



## CULTIVAR RELEASE

<http://dx.doi.org/10.1590/1984-70332014v14n2c23>

### RB962962, a sugarcane cultivar for late harvest

Luiz José Oliveira Tavares de Melo<sup>1\*</sup>, Edelclaiton Daros<sup>1</sup>, Djalma Euzébio Simões Neto<sup>2</sup>, Andrea Chaves<sup>2</sup>, Leonam José da Silva<sup>2</sup>, Amaro Epifânio Pereira Silva<sup>2</sup> and Tassia Taiana Abreu Tavares de Melo<sup>2</sup>

Received 25 February 2014

Accepted 13 March 2014

**Abstract** – In the Northeast of Brazil, sugarcane cultivar RB962962 is harvested at the end of the cycle, between December and February, with a high sugar yield per area. Recommended for sandy soils of medium texture and fertility, it is resistant to the major diseases and fast-growing in plant and ratoon crops.

**Key words:** *Saccharum spp.*, management, genetic improvement.

### INTRODUCTION

The Inter-University Network for the Development of Sugarcane Industry (RIDESA, [www.ridesa.com.br](http://www.ridesa.com.br)), is a successful partnership of 10 Federal Universities (UFSCar, UFRPE, UFAL, UFRRJ, UFV, UFG, UFPR, UFS, UFPI, and UFMT) that have the common goal of breeding genetically improved cultivars RB (Republic of Brazil).

Genotypes with the acronym RB are grown from seeds resulting from crosses of plant material of a genebank distributed in two stations of Flowering and Crossing. The first is the flowering station Estação de Floração Serra do Ouro (EFCO) of the Federal University of Alagoas (UFAL), in Murici – AL (lat 09° 13' S, long 35° 50' W, alt 450 m asl). The second is the Estação de Floração de Devaneio (EFCO), of the Federal Rural University of Pernambuco (UFRPE), in Amaraji, Pernambuco (lat 08° 19.8' S, long 35° 24.8' W, alt 514 m asl). In Pernambuco, the Experimental Station of Sugarcane Carpina-EECAC has contributed considerably to the development of methods and strategies in breeding for the release of cultivars of the sugarcane breeding program (PMGCA/RIDESA/UFRPE).

The cultivar RB962962 (*Saccharum spp.*), Protection Certificate No. 20120236-SNPC/MAPA, was released in 2010 in Pernambuco (Daros et al. 2010). It has a high agro-industrial yield at the end of the growing season and medium to late maturation. To maximize the exploitation

of the high sugar content, RB962962 is preferably grown in soils of sandy to medium texture with medium fertility, with significant response with high fertility. In northeastern Brazil, RB962962 must be harvested from January to February. It is resistant to the major sugarcane diseases, and has a rapid development after the first harvest in successive ratoon crops.

### PEDIGREE OF RB962962 AND BREEDING METHODOLOGY

The cross was made in June 1996 at EFCO, using multiple-parent crosses (multiple parents as pollen donors) for the pollination of female flowers of cv. R397 (Figure 1). In May 1997, the caryopses of this and other crosses of the series RB96 were germinated in a greenhouse of EECAC/UFRPE in Carpina-Pernambuco (lat 07° 47' S, long 35° 15' W, alt 178 m asl). In September 1997, the first test was conducted involving a total of 91,444 seedlings of the cross (R397 x ?) and of other crosses, planted individually at a spacing of 1 m between rows and 0.5 m between plants, in the experimental field of EECAC, together with the regionally most commonly grown cultivar SP78-4764 as control, constituting the initial selection phase (T<sub>1</sub>). In November 1998, the harvest of plant cane (first cut) was performed and in November 1999, visual phenotypic (mass) selection of individual T<sub>1</sub> plants in the ratoon phase (second cut). After the selection in T<sub>1</sub>, the clone was multiplied for the first time

<sup>1</sup> Universidade Federal do Paraná, Departamento de Fitotecnia e Fitossanitarismo, Rua dos Funcionários, 1540, 80.035-050, Curitiba, PR, Brazil.

\*E-mail: [luizjose@hotmail.com](mailto:luizjose@hotmail.com)

<sup>2</sup> Universidade Federal Rural de Pernambuco, Estação Experimental de cana-de-açúcar do Carpina, Rua Ângela Cristina C. Pessoa de Luna, s/n, Bairro Sta. Terezinha, 55.812-010, Carpina, PE, Brazil

in an area of a single plot of two 3-m rows (augmented block design) for the second selection phase ( $T_2$ ), involving 669 clones. In November 2000,  $T_2$  was selected in the plant cane crop and the 223 selected clones were planted ( $T_3$ ) in four 5-m rows. The selection of  $T_3$  was performed considering the data of cane plant selection in November 2001, from which 57 clones were promoted to the next phase termed Multiplication Stage (MSt) with ten 1-m rows. At this stage, the selected clones are planted in two agroecological environments. In November 2002, after selection of the MSt cane plant, 37 selected clones were planted in a new MSt, called Extended Multiplication Stage (EMSt) with fifteen 10-m rows in three agro-ecological environments. In June 2003, after the selection of the MSt ratoon crop, the TPH (Test Phase) was installed in the field with 37 clones. This experimentation phase was initiated in five environments of Atlantic Rainforest of Pernambuco (lat 7° 20' - 9° 00' S, long 34° 50' - 36° 20' W). The 37 clones were divided in two TPH per site, planted together with cv. SP78-4764 (control), using a randomized block design in plots of five 8-m rows, with four replications. For three seasons (2005, 2006 and 2007), the experiments of the first, second and third cuts, respectively, were harvested, determining the traits stalks per hectare (TCH) and sucrose percentage in cane juice (SPC), determined according to the method described by Fernandes (2003) and sucrose yield (tons of sucrose per hectare -TSH), which enabled an evaluation of the qualities of processed yield, the response to the major sugarcane diseases of the region and pattern of adaptability and phenotypic stability (Eberhart and Russell 1966). The maturation stage of RB962962 was also compared with that of cv. SP78-4764 (Figure 2) during the sugarcane milling period in Pernambuco (September to February), at the experimental sites. Owing to the advantageous results in field tests, RB962962 was intensely multiplied in areas of mills of the regional sugarcane industry, to identify the

most appropriate crop management. To release cultivar RB962962 to producers, data from 26 crops of experiments were collected, by which the superior traits of the cultivar were confirmed.

## PERFORMANCE

The mean results of 26 experimental harvests (14 first-cut, 8 second-cut and 4 third-cut harvests) showed that in the three cuts, the processed yield of cv. RB962962 was higher than that of SP78-4764 (Table 1), with a mean gain of 16.1 TCH (18.6%) and 0.16 SPC (1.10%). The gain was even more significant in sucrose yield per area (TSH 2.50 or 20.3 %).

The maturation curve of a plant cultivar is represented by the accumulation of sucrose from sugar cane (SPC) during the months of milling, determined by the method described by Fernandes (2003). For the harvest conditions in Pernambuco, the maturation of cv. RB962962 was excellent (Figure 2), indicating a long period of suitability for processing, with best results from December to February.

The response in processing yield of RB962962 to environmental changes was assessed by the methodology of Eberhart and Russell (1966), based on data of the 26 evaluated experimental harvests, confirming the wide adaptability and stability in TCH and TSH and the responsiveness to environmental improvement of cv. RB962962 (Figure 3).

With regard to the reaction to major diseases, cv. RB962962 has good plant health. The reactions to the two most important sugarcane diseases in Pernambuco were a moderately susceptible response to brown rust (*Puccinia*

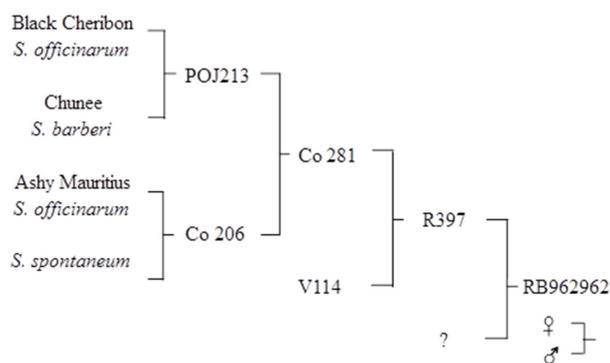


Figure 1. Pedigree of RB962962

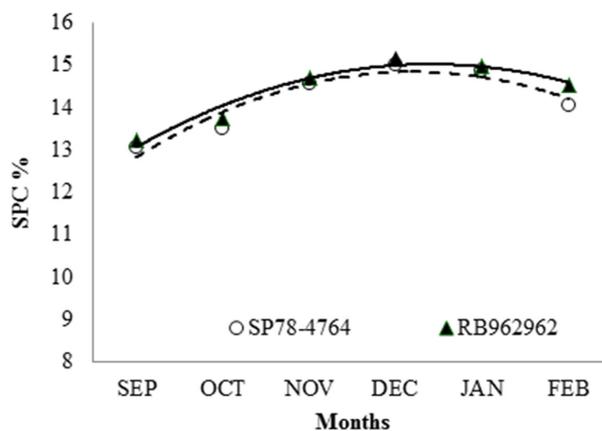
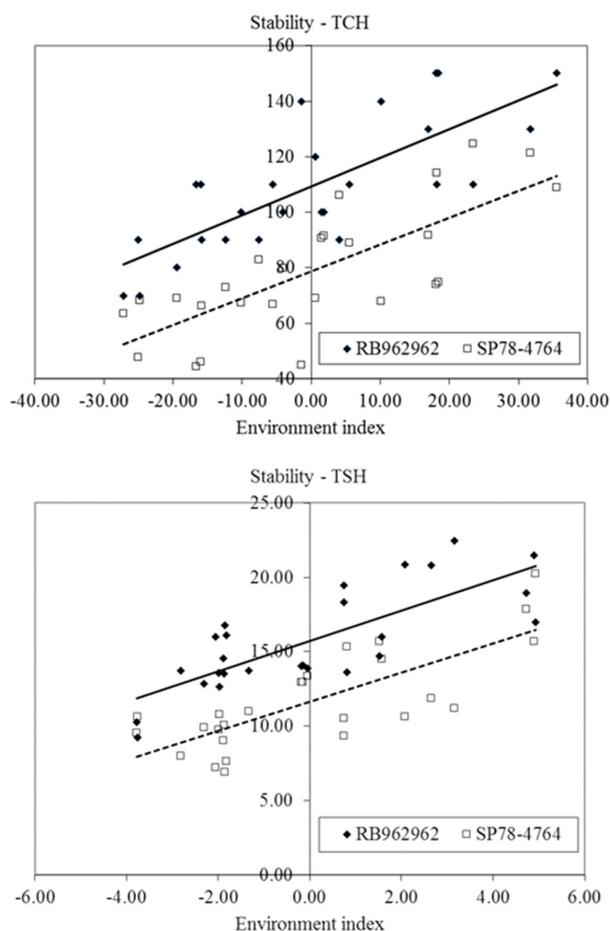


Figure 2. Maturation curves of the cultivars RB962962 and SP78-4764 for the variable sucrose percentage in cane juice (SPC) at harvest in the State of Pernambuco, from September to February.

**Table 1.** Average tons of cane per hectare (TCH) and tons of sucrose yield per area (TSH) of the cultivars RB962962 and SP78-4764, according to the estimated gain and yield of the released cultivar, based on average yield results of 26 experiments

Variables	Cut	RB962962	SP78-4764	Gain percentage
TCH (t ha <sup>-1</sup> )	1	121.7	99.5	22.3
	2	95.0	82.8	14.8
	3	92.0	78.0	17.9
	Mean	102.9	86.8	18.6
SPC (%)	1	14.0	13.8	02.0
	2	14.1	14.1	0.1
	3	14.5	14.3	1.3
	Mean	14.2	14.1	1.1
TSH (t ha <sup>-1</sup> )	1	17.1	13.7	24.8
	2	13.4	11.7	15.1
	3	13.3	11.1	20.1
	Mean	14.6	12.1	20.3

**Figure 3.** Average tons of cane per hectare (TCH) and tons of sucrose yield per area (TSH) of the cultivars RB962962 and SP78-4764, adjusted by linear regression, according to the environment index of 26 experiments in the State of Pernambuco, as described by Eberhart and Russell (1966).

*melanocephala*) and resistance to leaf scald (*Xanthomonas albilineans*). To date, no occurrence of Orange Rust (*Puccinia kuehnii*) was detected. In the center south region of Brazil the cultivar was resistant to sugarcane smut (*Sporisorium scitamineum*, synonym of *Ustilago scitaminea*), a low-incidence disease in Pernambuco and in the Northeast of Brazil.

## OTHER FEATURES

The visible part of the sheaths of cv. RB962962 is green and purplish, husking of the stalks is easy and the amount of leaves regular; it has an upright growth habit, rapid development and good canopy closure in plant and ratoon cane, while tillering is average. The sprouting of ratoon crops from burnt and green-harvested cane is good. The cultivar is fast-growing, tall, lodging is rare, and flowering and fiber contents are average.

## MAINTENANCE OF GERMPLASM AND SEEDLING DISTRIBUTION

Plants of cv. RB962962 are maintained by the clonal breeding program RIDESA/UFRPE/EECAC (Rua Ângela Cristina Canto Pessoa de Lunna, s/n, Bairro Santa Terezinha, Caixa Postal 40, 55.812.010, Carpina, PE, Brazil), where seedlings are multiplied to be placed at the disposal of the farmers.

## REFERENCES

- Daros E, Zambon JLC, Oliveira RA and Bespalhok Filho JC (eds.) (2010) **Liberação nacional de novas variedades “RB” de cana-de-açúcar**. AJIR, Curitiba, 64p.
- Eberhart SA and Russell WA (1966) Stability parameters for comparing varieties. **Crop Science** 6: 36-40.
- Fernandes AC (2003) **Cálculos na agroindústria da cana-de-açúcar**. 2<sup>th</sup> ed., EME, Piracicaba, 240p.