Description of cultivar

HAP14F: hybrid of ancho poblano pepper for the Altiplano de México

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Abstract

In Mexico, the poblano pepper has great gastronomic, economic and social importance because it is a basic ingredient of traditional dishes. Obtaining low yields in the producing areas, mainly in the Altiplano de México, is due to the high use of creole seeds. To mitigate the aforementioned problem, INIFAP developed the HAP14F wide pepper poblano hybrid, which is an early cycle because it presents flowering and ripening at 39 and 118 days after transplantation (DDT), respectively. It produces fruits of intermediate green color in an immature state that turn a dark red color with a strong brilliance in a mature state. In open-pit evaluations, this hybrid had an average yield of 3.7 t ha^{-1} of dried or dehydrated chili and in green fruit it reached 23.1 t ha^{-1}. For the aforementioned, HAP14F is considered a good alternative for the Altiplano de México.

Keywords: *Capsicum annuum* L., open sky, vegetable, yield.

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Chili is the second most important vegetable in Mexico (Narez-Jimenez *et al*., 2014), and within the different commercial types that are available, poblano pepper (*Capsicum annuum* L.) has great gastronomic, economic and social importance be a basic ingredient of traditional dishes (Rodríguez *et al*., 2007). It is sold mainly in fresh; however, it is used to dehydrate, in this way it is known as ancho pepper (Montalvo-González *et al*., 2009). At the national level, under open sky conditions, 12 552 ha of wide pepper and 13 009 ha of poblano pepper were harvested with average yields of 1.5 and 18.8 t ha^{-1}, respectively (SIAP-SIACON, 2014).

Obtaining low yields in the producing areas, mainly in the Altiplano of Mexico (Zacatecas, San Luis Potosí, Durango and Aguascalientes) is due to several factors, among which the high use of Creole seed, which is estimated to be sows 80% of the area dedicated to this crop (Marin *et al*., 2013). Due to the aforementioned, the objective of the present study was to develop a hybrid of broad pepper poblano with good botanical, horticultural and production characteristics for the Altiplano de México.

Hybrid registration HAP14F

The HAP14F hybrid is owned by the National Institute of Forestry, Agriculture and Livestock Research (INIFAP) and is registered in the National Catalog of Plant Varieties (CNVV) of the National Service of Seed Inspection and Certification (SNICS) with the definitive registration number CHI-031-100415, and Breeder's Title No. 1443.

Origin and development of the hybrid

The wide poblano pepper hybrid "HAP14F" was developed in the San Luis-INIFAP Experimental Field by simple crossing of the lines ♀AP-3526 x ♂AP-30010 with genealogy AP-3526 () 8 and AP-30010 () 8, respectively; both parents are property of INIFAP. Obtaining the two parents as pure lines was by successive self-fertilization; for the formation and selection of the hybrid, the use of diallel crosses of seven progenitors (advanced lines) was used, using the Design 2 proposed by Griffing (1956), until obtaining the hybrid of simple cross HAP14F (Figure 1).

Variety description

It was carried out through the use of qualitative and quantitative descriptors for pepper (IPGRI-AVRDC-CATIE, 1995, SAGARPA-SNICS, 2014).

Botanical characteristics. HAP14F has a plant height of 68-78 cm and a foliage cover of 60-70 cm in diameter. The pubescence in leaves and stems is scarce. It has light green leaves with weak blistering on the surface, the margin of the leaf blade is entire unlike the witness variety AP-VR that presents it wavy. Presents flowers in intermediate position and the color of the anthers is purple with white filament. HAP14F is considered to be early cycle because the flowering and ripening of the fruit are presented at 39 and 118 ddt, respectively; while the AP-VR variety is intermediate cycle with 48 and 140 ddt (Table 1).

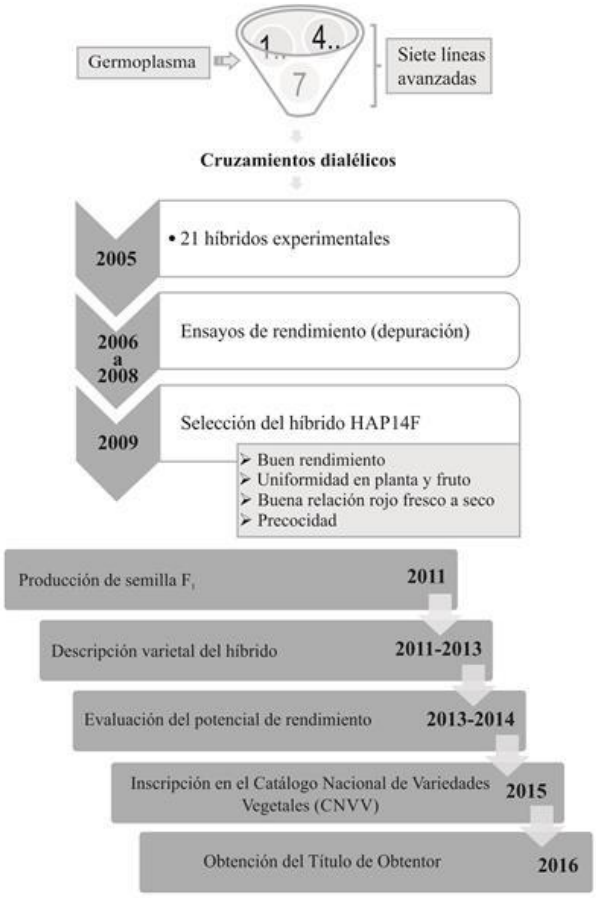

Figure 1. Process for obtaining the hybrid of poblano pepper HAP14F.

Table 1. Botanical characteristics of the hybrid HAP14F compared to the AP-VR variety.

Characteristics	HAP14F	AP-VR
Height of plant (cm)	63-78	85-100
Foliage coverage (cm)	60-70	75-85
Habit of growth	Dichotomous	Dichotomous
Type of root	Branched pivoting	Branched pivoting
Leaf color	Light green	Intermediate green
Leaf limb length (cm)	Large: 9.92	Medium: 6.60
Leaf limb width (cm)	Width: 5.25	Medium: 3.36
Stem pubescence	Limited	Limited
Pubescence in leaves	Limited	Limited
Flower position	Intermediate	Intermediate
Color of the anthers of the flower	Purple	Purple
Flower filament color	White	White
Days to the beginning of flowering (DDT)	Early: 39	Intermediate: 48
Days to ripening of the fruit (DDT)	Early: 118	Intermediate: 140

Horticultural characteristics. HAP14F produces fruits of intermediate green color in immature state (Figure 2) that turn a dark red color with a strong brilliance in mature state; while the AP-VR variety has a dark emerald green color that changes to bright red. The fruits of the hybrid are located in a slope position and have a length and diameter of 13.95 and 6.25 cm, respectively. The preponderant shape of the longitudinal section is triangular with a strong transversal undulation. A predominant feature of the fruits is the presence of a peduncular cavity with a medium depth. The texture of the surface is smooth and has two to three locules. The thickness of the pericarp is 4.13 mm, so it is considered thick (Table 2). This last character is important because the thicker it produces a better quality at the time of drying (Berrios *et al*., 2007).

Figure 2. Hybrid poblano pepper HAP14F. a) fruits in green; b) mature fruits; c) dried or dehydrated fruits.

Table 2. Horticultural characteristics of the hybrid HAP14F compared to the AP-VR variety.

Characteristics	HAP14F	AP-VR
Fruit color in green	Intermediate green	Dark emerald green
Ripe fruit color	Dark red	Red
Brilliance of fruit	Strong brilliance	Strong brilliance
Fruit length (cm)	13.95	14
Diameter of fruit (cm)	6.25	8.00
Thickness of the pericarp (mm)	4.13	3.3
Position of the placenta of the fruit	Compact	Distributed
Position of the fruit	Pending	Pending
Predominant shape of the longitudinal section of the fruit	Triangular	Trapezoidal
Transverse ripple of the fruit	Strong	Half
Depth of the peduncular cavity of the fruit	Half	Deep
Texture of the surface of the fruit	Smooth	Smooth
Predominant number of fruit locules	Two to three	Two to three

Performance evaluation under open sky conditions

During the 2013-2014 period, in different locations in the state of San Luis Potosi, the hybrid HAP14F and the control variety AP-VR were established under open sky conditions to evaluate fruit yield in green and dry or dehydrated. The management of the evaluation plots was according to the production systems of each locality. This hybrid had an average yield of 3.7 t ha^{-1} of dry or dehydrated pepper and in green fruit it reached 23.1 t ha^{-1} (Table 3), which was higher in comparison with the control variety in 15.6 and 12.7%, respectively. For the aforementioned, HAP14F is considered a good alternative for the Altiplano de México.

Table 3. Yield of green and dry or dehydrated fruit of hybrid HAM14F compared to AP-VR variety.

Year	Location	Yield in green (t ha^{-1})		Yield dry or dehydrated (t ha^{-1})	
		HAP14F	AP-VR	HAP14F	AP-VR
2013	V. Arista, SLP	ϕ	ϕ	2.5	2.3
2013	Moctezuma, SLP	ϕ	ϕ	2	1.9
2013	V. Ramos, SLP	19.2	21.4	2.6	2.2
2013	Soledad of GS, SLP	24.5	20.5	5.5	6
2014	V. Ramos, SLP	21.9	17.8	3.7	2.7
2014	*V. Ramos, SLP	ϕ	ϕ	4.5	3.1
2014	Soledad of GS, SLP	26.7	22.1	4.8	3.9
	Average	23.1	20.5	3.7	3.2

V. Reyes, SLP= Villa of Reyes, San Luis Potosi; V. Arista= Villa of Arista; V. Ramos= Villa de Ramos; Soledad of GS= Soledad of Graciano Sánchez; *= locality two in V. Ramos; ϕ= No data.

Conclusions

The hybrid HAP14F is a good alternative for the Altiplano of Mexico because it has better botanical, horticultural and production characteristics in relation to the control variety.

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