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Evaluation of the Agronomic Performances of Eight Varieties of Orange-Fleshed Sweet Potato in Central Côte d'Ivoire

Konan Evrard Brice Dibi*, Niambet Jean-Michel Koffi, Adou Emmanuel Ehounou, Brice Sidoine Essis, Kouassi Thiègba Kouamé, Kinampinan Adelphe Hala, Adjo Christiane Koffi, Guy Fernand Yao

Centre National de Recherche Agronomique (CNRA), Bouaké, Côte d'Ivoire
Email:*konan.dibi@cnra.ci

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Abstract

Sweet potato is one of the most important crops in Côte d'Ivoire. However, some constraints related to climate change limit its production. This study evaluated the agronomic and technological performances of eight varieties of orange-fleshed of sweet potato (*Ipomoea batatas* (L.) to identify the most promising ones. The results show three groups of varieties with different agronomic performances. Group 1 composed of Irene and Vita is characterized by low production of small and large tuberous roots, low number of productive plants and low yield. Group 2 consisting mainly of Kabode is characterized by high production and weight of large tuberous roots as well as high yield. Group 3, composed of Tacha-2 Ininda, Ejumula Gloria, TIB-440060, CIP-199062-1, Bela bela is characterized by high production of small and large tuberous roots, high number of productive plants and average yield. The TIB-440060 variety has a recovery rate of 100%. The Irene, Kabode, Vita, Kabode varieties were resistant to viral and fungal diseases. In terms of technological quality, the TIB-440060 and CIP-199062-1 varieties have the best organoleptic qualities. Given the agronomic performances of the Kabode, TIB-440060 and CIP-199062-1 varieties, could be selected as the elites varieties and distributed to producers.

Keywords

Sweet Potato, Agronomic and Technological Performances, Climate Change, Côte d'Ivoire

1. Introduction

Sweet potato *Ipomoea batatas* (L.) Lam., is one of the most important root crops in sub-Saharan Africa. It is widely cultivated as a staple food in several African countries [1]. This crop is becoming more and more economically important due to several advantages, including the reduction of blindness, the improvement of the nutritional status and well-being of rural populations and its adaptation to relatively poor soils and irregular rainfall [2]. In the current context of climate change with the scarcity of rainfall, sweet potatoes with these many advantages could contribute to guaranteeing sustainable food security [1] [3].

In Côte d'Ivoire, sweet potatoes are grown throughout the country [4]. Its roots and leaves are consumed and prized by the Ivorian population. The quality of the varieties depends on the color of the flesh (orange flesh is rich in provitamin A) [5]. In Côte d'Ivoire, sweet potatoes are increasingly consumed in pounded form (foutou) mixed with cassava which gives them their tender and stretchable texture. This form of consumption is widely observed among certain peoples in the center and north of the country [5]. Indeed, 58.2% of the varieties of sweet potatoes consumed in Côte d'Ivoire have white flesh [5]. However, only orange-fleshed sweet potatoes are able to combat vitamin A deficiencies. In addition, they have enormous potential in terms of organoleptic and nutritional quality, particularly in Phosphorus, Calcium, Magnesium, Potassium, zinc, iron and sodium [7]; Satheesh Neela, Solomon W. Fanta, 2019 [5].

Thus, for more than a decade, research through the National Center for Agronomic Research (CNRA) has introduced new varieties of orange-fleshed sweet potatoes to producers in most of the country's major producing regions. Despite this, sweet potato production in the center of the country is low due to the lack of varieties adapted to this agroecological zone. Also, the lack of quality orange-fleshed sweet potato varieties remains a concern for producers, particularly those in the center of the country. Thus, to meet the demand for quality varieties adapted to the Central production area, eight varieties of orange-fleshed sweet potato from the CNRA genetic resources collection were selected for an agronomic evaluation. The aim is to determine the agronomic performance of these eight varieties of orange-fleshed sweet potato in order to select the best performing ones. More specifically, the aim is to identify promising varieties that are resistant to climatic hazards and pests, and have good yields with good organoleptic qualities.

2. Material and Methods

2.1. Plant Material

Table 1. Morphological characteristics of eight selected orange-fleshed sweet potato varieties.

Varieties	Leaf	Central lobation	Number of lobes	Skin color	Colour of flesh	Origin
Irene	Almost split	Linear	7	Pink	Deep orange	Mozambique
Ejumula Gloria	Lobed	Semielliptical	3	Orange	Deep orange	Mozambique
Kabode	Lobed	lanceolate	7	Purple-red	Deep orange	Ouganda

Continued

Tacha-2 Ininda	Lobed	Oblanceolate	5	Orange	Pale orange	Mozambique
Vita	Almost split	Linear	7	Purple-red	Intermediate orange	Ouganda
TIB-440060	Lobed	lanceolate	5	Orange	Pale orange	Burkina Faso
CIP-199062-1	Lobed	lanceolate	5	Orange	Orange	Burkina Faso
Bela bela	Lobed	lanceolate	5	creamy	Orange	Mozambique

Cuttings of eight sweet potato varieties from the National Agronomic Research Center (CNRA) in Bouaké were used as plant material in this study. The names of the different varieties and their characteristics are given in Table 1.

2.2. Methods

2.2.1. Study Site

This study was conducted at the food crop research station (SRCV) of the National Agronomic Research Center (CNRA) in Bouaké. Bouaké is in the center of the Côte d'Ivoire. The geographical coordinates of the site are 7˚46' north latitude, 5˚06' west longitude and 376 m above sea level. The climate in the study area is humid tropical with four seasons: a long dry season (November to February), a long rainy season (March to June), a short dry season (July to August) and a short rainy season (September to October). These periods have become less marked in recent years [8]. The vegetation consists of wooded savannah with several Poaceae species [10] and soils are ferrallitic with a sandy-clay texture [9]. The average annual rainfall is 1200 mm with an average annual temperature of 25.73˚C [11].

2.2.2. Rainfall Conditions

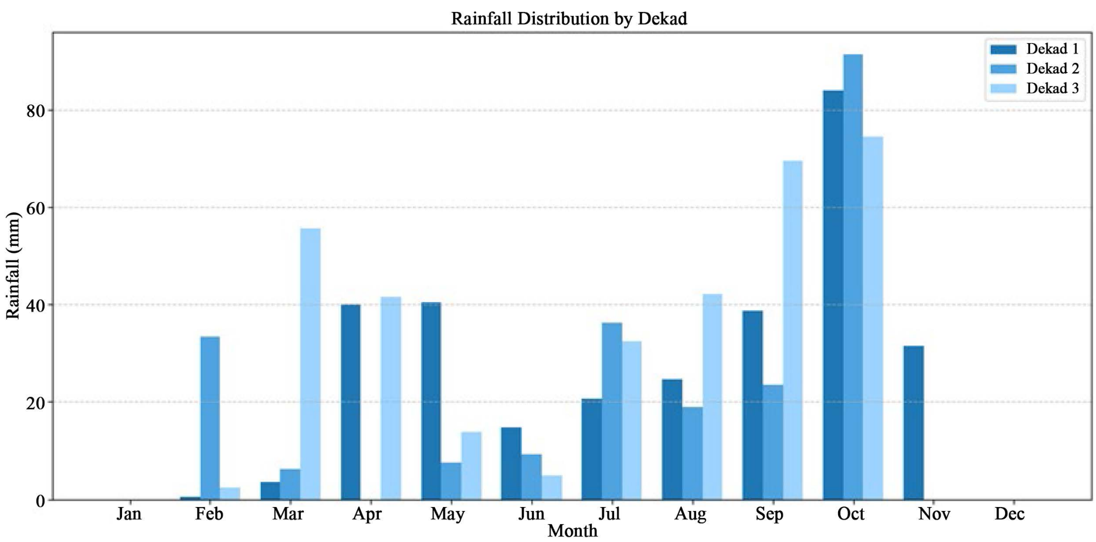


Figure 1. Rainfall distribution by dekad.

Since the trial was conducted under pure rainfed conditions, the meteorological parameter taken into account in this study was rainfall. The rainfall conditions at the ten-day and monthly time steps are presented graphically using diagrams, to highlight the variations in rainfall during the trial. During this period, the total cumulative rainfall recorded amounted to 397.5 mm. The ten-day distribution of this total varied, ranging from 7.6 mm (during the second ten-day period of May) to 69.6 mm during the third ten-day period of September (**Figure 1**).

2.2.3. Physico-Chemical Characterization of the Test Plot

The plot used for setting up the trial was characterized in order to determine the physicochemical parameters of the soil before and after setting up the trial. A sample of this fallow soil of more than 10 years was taken (1 kg) in the 0 - 20 cm layer for laboratory analyses, which focused on:

- determination of the granulometric fractions (clay, fine silt, coarse silt, fine sand and coarse sand) of the soil using the Robinson pipette method ([12]-[15]);
- determination of the apparent density using the [16] method;
- determination of the pH value of the soil by the electrometric method "glass electrode", in a soil/water ratio of 1/2.5 [15];
- la détermination de la teneur du sol en carbone organique (C) par la méthode d'attaque sulfochromique à froid, après oxydation par le bichromate de potassium (K_2CrO_7) en milieu fortement acide (H_2SO_4) [17] [18];
- determination of soil total nitrogen (N) content by the Kjeldahl method **[19]** [20];
- determination of soil exchangeable cation (Ca, Mg and K) content and cation exchange capacity (CEC) by the normal ammonium acetate extraction method at pH 7; soil Ca and Mg content was determined by flame atomic absorption spectrophotometry, while soil K content was determined by flame emission spectrometry [14] [21]-[23];
- determination of the soil content of assimilable phosphorus by colorimetry after extraction with an alkaline solution of sodium bicarbonate by the Olsen-Dabin method [24]; the P dosage is then done by colorimetry at 600 nm [25];
- determination of the exchangeable aluminium content of the soil by titrimetry after extraction with potassium chloride (KCl) [26];
- determination of the free iron content of the soil by the method of [27];
- determination of the aluminium content of the soil by the method of [26];
- determination of the values of the degree of saturation of phosphorus (DSP) by the method of [28]-[30].

This step made it possible to specify the essential morphological and physico-chemical features as well as the typology of the soil concerned by the study, and to take stock of the fertility of the soil before conducting the experiment.

2.2.4. Experiment Design

The trial was conducted using a Fisher block design with three replicates. Variety is the only level of comparison considered. Blocks are composed of plot separated by 2 m. Each trial plot consists of twenty-four mounds spread over an area of 6 × 4 m with a spacing of 1.5 m. The spacing between mounds was 1 m/1 m, *i.e.* a density of 10,000 mounds per hectare. The experiment took place over an area of 1500 m^2.

2.2.5. Data Collection and Analysis

The data of the physicochemical parameters of the soil were the subject of descriptive analysis. This involved determining the average quantities of nutrients and organic elements available in the soil. To determine agronomic performance fourteen parameters were considered. These parameters covered the agronomic performance, health and organoleptic qualities of the eight sweet potato varieties (Table 2). The data collected were analyzed by a main component analysis (MCA), a hierarchical ascending classification (HCA), a discriminant factorial analysis (DFA) and a variance analysis (ANOVA). Multivariate analyses (MCA, HCA and DFA) were used to group the eight varieties according to their performance and to give the characteristics of each group. ANOVA was then used to compare the varieties according to sanitary and organoleptic parameters. These analyses were carried out using R software version 4.4.1 [11].

Table 2. List of parameters measured and observed for the analysis of agronomic performance, health and organoleptic qualities of the eight sweet potato varieties.

Parameters	Indication	Codes
Incidence of virus diseases	Number of diseased plants/number of Plants	IVD
Incidence of fungal diseases	Number of diseased plants/number of Plants	IFD
Number of small roots	Number of roots with a diameter of less than 4 cm	NSR
Number of large roots	Number of roots with a diameter greater than 4 cm	NLR
Weight of small roots	Weight of root with a diameter of less than 4 cm	WSR
Weight of large roots	Weight of root with a diameter greater than 4 cm	WLR
Average root weight	Total root weight/number of productive plants	ARW
Incidence of pests	Number of roots damaged/total number of roots	InP
Yield	Total root weight/surface area	Yie
Dry matter content	Fresh weight of root subtracted from water content	DMC
Number of productive plants	Number of plants that produced roots	NPP
Cooking ability	1-good 2-acceptable 3-not good	CoA
Taste of roots	1-good 2-acceptable 3-not good	TaR
Appearance of root flesh	1-good 2-acceptable 3-not good	ARF

3. Results

3.1. Physico-Chemical Parameters of the Test Plot

Table 3 shows the results of physicochemical analyses of the soil taken from the 0 - 20 cm layer and used for the experiment. It reveals that the soil is sandy-silty-clayey (sand 48%; silt 31% and clay 21%). The apparent density (Da), low (1.42 < 1.5 g/cm^3), indicates a good state of aeration and good porosity of the soil, and therefore subject to a good water storage capacity. The organic carbon (C) content is low (3.6 $g \cdot kg^{-1}$ < 40 $g \cdot kg^{-1}$) for an equally insufficient content (< 1 $g \cdot kg^{-1}$) of total nitrogen (N) determined at 0.2 $g \cdot kg^{-1}$ coupled with a high (18/1) C/N ratio (> 10/1). The contents of exchangeable cations Ca, Mg and K are, respectively, 5.5 $cmol \cdot kg^{-1}$ (> 2 $cmol \cdot kg^{-1}$), 3.9 $cmol \cdot kg^{-1}$ (> 0.20 $cmol \cdot kg^{-1}$) and 0.2 $cmol \cdot kg^{-1}$ (> 0.10 $cmol \cdot kg^{-1}$), with yet a very low CEC (4.68 $cmol \cdot kg^{-1}$) below the critical threshold (< 20 $cmol \cdot kg^{-1}$). The Ca/Mg (1.41 < 10) and K/CEC (0.043 < 0.05) ratios are low. However, the Mg/K ratio of 19.5 is high (>2). The strongly acidic pHH_2O (4.6) is coupled with an insufficient content of assimilable phosphorus (modified Olsen method) of 3 $mg \cdot kg^{-1}$ well below the threshold of 10 $mg \cdot kg^{-1}$). The soil is rich in free iron-Fe (25.5 $cmol \cdot kg^{-1}$) and exchangeable aluminum-Al (3.58 $cmol \cdot kg^{-1}$) characteristic of acid Ferralsol, while the degree of phosphorus saturation (DSP) of 33.31% is higher than 20% (critical value).

Table 3. Physicochemical characteristics of the soil at 0 - 20 cm depth before the experiment.

Characteristics of soil	Values
Clay ($g \cdot kg^{-1}$)	210
Silt ($g \cdot kg^{-1}$)	310
Sand ($g \cdot kg^{-1}$)	480
Da ($g \cdot cm^{-3}$)	1.42
pH H_2O	4.6
pH KCl	4,1
Δ pH	0.5
Organic carbon—C ($g \cdot kg^{-1}$)	3.6
Total nitrogen—N ($g \cdot kg^{-1}$)	0.2
C/N	18
CEC ($cmol \cdot kg^{-1}$)	4.68
Pa ($mg \cdot kg^{-1}$)	3
Ca ($cmol \cdot kg^{-1}$)	5.5
Mg ($cmol \cdot kg^{-1}$)	3.9
K ($cmol \cdot kg^{-1}$)	0,2
Ca/Mg	1.41
Mg/K	19.5
K/CEC	0.043
Free Fe ($cmol \cdot kg^{-1}$)	25.5
Exchangeable Al ($cmol \cdot kg^{-1}$)	3.58
DSP (%)	33.31

Da: Apparent density; CEC: Cation exchange capacity; DSP: Degree of phosphorus saturation.

3.2. Agronomic Performance of the Eight Sweet Potato Varieties

3.2.1. Structuring of the Eight Sweet Potato Varieties

Variation in the agronomic performance and structure of the eight sweet potato varieties was revealed by Multiple Correspondence Analysis (MCA). This analysis revealed six principal components, two of which had eigenvalues greater than 1 and were therefore retained for interpretation of the results. These two principal components expressed 88.49% of the total inertia (Table 4).

Table 4. Eigenvalues, correlations between agronomic parameters and the first two principal components.

	PC 1	PC 2
Eigenvalues	4.01	2.19
% of variance	57.26	31.23
% of cumulative variance	57.26	88.49
Number of small roots (NSR)	0.82	−0.47
Number of large roots (NLR)	0.85	0.49
Weight of small roots (WSR)	0.86	−0.45
Weight of large roots (WLR)	0.21	0.98
Yield (Yie)	0.72	0.68
Dry matter content (DMC)	0.64	−0.26
Number of productive plants (NPP)	0.95	−0.18

PC: principal component, Bold indicates the most significant correlations (|r| ≥ 0.7).

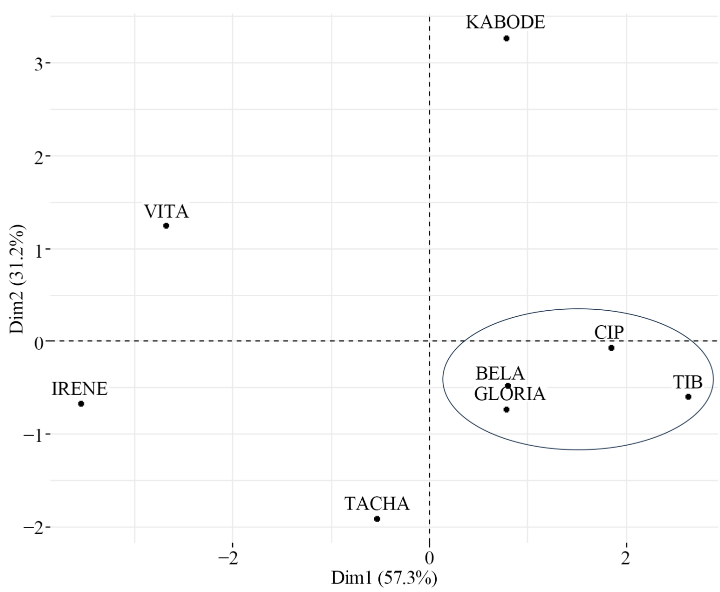
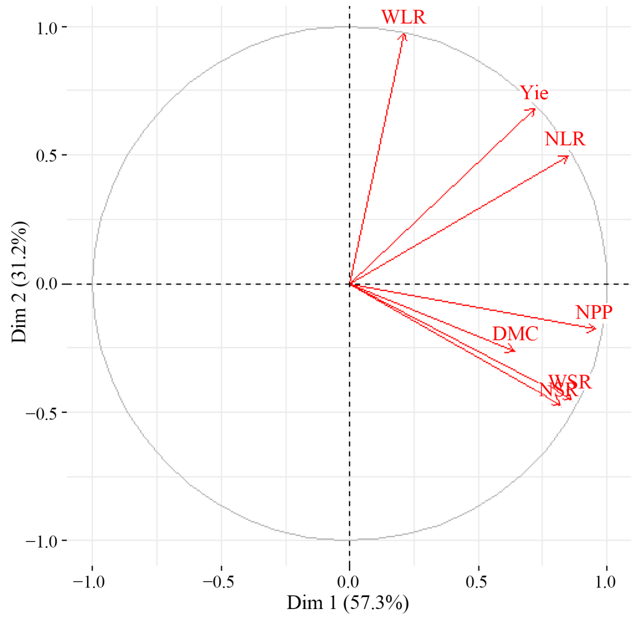


Figure 2. Structuring of the eight sweet potato varieties in the PCA factorial design.

Except for dry matter content (DMC), all the parameters are relevant (|r| > 0.7) in explaining the variation in agronomic performance of the eight sweet potato varieties. Only large root weight (WLR) was significantly correlated with PC 2. All other parameters were significantly correlated with PC 1. Projection of the sweet potato varieties in the plane shows that four of them (Ejumula Gloria, Bela bela, TIB-440060 and CIP-199062-1) form a group. On the other hand, the other four (Vita, Tacha-2 Ininda, Kabode and Irene) are distant from each other (**Figure 2**).

Based on the correlation circle between agronomic parameters and MCA principal components 1 and 2, the varieties Ejumula Gloria, Bela bela, TIB-440060 and CIP-199062-1 are characterized by a high number of small roots (NSR), productive plants (NPP) and a high weight of small roots (WSR). Kabode variety by a high weight of large root (WSR) and Tacha-2 Ininda by a low weight of large root (WSR). Irène variety is characterized by a low number of large roots (NLR) and a low yield (Yie). Finally, the Vita variety is characterized by a low number of small roots (NSR), a low number of productive plants (NPP) and a low small root weight (WSR) (**Figure 3**).



NLR: number of large roots, WSR: weight of small roots, DMC: dry matter content, NPP: number of productive plants, WLR: weight of large roots, NSR: number of small roots, Yie: Yield.

Figure 3. Structuring of the eight sweet potato varieties in the PCA factorial design.

3.2.2. Classification of Eight Sweet Potato Varieties and Class Discrimination Based on Agronomic Performance

Sweet potato varieties were grouped into three homogeneous clusters by Hierarchical Ascending Classification (HAC) based on the similarity of their agronomic performance. Cluster 1 is the Irène and Vita varieties. These two varieties have very similar agronomic performances. Similarly, Ejumula Gloria, Bela bela, TIB-440060, Tacha-2 Ininda and CIP-199062-1 varieties that make up Cluster 3 have similar agronomic performances. Kabode variety alone makes up Cluster 2. The projection of the three sweet potato variety clusters in the plane shows us that these clusters are quite distinct (**Figure 4**).

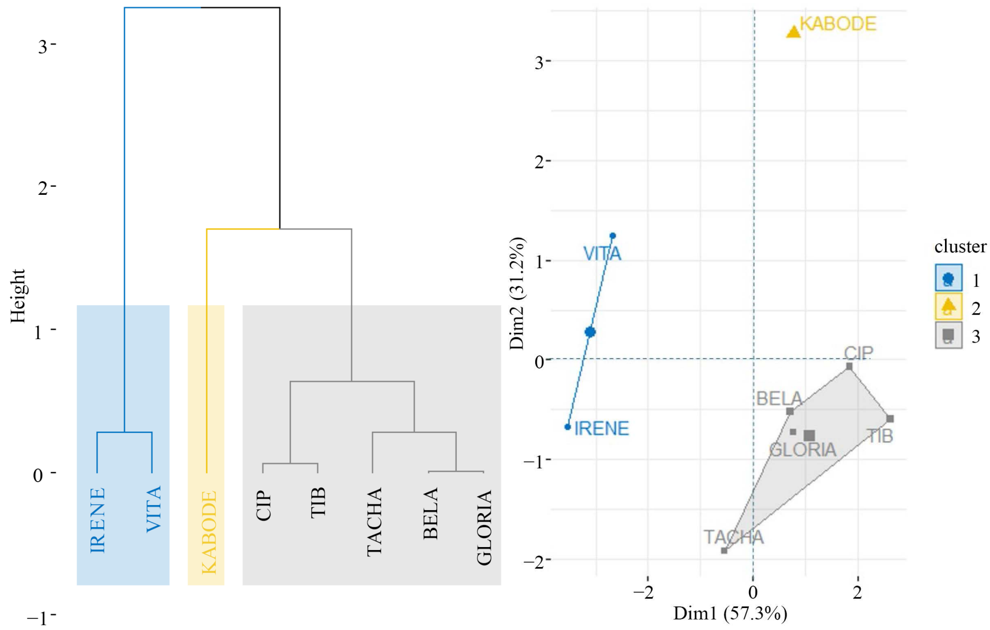


Figure 4. Classification of eight sweet potato varieties into homogeneous groups and projection into the plane.

Table 5. Agronomic performance of three sweet potato variety clusters.

Cluster	Agronomic parameter	Mean ± sd in category	Overall mean ± sd	p. value
Cluster 1 - Irène - Vita	NLR	42.17 ± 3.83	63.58 ± 16.49	*
	WSR (Kg)	4.50 ± 0.50	8.81 ± 3.31	*
	DMC	41.50 ± 0.50	44.40 ± 1.93	*
	NPP	52.17 ± 3.50	63.38 ± 7.44	*
Cluster 2 Kabode	WLR	31.67 ± 00	19.71 ± 5.41	*
Cluster 3 - Ejumula Gloria - Bela bela - TIB-440060 - Tacha-2 Ininda - CIP-199062-1	WSR (Kg)	11.10 ± 1.79	8.81 ± 3.31	*
	NSR	136.87 ± 32.6	104.92 ± 48.81	*
	NPP	68.20 ± 3.10	63.38 ± 7.44	*

Sd: standard deviation, *: p. value < 0,05, NLR: number of large roots, WSR: weight of small roots, DMC: dry matter content, NPP: number of productive plants, WLR: weight of large roots, NSR: number of small roots.

The main agronomic performance of the three sweet potato clusters is reported in Table 5. Cluster 1 consisting of varieties Irène and Vita is characterized by averages of number of large roots (NLR), weight of small roots (WSR), dry matter content (DMC) and number of productive plants (NPP) lower than the respective general averages. Kabode variety that constitutes Cluster 2 is characterized by an average of weight of large roots (WLR) well above the general average. Cluster 3, which is composed of the other five varieties, is characterized by the averages of weight of small roots (WSR), number of small roots (NSR) and number of productive plants (NPP) superiors to the respective general averages. The other agronomic parameters were not specific to any of the three groups. They are not relevant for determining the agronomic performance between the three groups of sweet potato varieties.

3.3. Health Status of the Eight Sweet Potato Varieties

The eight sweet potato varieties evaluated in this study varied in their response to the presence of viral and fungal diseases. Varieties, namely Vita, Bela bela, Kabode and Irène were the least sensitive with 0%, 0%, 0% and 1% incidence of virus diseases (IVD), respectively. The most sensitive were Tacha 2 Ininda (24%) and Ejumula Gloria (38.33%), followed by varieties TIB-440060 (12.33%) and CIP-199062-1 (12.67%). Ejumula is the least sensitive variety of the eight to fungal diseases (IFD). No difference was observed in the behavior of the eight varieties against pest attacks (InP) (**Table 6**).

Table 6. Health status of the eight sweet potato varieties.

Parameters	Irène	Ejumula Gloria	Kabode	Tacha-2 Ininda	Vita	TIB-440060	CIP-199062-1	Bela bela	p. value
IVD	1^{a}	38.33^{d}	0^{a}	24^{c}	0^{a}	12.33^{b}	12.67^{b}	0^{a}	***
IFD	1^{a}	13.33^{b}	0^{a}	5^{a}	0^{a}	4.66^{a}	3.33^{a}	0^{a}	*
InP	3	2.3	4.7	8	2	9.3	4.7	1.3	ns

IVD: incidence of virus diseases, IFD: incidence of fungal diseases, InP: incidence of pests, ns: not significant, *: p. value < 0.05, ***: p. value < 0.001.

3.4. Organoleptic Qualities of the Eight Sweet Potato Varieties

No differences were observed in the cooking ability of the roots (CoA) of eight sweet potato varieties. Overall, the roots of the eight sweet potato varieties have a good taste (TaR). However, Ejumula Gloria, Tacha-2 Ininda, TIB-440060, CIP-199062-1 and Bela bela are the tastiest. Irène and Kabode presented the best appearance of root flesh (ARF), followed by Ejumula Gloria, TIB-440060 and CIP-199062-1 (**Table 7**).

Table 7. Taste, cooking ability and appearance of roots of the eight sweet potato varieties.

Parameters	Irène	Ejumula Gloria	Kabode	Tacha-2 Ininda	Vita	TIB-440060	CIP-199062-1	Bela bela	p. value
CoA	1.22	1.11	1.44	1.33	1.33	1	1.11	1.22	ns
TaR	1.56^{ab}	1.11^{a}	2.11^{b}	2.11^{b}	1.67^{ab}	1.44^{a}	1.44^{a}	1.44^{a}	*
ARF	1.11^{a}	1.55^{ab}	1.22^{a}	2.22^{bc}	2.22^{bc}	1.33^{ab}	1.33^{ab}	2.55^{c}	*

CoA: cooking ability, TaR: taste of roots, ARF: appearance of root flesh, ns: not significant, *: p. value < 0.05.

4. Discussion

The results of the analysis did not reveal a significant difference between the high rework rates after planting the eight sweet potato varieties. This would be due to the potential for recovery of the varieties considered in our study. These results are in line with those of [31]. This author in a study conducted under Kabode pedoclimatic conditions revealed similar rates of recovery among five sweet potato genotypes.

Number of roots per plant varied by variety (1.57 to 3.7). The results obtained are close to those obtained in the 10 sweet potato varieties whose number of roots per plant varied from 1 to 4 in Bongor (Chad) and 3 to 5 in Ouagadougou (Burkina Faso) [32]. Our results are also similar to those of the 4 sweet potato varieties grown in western Kenya [31]. However, in eastern Congo two varieties of sweet potato (Yan Shul and White Delite), yielded a larger number of roots per plant (15.5 and 14) than that of our study [33] [34]. This large number obtained from these varieties grown in Congo can be related to soil type, environmental temperature and especially rainfall. Moreover, the development of the roots depends on the supply of assimilas, which depends on the photosynthetic efficiency and the effective leaf area of the plant. However, root initiation requires a minimum level of assimilation, because the rootization phase only begins when the plant has acquired a certain development of its vegetative apparatus [35].

Regarding agronomic parameters, there is a strong correlation between the different parameters and the eight sweet potato varieties. Thus, the weight of large roots best characterizes the Kabode variety while the number and weight of small tuberous roots, the number of productive plants, the number of large tuberous roots characterize Ejumula Gloria, Bela bela, TIB-440060 and CIP-199062-1, and Irene. Based on these results, three distinct groups of sweet potato varieties were identified with their agronomic performances. Cluster 1 Irene and Vita is characterized by low production of small and large tuberous roots, low number of productive plants and low yield. Cluster 2 consisting mainly of Kabode is characterized by high production and weight of large tuberous roots as well as high yield. Cluster 3, composed of Tacha-2 Ininda, Ejumula Gloria, TIB-440060, CIP-199062-1, Bela bela is characterized by high production of small and large tuberous roots, high number of productive plants and average yield. These differents groups show the agronomic variability that exists within the eight orange-fleshed sweet potato varieties.

Kabode's performance in terms of yield, dry matter, large tuberous roots could be explained by several physiological, soil or agroclimatic factors. Indeed, some authors including [36], have shown a correlation between yield and dry matter of above-ground biomass. According to these authors a leafy plant with vigorous stems very often has a high production of roots. In addition, [37] also thought that root formation is a function of the accumulation of Photosynth states, especially carbohydrates from the aerial part. [38] showed that sweet potato plants produce higher amounts in roots when subjected to a constant soil temperature of 30˚C, combined with an air temperature of 25˚C at night. In addition, soil compactness may also have a significant influence on yield [36]. This shows that the more foliage the sweet potato plant has, the more photosynthesis it accumulates necessary for root formation. Based on agronomic performance, Kabode variety would be a candidate variety for selection.

No significant difference was observed for the cooking capacity of orange-fleshed sweet potato varieties; which would mean that all varieties presented the same cooking. For the taste and appearance of the flesh, there is a significant difference between the varieties. These parameters varied from variety to variety. For taste, Ejumula Gloria, Tacha-2 Ininda, TIB-440060, CIP-199062-1 and Bela bela had the best tastes; while Irene and Kabode have a good appearance of the flesh of the tuberous roots, followed by the varieties Ejumula Gloria, TIB-440060 and CIP-199062-1. These two parameters are very importants and constitute consumer acceptance criteria according to [6]. In fact, the taste and appearance would therefore depend on certain characteristics or elements contained in each variety that would improve the flavor or appearance. Our results are similar to those of [39] and [40] who argue that the diversity of taste observed between varieties could be explained by the combination of different carbohydrate fractions to the total sugar contained in each sweet potato variety.

For the incidence of viruses and fungi, the results could be explained by the fact that some varieties exhibit resistance to viral and fungal diseases than others. The most sensitive varieties in our study are Tacha Ininda, Ejumula Gloria, TIB-440060 and CIP-199062-1. Our results partially corroborate those of [41]. In a study conducted in northern and northeastern Côte d'Ivoire, these authors observed susceptibility TIB-440060 to viral and fungal diseases of TIB-440060 and Tacha Ininda. It should be noted, however that these results are essentially based on visual observations. No laboratory tests have been carried out to confirm the resistance of these varieties to these pathogens.

5. Conclusion

Agronomic performance, health status and organoleptic qualities taken into account in our study, allowed us to compare the eight sweet potato varieties. The results obtained in this study showed three groups of varieties with very distinct agronomic characteristics. The Kabode variety of Group 2 of agronomic diversity presented the best agronomic performances in terms of weight and number of tuberous roots, dry matter rate and yield unlike other varieties. In addition, on the organoleptic and health level, it is a variety that presents very good organoleptic qualities and resistance to viral and fungal diseases. The varieties TIB-440060 and CIP-199062-1 are from Group 3 of agronomic diversity. They have lower yields than the Kabode variety, but have good organoleptic qualities and are tolerant to viral and fungal diseases. Given the agronomic, technological and nutritional performances, the Kabode, TIB-440060 et CIP-199062-1 varieties could be selected and distributed to producers in the Central region of the country.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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