

First okra-leaf cotton cultivar bred and released in Argentina

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ABSTRACT

In the 1997/98 cotton season Argentina reached 1,150,000 planted hectares, but its average planted area is around 600,000 to 700,000 ha. Today more than 80% of the cotton crop area is planted with INTA's cultivars, which has a breeding program since the 1960s. "Guazuncho 2 INTA" is the most grown cultivar. It is short-season, has high yields and high gin turn-out, with medium fiber qualities, accepted by the national and international textile industry. INTA has released during the 2000/2001 season its new okra-leaf cultivar named "OROBLANCO INTA". It was bred from the original cross between the Australian cultivar "Siokra" and the breeder's line "SP 2473-A". The later had its origin in a cross of "Guazuncho INTA" and the breeder's line "SP 8535". "OROBLANCO" was bred through evaluation and selection according to the Pedigree method. Plants are medium-height, pubescent, with open canopy and medium-sized okra-type leaves. Bolls are round-shaped with 4 to 5 locules, medium-sized and with good opening. Pollen is creamy (light yellow) colored and internode length is short to medium. It is well adapted to both irrigation and rain-fed conditions, getting its best yield in highly fertile soils. It has a short cycle (125 - 130 days), 10% shorter than "Guazuncho 2 INTA", with good capacity for continuing growth after a water deficit. It is immune to "bacterial blight" (*Xanthomonas malvacearum*), immune to "blue disease", tolerant to "marchitamiento rojizo" (red wilt) and susceptible to "Fusarium wilt". Its fiber properties compared to "Guazuncho 2 INTA" are similar for fiber length, higher for fiber strength (+ 1 g/tex) and lower for micronaire (- 0.2). Its main advantage, over other commercially grown cultivars in Argentina, is its okra-leaf characteristic, which allows for better air circulation, decreasing the percentage of boll rot under irrigation or in highly fertile soils. It also allows for increased pest control, given that sprays are more effective with the decreased leaf area.

Introduction

In 97/98 cotton season, Argentina reached 1,150,000 planted hectares, but the current average planted area is around 600,000 to 700,000 ha. Today more than 80% of the cotton crop area is planted with INTA's cultivars, which has a breeding program since the 1960s. "Guazuncho 2 INTA" is the most grown

cultivar. It is short-season, has high yields and high gin turn-out, with medium fiber qualities, accepted by the national and international textile industry. INTA has released during the 2000/2001 season its new okra-leaf cultivar named "OROBLANCO INTA".

It is well known the negative effect of hot and dry weather on boll weevil populations. This effect is greater in okra-leaf plants (Jones *et al.* 1986). In Argentina boll weevil is present in some northern provinces but has not reached the main growing region of the country. This type of leaf morphology could help prevent high population outburst of possible boll weevil advance. Also, okra leaf strains had lower thrips and white fly infestation than normal varieties in Pakistan (Soomro, 1998). In the USA, the MAR cotton germplasm development program at Texas A&M University has used okra-shaped leaf isogenic lines in their studies (Thaxton and El-Zik, 1994).

Other advantages of okra-leaf types of commercially grown cultivars over normal leaf shaped cultivars are that they allow for better air circulation, decreasing the percentage of boll rot under irrigation or in highly fertile soils. They also allow for increased pest control, given that spraying applications are more effective with the decreased leaf area.

Experimental procedure

It was bred from the original cross between the Australian cultivar "Siokra" and the breeder's line "SP 2473-A". The later had its origin in a cross of "Guazuncho INTA" and the breeder's line "SP 8535". "OROBLANCO" was bred through evaluation and selection according to the classical Pedigree method (Figure 1).

Results and Discussion

Plants are medium-height, pubescent, with open canopy and medium-sized okra-type leaves. Bolls are round-shaped with four to five locules, are medium-sized and with good opening. Pollen is creamy (light yellow) coloured and internode length is short to medium. It is well adapted to both irrigation and rain-fed conditions, getting its best yield in highly fertile soils. It has a short cycle (125 - 130 days), 10% shorter than "Guazuncho 2 INTA", with good capacity for continuing growth after a water deficit. It is immune to "bacterial blight" (*Xanthomonas campestris* pv. *malvacearum* race 18), resistant to "blue disease", tolerant to "marchitamiento rojizo" (red wilt) and susceptible to "Fusarium wilt". Its fiber properties compared to "Guazuncho 2 INTA" are similar for fiber length, higher for fiber strength (+ 1 g/tx) and lower for micronaire (- 0.2). Data are shown on Table 1, and a schematic representation of Oroblanco's pedigree is shown in Figure 1.

Its main advantage, over other commercially grown cultivars in Argentina, is its okra-leaf characteristic which allows for better air circulation, decreasing the percentage of boll rot under irrigation or in highly fertile soils. It also allows for increased pest control, given that sprayings are more effective with the decreased leaf area.

Conclusions

Throughout its history, INTA's cotton breeding program has developed new cultivars with normal leaf shape. This is the first cultivar released in Argentina with the okra-leaf phenotype. The main objective for the incorporation of the trait was to lower boll rots in crops grown in highly fertile soils, a widespread phenomenon in the Argentinian cotton region due to abundant rains, particularly at harvest time.

References

- Jones J.E., Weaver J.B. and Shuster, M.F. (1986). Plantas resistentes ao bicudo. *In* O bicudo do algodoeiro, Empresa Brasileira de Pesquisa Agropecuaria, Dept. Difusao Tecnologia, Brasilia DF, pp. 221-249.
- Soomro, A.R. (1998). Breeding for insect resistance in cotton utilizing morphological traits at the Cotton Research Institute, Sakrand, Sindh, Pakistan. *In* Proceedings of the World Cotton Research Conference -2: New frontiers in Cotton Research, Athens, Greece, Gillham F. Et al (Eds), Volume I, pp. 107-112.
- Thaxton, P.M. and El-Zik, K.M. (1994). Development of MAR cotton germplasm with morphological mutant traits. *In* Challenging the future: Proceedings of the World Cotton Research Conference-1, Brisbane Australia, G.A. Constable and N.W. Forrester (Eds), CSIRO, Melbourne, pp. 244-250.

Table 1. Lint quantity and quality data comparing Oroblanco against Guazuncho 2, averaged through years 1992/93 – 1993/94 – 1994/95 and 1995/96 corresponding to 28 trials.

Variety	Lint quantity (kg/ha)						
	1 st Harvest	Total	Gin turn-out (%)	Length 2.5% span (mm)	Strength T(1/8") (g/tex)	Elongation E(1/8") (%)	Fineness Micronaire (Index)
Guazuncho 2	731	1147	42.2	29.1	26.6	6.0	4.5
Oroblanco	816	1107	40.8	29.3	27.7	6.3	4.3

Figure 1.
Oroblanco INTA
pedigree.

