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AGRONOMIC EVALUATION OF BANANA PLANTS IN THREE PRODUCTION CYCLES IN SOUTHWESTERN STATE OF BAHIA [1]

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ABSTRACT - This assay was conducted in the experimental area of the Federal Institute of Bahia, Campus Guanambi, BA, and aimed to evaluate agronomic traits of Prata, Cavendish, Gros Michel and Maçã banana cultivars three production cycles. The 72 treatments, 24 cultivars and three production cycles were arranged in a split plot scheme in time, in a completely randomized design with five replications and four plants per plot. Plots were arranged in 24 cultivars, Prata-Anã, Maravilha, FHIA-18, FHIA-18 BRS, BRS Platina, JV42-135, Pacovan, Japira, PV79-34, Pacovan-Ken, Preciosa, Guarantida, Maçã, Caipira, BRS Tropical, BRS Princesa, YB42-03, YB42-07, YB42-47, Grande-Naine, Calypso, Buccaneiro, FHIA-23 and FHIA-17; and subplots consisted of three production cycles. Data obtained were submitted to analysis of variance. The average of the cultivars were grouped by Scott-Knott criterion ($p<0.05$) and production cycles compared by Tukey test ($p<0.05$). 'JV42-235', 'Japira' and 'Pacovan-Ken' cultivars had larger size and 'Grande Naine' had smaller size. 'Prata-Anã' cultivar had higher number of leaves at harvest, with leaf area index similar to the others. 'BRS Platina' cultivar is earlier at flowering and harvest. 'Maravilha', 'BRS Platina', 'FHIA-23', 'BRS Tropical and BRS Princesa' cultivars presented greater potential for use by farmers.
Index Terms: Genotypes, *Musa* spp., productive potential, vegetative vigor.

AVALIAÇÃO AGRONÔMICA DE BANANEIRAS EM TRÊS CICLOS DE PRODUÇÃO NO SUDOESTE DA BAHIA

RESUMO – O ensaio foi conduzido na área experimental do Instituto Federal Baiano, Câmpus Guanambi-BA. Objetivou-se avaliar características agronômicas de cultivares de bananeira com frutos tipo Prata, Cavendish, Gros Michel e Maçã, em três ciclos de produção. Os 72 tratamentos, 24 cultivares e três ciclos de produção foram dispostos em esquema de parcela subdividida no tempo, em um delineamento inteiramente casualizado, com cinco repetições e quatro plantas úteis por parcela. As 24 cultivares, Prata-Anã, Maravilha, FHIA-18, BRS FHIA-18, BRS Platina, JV42-135, Pacovan, Japira, PV79-34, Pacovan-Ken, Preciosa, Garantida, Maçã, Caipira, BRS Tropical, BRS Princesa, YB42-03, YB42-07, YB42-47, Grande-Naine, Calipso, Bucaneiro, FHIA-23 e FHIA-17 constituíram as parcelas; e os três ciclos de produção as subparcelas. Os dados mensurados foram submetidos à análise de variância. As médias das cultivares foram agrupadas pelo critério de Scott-Knott ($p<0,05$) e dos ciclos de produção comparadas pelo teste de Tukey ($p<0,05$). As 'JV42-235', 'Japira' e 'Pacovan-Ken' apresentam maior porte, e 'Grande Naine', menor. A 'Prata-Anã' tem maior número de folhas na colheita, com índice de área foliar similar às demais. A 'BRS Platina' é mais precoce para florescimento e colheita. 'Maravilha', 'BRS Platina', 'FHIA-23', 'BRS Tropical' e 'BRS Princesa' apresentam maior potencial de utilização pelo agricultor.
Termos para Indexação: *Musa* spp., genótipos, produção, vigor.

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INTRODUCTION

Banana cultivation in southwestern Bahia and northern Minas Gerais is characterized by the cultivation of Prata-Anã cultivar (RODRIGUES et al., 2011). The main phytosanitary problems affecting banana plants in these regions are yellow sigatoka (MATOS; CORDEIRO, 2011) and the Panama disease, another fungal disease that limits 'Maçã' banana cultivation (SILVA et al., 2002; MOHANDAS et al., 2013). This limitation also occurs in some areas of 'Prata' banana cultivation, where this disease has become severe, especially in regions with more sandy soil (RODRIGUES et al., 2011).

Alternatives have been proposed by the Brazilian Program for Genetic Improvement of Banana, through the development of resistant cultivars that have been tested in several regions of the country. At Guanambi-BA, some studies have already been conducted to evaluate banana genotypes, as those performed by Donato et al. (2006, 2009, 2010), Azevedo et al. (2010), Faria et al. (2010), Marques et al. (2011) and Sant'Ana et al. (2012).

Studies of this nature are important because they provide information about new cultivars, stability, behavior and resistance to diseases in different environments, and consolidate and strengthen the recommendation of genotypes in the test phase. Therefore, it is essential to continue these studies, not only with the most cultivated subgroup, but also with others evaluated in several production cycles in order to obtain a greater number of cultivation options for farmers, ensuring the consistency and extrapolation of results.

Thus, the aim of this study was to evaluate the agronomic characteristics of Prata, Cavendish, Gros Michel and Maçã banana cultivars in three production cycles in southwestern Bahia.

MATERIAL AND METHODS

The experiment was carried out at the Federal Institute of Bahia, Campus Guanambi, in a typical dystrophic Red-Yellow Oxisol, A weak, medium texture, with average annual precipitation of 678 mm and mean temperature of 26 ºC.

At planting, micropropagated seedlings spaced 3.0 x 2.5 m were used. The implantation and the cultural treatments followed recommendations for the culture, according to Rodrigues et al. (2008).

The 72 treatments, 24 cultivars and 3 production cycles were arranged in a plot scheme subdivided in time in a completely randomized design, with five replicates and four useful plants per plot. Plots consisted of 24 cultivars, Prata type: Prata-Anã and Pacovan (AAB), Maravilha, FHIA-18, BRS FHIA-18, BRS Platina, Pacovan, Japira, Pacovan-Ken, Preciosa, Garantida and genotypes PV79- 34 and JV42-135 (AAAB); maçã type: Maçã(AAB), Caipira (AAA), BRS Tropical, BRS Princesa and genotypes YB42-03, YB42-17 and YB42-47 (AAAB); Cavendish type: Grande-Naine (AAA);Gros Michel type: Calipso, Bucaneiro, FHIA-23and FHIA-17 (AAAA); and subplots, for the three production cycles: mother plant, daughter plant and granddaughter plant. Growth, yield, and cycle duration were evaluated. In the growth and yield measurements, standard phenotypic descriptors were defined in the Descriptors Manual (IPGRI, 1996; BRANDÃO et al., 2013): plant height, corresponding to pseudostem length, pseudostem perimeter at 30 cm from the soil, number of live leaves at flowering and harvest, length and width of the third leaf, total leaf area and the leaf area index. Total leaf area of the plant (TLA), expressed in m², was estimated according to Zuculoto et al. (2008). At harvest, bunch and hand mass, average hand mass, number of hands and number of fruits were determined. Cycle duration (in days) was also evaluated, determining the flowering period, period between flowering and harvest, and harvesting period.

Data obtained were submitted to analysis of variance. The averages of cultivars were grouped by the Scott-Knott criterion ($p < 0.05$), and the production cycles were compared by the Tukey test ($p < 0.05$).

RESULTS AND DISCUSSION

Flowering and harvesting characteristics were influenced by cultivars and cycle (Tables 1, 2, 3, 4), except for the flowering period (Table 5).

Plant height differed among cultivars with the formation of six groups in the first and third cycles, and of five groups in the second, by the Scott-Knott criterion ($p < 0.05$) (Table 1). The highest cultivars in all cycles were Japira, Pacovan-Ken and genotype JV42-135, and the smallest ones, Grande Naine and Caipira, agreeing with Camolesi et al. (2012). Banana plants increased in height during cycles, which is consistent with literature (SOUZA et al., 2011a; Oliveira et al., 2013). Possibly, the third cycle is representative of the height of each cultivar, since as reported by Belalcázar Carvajal (1991) and Soto Ballestero (2008), there is usually no increase in plant

height from the third cycle.

The identification of groups of cultivars of different sizes in evaluation trials may support future recommendations of specific planting spacings, since the plant height interferes with the spacing, planting density and consequently light capture, directly related to photosynthesis, which determines productivity (AZEVEDO et al., 2010). In addition, higher height makes harvesting and cultural management difficult. It is an undesirable characteristic in regions with strong winds due to intense plant bending.

Pseudostem perimeter, evaluated at 30 cm from the soil, in the first two cycles, formed six groups (Table 1). 'FHIA-23' presented the largest perimeter, 109.45 cm, in the first cycle. In the second cycle, this cultivar, together with 'FHIA-18', 'Prata-Anã' and 'FHIA-17' presented the highest averages. In the third cycle, with seven groupings, the highest averages were observed for 'FHIA-18', 'Maravilha', 'BRS Platina' and 'PV79-34'. In all cycles, the lowest performance was observed for Caipira cultivar, similar to that observed by Camolesi et al. (2012). As in the present study, Azevedo et al. (2010) observed that 'PV79-34', a Pacovan-type hybrid susceptible to Panama disease (RODRIGUES FILHO et al., 2014), expresses greater vigor and smaller size than 'Pacovan' and its hybrids 'Preciosa', 'Garantida', 'Japira' and 'Pacovan-Ken'. Possibly, its male genitor identified as 79 (AA) provides the greatest vigor and smallest size (AZEVEDO et al., 2010), but it does not provide resistance to Panama disease as M53 to its progeny (RODRIGUES FILHO et al., 2014).

There were differences in the pseudostem perimeter among cycles, with size increase for all cultivars, except for FHIA-17, which did not present difference, and for 'FHIA-23', the only one that presented continuous size reductions over the cycles.

Increases in the pseudostem perimeter of banana plants from the first production cycle are reported in several studies, such as Damatto Júnior et al. (2011), with 'Prata-Anã' (AAB), Souza et al. (2011b), with 'Figo Cinza' (ABB) and Silva et al. (2013), with 'Thap Maeo' (AAB). According to Silva et al. (2011), this feature is of great importance for the culture, because the pseudostem perimeter is related to the ability of the bunch to support, susceptibility to bending, number of leaves and bunch development; therefore, it expresses the plant vigor.

Banana plants presented a number of leaves evaluated in flowering, in three groups, in the first and third cycles and four groups in the second cycle (Table 1). In the first cycle, averages ranged from 12 to 18 leaves for 'BRS FHIA-18' and 'Prata-Anã', respectively. In the second cycle, 'Prata-Anã' and 'Maçã' showed higher number of leaves, and the group with the lowest number included the majority of cultivars, with average around 12 leaves. In the third cycle, the majority of cultivars formed the group with the lowest number of leaves, while 'BRS Platina' and 'Pacovan' cultivars presented the highest number. The number of leaves in flowering did not differ among months for most cultivars. The differences observed indicate a reduction in this characteristic from the first to the other cycles.

The number of live leaves is an important characteristic to be analyzed, considering that the photosynthesis rate depends on the plant leaf area (OLIVEIRA et al., 2013). Souza et al. (2011a) did not find differences among cultivars of three genomic groups, Grande Naine, Caipira, Prata-Anã, FHIA-18 and BRS Tropical evaluated in subtropical climate. Different results were found in this work for most plants in the three cycles. From flowering, there is no emission of leaves, which decreases in number until harvest by the natural process of foliar senescence and defoliation to control sigatoka infestation (OLIVEIRA et al., 2013).

The number of leaves at harvest varied among cultivars in the evaluated cycles, forming three, six and four groups for the first, second and third cycles, respectively. 'Prata-Anã' cultivar had the highest number of leaves in all cycles, along with 'Maçã', in the first and third cycles. The latter group also included 'Maravilha' and 'BRS Platina' cultivars. The lowest number of leaves in all cycles was observed in 'Garantida', 'Preciosa' and 'Caipira' cultivars. In the majority of variations observed among cycles, in 50% of the cultivars evaluated, there was a reduction in the number of leaves at harvest along the cycles. The number of leaves at harvest for Thap Maeo cultivar (AAB), with 'Maçã' type fruits during two production cycles in the *Vale do São Francisco* region (SILVA et al., 2013), was about 9 and 10, respectively, values similar to those obtained in this work.

The length of the third leaf showed a small difference among cultivars in the first and second cycles, forming three and two groupings by the Scott-Knott criterion ($p < 0.05$) (Table 2). The highest leaf length was observed for 'FHIA-23' and 'FHIA-17' cultivars, and the smaller leaf lengths were observed for 'Prata' type fruits: 'BRS FHIA-18', 'BRS Platina', 'Prata-Anã'; 'Grande Naine' of the Cavendish group and 'Maçã' type fruits: 'Caipira' and 'BRS Princesa'. In the second cycle, a small variation occurred with formation of only two groupings, and banana plants with the shortest length of the third leaf were the same as those of the previous cycle. This feature reflects genotypic differences,

since Gros Michel banana plants have larger leaves. Most cultivars increased the length of the third leaf from the first to the second cycle.

The width of the third leaf varied among cultivars, forming five groups in the first cycle (Table 2). The lowest leaf width was recorded for 'Maçã' cultivar, while the largest was observed for 'Calipso' and 'Bucaneiro', in both cycles, in the latter group 'FHIA-23', 'FHIA-17' and 'Grande Naine' were also grouped. This was expected due to the genetic proximity of these cultivars. In the majority of cultivars, the width of the third leaf among cycles did not differ, but there was a decrease from the first to the second cycle in 'Maravilha', 'Pacovan-Ken', 'Pacovan' and 'Caipira' cultivars.

Marques et al. (2000) evaluated 'Prata-Anã' and 'BRS Platina' (PA42-44) cultivars in three production cycles with different irrigation systems in Guanambi-BA and found differences in the width of the third leaf only in the second cycle. 'Prata-Anã' cultivar emitted wider leaves compared to 'BRS Platina' cultivar, with values ranging from 66.14 cm to 79.23 cm, a result similar to that obtained in this study.

The total leaf area varied similarly in both evaluated cycles, forming three groups (Table 2). In the first cycle, the majority of cultivars were included in the group with the highest leaf area, while the lowest results were obtained for 'BRS FHIA-18', 'Caipira', 'YB42-03' and 'BRS Princesa' cultivars. In the second cycle, the lower averages were found for 'Garantida' and 'Caipira' cultivars. There was a statistical difference between cycles, with increases in leaf area for 'BRS FHIA-18', 'Prata-Anã', 'BRS Tropical', 'BRS Princesa' and 'Maçã' cultivars, and decrease for 'Pacovan Ken' and 'FHIA-17' cultivars from the first to the second cycles.

The results of this experiment exceeded those of Costa et al. (2012), in which leaf area at flowering for Galil-18 (FHIA-18) cultivar ranged from 9.29 to 12.26 m^2, being significantly influenced by irrigation depths in Cruz das Almas-BA.

Agronomic characteristics of 'Prata' type banana in three productive cycles evaluated by Marques et al. (2011) in Guanambi-BA, reached leaf area values around 9.75 and 11.70 m^2 for 'Prata-Anã' and 'BRS Platina' cultivars, respectively, lower than those observed in this study.

Cultivars presented the same leaf area index in both cycles with the formation of only one group by the Scott-Knott criterion ($p < 0.05$) (Table 2). The leaf area index did not differ between cycles for most cultivars, and increases were observed for 'BRS FHIA-18', 'Prata-Anã', 'BRS Tropical', 'BRS Princesa' and 'Maçã' While for 'Pacovan-Ken' cultivars and decreased for 'FHIA-17' cultivar.

Superiority of leaf area indexes of 'Prata-Anã' cultivar when compared to its progeny, 'BRS Platina', in three cycles evaluated under different irrigation systems was also recorded by Marques et al. (2011). The results ranged from 1.30 to 2.36 $m^2\ m^{-2}$, whose values are similar to those found in this study.

The variation of the number of hands among cultivars was similar in the three cycles evaluated with the formation of three clusters (Table 3). Cultivars originating from the breeding program of Honduras (FHIA) presented the highest number of hands in the first two cycles. In the third cycle, 'Bucaneiro' cultivar stood out with the highest number of hands, 16.42. In all cycles, the smallest number of hands was registered in tall 'Prata' banana cultivar and in those with 'Maçã' type fruits, as well as in 'Calipso' cultivar. There was no difference between the cycles for most cultivars; however, among those that showed difference, BRS FHIA-18, 'BRS Platina', 'FHIA-18', 'Caipira' and 'YB42-03' cultivars presented lower values in the first cycle and higher in the third cycle, 'Bucaneiro', the only one that presented increase in the number of hands from the first to the second and from the second to the third cycle.

The superiority of 'Prata-Anã' cultivar in relation to the number of number of hands per bunch, when compared to 'BRS Platina' cultivar, observed by Marques et al. (2011) in three production cycles, was only observed in the second cycle of the present study.

The lowest number of fruits per hand was observed in tall 'Prata' banana plants in all cycles, and the highest in the 'Cavendish' and 'Gros Michel', and in 'Caipira' cultivars (Table 3). Among cases of variation, most of the cultivars showed an increase in the number of fruits per hand throughout cycles. Similar results were found by Silva and Rodrigues (2013) when evaluating bunch mass, number of hands and fruits per bunch of 'Prata-Anã' banana plants, regardless of application of P in the soil, in four production cycles.

'Maravilha' cultivar showed the highest average hand mass in the three cycles, while the lowest average mass was obtained for 'Maçã'-type banana plants, with exception of 'Tropical BRS' in the second cycle and 'YB42-17' in the third cycle (Table 3). There were differences among cycles with the reduction of the average hand mass from the first to the third cycle for most cultivars. The largest reduction was observed for 'FHIA-23' and 'FHIA-17' cultivars.

In addition, FHIA cultivars, regardless of the genomic group, for example 'FHIA-23' (AAAA) and 'Maravilha' (AAAB) showed higher bunch mass (Table 3), corroborating Donato et al. (2009) and Souza et al. Al. (2011), who concluded that

'Maravilha' (FHIA-01) along with 'Grande Naine' were more productive. Donato et al. (2006) found that 'Grande Naine' was more productive, and Camolesi et al. (2012), 'Grande Naine' followed by 'Maravilha' cultivars. Lighter hands were observed in cultivars with 'Maçã'-type fruits in all cycles, except for 'BRS Tropical' and 'YB42-17' in the second cycle, agreeing with Roque et al. (2014). The difference among cycles occurred for most cultivars, with the increase in 'FHIA-18' mass throughout the cycles, while 'Japira' cultivar decreased.

Hand mass varied among cultivars with formation of six, four and five groups in the first, second and third cycles, respectively (Table 3). Cultivars originating from FHIA reached higher values in all cycles, as banana plants with 'Maçã'-type fruits presented lower hand mass in all cycles. There were no differences among cycles for banana plants with 'Pacovan' and 'Maçã'-type fruits. 'FHIA-18', 'FHIA-18' and 'Bucaneiro' cultivars presented mass increment from the first to the second cycle and were similar in the third cycle, while 'FHIA-17' and 'FHIA-23' cultivars decreased from the second to the third cycle.

Fresh hand mass is directly related to mass and number of fruits; however, this positive correlation can be greater or lower, depending on the genotype and environment (LIMA NETO et al., 2003). Souza et al. (2011b) evaluated the first two cycles of the 'Figo Cinza' cultivar and verified an increase in the fresh mass values of the second hand, without finding an increase in the number of fruits.

Banana plants presented small variation among cultivars in relation to the number of days to flowering, with formation three groups in the first two cycles and greater variation with formation of five groups in the third cycle (Table 4). The highest precocity of flowering in all cycles was found for 'BRS FHIA-18', 'BRS Platina' and 'Pacovan' cultivars. 'FHIA-23' and 'FHIA-17' were the latest in all cycles, both in flowering and harvesting. Banana plants varied in number of days for flowering among cycles, obviously, this variation is explained by the fact that the number of days for flowering is cumulative from one cycle to another.

The flowering precocity is an important characteristic because it reduces the time of plant exposure to pathogens, being able to increase the number of leaves at the time of floral differentiation and favor a greater amount of female flowers during inflorescence (ROBINSON; GALÁN SAÚCO, 2010), resulting in bunches with greater number of hands.

Data measured by Azevedo et al. (2010) indicate that, during the period from planting to flowering, 'Garantida', 'PV42-53', 'Preciosa', 'Pacovan-Ken', 'Japira' cultivars and 'PV79-34' hybrids were later than 'Pacovan' in the first two cycles. Similar behavior was observed in the present experiment in the second and third production cycles, that is, 'Pacovan' was earlier than hybrids, except for 'PV79-34' in the second and third cycles.

The variation in the number of days to harvest among cultivars allowed four groups in the first and third cycles and three in the second (Table 4). The earliest cultivars in all cycles were BRS FHIA-18 and BRS Platina.

The reduction in the number of days required for the bunch emission brings expectations of return of the initial investment (FARIA et al., 2010). Melo et al. (2010) observed the anticipation of 103 days of harvest in the first cycle of 'Prata-Anã' cultivar when they used 1,016 kg ha^{-1} of N and 1,200 kg ha^{-1} of K_2O together, and reported that the cycle of this cultivar is extended in N and K deficiency situations.

'Prata-Anã' cultivar cultivated under the edaphoclimatic conditions of Juazeiro-BA presented in the first production cycle an interval of 347 days from planting to harvesting and the interval between harvesting from the first and second cycles, that is, between harvesting of the mother plant and daughter plant, of 224 days (SILVA et al., 2013). In the present study, the first harvest of 'Prata-Anã' cultivar was at 268 days after planting, that is, 79 days earlier than in Juazeiro-BA, while the interval between harvest of the first and second cycles was similar in both sites, with a slight difference of six days.

The period between flowering and harvesting of banana plants evaluated varied with production cycles (Table 5) and with cultivars (Table 6) independently. For the variation of this characteristic among cycles, it was observed that the shortest period between flowering and harvest, 125 days, was recorded in the second cycle. The variation among cultivars was small, with the formation of only two groups, and the longest periods between flowering and harvesting were observed for 'Prata' cultivar.

In general, considering greater production and resistance to diseases, 'Maravilha' and 'FHIA-23' cultivars are an alternative for planting in conductive environments for Panama disease; referring to 'Prata'-type cultivars, BRS Platina stands out with characteristics closer to those of the genitor; for cultivars with 'Maçã'-type fruits, the hybrids, for being tolerant to Panama disease. Among banana plants with 'Pacovan'-type fruits, the most productive is 'PV79-34'; however, it is susceptible to Panama disease (RODRIGUES FILHO et al., 2014), as verified in the present study.

In addition to performance and disease resistance, in order to recommend a cultivar, it is necessary to consider commercial acceptance to minimize the risk of low adoption or rejection by producers.

TABLE 1-Vegetative characteristics of banana cultivars in three production cycles. Guanambi-BA, 2010-2013.

CULTIVAR	Plant height (cm)			Pseudostem perimeter (cm)			Number of leaves at flowering			Number of leaves at harvest		
	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle
Maravilha	310.75bC	383.20aB	395.65aC	85.60cC	98.15bB	110.70aA	16.45aA	16.05aB	15.10aB	11.95aB	12.80aB	13.12aA
BRS FHIA-18	249.45cE	317.20bD	366.15aD	69.33cE	87.75bC	100.35aC	12.20aC	13.80aC	13.65aC	9.70aC	10.60aC	10.00aB
BRS Platina	285.75cD	332.10bD	379.85aD	76.78cD	92.75bC	107.40aA	16.25aA	16.10aB	16.55aA	12.10aB	12.53aB	12.85aA
FHIA-18	303.30bC	385.80aB	413.45aC	88.63bC	106.47aA	110.13aA	15.37aA	14.18abC	12.73bC	10.13aC	9.83aD	9.40aC
Prata-Anã	295.15bD	348.72aC	348.87aD	77.75cD	105.08aA	95.65bD	17.95aA	18.93aA	15.08bB	13.68bA	15.57aA	12.60bA
JV42-135	372.75bA	466.80aA	495.15aA	80.95bC	100.75aB	101.70aC	16.15aA	13.17bC	12.30bC	11.50aB	10.60aC	8.80aC
Garantida	352.55bB	463.67aA	469.40aB	65.30bE	89.90aC	89.35aE	13.20aC	11.08bD	10.75bC	9.35aC	6.52bF	6.42bD
Japira	370.50cA	462.35bA	508.00aA	70.35cE	88.58bC	98.90aC	14.85aB	12.90aD	13.45aC	10.25aC	8.35bE	7.10bD
PV79-34	338.30bB	400.55aB	415.56aC	85.83cC	96.20bB	108.69aA	16.20aA	14.10bC	14.13bB	9.50aC	9.27aD	8.60aC
Pacovan-Ken	375.55cA	466.43bA	502.02aA	78.05cD	96.00bB	103.77aB	16.60aA	14.65aB	12.07bC	11.00aB	10.53aC	7.72bD
Preciosa	356.75cB	479.25bA	517.53aA	70.00bE	98.92aB	104.33aB	14.40aB	12.30bD	12.83abC	8.80aC	6.97bF	6.73bD
Pacovan	352.85cB	465.20bA	518.52aA	68.68cE	87.65bC	99.70aC	17.40aA	16.40aB	16.92aA	11.25aB	11.10aC	10.33aB
Calipso	296.30bD	354.75aC	358.75aD	78.80bD	97.95aB	100.73aC	12.90aC	12.35aD	11.47aC	7.90aC	8.13aE	7.57aD
Bucaneiro	269.10bD	340.27aD	359.82aD	75.20bD	96.45aB	100.73aC	13.80aB	12.30aD	11.95aC	8.82aC	9.30aD	8.43aC
FHIA-23	350.80bB	379.50aB	363.12abD	109.45aA	105.85abA	99.25bC	13.25aC	12.28abD	11.22bC	9.42aC	8.45abE	6.79bD
FHIA-17	324.72bB	367.67aC	351.77abD	98.02aB	102.30aA	103.07aB	13.90aB	11.92abD	11.67bC	9.53aC	8.70abE	7.82bD
Grande Naine	217.50bF	269.53aE	255.65aF	67.45bE	80.08aD	81.25aF	14.40aB	14.45aC	14.05aB	10.47aC	9.37aD	9.07aC
Caipira	212.05cF	360.57aC	322.30bE	51.65bF	61.43aF	67.55aG	14.25aB	10.88bD	12.15bC	8.65aC	6.52bF	7.5abD
YB42-17	315.90bC	380.70aB	395.10aC	83.70bC	92.12aC	95.82aD	15.30aA	15.17aB	12.82bC	11.25aB	9.63abD	8.27bC
BRS Tropical	317.45bC	384.22aB	399.85aC	83.70bC	95.92aB	100.75aC	14.95aB	15.08aB	12.70bC	9.90aC	8.40abE	7.22bD
YB42-03	305.30cC	375.55bB	421.45aC	69.20cE	83.50bD	93.98aD	12.85aC	12.70aD	12.77aC	9.32aC	8.05aE	7.92aD
BRS Princesa	295.17bD	366.12aC	366.90aD	71.28cE	80.38bD	91.83aD	13.47aC	13.23aC	12.38aC	9.40aC	9.02aD	7.87aD
Maçã	293.55bD	339.68aD	356.31aD	71.35bE	73.45bE	82.00aF	16.65aA	17.27aA	15.56aB	14.00aA	11.83bB	12.13bA
YB42-47	310.10cC	363.92bC	402.40aC	76.60bD	90.38aC	93.18aD	14.25aB	13.37aC	12.77aC	10.40aC	7.85bE	7.10bD
CV(%)	4.66			5.03			9.16			11.26		

TABLE 2-Leaf characteristics of banana cultivars in two production cycles. Guanambi-BA, 2010-2013.

CULTIVAR	Length of the 3rd leaf (cm)		Width of the 3rd leaf (cm)		Total leaf area (m^2)		Leaf Area Index (m^2m^{-2})	
	1st Cycle	2nd Cycle	1st Cycle	2nd Cycle	1st Cycle	2nd Cycle	1st Cycle	2nd Cycle
Maravilha	225.20bB	252.90aA	79.05aC	70.80bC	16.16aA	15.98aA	2.69aA	2.66aA
BRS FHIA-18	193.20aC	209.66aB	73.25aC	77.70aB	9.89bC	12.70aB	1.65bA	2.12aA
BRS Platina	206.31bC	224.30aB	73.75aC	70.70aC	13.84aB	14.20aB	2.31aA	2.37aA
FHIA-18	233.18bB	250.80aA	75.93aC	72.93aC	15.06aA	14.30aB	2.51aA	2.38aA
Prata-Anã	197.60bC	223.07aB	75.63aC	79.60aB	14.86bA	18.39aA	2.48bA	3.07aA
JV42-135	240.80bB	275.00aA	76.60aC	76.05aC	16.38aA	15.95aA	2.73aA	2.66aA
Garantida	236.30aB	246.78aA	69.65aD	67.72aD	12.34aB	10.77aC	2.06aA	1.80aA
Japira	232.10bB	262.33aA	69.70aD	68.57aC	13.44aB	13.25aB	2.24aA	2.21aA
PV79-34	229.05bB	248.50aA	66.60aD	63.10aD	13.77aB	12.68aB	2.30aA	2.11aA
Pacovan-Ken	233.45aB	243.87aA	77.00aC	64.52bD	16.58aA	12.99bB	2.76aA	2.17bA
Preciosa	229.15bB	269.25aA	73.50aC	70.10aC	13.51aB	13.07aB	2.25aA	2.18aA
Pacovan	219.55bB	262.00aA	70.00aD	62.35bD	14.91aA	14.91aA	2.48aA	2.49aA
Calipso	235.90aB	251.60aA	96.75aA	92.25aA	16.52aA	16.05aA	2.75aA	2.68aA
Bucaneiro	221.10bB	244.15aA	92.35aA	91.45aA	15.59aA	15.21aA	2.60aA	2.53aA
FHIA-23	267.90aA	255.35aA	88.10aB	90.22aA	17.09aA	15.12aA	2.85aA	2.52aA
FHIA-17	261.25aA	241.32bA	86.72aB	88.33aA	17.31aA	13.47bB	2.88aA	2.25bA
Grande Naine	199.45aC	216.42aB	88.00aB	87.63aA	14.27aA	13.64aB	2.38aA	2.27aA
Caipira	224.27aC	192.50bB	69.30aD	62.33bD	11.02aC	8.91aC	1.84aA	1.48aA
YB42-17	225.45bB	246.65aA	82.00aB	78.13aB	15.75aA	16.13aA	2.63aA	2.69aA
BRS Tropical	223.75bB	254.37aA	79.80aC	83.77aB	14.98bA	17.62aA	2.50bA	2.94aA
YB42-03	222.70bB	258.90aA	68.80aD	65.70aD	11.23aC	12.19aB	1.87aA	2.03aA
BRS Princesa	208.58bC	256.58aA	68.50aD	73.30aC	11.04bC	13.93aB	1.84bA	2.32aA
Maçã	218.95bB	252.00aA	60.65aE	64.67aD	12.52bB	15.83aA	2.09bA	2.64aA
YB42-47	218.55bB	254.00aA	76.10aC	74.43aC	13.48aB	14.13aB	2.25aA	2.36aA
VC (%)	5.94		5.45		12.42		12.42	

Means followed by equal letters, lowercase in rows, do not differ from each other, by the F test ($p < 0.05$).
Means followed by equal letters, upper case in columns, belong to the same group by the Scott-Knott criterion ($p < 0.05$).

TABLE 3- Yield of banana cultivars in three production cycles. Guanambi-BA, 2010-2013.

CULTIVAR	Number of per buch			Number of fruits per hand			Average hand mass (Kg)			Bunch mass (Kg)			Hand mass (Kg)		
	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle
Maravilha	9.30aB	10.95aB	11.38aB	15.67aC	16.05aC	14.95aC	3.64aA	3.62aA	2.90bA	37.96bB	43.41aA	36.84bA	33.73bB	39.41aA	33,05bA
BRS FHIA-18	9.7bB	10.80abB	12.33aB	14.97bC	16.29bC	18.26aB	2.15aC	2.53aC	2.30aB	23.66bD	30.26aB	31.56aB	20.87bD	27.35aB	28,26aB
BRS Platina	9.20bB	9.60abC	11.95aB	16.06aC	15.73aC	17.56aB	2.31aC	2.21aC	2.02aB	24.64aD	23.95aC	27.11aC	21.36aD	21.34aC	24,29aC
FHIA-18	11.07bA	13.00abA	13.58aB	16.36bB	17.32abB	18.82aB	2.18aC	2.32aC	2.24aB	27.83bC	34.12aB	34.16aA	24.02bC	30.07aB	30,33aA
Prata-Anã	9.87aB	11.52aB	11.25aB	15.07aC	16.51aC	16.23aC	1.57aD	1.68aD	1.51aC	17.99aE	22.01aC	19.01aD	15.59aF	19.56aC	16,97aD
JV42-135	7.87aC	8.60aC	9.50aC	15.42aC	15.82aC	16.78aC	2.61aB	2.33abC	2.01bB	23.30aD	22.42aC	21.52aD	20.48aD	19.91aC	19,21aD
Garantida	6.80aC	7.33aC	7.82aC	12.87bD	13.82abD	14.94aC	1.76aD	1.42abE	1.29bD	14.38aF	12.10aE	11.71aE	11.99aF	10.38aD	10,17aE
Japira	7.50aC	7.57aC	8.40aC	13.99aD	15.17aD	15.44aC	2.25aC	1.91aD	1.45bC	19.52aE	16.31aD	13.90bE	17.02aE	14.39aD	12,21aE
PV79-34	9.70aB	9.45aC	10.08aC	14.00bD	13.96bD	16.55aC	2.13aC	1.80abD	1.67bC	24.30aD	19.41aC	19.11aD	20.63aD	16.92aC	16,87aD
Pacovan-Ken	7.42aC	7.95aC	9.02aC	14.17aD	15.77aC	15.93aC	2.08aC	1.82aD	1.73aC	17.72aE	17.71aD	16.55aD	15.41aF	14.43aD	15,73aD
Preciosa	7.00aC	8.10aC	8.15aC	14.25bD	15.19abD	16.60aC	2.20aC	1.90aD	1.38bC	17.70aE	17.43aD	13.54aE	15.40aF	15.40aD	12,41aE
Pacovan	7.90aC	8.15aC	9.13aC	14.40aD	14.65aD	16.06aC	2.22aC	2.05abD	1.73bC	20.28aE	18.99aC	18.12aD	17.49aE	16.73aC	15,87aD
Calipso	7.05bC	10.10aC	10.57aC	17.57bB	19.97aA	19.16abB	2.89aB	2.89aB	2.12bB	23.88bD	33.35aB	25.14bC	20.75bD	29.26aB	22,39bC
Bucaneiro	7.32cC	10.75bB	16.42aA	17.80aB	19.05aA	17.40aB	2.68aB	2.67aB	2.29aB	22.83bD	32.89aB	30.59aB	19.88bD	28.98aB	27,21aB
FHIA-23	13.17aA	15.32aA	13.25aB	19.29aA	19.31aA	16.84bC	3.30aA	2.41bC	1.51cC	48.89aA	42.21bA	23.83cC	43.10aA	36.63bA	20,57cC
FHIA-17	11.03bA	14.80aA	13.37abB	17.73aB	18.72aA	17.91aB	2.90aB	2.42bC	2.00cB	36.66abB	41.18aA	31.44bB	31.92aB	35.94aA	26,98bB
Grande Naine	9.02aB	11.03aB	11.50aB	17.12bB	19.00aA	17.17abC	2.82aB	2.66aB	2.20bB	28.53aC	32.89aB	28.45aC	25.32aC	29.75aB	26,08aB
Caipira	6.50bC	8.98abC	10.07aC	17.12cB	19.12bA	21.18aA	1.28aD	1.23aE	1.15aD	9.70aF	12.03aE	13.16aE	8.47aF	11.10aD	11,61aE
YB42-17	6.52bC	9.67aC	8.87abC	15.41bC	17.36aB	17.98aB	1.64aD	1.45aE	1.41aC	12.82aF	17.00aD	14.92aE	10.68aF	14.12aD	12,48aE
BRS Tropical	6.40aC	8.37aC	8.43aC	16.01aC	17.77aB	17.55aB	1.59abD	1.69aD	1.20bD	12.17aF	16.51aD	12.28aE	10.30aF	14.07aD	10,25aE
YB42-03	5.98bC	7.60abC	8.73aC	15.22bC	16.86abC	17.77aB	1.48aD	1.42aE	1.29aD	10.48aF	12.72aE	13.21aE	8.88aF	10.73aD	11,11aE
BRS Princesa	7.23aC	9.73aC	8.83aC	14.40bD	16.55aC	16.29aC	1.26aD	1.28aE	1.06aD	10.72aF	14.15aE	11.16aE	9.23aF	12.22aD	9,45aE
Maçã	7.35aC	8.08aC	8.69aC	14.29aD	14.99aD	16.09aC	1.56aD	1.48aE	1.28aD	13.21aF	14.02aE	12.65aE	11.53aF	12.07aD	11,07aE
YB42-47	6.40aC	8.13aC	8.90aC	15.45bC	16.99abC	17.72aB	1.63aD	1.36abE	1.06bD	12.56aF	13.55aE	11.43aE	10.50aF	11.20aD	9,45aE
CV(%)	17.56			7.98			13.43			14.86			15.98		

Means followed by equal letters, lowercase in rows, do not differ from each other, by the Tukey test ($p < 0.05$).
Means followed by equal letters, upper case in columns, belong to the same group by the Scott-Knott criterion ($p < 0.05$).

TABLE 4 - Period of days for flowering and harvest of banana cultivars in three production cycles. Guanambi-BA, 2010-2013.

CULTIVAR	Number of days from Planting to Flowering			Number of days from Planting to harvest		
	1st Cycle	2nd Cycle	3rd Cycle	1st Cycle	2nd Cycle	3rd Cycle
Maravilha	276.35cC	550.65bA	859.68aB	385.70cD	670.10bB	1005.75aA
BRS FHIA-18	258.80cC	379.45bC	647.02aE	390.67cD	513.30bC	799.48aD
BRS Platina	260.85cC	421.00bC	669.05aE	399.45cD	555.08bC	826.20aD
FHIA-18	289.65cC	499.90bB	745.28aC	442.60cC	589.05bC	878.03aC
Prata-Anã	268.30cC	499.03bB	803.77aB	426.00cC	556.02bC	934.83aC
JV42-135	300.15cC	532.05bB	779.80aC	440.72cC	612.58bB	890.25aC
Garantida	305.55cC	495.18bB	696.03aD	446.60cC	626.30bB	848.97aD
Japira	304.90cC	500.55bB	708.40aD	455.90cB	638.97bB	856.65aD
PV79-34	311.65cC	443.80bC	702.96aD	463.95cB	568.73bC	851.83aD
Pacovan-Ken	326.95cB	522.85bB	714.38aC	465.63cB	640.01bB	861.23aD
Preciosa	295.95cC	511.03bB	733.60aC	450.90cC	641.03bB	882.83aC
Pacovan	268.75cC	412.90bC	644.63aE	437.80cC	552.83bC	823.48aD
Calipso	344.10cB	561.37bA	805.73aB	473.55cB	657.00bB	921.88aC
Bucaneiro	339.95cB	528.95bB	791.25aB	474.95cB	658.70bB	916.73aC
FHIA-23	447.20cA	587.07bA	942.85aA	557.37cA	719.58bA	1047.96aA
FHIA-17	400.18cA	599.62bA	910.63aA	513.82cA	722.80bA	1026.97aA
Grande Naine	324.25cB	524.02bB	759.73aC	443.35cC	650.10bB	896.52aC
Caipira	360.15cB	560.67bA	722.51aC	477.55cB	688.17bA	848.33aD
YB42-17	368.95cB	574.45bA	740.43aC	485.90cB	687.10bA	900.87aC
BRS Tropical	353.15cB	550.85bA	777.98aC	474.95cB	670.32bB	922.25aC
YB42-03	349.65cB	492.70bB	725.08aC	469.13cB	621.00bB	857.03aD
BRS Princesa	336.60cB	568.93bA	823.07aB	492.12cB	740.20bA	967.37aB
Maçã	368.85cB	530.87bB	757.25aC	475.50cB	623.53bB	854.50aD
YB42-47	347.65cB	506.27bB	749.37aC	470.45cB	635.07bB	850.55aD
VC (%)	6.52			5.32		

Means followed by equal letters, lowercase in rows, do not differ from each other, by the Tukey test ($p < 0.05$). Means followed by equal letters, upper case in columns, belong to the same group by the Scott-Knott criterion ($p < 0.05$).

TABLE 5 - Number of days between flowering and harvest of banana cultivars in three production cycles. Guanambi-BA, 2010-2013.

Period between Flowering and Harvesting (days)		
1st Cycle	2nd Cycle	3rd Cycle
134.0 A	124.6 B	136.0 A
VC (%)	20.06	

Means followed by equal letters, upper case in rows, do not differ from each other, by the Tukey test ($p < 0.05$).

TABLE 6 - Number of days between flowering and harvesting of banana cultivars in three production cycles. Guanambi-BA, 2010-2013.

Maravilha	124.9 B
BRS FHIA-18	139.6 A
BRS Platina	143.7 A
FHIA-18	132.9 A
Prata-Anã	140.1 A
JV42-135	122.9 B
Garantida	139.1 A
Japira	146.8 A
PV79-34	141.8 A
Pacovan-Ken	138.0 A
Preciosa	146.6 A
Pacovan	160.6 A
Calipso	118.7 B
Bucaneiro	129.4 B
FHIA-23	121.7 B
FHIA-17	117.0 B
Grande Naine	131.9 B
Caipira	123.5 B
YB42-17	134.7 A
BRS Tropical	126.8 B
YB42-03	127.3 B
BRS Princesa	129.7 B
Maçã	101.9 B
YB42-47	117.5 B
VC (%)	20.06

Means followed by equal letters, upper case in columns, belong to the same group, by the Scott-Knott criterion ($p < 0.05$).

CONCLUSIONS

'JV42-235', 'Japira' and 'Pacovan-Ken' cultivars are larger in size, and 'Grande Naine' is smaller. 'Prata-Anã' cultivar has higher number of leaves at harvest and leaf area index similar to the others. 'BRS Platina' cultivar is the earliest in flowering and harvesting.

'Maravilha', 'BRS Platina', 'FHIA-23', 'BRS Tropical' and 'BRS Princesa' cultivars showed greater potential for use by farmers.

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