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## Performances of some local and foreign almond cultivars in South East Anatolia

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**SUMMARY** - Almond growing under irrigated conditions in South East Anatolia has given very promising results. During the last 8 years, none of the almond cvs under experiment showed frost damage. Therefore the region was supposed to be quite a suitable place for almond growing in Turkey. In our earlier experiments with local cvs, early flowering (48-1, 48-2 and 48-5), late flowering (101-13, 101-23) and American cvs (Non Pareil, Drake and Texas), it was observed that the Turkish cvs started bearing in the ages of 5, 6 whereas the American cvs came into bearing in the 3<sup>rd</sup> year. Three years ago we planted Ferragnes, Ferraduel, Genco, Yaltinski and Picantili cvs in the same area. Last year these cvs started bearing and this year they have produced quite a good yield. Their flowering times were later than the previously tried cvs except the two very late flowering cvs of 101-13 and 101-23. Since the irrigation water is available from the huge Atatürk Dam and the results of almond experiments are very promising, the Harran Plain seemed to be a potential almond producing area for Turkey.

**Key words:** Late flowering almonds, early bearing, irrigation.

**RESUME** - "Performances de quelques cultivars d'amandier locaux et étrangers dans le Sud-Est de l'Anatolie". La culture d'amandiers en irrigué dans le Sud-Est de l'Anatolie a donné des résultats très prometteurs. Pendant ces dernières 8 années, aucun cultivar d'amandier sous expérimentation n'a montré de dommages dues aux gelées. Par conséquent la région est censée être bonne pour la culture de l'amandier en Turquie. Dans nos expériences préalables avec des cultivars locaux à floraison précoce (48-1, 48-2 et 48-5), à floraison tardive (101-13, 101-23) et des cultivars américains (Nonpareil, Drake et Texas), on a observé que les cultivars turcs sont entrés en production à la 5<sup>ème</sup> ou 6<sup>ème</sup> année alors que les cultivars américains le faisaient à la 3<sup>ème</sup> année. Il y a trois ans, nous avons planté les cultivars Ferragnes, Ferraduel, Genco, Yaltinski et Picantili dans la même zone. L'année dernière, ces cultivars sont entrés en production et cette année ils ont produit un rendement franchement bon. Leurs périodes de floraison ont été plus tardives que pour les cultivars testés au préalable sauf pour les deux cultivars à floraison très tardive 101-13 et 101-23. Etant donné que l'eau d'irrigation est disponible à partir de l'immense barrage d'Atatürk et que les résultats des expérimentations sur amandier sont très prometteurs, la plaine d'Harran semble être une zone de production d'amandes potentielle pour la Turquie.

**Mots-clés :** Amandiers à floraison tardive, entrée en production précoce, irrigation.

### Introduction

Turkey's almond production was 48 thousand metric tons in 1994 although the number of trees in the same year was 4,727,000 (Anonymous, 1994). The reason of the low yield is due to the late spring frosts. On the other hand most of the almond trees in Turkey are seedling trees as in the case of walnut. Therefore the nuts are not standardized (Küden *et al.*, 1993). Cukurova region is frost free for almond but due to the humidity during the summer months, some fungal diseases were observed. Therefore in the Mediterranean region we are looking for some other dry summered places.

Several foreign almond cultivars and local types were also experimented in the Taurus mountains of the Mediterranean region and very good results were obtained with the cultivars such as Cristomorto, Ferraduel, Ferragnes, Drake, Non Pareil, Texas, 101-9, 101-13, etc., (Kaşka *et al.*, 1996).

Eight years ago we wanted to try almond growing in the South East Anatolia. Surprisingly we obtained very promising results with Non Pareil, Drake and Texas (Kaşka *et al.*, 1993a,b).

Three years ago we introduced there the late flowering almond cvs such as Ferragnes, Ferraduel, Genco, Picantili and Yaltinski.

The objective of this work is to compare the flowering times of the newly introduced cvs with the previously planted Turkish and foreign types and cvs. At the same time we wanted to see the behaviour of the trees, bearing conditions and the quality of the nuts.

### Material and method

The experiment which was carried out at Ç.Ü. Agricultural Faculty, Koruklu Research Station in Panlyurfa showed us that, the almond growing has an important future in the GAP area in Harran plain under irrigated conditions. The trees were planted by 6 x 3 meter distances between and on the row and irrigated by mini sprinkler.

In the experiments, five late flowering almond cultivars were tried during 1993-1996. These cultivars were Ferragnes, Ferraduel, Genco, Picantili and Yaltinski.

The flowering and harvesting times, the yield and the nut quality characteristics of the experimented almond cultivars were determined.

### Results and discussion

The full bloom dates of the experimented almond cultivars are given in Fig. 1. Except Ferraduel, the other almond cultivars reached full bloom on 14<sup>th</sup> of March, 1996. These flowering dates are similar to the dates at INRA in France, but later than the flowering dates at GREMPA (France) and IRTA (Spain).

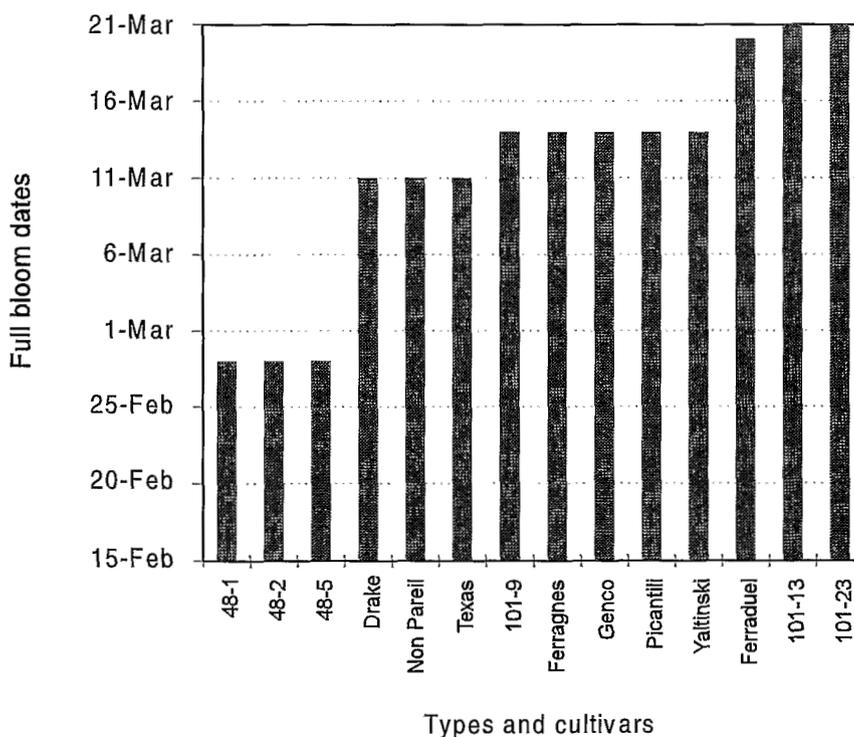


Fig. 1. The full bloom dates of the experimented almond types and cultivars under Koruklu (Panlyurfa) ecological conditions.

Ferraduel full bloomed on 20<sup>th</sup> of March, 1996. As it is seen in this figure, the full bloom dates of the 2 Turkish types, 101-13 and 101-23 were later (21<sup>st</sup> March) than of all the other experimental cvs (Kaşka *et al.*, 1993b). The early flowering Turkish almond types (48-1, 48-2 and 48-5) have shown similar behaviour in the GAP region and full-bloomed much earlier (28 Feb. 1996) than the rest of the other cvs. Drake, Texas and Non Pareil's full bloom dates were about the same and 13 days later than early flowering types and 3 days earlier than 101-9, Ferragnes, Genco, Picantili and Yaltinski and 7 and 8 days earlier than Ferraduel, 101-13 and 101-23.

Although the newly introduced trees were only 3 years old, quite a good yield was obtained (Table 1). Picantili gave the highest yield value per tree with 4.45 kg/tree. It was followed by Genco (3.60 kg/tree) and Yaltinski (3.11 kg/tree), Ferragnes (2.18 kg/tree) and Ferraduel (1.75 kg/tree).

Table 1. The yield and some characteristics of the nuts of experimental cvs (1996)

Cultivars	Average yield (kg/tree)	Date of harvesting	Average fruit weight (g)	Average kernel weight (g)	Double kernels (%)	Percent kernel (%)	Kernel length (mm)	Kernel width (mm)	Kernel thickness (mm)
Ferraduel	1.75	29/8	6.69	1.56	13.33	23.33	25.06	16.02	8.89
Ferragnes	2.18	29/8	5.06	1.74	-	34.39	28.48	15.06	8.38
Genco	3.60	29/8	4.45	1.34	6.67	30.11	22.50	13.64	9.08
Picantili	4.45	27/8	3.85	1.46	13.33	37.92	27.56	15.66	10.36
Yaltinski	3.11	31/8	4.38	1.73	26.67	39.50	25.20	14.98	10.34

Picantili harvested earlier than the others on the 27<sup>th</sup> August of 1996. The average fruit weight of Ferraduel was found to be the highest (6.69 g). It was followed by Ferragnes (5.06 g), Genco (4.45 g), Yaltinski (4.38 g) and Picantili (3.85 g). The average kernel weight was higher in Ferragnes and Yaltinski with 1.74 g and 1.73 g, respectively. Double kernel rate was the highest (26.67%) in Yaltinski. No double kernels were found in Ferragnes. The kernel percentage was also higher in Yaltinski with 39.50%. Kernel length, width and thickness were changed according to the shapes of the cultivars.

Both earlier (Kaşka *et al.*, 1993a,b) and present results showed that there is a big potential for almond production in the South East Anatolia. Since the summers are extremely warm, pre-cooling, cold storage and refrigerated long-distance transport of the table fruits such as peach, nectarine, apricot, etc., would be difficult and expensive, dry fruit (such as almond and pistachio nut) production will be a reasonable choice for the region. In this points prices and the market demands to these nuts should not be forgotten.

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