	1276
Aegean	90 599	108 471	1197
Marmara	2 175	3 104	1427
Mediterranean	147 658	135 335	917
North East	11 119	8 394	755
South East	89 658	67 088	748
Black Sea	2 816	2 552	906
Central East	66 382	73 954	1114
Central South	113 243	158 104	1396
Total	655 324	725 000	1106

cal region and the susceptibility of local cultivars to diseases.

Registered chickpea varieties

Until recent years there were no registered chickpea varieties. In 1987, "Canitez 87" and "Easer 87" were registered by Eskisehir Agricultural Research Institute and Ankara University Agricultural Faculty respectively. Additionally, the cultivar ILC 195/2 was licensed for seed production. Variety "Canitez 87" is large-seeded type but highly susceptible to ascochyta blight. On the other hand, seeds of blight resistant line ILC 195/2 and tolerant variety Easer 87 are not large enough. In terms of seed

Fig. 1. Area sown of chickpea in Turkey, 1986. (Each dot represents 1000 ha).

quality these varieties are rather below the level demanded by consumers. Therefore, farmers still use the seed from their own local populations, which are generally larger in seed size than the improved cultivars.

Diseases

Diseases are main constraint to increased chickpea production in Turkey. The most important disease is ascochyta blight (anthracnose) caused by *Ascochyta rabiei*. Ascochyta blight can damage chickpea in all the growing areas; in some years depending on climatic conditions, heavy yield loss may occur. Localized epidemics are frequent but region-wide losses are rare. As is clear from the yield data in Table 2, the worst epidemic was experienced in 1983.

In order to avoid the damage fron blight disease, growers prefer late spring sowing which sometimes lasts until the second part of May. Late sowing causes yield decreases due to short vegetative growth.

Although there are some recommendations for controlling the disease such as fungicidal seed dressing and foliar applications and some cultural practices, none of them can control the disease completely. Therefore, breeding the blight resistant varieties is the best way.

Chickpea research activities in turkey

Chickpea research activities are mainly carried out by the Aegean Agricultural Research Institute, Field Crops Central Research Institute, Agricultural Research Institute (Eskisehir) and South Eastern Anatolia Agricultural Research Institute under the National Food Legume Project. The Agricultural Faculty Ankara University, and some other research institutes are also interested in chickpea research. All above mentioned institutes have their own breeding and agronomy programmes and they are cooperating with each other and ICARDA.

The main objectives of chickpea research activities in general are as follows:

- To improve the large seeded ascochyta blight resistant varieties with

. high yield,

. cold and drought resistance,

. good quality,

. suitable for mechanization, and

- To conduct the agronomic trials.

Chickpea Breeding proogramme can be outlined in three steps and schematized as shown in Fig. 2. The steps include

- Obtaining the genetic variation

- Selecting the lines from this variation

- Testing the selected lines from the point of yield value.

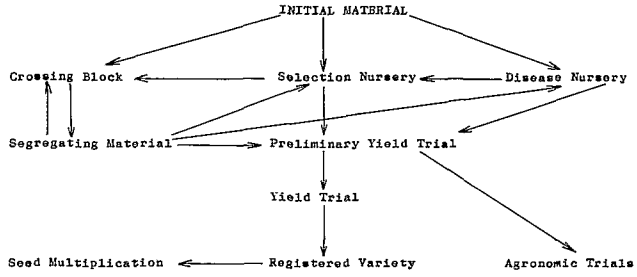

Fig. 2. Chickpea breeding scheme.

Breeding work at the Aegean Agricultural Research Institute, Izmir

Chickpea research has started with a large range of material originated from Turkey and other countries. After screening under artificial ascochyta blight epidemics, resistant lines were selected for further breeding steps. For example the lines with desirable seed characters have been directly tested in yield trials. Line ILC 195/2 was improved in this way. It is resistant to ascochyta blight, can be grown in coastal areas in winter, is medium-seeded and because of its semi-erect growth habit it can be harvested by combine. Some promising genotypes from the above mentioned screening are in the regional yield trials.

Hybridization programme was initiated in 1983 for enhancing variability. Selections have been done from the segregating materials under artificial blight epidemics. Some lines selected from F_6 are being tested in yield trials, in ascochyta blight nurseries and observation nurseries.

The inheritance of resistance to ascochyta blight disease has also been studied. A single recessive gene was found to be conferring resistance in lines 72012, ILC 195 and Nec 138-1; a single dominant gene was found controlling resistance in lines ILC 201 and ILC 202 (Acikgöz, 1983).

Regional yield trials have been conducted in three locations in Aegean region. There are also some "On Farm Trials" in cooperation with "Agricultural Extension and Applied Research Project".

Yield trials for registration

Yield trials for registration are organized by a separate institute namely Seed Registration and Certification Directorate in a close cooperation with regional research institutes. The number of candidate lines and the number of locations can vary every year. For instance, in the 1988, seven lines in addition to standard check have been tested at five locations.

Seed production

Since chickpea is self-pollinated, the growers are able to use the certified seed up to 5 years. The registered chickpea seed production scheme for 1988 is summarized on Table 4. (Anon., 1988a).

Table 4. Seed production targets of registered chickpea varieties (1988).

	Basic seed I (tons)	Basic seed II (tons)	Foundation seed I (tons)	Certified seed (tons)	Cont. seed (tons)
Canitez-87	1	–	10	–	–
Eser-87	0.1	0.6	1	18	–
84 AK 1121	0.1	–	–	–	–
ILC 195/2	1	15	20	–	–
Güney					
Sarisi 482	–	–	–	–	1
Ispanyol	–	–	–	–	560
Total	2.2	15.6	31	18	561

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