

CULTIVAR RELEASE

BRS 274 (BRS Jacaju): common or giant cashew clone

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Received 19 October 2007

Accepted 10 March 2008

ABSTRACT – *BRS Jacaju* is a common cashew clone developed by the Brazilian Agricultural Research Corporation Embrapa, sector Tropical Agro-industry, in partnership with the Companhia Industrial de Óleos do Nordeste (CIONE). The clone is recommended for rainfed cultivation along the coastline of the Northeastern Region or similar environmental conditions, for both nut and peduncle production for fruit juice industry.

Key words: *Anacardium occidentale*, cultivar, commercial planting.

INTRODUCTION

The cashew agribusiness generates jobs and income for thousands of people as well as foreign exchange for the producing and exporting countries, which are nearly all economically dependent on agribusiness. In Brazil, the cashew agro-industry began to boom in the 1960s and now plays an important economic and social role in the states of Ceará, Rio Grande do Norte and Piauí. The importance of this agro-industry for these states is clearly shown by export volume of kernels worth about 200 million dollars per year. Despite the socio-economic importance and the expansion of the cultivated area, the technology level was always critically low, leading to a drop in yields from 635 kg ha⁻¹ in the beginning of the 70s to 236 kg of kernels ha⁻¹ in the harvest of 2006 (Barros et al. 2008).

The reduction in yield and quality of the raw material of commercial cashew orchards in the state of Ceará has affected the entire production chain. The expected consequences are a discouragement of growth or even a freezing of the activity, which would obviously cause serious economic and social problems in the state. Cashew is cultivated in Ceará, from the coastline to the semi-arid region, and is the main agricultural possibility of several areas. Since the species adapts well to different ecosystems, it is now being cultivated also in the Cerrado and in transition areas between the Restinga and the semi-arid vegetation, despite the lack of previous studies of cultivar adaptation.

To meet the demand, the Embrapa Agroindústria Tropical has provided alternative plant material with clones of dwarf cashew (Paiva et al. 2003). However,

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research efforts with common cashew were resumed in 1997 in partnership with the Companhia Industrial de Óleos do Nordeste (CIONE) and resulted in the establishment of a common cashew clone type, selected for medium plant height and kernel traits for higher prices on the international market, *i.e.* a better kernel quality.

CLONE SELECTION PROCEDURE

The main focus of the breeding program of the Embrapa Agroindústria Tropical is to develop well-adapted cashew clones to the different regions in terms of high yield as well as kernel and peduncle market quality. These genotypes will enable farmers to earn higher profits and allow improvements of the socio-economic status of all participants in the production chain. The success with selection of clones depends on the genetic variability in the base population. For this purpose, aside from the introduction of trees, crosses between cashew clones have been used, resulting in segregating progenies for selection and cloning of individual plants (Barros et al. 2002).

The methodology applied consisted of the selection of individual trees, followed by cloning and evaluation of the clone in both small and large scale. Clone BRS 274 was vegetatively propagated from a selected genotype plant of common cashew, denominated Lindolfo 47, on the Fazenda Uruanã (lat 04° 39' 06" S, long 38° 08' 07" W, altitude 95 m asl) of CIONE, Beberibe county, Ceará State.

The clone was experimentally evaluated, in a random block design with 40 clones, three replications, five trees per plot, and spaced 10 m x 10 m, on the Fazenda Jacaju of CIONE, at km 01 of the federal highway BR 304, in Beberibe, CE. The following traits were evaluated:

Plant height: annual measurement in all trees in the period from 2000 to 2007;

Canopy diameter: annual measurement of canopy projection diameter between 2000 and 2007;

Yield: evaluation of nut weight per clone in the period from 2002 to 2006;

Pest severity: evaluated three times a year (April, August and December) by recording the presence of pest species and the attack intensity;

To evaluate the technological indicators, nuts of the 40 clones were processed in the factory-school of Embrapa Agroindústria Tropical by a semi-mechanized system. The kernels were autoclaved at a pressure of 2 kgf cm⁻², shelled in hand-operated machines, dried at 55° C, and hand-peeled (Lima et al. 1995). A sample of nuts of each clone (approximately 5 kg) was collected in the period of 2004 to 2006 and evaluated for the following traits: nut weight, kernel weight, percentage of kernel nut⁻¹, percentage of whole kernels, percentage of nuts broken at cutting and percentage of halves.

PERFORMANCE

The agronomic traits and agro-industrial indicators of nut and peduncle of clone BRS 274 (BRS Jacaju) are listed as follows:

Plant traits: medium plant height, average height of 5.1 m and average canopy diameter of 11.0 m in eight-year-old trees; recommended spacing 12 m x 10 m in rectangular system or 11 m x 11 m in a square system, both with 83 trees ha⁻¹; moderate resistance to anthracnose and resistance to black mold.

Nut yield: evolution of nut yield per hectare at different ages in Table 1, demonstrating the yield potential of the clone.

Agro-industrial indicators: agro-industrial indicators for nut in Table 2 and for peduncle in Table 3.

Recommendation: traits of clone BRS 274 (BRS Jacaju) in non-irrigated cultivation indicate commercial exploitation of both nut and apple for fruit juice.

Table 1. Evolution of nut yield of clone BRS 274 (BRS Jacaju) in a commercial orchard under non-irrigated cultivation, in Beberibe county, CE

Years of evaluation	Plant age (year)	Yield (kg ha ⁻¹) ¹	Yield (kg ha ⁻¹) ²
1	3	800.0	664.0
2	4	922.1	765.3
3	5	1,081.2	897.3
4	6	778.6*	646.6
5	7	1,248.9	1,036.7

¹ Evaluation in non-irrigated cultivation at a spacing of 10 m x 10 m and density of 100 trees ha⁻¹.

² Estimated yield in non-irrigated cultivation at a spacing of 12 m x 10 m and density of 83 trees ha⁻¹.

* drought-induced reduction.

Table 2. Agro-industrial indicators of nut and kernel of clone BRS 274 (BRS Jacaju)

Traits	BRS 274
Nut weight (g)	16.00
Kernel weight (g)	3.46
Percentage kernel nut ¹ (%)	21.62
Whole kernels (%)	98.45
Nuts broken at cutting (%)	1.59
Percentage of nut halves (%)	4.69

Table 3. Agro-industrial indicators of the peduncle of clone BRS 274 (BRS Jacaju)

Traits	BRS 274
Peduncle weight (g)	128.6
Coloration	Orange
Fruit firmness (N)	16.1
Total soluble solids - TSS (%brix)	12.37
Total titratable acidity - TTA (%)	0.47
TSS/TTA	26.42
Vitamin C content (mg 100 g pulp ⁻¹)	305.53
Dimeric phenolic compounds (%)	0.17
Oligomeric phenolic compounds (%)	0.22
Polymeric phenolic compounds (%)	0.23
Anthocyanin (mg 100 g pulp ⁻¹)	12.01

STRATEGY OF CLONE DISTRIBUTION FOR COMMERCIAL CULTIVATION

Clone BRS 274 was registered by the Ministério da Agricultura e Pecuária e Abastecimento – MAPA (Ministry of Agriculture Animal Husbandry and Supply)

followed by the installation of a clone orchard in an experimental field of Pacajus, in Pacajus county, CE. Plantlets are distributed to farmers by Embrapa Agroindústria Tropical and to commercial nurseries registered by the Ministério da Agricultura in order to accelerate the multiplication and distribution of the new cashew clone.

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