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Faba bean production in Turkey

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SUMMARY - Faba bean is grown in the Aegean region of Turkey as both human food and animal feed in addition to being an export item. Traditional techniques are still practised in faba bean culture. Country-wide research on this crop is primarily undertaken by Aegean Agricultural Research Institute. The faba bean cultivar 'Eresen-87' has been released and registered by the same institute. The main problems of faba bean cultivation are *Orobanche* attacks, lack of disease-tolerant cultivars and inadequate mechanization of the culture.

RESUME - "La production de fève en Turquie". La fève est cultivée en Turquie dans la région de la mer Egée, aussi bien pour l'alimentation humaine qu'animale, et elle constitue également un article d'exportation. Les techniques traditionnelles sont toujours utilisées pour la culture de la fève. La recherche sur cette espèce à l'échelle nationale a été menée en premier lieu par l'Institut de la Recherche Agricole de l'Egée. Le cultivar 'Eresen-87' a été obtenu et enregistré par ce même Institut. Les problèmes principaux en ce qui concerne la culture de la fève sont l'*Orobanche*, le manque de cultivars résistants aux maladies, et une mécanisation peu adaptée à cette culture.

Introduction

Turkey has 1,722,921 ha of food legumes production. Faba bean, with 44000 ha, accounts for 2.4% of this area.

When compared with other food legumes, its production in Turkey is relatively less important. Considering food legume crops, faba bean comes fourth in dry seed production after chickpea, lentil and dry bean. Almost 30% of dry seed production is exported every year (Table 1; Anonymous, 1988b). The increases in faba bean production and cultivation area which have been less in last decade are shown in Table 2 (Anonymous, 1988a). As for the distribution by regions in Turkey, it is mainly concentrated in Aegean region (approx. 88%) followed by Marmara, Central North, Black Sea, Mediterranean and Central East (Table 3; Fig. 1; Anonymous, 1988c).

Faba bean is consumed as immature green pods, green seeds or mature dry seeds, while a large proportion of the dry seed production is exported every year. Dry seeds and by-products of seed production which include plant residue are also used for animal feed.

Although large seeded landraces cover large areas of production, some farmers also grow small seeded cultivars.

Cultivation

Faba bean as a winter crop is cultivated under rainfed conditions in autumn. Irrigation is not common except in some areas where faba bean is grown for green pods as vegetable.

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

Year	Quantity (t)	Value (1000 \$)
1978	2410	685
1979	12289	3792
1980	20240	6304
1981	18696	6626
1982	30811	9022
1983	42464	11074
1984	23444	6280
1985	24828	6287
1986	22611	5508
1987	25912	6243

Table 2. 1978-1987 sown area, production and yield of faba bean in Turkey.

Year	Sown area (ha)	Production (t)	Yield (t/ha)
1978	31000	53500	1.726
1979	31000	52000	1.677
1980	30000	52000	1.733
1981	30000	55000	1.833
1982	35500	65000	1.831
1983	42500	77000	1.812
1984	42000	76000	1.810
1985	42000	73000	1.738
1986	42500	80000	1.882
1987	44000	80000	1.818

Table 3. Sown area and production of faba bean by regions (1987).

Region	Sown area (ha)	Production (t)	Yield (t/ha)
Central North	1823	4681	2.568
Aegean	38832	68707	1.769
Marmara	2006	4248	2.118
Mediterranean	405	761	1.879
North East	—	—	—
South East	—	—	—
Black Sea	792	1355	1.711
Central East	142	248	1.746
Central South	—	—	—
Total	44000	80000	1.818

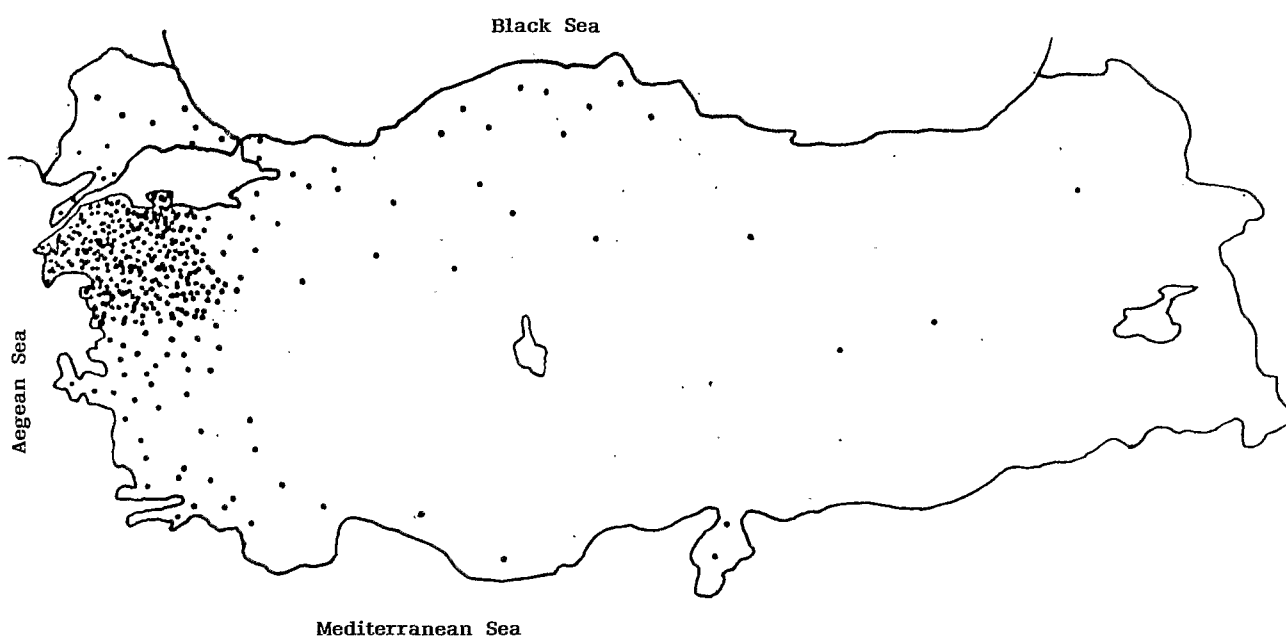


Fig. 1. Cultivated area of faba bean in Turkey in 1987 (each dot represents 100 ha).

Farmers usually broadcast the seeds and cover them by soil afterwards. Sowing by drills is very rare. There have been some efforts for mechanized sowing, particularly in Balıkesir and Çanakkale provinces where faba bean production is concentrated. The seed drills for sunflower, corn, cotton, etc., can be adapted to faba bean sowing but they are not yet common practices. Weeding and harvesting are done by hand. After harvesting, farmers in some areas such as Balıkesir province, use threshers of other crops.

Problems of faba bean

Turkey is among the first ten countries in the world in terms of both production and acreage but average yield is not as high as many countries.

The main yield-limiting factors are: the lack of the registered varieties, *Orobanche*, diseases and lack of farmers' knowledge on agronomic practices such as seed

bed preparation, chemical control application, and production techniques, and limited mechanization facilities.

Registered varieties

Until recent years there were no registered faba bean varieties except cv. 'Sevil' that was originally registered for green consumption. But some farmers grow it for dry consumption as well. In 1987, cv. 'Eresen-87' was registered by Aegean Agricultural Research Institute. The seed production of these varieties cannot meet the seed demands of growers. Therefore, they still get the seed from their own local populations.

Broomrape (*Orobanche* sp.)

Broomrape which is a main problem in some places of Çanakkale province, causes damage in faba bean fields, discouraging growing this crop more. No chemical is applied against *Orobanche*. Some farmers practise crop rotation which is not successful enough.

Pests and diseases

Important fungal diseases are ascochyta blight caused by *Ascochyta fabae*, rust (*Uromyces fabae*), chocolate spot (*Botrytis fabae*) and *Alternaria* spp. Insects, like black aphids (*Aphis fabae*) and *Bruchus* spp., cause heavy losses if proper chemicals are not applied. *Thrips angusticeps* that causes decrease of marketing quality is also an important pest for faba bean grown for green consumption.

Research activities in Turkey

Faba bean research activities are mainly carried out by Aegean Agricultural Research Institute. Some other research institutes namely Mediterranean Agricultural Research Institute, and South Eastern Anatolia Agricultural Research Institute are interested in its research under the framework of National Food Legumes Project. Some research is also performed by some universities such as Aegean University Agricultural Faculty, Çukurova University Agricultural Faculty, etc.

Aegean Agricultural Research Institute that has its own breeding and agronomy programme is cooperating with above-mentioned institutes and ICARDA.

The main objectives of faba bean research activities are to improve the varieties (looking for high yield, cold, heat and drought tolerance and disease resistance) and to conduct the research work on agricultural practices and technology of faba bean.

Faba bean breeding programme can be outlined in three steps and summarized in Fig. 2. These are: to obtain the required genetic variation; to select better lines from this material, and to test the selected lines from the point of view of yield.

Breeding and agronomic work in Aegean Agricultural Research Institute

Faba bean research started on three populations originated from Turkey. Two of them were large seeded ones, namely 'Sakiz' and 'Fransiz' landraces. The third one was small-seeded, known as 'Milas'.

Single plant selection was applied through reserve seed method. Screening characters were earliness and yield as well as tolerance to diseases, drought and cold in natural conditions and resistance to lodging and shattering. Promising lines were also tested in regional yield trials and on-farm trials.

Cv. 'Eresen-87' was improved from Sakiz population in the way mentioned above. It is large-seeded, semi-erect type and tolerant to temperatures of up to -5 °C. It is registered for dry seed production but is also suitable for green consumption, having 27% higher yield than cv. 'Sevil'.

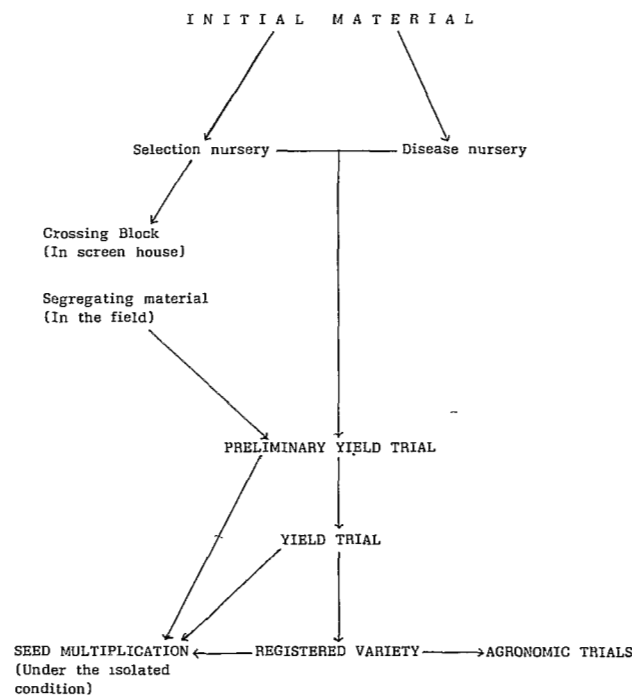


Fig. 2. Faba bean breeding programme scheme.

Besides these three initial populations, a large range of materials which were originated from Turkey and other countries have been tested.

Recently, faba bean breeding programme has been modified in order to obtain varieties that are early, *Orobanche* tolerant and suitable for mechanization.

The hybridization programme was initiated in 1984 for the same purposes. Segregating materials produced by ICARDA have been also tested. At the present time, some promising genotypes from segregating materials are tested in regional yield trials.

Yield trials for variety registration were conducted by AARI in close cooperation with Seed Registration and Certification Directorate which is a separate authority for organizing yield trials in different locations of Turkey. In connection with this breeding programme, some other studies have been or are still being performed, such as:

- Determination of faba bean yield components and their inheritance had been studied. In this study dominant gene action was found significant for plant weight, pod number per plant, seed number per plant and yield per plant. Additive gene action was found significant for days to flowering, plant height of first podded node, seed number per pod and 100-seed weight (Kitiki and Demir, 1987).
- A line x tester analysis for combining ability was carried out in three female and four male parents and their twelve hybrids. Yield components were analysed. General combining ability effects of testers and lines were significant (Kitiki and Açıkgöz, 1986).
- Some agronomic studies have been performed on plant densities and sowing distances, effect of chemicals on weed control and control of *Orobanche* by chemicals. Results of experiments indicated that 25 plant/m² in low lands and 30 plant/m² in dry lands respectively gave the best yield (Akdemir, 1983). Terbutryne, terbutryn + pronamide, and/or triflurine were effective to control weeds in faba bean fields. On-farm trials showed that *Orobanche* control would be possible if 80 g/ha or 120 g/ha of glyphosate was applied three times in 15-day intervals. Trials in connection with *Orobanche* have been performed in farmers fields where this parasite is present.

Results obtained so far are tried to be transferred to farmers. For this purpose, demonstrations have been scheduled for Aegean Region, especially for Çanakkale

Table 4. Seed production (t) targets of registered faba bean varieties (1989).

	Basic seed	Foundation seed	Certified seed
Sevil	-	-	2
Eresen-87	2	2	-
Total	-	2	2

and Balıkesir provinces. There are also some On-Farm Trials that is a cooperative work with Agricultural Extension and Applied Research Project.

Seed production

Since faba bean shows partial allogamy, the certified seed must be replaced annually. The registered faba seed production scheme for 1989 is summarized in Table 4 (Anonymous, 1989).

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