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in

Ak B.E. (ed.).
XI GREMPA Seminar on Pistachios and Almonds

Zaragoza : CIHEAM
Cahiers Options Méditerranéennes; n. 56

2001
pages 365-367

Antoñeta and Marta: Two new self-compatible late flowering almond cultivars

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SUMMARY – Two new self-compatible late-flowering almond cultivars released at CEBAS-CSIC (Spain) are presented. Both cultivars, obtained from the cross Ferragnès Tuono made in 1985, show the following characteristics: besides their self-compatibility (with a high degree of autogamy) and late-flowering, both cultivars have high productivity and more frost resistance than other late-flowering cultivars; the fruit of both cultivars have attractive, non-double, good flavoured kernels, with hard-shells and a percentage of kernel of around 35% (Antoñeta) and 32% (Marta). While Antoñeta shows a half-opened mid-branched habit, Marta is upright and low branched.

Key words: Almond, *Prunus dulcis* Miller, self-compatibility, late-flowering, new cultivars.

RESUME – *"Antoñeta et Marta : Deux nouveaux cultivars d'amandier autocompatibles à floraison tardive". Deux nouveaux cultivars d'amandier autocompatibles à floraison tardive mis au point au CEBAS-CSIC (Espagne) ont été présentés. Les deux cultivars, obtenus à partir du croisement Ferragnès x Tuono réalisé en 1985, ont montré les caractéristiques suivantes : outre leur autocompatibilité (avec un fort degré d'autogamie) et floraison tardive, les deux cultivars ont une haute productivité et plus de résistance au gel que les autres cultivars à floraison tardive ; le fruit des deux cultivars donne des amandes attrayantes, non doubles, à goût agréable, avec des coques dures et un pourcentage d'amandons d'environ 35% (Antoñeta) et 32% (Marta). Tandis qu'Antoñeta montre une tendance de branches à mi-hauteur et semi-ouvertes, Marta est à branches basses et dressées.*

Most-clés : *Amandier,* Prunus dulcis *Miller, autocompatibilité, floraison tardive, nouveaux cultivars.*

Introduction

Self-compatibility is an increasingly important characteristic of new almond cultivars, especially when the prevailing climatic conditions during blooming (low temperatures, wind, mist) are unsuitable for bee activity. In these conditions, self-compatibility replaces to a great extent the absence of bee pollinators.

Another advantage of self-compatibility is that it permits monovarietal orchards in which the fruits are ready for harvesting at the same time. The efficacy of phytosanitary treatments is also improved since the orchards develop more homogeneously.

We present in this paper two late-blooming self-compatible cultivars, Antoñeta and Marta.

Origin

The two new cultivars arise from a crossing made between Ferragnès and Tuono in 1985 (García *et al*., 1985). The seedlings were grown in a nursery in 1996 before planting in the field in 1987. They were systematically studied for the most important agronomic characteristics (García *et al*., 1996).

The orchard where selection was achieved is situated in an area of cold winters and hot summers. The selections were subsequently grafted onto rootstocks in different localities for experiments on a commercial scale.

Description

The main characteristics of the cultivars Antoñeta and Marta are showed in Table 1.

Table 1. Characteristics of Antoñeta and Marta, the new cultivars obtained in CEBAS-CSIC, Murcia (Spain)

	Antoñeta	Marta
Tree		
Vigour	High	Very high
Crown form	Open	Upright
Ramification	Abundant	Scarce-balanced
Productivity	High	High
Disease resistance	Intermediate	Intermediate
Flowering		
Floral morphology	Small white flower with a curved pistil and stigma at the level of anthers	Big white flower with a straight pistil and stigma at the level of anthers
Floral density	High	High
Flowering time	Late (Ferragnès-1 day)	Late (Ferragnès-5 days)
Self-compatibility	Yes	Yes
Autogamy	37%	28%
Resistance to frost	High	High
Fruit		
Shell hardness	Hard	Hard
Kernel percentage	35%	32%
Kernel weight	1.2-1.5 g	1.2-1.5 g
Kernel shape	Rounded	Elongated
Double kernels	0%	0%
Kernel aspect	Very attractive	Very attractive
Maturation time	Early (15 August)	Intermediate (31 August)
Harvest facility	Very good	Very good
Drop of mature fruits	No	No
Facility of hulling	Very good	Very good

Characteristics of tree

Vigor: both Antoñeta and Marta are very vigorous. The original trees, although at the beginning grown close together with the other seedlings, had by their 13 year developed trunk diameters measuring 20 cm and 25 cm respectively.

Crown form and ramification: Marta is very erect with vigorous branches. Antoñeta, on the other hand, is more open with a substantial number of lateral branches on the primary branches.

Productivity: during the years without frost the yield was greater than of other commercial cultivars and other selections of the breeding programme grown together. For 1999 the estimated kernel yield for Antoñeta and for Marta is 2000 kg/ha.

Disease resistance: the climatic conditions of the area where the trees are located are favorable for *Monilia laxa* and *Polystigma occhraceum*. Both cultivars have demonstrated a greater resistance to *Monilia* than other cultivars as Ferragnès. They showed an intermediate degree of resistance to *Polystigma occhraceum* similar to that showed by other cultivars. *Fusicoccum* and *Tranzschelia* hardly attacked these cultivars.

Characteristics of blooming

Flower: Marta has a large flower with smooth white petals and a straight stigma at anther height. Antoñeta on the other hand has small flowers with white wrinkled petals and a pistil bent downwards so that the stigma just reaches the anthers. Both cultivars have double floral buds, which increases flower density.

Density of blooming: both cultivars produce abundant flowers in excess of those produced by commercial cultivars such as Ferragnès.

Blooming time: Antoñeta and Marta flower close to the late blooming cultivars grown in Spain such as Guara, Ferragnès, Glorieta and Masbovera.

Self-compatibility and autogamy: the natural autogamy of both Antoñeta and Marta, was followed for four consecutive years by bagging branches with floral buds about to open and stating the fruit set. Antoñeta showed a mean autogamy rate of 37% and Marta 28%. Because of the high flowering density, the levels of autogamy shown guarantee a good yield even in the absence of pollinating insects.

Frost resistance: our cultivars have inherited from their genitor Tuono a good resistance to frost. After three frosts in recent years, Antoñeta and Marta maintained better yields than other cultivars.

Characteristics of fruit

Fruit: both cultivars are hard-shelled with a kernel percentage of about 35% in the case of Antoñeta and 32% in the case of Marta. The kernel weight as calculated from the most abundant crops, was between 1.2 g and 1.5 g for both cultivars. The kernel of Antoñeta is rounded (Marcona type) while Marta's is elongated (Desmayo Largueta type). Neither cultivar has double kernels.

Maturation time: Antoñeta, the earlier, coincides with Guara, while Marta matures 15 days later, coinciding with Ferragnès.

Ease of harvesting and hulling: both cultivars freely dropped their fruit after the branches were tapped by rubber hammer, meaning that fruits can be collected using vibrators without the trees being unduly damaged. Fruits were not observed to fall before harvesting in either cultivar even when very ripe. The hull of both cultivars can be eliminated easily.

The results obtained strongly suggest that Antoñeta and Marta are good cultivars for areas with a risk of frost because of their late blooming, frost resistance, high degree of autogamy, high yield and good quality kernel. In our opinion, both cultivars are superior to other grown commercially at the moment in Spain and their introduction will boost almond production considerably.

Acknowledgements

The authors wish to thank Mariano Gambín and José Luís Patiño for technical assistance in the experiments presented in this paper.

The work has been financed with the project "*Mejora Genética del Almendro*" (AGF98-0211-C03-02) from the "Plan Nacional de I+D" of Spanish Ministry of Education and Culture.

References

García, J.E., Dicenta, F., Egea, J. and Berenguer, T. (1996). Programa de mejora del almendro del CEBAS (CSIC-MURCIA). *Fruticultura Profesional*, 81: 64-70.

García, J.E., Egea, L., Egea, J. and Berenguer, T. (1985). Programme d'amélioration de l'amandier au CEBAS de Murcie. *Options Méditerranéennes*, 1985(I): 7-8.