



A new hybrid for the tropical world



Brachiaria hybrid  
cv. CIAT BR02/1752

“Cayman”

Grupo Papalotla  
Research and Development Department

Esteban A. Pizarro

**SEMILLAS PAPALOTLA, S.A. DE C.V.**  
Orizaba 195, Col. Roma, C.P. 06700, México D.F. Tel. (55)5265-9870, Fax: (55) 5265-9871  
E-mail: [mexico@grupopapalotla.com](mailto:mexico@grupopapalotla.com) [www.grupopapalotla.com](http://www.grupopapalotla.com)

**TROPICAL SEEDS, LLC.**  
5850 Coral Ridge Dr., Suite 302 Coral Springs, Fl. 33076, Florida, USA  
Tel. (954) 753-6301, Fax. (954) 753-6382 [usa@grupopapalotla.com](mailto:usa@grupopapalotla.com)

**TROPICAL SEEDS DO BRASIL, LTDA**  
Tel. (19) 3242-9060 Fax. (19) 3241-4334  
Regente Feijó SP, BRASIL, [brasil@grupopapalotla.com](mailto:brasil@grupopapalotla.com)



This document has been possible, due to the commitment, enthusiasm and effort of the following collaborators:

Papalotla Group  
CIPAT

Costa Rica – Mexico

Rodolfo Ruíz Ramón  
Francisco Avila  
Alberto López  
Usiel Reyes Campechano  
Ronald Quirós

**SEMILLAS PAPALOTLA, S.A. DE C.V.**  
Orizaba 195, Col. Roma, C.P. 06700, México D.F. Tel. (55)5265-9870, Fax: (55) 5265-9871  
E-mail: [mexico@grupopapalotla.com](mailto:mexico@grupopapalotla.com) [www.grupopapalotla.com](http://www.grupopapalotla.com)

**TROPICAL SEEDS, LLC.**  
5850 Coral Ridge Dr., Suite 302 Coral Springs, Fl. 33076, Florida, USA  
Tel. (954) 753-6301, Fax. (954) 753-6382 [usa@grupopapalotla.com](mailto:usa@grupopapalotla.com)

**TROPICAL SEEDS DO BRASIL, LTDA**  
Tel. (19) 3242-9060 Fax. (19) 3241-4334  
Regente Feijó SP, BRASIL, [brasil@grupopapalotla.com](mailto:brasil@grupopapalotla.com)



## Origin

Apomictic clone BR02/1752 resulted from the crossbreeding of a sexual clone, identified as SX00NO/1145, selected from the fourth cycle (C4) from a sexually reproductive breeding population, tetraploid, with the seed bank accession of Apomictic B. Brizantha CIAT 16320.

Synthetic sexual breeding population contains the seed bank from the species *Brachiaria* (*B. ruzizensis*, *B. brizantha* and *B. decumbens*). This is allogamous and heterogeneous. Tetraploid sexual breeding population was synthesized in 1993, through open pollination of 29 fully sexual clones, which were selected from hybrid populations obtained from the crossbreeding of 9 apomictic pollen progenitors selected from *B. decumbens* *B. brizantha*, as well as the seed bank from the artificially tetraploid *B. ruzizensis*, derived from a material originally produced at the Catholic University of Leuven (Belgium) donated to CIAT by Dr. C.B. do Valle (Embrapa – CPGC, Brazil) in 1988.

The fourth cycle of this population was the result from three selection cycles and recombinations. The selection was made based in their general agronomic merit, which was judged visually, during field tests in Colombia at specialized plants. Resistance to froghoppers (Homoptera: Cercopidae), was evaluated through greenhouse tests with artificial infestation.

The pollen progenitor for the BR02/1752 was the *B. brizantha* CIAT 16320, an apomictic bank seed accession from the collection stored at the International Center for Tropical Agriculture – CIAT.

The BR02/1752 clone was selected from a biparental hybrid population, formed by exposing plants from the sexual clone (maternal) SX00NO/1145 to CIAT 16320 pollen in an isolated field breeding block in 2001.

The hybrid BR02/1752 was evaluated firstly and selected at a field test in 2002. Its breeding behavior (apomixis) was confirmed through field progeny tests at the central offices of the CIAT in 2003.

## Agronomic Evaluation

### Persistence

One of the characteristics studied in the *Brachiaria* hybrid cv. CIAT BR02/1752 at CIPAT-Oaxaca, Mexico was its level of persistence.

Table 1 shows the percentage of covered soil through time, compared with the most popular commercial cultivar in tropical America which is *Brachiaria brizantha* cv. Marandu.

**SEMILLAS PAPALOTLA, S.A. DE C.V.**  
Orizaba 195, Col. Roma, C.P. 06700, México D.F. Tel. (55)5265-9870, Fax: (55) 5265-9871  
E-mail: [mexico@grupopapalotla.com](mailto:mexico@grupopapalotla.com) [www.grupopapalotla.com](http://www.grupopapalotla.com)

**TROPICAL SEEDS, LLC.**  
5850 Coral Ridge Dr., Suite 302 Coral Springs, Fl. 33076, Florida, USA  
Tel. (954) 753-6301, Fax. (954) 753-6382 [usa@grupopapalotla.com](mailto:usa@grupopapalotla.com)

**TROPICAL SEEDS DO BRASIL, LTDA**  
Tel. (19) 3242-9060 Fax. (19) 3241-4334  
[Regente\\_Feijó\\_SP\\_BRASIL\\_brasil@grupopapalotla.com](mailto:Regente_Feijó_SP_BRASIL_brasil@grupopapalotla.com)



It can be observed that while the new hybrid Brachiaria CIAT BR02/1752, four years from sowing, has 83% soil coverage, cv. Marandu covers only 53 per cent of the area.

Brachiaria Hybrids	Year	
	2007	2010
	Soil Coverage, %	
CIAT BR02/1752	100 a*	83 a
cv. Marandu	100 a	53 b

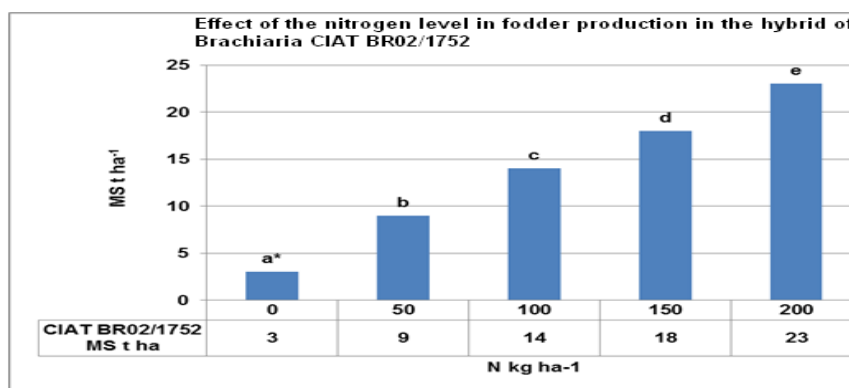
\* Values with different letter, statistically differ from the level of (P<0.01).

#### Fodder Production

In an essay which estimated the production of fodder accumulated every ten weeks during the rainy season of Oaxaca – Mexico, the Brachiaria hybrid cv. CIAT BR02/1752, reached a fodder production of 15 t MS ha<sup>-1</sup>, similar to that accumulated by cv. Marandu, 13 t MS ha<sup>-1</sup>.

In another of the tests carried out at the same locality, which analyzed the application of several nitrogen levels, it can be observed in Figure 1 that the new hybrid of Brachiaria CIAT BR02/1752, responds in a linear manner to the application of nitrogen varying from 3 to 23 t of MS ha<sup>-1</sup>, when the nitrogen level was increased from 1 to 200kg N ha<sup>-1</sup>, respectively. Besides from the applied nitrogen levels, the amount of P and K was constant for all used nitrogen levels. 100kg of P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O were administered per hectare at the moment of sowing.

Figure 1. Effect of the nitrogen level in fodder production of Brachiaria hybrid cv. CIAT BR02/1752



\* Values with different letter, statistically differ from the level of (P<0.01).



Table 2 summarizes the production of fodder production of Brachiaria hybrid cv. CIAT BR02/1752 in Oaxaca-Mexico for two consecutive years, 2010 and 2011.

Table. Effect of the nitrogen level in fodder production

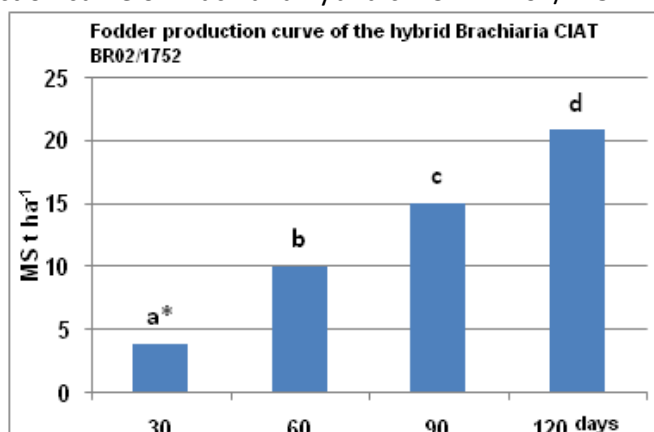
Brachiaria hybrid	Nitrogen Levels				
	0	50	100	150	200
	MS kg ha <sup>-1</sup>				
	<b>Year 2010</b>				
CIAT BR02/1752	10490 de*	16073 bc	15148 bcd	17658 bc	22820 ab
	<b>Year 2011</b>				
CIAT BR02/1752	2836 a	8995 b	13825 b	18169 bc	22875 c

\* Values with different letter, statistically differ from the level of (P<0.01).

The variation in fodder production between the two evaluated years was different in treatment without fertilization and with 50 KG N ha<sup>-1</sup>, was similar between the two cycles. In the year 2010 the accumulated precipitation in the rainy period was 811mm, while in the second year it was 1232mm.

When fodder production was estimated at different cut intervals at 30, 60, 90 and 120 days of growth, the production curve varied from 4 to 21 T of MS ha<sup>-1</sup>. Figure 2 shows obtained results.

Figure 2. Fodder production curve of Brachiaria hybrid cv. CIAT BR02/1752 in Oaxaca – Mexico

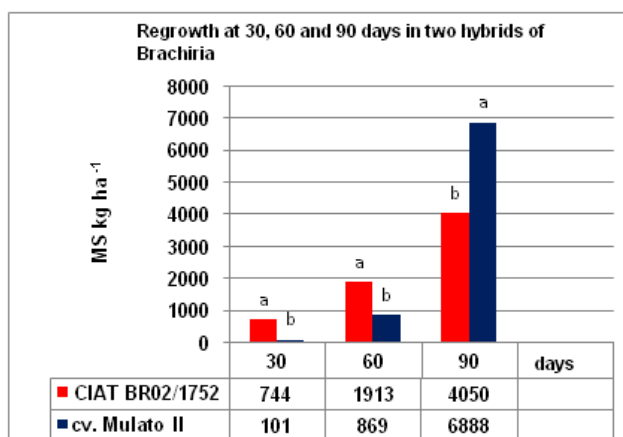


\* Values with different letter, statistically differ from the level of (P<0.01).

Once the cut has been made at 30, 60, 90 and 120 days, regrowth capacity was estimated for the Mulato II cultivar and Brachiaria hybrid cv. CIAT BR02/1752 at 30, 60 and 90 days after cutting.

Results show the big regrowth capacity of the hybrid CIAT BR02/1752 versus cv. Mulato II in the first 30 and 60 days of growth. After 90 days from regrowth, cv. Mulato II significantly surpasses ( $P < 0.05$ ) the hybrid CIAT BR02/1752 in the production of fodder. These results confirm the generalized comment with regard to the slow recover of the cv. Mulato II at cutting or harvest, in the first weeks after cutting or harvest. Figure 3 shows obtained results.

Figure 3. Regrowth at 30, 60 and 90 days in two hybrids of Brachiaria: cv. Mulato II and CIAT BR02/1752



\* Values with different letter, statistically differ from the level of ( $P < 0.01$ ).

### Nutritional Value of CIAT BR02/1752

Studies carried out at the University of Florida – USA, in grazing essays with different harvest use frequency (2, 4 and 6 weeks), show a high nutritional value in the contents of crude proteins and in vitro digestibility for organic matter in the two new hybrids of Brachiaria: Mulato II and CIAT BR02/1752 cultivars.

Table 4. Crude protein contents in the whole plant of CIAT BR02/1752 and Mulato II under three harvest frequencies

Brachiaria Hybrid	Harvest frequency - weeks			Average
	2	4	6	
Mulato II	17.0	14.7	11.6	14.4
CIAT cv BR02/1752	17.5	13.8	12.0	14.4
Average	17.2 a*	14.2 b	11.8 c	

\* Values with different letter, statistically differ from the level of ( $P < 0.01$ ).

Adapted from: Vendramini, J.M.B., L.E. Sollenberger, W.L. da Silva, A.B. Soares, J.D. Sánchez, and A.L. Valente. Harvest frequency affects herbage accumulation and nutritive value of Brachiaria hybrids (in preparation).

Table 5. Crude protein contents in the layers of CIAT BR02/1752 and Mulato II under three harvest frequencies

Brachiaria Hybrids	Harvest frequency - weeks			Average
	2	4	6	
Mulato II	19.3	17.1	15.0	17.1
CIAT cv BR02/1752	21.1	16.5	14.4	17.3
Average	20.2 a*	16.8 b	14.7 b	

\* Values with different letter, statistically differ from the level of (P<0.01).

Adapted from: Vendramini, J.M.B., L.E. Sollenberger, W.L. da Silva, A.B. Soares, J.D. Sánchez, and A.L. Valente. Harvest frequency affects herbage accumulation and nutritive value of Brachiaria hybrids (in preparation).

Table 6. Crude protein contents of the stems of CIAT BR02/1752 and Mulato II under three harvest frequencies

Brachiaria Hybrids	Harvest frequency - weeks			Average
	2	4	6	
Mulato II	10.5	8.8	8.0	9.1
CIAT cv BR02/1752	11.8	9.9	8.2	10.0
Average	11.1 a*	9.3 b	8.1 b	

\* Values with different letter, statistically differ from the level of (P<0.01).

Adapted from: Vendramini, J.M.B., L.E. Sollenberger, W.L. da Silva, A.B. Soares, J.D. Sánchez, and A.L. Valente. Harvest frequency affects herbage accumulation and nutritive value of Brachiaria hybrids (in preparation).

Table 7. In Vitro digestibility of organic matter in the whole plant of CIAT BR02/1752 and Mulato II under three harvest frequencies

Brachiaria hybrid	Harvest frequency - weeks			Average
	2	4	6	
Mulato II	70.6	67.4	63.1	67.0
CIAT cv BR02/1752	72.3	72.3	65.7	68.3
Average	71.4 a*	67.2 b	64.4 b	

\* Values with different letter, statistically differ from the level of (P<0.01).

Adapted from: Vendramini, J.M.B., L.E. Sollenberger, W.L. da Silva, A.B. Soares, J.D. Sánchez, and A.L. Valente. Harvest frequency affects herbage accumulation and nutritive value of Brachiaria hybrids (in preparation).

**SEMILLAS PAPALOTLA, S.A. DE C.V.**

Orizaba 195, Col. Roma, C.P. 06700, México D.F. Tel. (55)5265-9870, Fax: (55) 5265-9871  
E-mail: mexico@grupopapalotla.com www.grupopapalotla.com

**TROPICAL SEEDS, LLC.**

5850 Coral Ridge Dr., Suite 302 Coral Springs, Fl. 33076, Florida, USA  
Tel. (954) 753-6301, Fax. (954) 753-6382 usa@grupopapalotla.com

**TROPICAL SEEDS DO BRASIL, LTDA**

Tel. (19) 3242-9060 Fax. (19) 3241-4334  
Regente Feijó SP, BRASIL, brasil@grupopapalotla.com



Table 8. In Vitro digestibility of organic matter in the layers of CIAT BR02/1752 and Mulato II under three harvest frequencies.

Brachiaria hybrid	Harvest frequency - weeks			Average
	2	4	6	
Mulato II	72.5	71.4	68.1	70.7
CIAT cv BR02/1752	74.8	70.3	68.5	71.2
Average	73.6 a*	70.8 b	68.3 c	

\* Values with different letter, statistically differ from the level of (P<0.01).

Adapted from: Vendramini, J.M.B., L.E. Sollenberger, W.L. da Silva, A.B. Soares, J.D. Sánchez, and A.L. Valente. Harvest frequency affects herbage accumulation and nutritive value of Brachiaria hybrids (in preparation).

Table 9. In Vitro digestibility of organic matter in the stems of CIAT BR02/1752 and Mulato II under three harvest frequencies.

Brachiaria hybrid	Harvest frequency - weeks			Average
	2	4	6	
Mulato II	59.0	59.0	54.5	56.4
CIAT cv BR02/1752	61.1	57.9	56.3	58.4
Average	60.0 a*	56.8 b	55.4 b	

\* Values with different letter, statistically differ from the level of (P<0.01).

Adapted from: Vendramini, J.M.B., L.E. Sollenberger, W.L. da Silva, A.B. Soares, J.D. Sánchez, and A.L. Valente. Harvest frequency affects herbage accumulation and nutritive value of Brachiaria hybrids (in preparation).

Values presented in tables 4 through 9 show the high protein value and digestibility of both hybrids of Brachiaria at three harvest frequencies studied in the University of Florida – USA.

#### CIAT BR02/1752 flooding tolerance.

Since the beginning of the Brachiaria Project at CIAT as well as the research center of Grupo Papalotla in Mexico – Oaxaca – CIPAT, efforts have been directed towards selecting materials tolerant to flooding, given the low tolerance to badly drained soil in the cv. Mulato II and commercial cultivars of Brachiaria, with the exception of *B. humidicola*.

The first tests on the new Brachiaria hybrids began in the year 2006, following the traditional technique of 21 days of flooding in hermetic container and keeping a 10cm water layer in the surface, as shown in figure 4.



Figure 4. Containers used in the flooding tests at CIPAT, Oaxaca-Mexico



Tests carried out with only 21 days of observation, did not allowed detection of differences between the evaluated hybrids.

A second test with duration of 41 days of flooding, allowed detecting some changes shown in Table 10.

Table 10. Effect of flooding in the color of leaves in Bracharia hybrids.

Seed Bank	Flooding Days*
Group 1	6
Group 2	7
Group 3 + cv. Mulato II	8
Group 4	9
Brachiariabrizantha cv. Marandu	10
Brachariahumidicola	33

Level 3= 50% green leaves + 50% dry leaves

It can be observed in Table 10 that with the exception of Bracharia humidicola, the rest of the evaluated materials had 50% of their leaves dried between 6 and 10 days after being flooded.

In a third test with a duration of 55 days of flooding, Bracharia humidicola and the hybrid of CIAT BR02/1752 (Cayman) did not show any change of color in their layers, after almost two months of flooding.

A fourth test with 28 hybrids of Bracharia of the generation BR06, and the witnesses CIAT BR02/1752, BR02/1794, Bracharia humidicola, Bracharia brizantha cv. Marandu, were submitted to a flooding cycle of 55 days, in a random block design with four repetitions. Obtained results gave an average of 1066 and 998 adventitious roots per plant, for CIAT BR02/1752 and Bracharia humidicola, respectively.

In addition to tests carried out under induced flooding (pot tests), two agronomic tests were carried out in one lagoon located in Santa Elena, Oaxaca – Mexico. Two promissory materials were sowed in the induced flooding tests, plus the commercial Brachiarias (*B. humidicola* and *B. brizantha* cv. Marandu).

Finally the cv. Mulato II, cv. Toledo and the hybrids of Brachiaria CIAT BR02/1794, CIAT BR02/1752, BR06/0423, BR05/1738 and BR06/100 were sowed in the aforementioned lagoon, in a random block design with four repetitions. After a cycle of 85 days of flooding, again the Brachiaria hybrid cv. CIAT BR02/1752 as well as the witness *B. humidicola* were outstanding. Figures 5 and 6 show the development and force of Brachiaria hybrid cv. CIAT BR02/1752.

Figure 5. Development and force of the cv. Marandu and Brachiaria hybrid cv. CIAT BR02/1752, after 85 days of flooding in the flooded zone of Oaxaca-Mexico.



On the left side is the cv. Marandu and on the right side Brachiaria hybrid cv. CIAT BR02/1752

Figure 6. Vegetative development and force of Brachiaria hybrid cv. CIAT BR02/1752, after 85 days of flooding in the flooded zone.



### Animal Production

Tests related to the production of the new Brachiaria CIAT hybrid BR02/1752, have been initiated recently, mainly in Costa Rica.

One of the experiments intends to evaluate persistence under different animal loads. This test is established at the facilities of the National Agricultural Technology Institute (INTA), located at Guápiles, located in the humid tropic.

Another of the tests established recently, intends to estimate the production of milk with grass CIAT BR02/1752 in comparison with fodders from the zone. The same is located in the farm of Mister Humberto Gamboa in San Carlos, Alajuela.

A similar experiment has been established in the farm of Engineer Edgar Quesada, in San Carlos, Alajuela.

An experiment is being assembled, comparing the two *Brachiaria* hybrids (cv. Mulato II and CIAT BR02/1752), in Río Frío, Sarapiquí, at the farm La Morena.

The oldest pasture with *Brachiaria* hybrid cv. CIAT BR02/1752 is located in Daniel Flores de Pérez Zeledón – Costa Rica, where it has been harvested for six years in the estate of Don Rony Chaves. The status of this pasture can be observed in the following pictures (Figures 7 and 8).



Figure 7. Development of adventitious roots of the *Brachiaria* hybrid CIAT BR02/1752 in flooded zone under grazing conditions in Daniel Flores de Pérez Zeledón – Costa Rica.



Figure 8. Pasture with *Brachiaria* hybrid cv. CIAT BR02/1752 under grazing in the humid tropic, at the locality Daniel Flores de Pérez Zeledón – Costa Rica.