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Performance of sweetpotato cultivars and elite genotypes in subtropical southern Brazil

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ABSTRACT

The average yield and quality of sweetpotato in Brazil are below the crop potential due to several traits that can be improved by plant breeding. This study aimed to evaluate the performance of sweet potato advanced clones with potential to be released as new cultivars, recommend cultivars with better attributes for grower's needs at the subtropical region of Brazil or to be used as parents in breeding programs. The genotypes MD1604002, MD1611010, MD1609023, MD1609024, MD1609026, and MD1610036 and cultivars Brazlândia Roxa, Beauregard, BRS Cuia, BRS Amélia, and BRS Rubissol, were evaluated during two seasons 2020/2021 and 2021/2022, in Canoinhas-SC. The experiments were conducted in complete randomized blocks design with four replications where plots were composed of three rows with 15 plants each, spaced 0.75 m apart with 0.35 m between plants. Storage roots were harvested 180 days after planting and evaluated for yield, appearance, insect damage, and shape characteristics. 'BRS Rubissol', the genotype MD1610036, with higher root yield, storage roots shape, appearance, and less susceptible to insect damage, and MD1609024, with a good root yield, similar or superior to cultivars Brazlândia Roxa, Beauregard, and BRS Amélia, stood out, and have potential to be cultivated in this region. 'Brazlândia Roxa' and genotype MD1611010 are potential sources of resistance genes to insect damage, which is one of the biggest challenges in sweetpotato production in Brazil.

Keywords: *Ipomoea batatas*, yield, appearance, insect damage, storage root shape.

RESUMO

Desempenho de genótipos e cultivares de batata-doce no subtropical sul do Brasil

A produtividade média e a qualidade da batata-doce no Brasil estão abaixo do potencial da cultura, devido, dentre outros fatores, a caracteres que podem ser melhorados pelo melhoramento genético de plantas. Este trabalho teve como objetivo avaliar o desempenho de clones avançados de batata-doce com potencial para serem lançados como novas cultivares, e também recomendar cultivares com melhores características para produtores da região subtropical do Brasil, ou para serem utilizadas como genitores em programas de melhoramento. Os genótipos de batata-doce MD1604002, MD1611010, MD1609023, MD1609024, MD1609026 e MD1610036 e as cultivares Brazlândia Roxa, Beauregard, BRS Cuia, BRS Amélia e BRS Rubissol, foram avaliados durante duas safras 2020/2021 e 2021/2022, em Canoinhas-SC. Os experimentos foram conduzidos em delineamento de blocos completos casualizados com quatro repetições de parcelas compostas por três linhas com 15 plantas cada, espaçadas 0.75 m com 0.35 m entre plantas. As raízes foram colhidas 180 dias após o plantio e avaliadas quanto ao rendimento, aparência, danos causados por insetos e características de formato. Destacam-se 'BRS Rubissol' e o genótipo MD1610036 com elevado rendimento, formato, a aparência de raízes, e menos suscetíveis a danos por insetos, além de MD1609024, com rendimento de raízes similar ou superior às cultivares Brazlândia Roxa, Beauregard e BRS Amélia, se destacaram e apresentam potencial para serem cultivados nesta região. 'Brazlândia Roxa' e o genótipo MD1611010 são potenciais fontes de genes de resistência a danos causados por insetos, que é um dos maiores desafios na produção de batata-doce no Brasil.

Palavras-chave: *Ipomoea batatas*, produtividade, aparência, danos por insetos, formato de raízes.

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Sweetpotato (*Ipomoea batatas*) is one of the most important vegetables in Brazil and its social and economic significance can be attributed mainly to the rusticity, climatic adaptation, and high production capacity (Amaro *et al*., 2019). The country's production reached the volume of 848 K tons in a cultivated area of 60 K hectares (IBGE, 2021).

Sweetpotato land acreage increased in the last years, unlike the yield, which has maintained an average of ≈14 t/ha (IBGE, 2021), a low value compared to the crop potential that can reach from 50 to ≥ 60 t/ha in 4 to 5 months cycle (Melo *et al*., 2020a). Several reasons may be attributed to this circumstance, but the widespread use of obsolete production techniques, low adoption of inputs, and the use of old/unimproved and uncertified propagating material are considered the main factors (Amaro *et al*., 2019; Melo *et al*., 2020a; Mello *et al*., 2022).

On the other hand, the production volume and consumption increased in Brazil since 2012, after a long period of stagnation (IBGE, 2021), probably due to the encouragement of healthy eating and the recognition of health-related benefits. Sweetpotato roots are a source of energy due to their high starch content, as well as a significant content of nutrients and bioactive compounds, such as carotenoids, especially β-carotene (Provitamin A), anthocyanins, flavonoids, and other phenolic compounds (Frond *et al*., 2019). These phytochemicals play an important role in human health and disease prevention due to their antioxidant activity (Kibe *et al*., 2017; Alam, 2021), and also for the industrialization of derivative products, as a source of high-quality/resistant starch, with properties of low digestion (Kwon *et al*., 2019), and for gluten-restricted diets.

Brazilian market roots commonly present a bad appearance, with growth cracks, veins, bruising and insect damage, which harm quality and acceptance by the consumers. Many of them are related to traits with genetic control and can be improved by plant breeding, like insect resistance (Wadl *et al*., 2022).

The insect resistance has a major importance for crop management because chemical pesticides are not highly effective in controlling insects since roots develop underground (Kyereko *et al*., 2019). Therefore, their control should be focused on cultural management and genetic resistance (Kyereko *et al*., 2019; Wadl *et al*., 2022).

Shape and weight preferences vary noticeably according to the consumer's profile (Mello *et al*., 2022), but the general preference is for fusiform roots of a 3/1 length/diameter ratio (Melo *et al*., 2020b). Root weights between 150 and 450 g receive better classification and prices in the wholesale market. Moreover, those above 450 g have a better acceptance compared with smaller ones, lower than 150 g (CEAGESP, 2014).

Sweetpotato is a major crop in the southern states of Brazil (IBGE, 2021). The climate of this region has some peculiarities including no dry season, cool summers and frequent frosts from June through August. Therefore, it is essential to evaluate advanced genotypes and cultivars under this unique environment conditions.This study aimed to evaluate the performance of sweet potato advanced clones with potential to be released as new cultivars, and also to recommend cultivars with better attributes for growers needs at the subtropical region of Brazil or to be used as parents in breeding programs.

MATERIAL AND METHODS

Two experiments were held at Canoinhas, Santa Catarina state, Brazil (26°10'S, 50º23'W, 839 m altitude) in a Dystrophic Red Latosol (Santos *et al*., 2014). Planting dates were November 24, 2020 (Year 1), and November 03, 2021 (Year 2). Monthly air temperature and precipitation data were obtained from a local weather station (CIRAM-EPAGRI, 2022).

Six sweetpotato advanced clones from Embrapa's breeding program and five cultivars were evaluated (Table 1) in a complete randomized blocks design with four replications, where plots were composed of three rows with 15 plants each, spaced 0.75 m apart with 0.35 m between plants. About the cultivars, 'Brazlândia Roxa' is a good source of resistance to insect damage, 'Beauregard' has a good root appearance and high root yield, and 'BRS Cuia', 'BRS Amélia' and 'BRS Rubissol' were developed in the south Brazil, having potential to be adaptated to this region.

Pre-planting fertilization was carried out with phosphorus (50 kg/ha P_2O_5) and potassium (120 kg/ha K_2O) in both experiments. Slips were transplanted 3 inches deep with 4 planting nodes underground, and 2 to 3 nodes above the ground. Weed control by hand-hoeing and topdress N fertilization (50 kg/ha) were performed 30 days after planting (DAP).

About 180 DAP, for both experiments, the central row of each plot was harvested and roots were evaluated for the following storage root yield components: 1) number of marketable roots (NMR); 2) marketable roots mass [MRM, (t/ha)]; 3) number of non-marketable roots (NNMR); 4) non-marketable roots mass [MNRM, (t/ha)]; 5) total number of roots (TNR); 6) total mass of roots [TMR (t/ha)]; 7) average root mass [ARM (g)]; 8) average marketable root mass [AMRM (g)]. Marketable roots were classified according to storage root appearance scores ranging from 4 to 5 and insect damage scores from 1 to 3, and weighing between 150 and 1.500 g (Melo *et al*., 2020b).

The storage roots appearance (RA) was evaluated using visual index scores corresponding to 1) out of all standards, very irregular shape, large veins, growth cracks, and other means; 2) very non-uniform, presence of large veins and growth cracks, and other means; 3) non-uniform, small veins, growth cracks, and other means; 4) uniform, eventual presence of veins or growth cracks, and other means; and 5) regular fusiform without veins, growth cracks, and other means (Andrade Júnior *et al*., 2012).

After sampling 10 marketable roots at random per plot, the same were evaluated for insects damage (ID) using an index score, as follows: 1) free of insect damage; 2) little damage; 3) few marketable roots damaged; 4) most of the marketable roots damaged; and 5) roots unacceptable for both human and animal consumption (Andrade Júnior *et al*., 2012). The roots also were evaluated about the diameter (cm) and length (cm).

Data were tested for normal distribution by Lilliefors test and submitted to individual and joint analysis of variance on both years of experiments, and cluster means were compared by Scott-Knott grouping test at 5%. Counting and grading data were transformed by square root of the values added to 0.5. All statistical analyses were performed using Genes Software (Cruz, 2013).

RESULTS AND DISCUSSION

The analysis of variance showed that there was an interaction between the years and genotypes for almost all traits, except for average of marketable root mass. There were differences among genotypes for almost all the evaluated traits, except for the mass of non-marketable roots in the second year. The coefficient of variation (CV) values were considered low for most of the evaluated traits, except for the number and mass of non-marketable roots in both years, and the insect damage in the first year (Tables 2 and 3). Therefore, in the second year, better environmental conditions were observed to accurately evaluate this trait (insect damage) than in the first year. About root traits, the classification of marketable and non-marketable roots depends more than only on their weight, with higher CV values considered common for this variable (Câmara *et al*., 2013; Otoboni *et al*., 2020; Cajango *et al*., 2021). The genotypic coefficient of determination, as a measurement of selection accuracy, in general was higher for most of the characters, except for mass of nonmarketable roots in the second year (56%). This fact indicates a selection accuracy varying from 76 to 97% for the other characters, being expected a great probability of success in the selection of the best genotypes.

Temperatures and precipitation data provided an assessment of the weather patterns for Canoinhas-SC during both trials. Overall, the weather conditions were very similar and within the normal for the season in the region. In the first year, higher precipitation means were registered within November and March (total of 766.4 mm, 92% of the period), except for April which was a month of drought (4.6 mm), demanding complementary irrigation, once a week, only in this month. In the second year, the precipitation was lower but well distributed during the whole period, with a total volume of 547.4 mm. Average maximum and minimum temperature values were 30.32°C and 8.65°C in Year 1, 33.00°C and 10.00°C in Year 2, respectively.

In Year 1, the cultivar BRS Cuia showed the highest mass of marketable roots (84.23 t/ha) followed by BRS Rubissol (62.82 t/ha) and the genotype MD1610036 (52.45 t/ha) (Table 2). The genotype MD1609024 with (44.86 t/ha) also had a good root yield, similar to the cultivars Beauregard and BRS Amélia. In Year 2, ‘BRS Cuia’ also had the highest mass of marketable roots (84.00 t/ha), as well as cultivar Brazlândia Roxa (93.33 t/ha) and genotype MD1609024 (73.33 t/ha). The genotype MD1610036 also had a good root yield (53.33 t/ha), grouped with genotypes MD1604002, MD1609023, as well as the cultivars BRS Amélia and BRS Rubissol. ‘Beauregard’, genotypes MD1611010 and MD1609026 presented the lowest root yield in both experiments.

Steffler *et al*. (2022) evaluated the yield of some of these cultivars in Bom Progresso, in the neighboring state of Rio Grande do Sul, with 53.33 t/ha for BRS Cuia, as well, as a very similar result for BRS Amélia (48.61 t/ha), but a lesser value for BRS Rubissol (46.20 t/ha). Senff *et al*. (2021) evaluated the cultivar BRS Rubissol in Curitibanos, a municipality also located in Santa Catarina state, confirming its yield potential above 40 t/ha (48.26 t/ha).

The mean mass of marketable roots, considering both experiments (48.38 t/ha), is equivalent to or higher than that obtained in different studies held in Brazil (Amaro *et al*., 2019; Melo *et al*., 2020a; Mello *et al*., 2022; Steffler *et al*., 2022), and much higher than the average country yield (14.51 t/ha) (IBGE, 2021), indicating that the experimental and environmental conditions were suitable for optimum sweetpotato yield.

In Year 1, ‘BRS Cuia’ had the highest marketable root number; and in Year 2 were ‘Brazlândia Roxa’ and genotype MD1609024 (Table 2). Also considering both experiments, cultivars BRS Cuia, BRS Amélia, and BRS Rubissol, produced roots with a higher average mass. Genotypes MD1609024 and MD1610036, which stood out for marketable root production, also had average root mass equivalent to ‘Brazlândia Roxa’ in both experiments. In general, all genotypes produced

Table 1. Skin and flesh colors, and origin of advanced sweetpotato clones and cultivars evaluated. Canoinhas, Embrapa, 2020-2021.

Genotypes/Cultivars	Skin color	Flesh color	Origin
MD1604002	Cream	Yellow/cream	2016 - polycross nursery
MD1611010	Purple	Orange	2016 - polycross nursery
MD1609023	Purple	Cream	2016 - polycross nursery
MD1609024	Purple	Orange	2016 - polycross nursery
MD1609026	Purple	Yellow/Orange	2016 - polycross nursery
MD16100036	Purple	Orange	2016 - polycross nursery
‘Brazlândia Roxa’	Purple	Cream	Embrapa
‘Beauregard’	Orange/Copper	Orange	Louisiana State University
‘BRS Cuia’	Cream	Cream	Embrapa
‘BRS Amélia’	Light pink	Yellow/Orange	Embrapa
‘BRS Rubissol’	Light purple	Cream	Embrapa

Table 2. Root yield traits of sweetpotato genotypes and cultivars evaluated in Canoinhas-SC: 2020/2021 (Year 1) and 2021/2022 (Year 2). Canoinhas, Embrapa, 2020-2021.

Genotype	Number of marketable roots (ha/10²)		Mass of marketable roots (t/ha)		Number of nonmarketable roots (ha/10²)	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
MD1604002	60.91 dB	120.73 bA	20.30 dB	51.10 bA	97.72 cB	160.73 aA
MD1611010	52.03 dA	42.23 bA	31.95 dA	20.38 cA	63.45 dB	187.40 aA
MD1609023	71.70 cB	128.15 bA	31.41 dB	55.20 bA	105.97 cA	128.88 aA
MD1609024	89.47 cB	187.43 aA	44.86 cB	73.33 aA	254.44 aA	104.43 bB
MD1609026	84.39 cA	82.98 bA	29.35 dA	27.78 cA	134.52 cA	149.63 aA
MD1610036	118.66 bA	126.68 bA	52.45 bA	53.33 bA	92.01 cA	85.93 bA
Braz. Roxa	55.84 dB	221.50 aA	22.84 dB	93.33 aA	101.53 cB	197.05 aA
Beauregard	106.60 bA	101.48 bA	40.93 cA	34.18 cA	162.44 bA	75.55 bB
BRS Cuia	164.97 aA	145.93 bA	84.23 aA	84.00 aA	100.25 cA	148.15 aA
BRS Amélia	70.43 cA	85.93 bA	43.15 cA	48.55 bA	51.40 dA	71.10 bA
BRS Rubissol	131.34 bA	114.83 bA	62.82 bA	60.10 bA	36.80 dA	68.90 bA
Mean	91.49	123.47	42.21	54.56	109.14	125.25
CV (%)	18.81	18.94	26.11	19.53	29.96	20.99
H^2	0.94	0.79	0.91	0.86	0.92	0.85
	Mass of nonmarketable roots (t/ha)		Total number of roots (ha/10²)		Total mass of roots (t/ha)	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
MD1604002	7.46 cB	14.83 aA	158.63 dB	281.45 bA	27.76 dB	65.95 bA
MD1611010	4.95 cB	14.45 aA	115.48 eB	229.63 cA	36.90 dA	34.83 cA
MD1609023	7.52 cA	8.68 aA	177.67 cB	257.03 cA	38.93 dB	63.83 bA
MD1609024	18.75 aA	12.23 aA	343.91 aA	291.83 bA	63.61 bB	85.55 aA
MD1609026	9.52 cA	10.85 aA	218.91 cA	232.58 cA	38.87 dA	38.60 cA
MD1610036	7.58 cA	8.15 aA	210.66 cA	212.58 cA	60.03 bA	61.48 bA
Braz. Roxa	6.66 cB	20.75 aA	157.36 dB	418.53 bA	29.51 dB	114.08 aA
Beauregard	11.74 bA	4.43 aB	269.04 bA	177.05 cB	52.67 cA	38.58 cA
BRS Cuia	11.90 bA	15.70 aA	265.23 bA	294.08 bA	96.13 aA	99.70 aA
BRS Amélia	5.55 cA	9.10 aA	121.83 eA	157.00 cA	48.70 cA	57.63 bA
BRS Rubissol	4.76 cB	12.30 aA	168.15 dA	183.73 cA	67.58 bA	72.40 bA
Mean	8.76	11.95	200.62	248.71	50.97	66.50
CV (%)	29.80	31.08	16.12	16.17	21.34	25.68
H^2	0.90	0.56	0.95	0.82	0.93	0.87

Means followed by different lower case letters in the column and capital letters in the line, differ significantly by Scott & Knott at $p<0.05$. CV (%)= coefficient of variation. H^2= genotipic coefficient of determination.

roots, on average, ranging in weight from 150 to 450 g (Table 3), which are most profitable for growers (CEAGESP, 2017).

The cultivars BRS Rubissol, Beauregard, Brazlândia Roxa, and genotypes MD1610036, MD1611010, MD1609023, and MD1609024, obtained the highest average mass of marketable roots values, ranging from 491.36 to 596.97 g, as for the other genotypes, marketable roots weigh ranged from 393.82 g to 460.42 g (Table 3). About root length, in the first year of the experiment, two groups of genotypes were formed, and in the second year, three groups. Except for genotype MD1610036, and cultivars Beauregard and BRS Cuia, the others grouped among the ones with higher root length considering both experiments.

Concerning root diameter, 'BRS Amélia' had the highest value in both experiments, and 'BRS Rubissol', and

Table 3. Quality traits of sweetpotato genotypes and cultivars evaluated in Canoinhas-SC: 2020/2021 (Year 1) and 2021/2022 (Year 2). Canoinhas, Embrapa, 2020-2021.

Genotype	Average root mass (g)		Root length (cm)		Root diameter (cm)	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
MD1604002	179.50 bA	235.50 cA	23.75 aA	20.00 bB	7.00 cA	7.25 bA
MD1611010	317.14 aA	165.68 cB	22.50 aA	19.75 bB	9.50 aA	6.75 bB
MD1609023	220.41 bA	248.58 cA	22.00 aA	21.75 aA	7.00 cA	6.75 bA
MD1609024	185.82 bB	291.78 bA	20.00 bA	21.50 aA	8.50 bA	7.00 bB
MD1609026	179.92 bA	163.10 cA	16.50 bB	20.50 bA	6.50 cA	6.50 bA
MD1610036	279.46 bA	293.15 bA	18.75 bA	17.25 cA	8.50 bA	7.75 aA
Braz. Roxa	194.08 bA	272.88 bA	21.75 aB	24.50 aA	7.00 cA	7.75 aA
Beauregard	203.10 bA	205.08 cA	18.75 bA	16.50 cA	8.00 bA	8.00 aA
BRS Cuia	363.95 aA	352.85 aA	17.25 bA	15.75 cA	8.50 bA	9.00 aA
BRS Amélia	395.44 aA	362.90 aA	22.00 aA	19.75 bA	10.00 aA	8.75 aA
BRS Rubissol	404.59 aA	395.25 aA	24.50 aA	22.75 aA	7.00 cA	7.25 bA
Mean	265.76	270.77	20.70	20.00	7.95	7.52
CV (%)	18.74	17.03	9.40	8.90	8.97	8.40
H^2	0.92	0.85	0.86	0.92	0.90	0.83

	Root appearance		Insect damage		Average marketable root mass (g)
	Year 1	Year 2	Year 1	Year 2	Year 1 and Year 2
MD1604002	4.50 aA	3.50 bB	1.00 cB	3.00 bA	410.65 b
MD1611010	2.50 cB	3.25 bA	1.00 cA	1.25 cA	548.56 a
MD1609023	4.75 aA	4.75 aA	2.00 bA	1.50 cA	572.11 a
MD1609024	3.25 bB	4.75 aA	1.75 bA	2.00 cA	596.87 a
MD1609026	2.25 cB	3.50 bA	3.50 aA	3.50 bA	460.42 b
MD1610036	4.25 aA	4.50 aA	1.25 cB	2.75 bA	500.74 a
Braz. Roxa	2.25 cB	4.75 aA	1.00 cA	1.25 cA	518.70 a
Beauregard	4.50 aA	4.75 aA	2.00 bB	4.75 aA	491.36 a
BRS Cuia	4.00 aA	2.50 cB	1.00 cB	3.50 bA	393.82 b
BRS Amélia	1.00 dB	2.25 cA	1.50 bB	4.50 aA	431.95 b
BRS Rubissol	5.00 aA	4.00 aB	1.00 cB	3.00 bA	518.70 a
Mean	3.48	3.86	1.55	2.82	494.85
CV (%)	13.20	5.14	40.38	7.06	13.83
H^2	0.97	0.93	0.83	0.96	0.76

Means followed by different lower case letters in the column and capital letters in the line, differ significantly by Scott and Knott at $p<0.05$. CV (%): coefficient of variation. H^2: genotipic coefficient of determination.

genotypes MD1609026, MD1609023, and MD1604002 the smallest in both experiments. The higher diameter of 'BRS Amélia' and smaller diameter of 'BRS Rubissol' are in accordance with Senff *et al*. (2021).

For the ratio between root length and diameter, on the average of the two experiments, 'BRS Cuia' presented roots with a smaller value, 1.88/1, with rounder storage roots, considered distant to the consumer's preference of a fusiform shape with a 3/1 length/diameter ratio (Mello *et al*., 2022). Cultivars Beauregard and BRS Amélia presented similar ratio values, close to 2.20/1. As for 'Brazlândia Roxa' and 'BRS Rubissol', their ratio values were close to 3.20/1. MD1610036 was similar to 'BRS Amélia' and 'Beauregard' (2.22/1). The genotypes MD1604002 (3.07/1) and MD1609023 (3.18/1) were similar to 'Brazlândia Roxa' (3.13/1) and 'BRS Rubissol' (3.32/1). MD1611010 (2.60/1), MD1609024 (2.68/1), and MD1609026 (2.85/1) demonstrated intermediate values.

Regarding the roots appearance, which is considered to be the most influential attribute taken into account during the purchase decision-making process (Leksrisompong *et al*., 2012), 'Beauregard', 'BRS Rubissol', and genotypes MD1604002, MD1609023, MD1609024, and MD1610036, were grouped among the two groups with the highest scores in both experiments. 'BRS Amélia', in general, presented roots with bad appearance.

The major pest species responsible for direct damages to sweetpotato roots in Brazil are *Euscepes postfasciatus*, *Diabrotica speciosa*, *Diabrotica bivittula*, *Sternocolaspis quatuordecimcostata* and *Conoderus* spp. (Melo *et al*., 2020b). Because chemical pesticides are not highly effective for controlling these pest species, since they develop in the soil and are protected in the roots, their management should be focused on the cultural control and plant resistance (Massaroto *et al*., 2014). 'Beauregard', 'BRS Amélia', and genotype MD1609026 were less resistant to insect damage in both experiments. 'Brazlândia Roxa' and genotype MD1611010 were the most resistant. The others, in general, were intermediate or not stable. The susceptibility of the cultivar 'Beauregard' is also attested by Jackson *et al*. (2013), and Melo *et al*. (2020a). Cultivar Brazlândia Roxa is considered insect-resistant (Barreto *et al*., 2011; Andrade Junior *et al*., 2012; Massaroto *et al*., 2014; Amaro *et al*., 2019, Melo *et al*., 2020a).

Among the most demanded traits in sweetpotato cultivars, 'BRS Rubissol' and genotype MD1610036 stood out, with higher root yield, storage roots shape, appearance, and less susceptible to insect damage. The genotype MD1609024 had a good root yield, similar or superior to cultivars Brazlândia Roxa, Beauregard, and BRS Amélia. These genotypes have highest potential to be cultivated in this region. 'Brazlândia Roxa' was not stable for root yield and appearance, but together with genotype MD1611010 is a good source of resistance to insect damage, which is one of the biggest challenges in sweetpotato production in Brazil. Thus, these five best genotypes also have the potential to be used in breeding programs as sources of genes for these respective characters and for adaptation to this region or regions with similar environmental characteristics. The genotype MD1609026 is not productive and is susceptible to insect damage. Genotypes MD1604002 and MD1609023 had an intermediate performance for the evaluated traits and have lower potential to become new cultivars, or to be used in breeding programs aiming adaptation to this or to similar environments.

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